RESEARCH ARTICLE

The impact of health behaviours development training on healthy lifestyle behaviours amongst adolescents with obesity risk: A school example in a city in western Turkey

Duygu Yesilfidan, Filiz Adana

Abstract

Objective: To determine the impact of health behaviours development training on healthy lifestyle.

Methods: This pre-experiment research was conducted at a junior high school governed by Aydin Provincial Directorate of National Education in Aydin, Turkey, from November 2014 to December 2015, and comprised students. All the students with obesity risk were included. Participants were asked to complete the questionnaire, and Healthy Lifestyle Behaviours Scale II.SPSS 18 was used for data analysis.

Results: Of the 1,042 students, 78(7.48%) were included in the study. Of them, 38(48.7%) were girls and 40(51.3%) were boys. The overall mean age was 11.77±0.92 years. It was found that healthy lifestyle behaviour improved after the training ($p<0.05$).

Conclusion: Adolescents assessed with the Healthy Lifestyle Behaviour Scale II had higher post-training scores.

Keywords: Obesity, Adolescent, Health, Teaching. (JPMA 67: 1698; 2017)

Introduction

Healthy living is a lifestyle based on the individual adopting behaviour aimed at maintaining, ensuring and developing well-being, while also helping to make the right decisions regarding their own health. Individuals need to take responsibility regarding healthy eating habits, getting adequate physical activity, effective communication and stress management in order to live a healthy life.[1,2]

Rapid growth, and physiological, emotional and social development and changes are the most important characteristics of adolescence. These factors can have an effect on eating habits and well-being. Behaviours like bad eating habits, inadequate physical activity, poor coping can not only affect mental activities like learning, understanding and comprehension, they can also trigger obesity and other medical problems.[2]

The problem affects many low- and middle-income countries on a global scale, particularly in urban environments. Between 1980 and 2014, global prevalence of obesity more than doubled.[3]

A review of international literature on studies conducted in different countries reveals the following: according to Gunter et al.'s[4] study carried out in the United States on students aged 5-12 years, 17.8% of girls and 20.8% of boys were found to be obese, whereas in Shih et al's[5] study carried out in Taiwan on students aged 11-12 years, the percentage was 15.2% among both boys and girls, and in Ha et al's[6] study carried out in Korea on students aged 12-14 years, 8.5% of girls and 16.8% of boys were identified to be obese. According to the National Health and Nutrition Examination Survey (NHANES) survey carried out in the United States, 16.9% of children and adolescents in the 2-19 age group in 2009-2010 were reported to be obese.[7]

Recent studies carried out in various parts of Turkey suggest that obesity is a growing medical problem that has come to affect school-age children. According to Karayagiz-Muslu et al's[8] study, 17.8% of children aged 7-15 years in Aydin were obese and 13.3% of children aged 7-15 years were overweight. Savashan et al's[9] study carried out in Ankara reported that 7.5% of children in the 6-11 age group were obese and 11.1% of children in the 6-11 age group were overweight. Obesity prevalence in Turkey was found to be 8.5% (boys 10.1%; girls 6.8%) in the 0-5 age group and 8.2% (boys 9.1%; girls 7.3%) in the 6-18 age group.[10] Factors contributing to obesity risk include poor health behaviours, irregular and incorrect eating habits and a sedentary lifestyle. This is why it was thought that this group should be given priority in scope of school health nursing practices and adolescents with obesity risk were included in the study.

It is possible to control obesity in adolescents linked with malnutrition or irregular eating patterns and sedentary lifestyles with positive and effective interventions to

Adnan Menderes University, Faculty of Nursing, Public Health Nursing, Aydin, Turkey.

Correspondence: Filiz Adana. Email: filizadana@yahoo.com

lifestyle. Training on the subject plays a key role in initiating and sustaining healthy behaviour. Health training is also one of the most cost-effective and implementable ways of improving community health.[11]

The health promotion model (HPM) developed by Nola J. Pender adopts the approach of improving well-being and developing health behaviour based on the social learning hypothesis. In this context, a school health nurse must ensure the provision of physical activity, prevent unhealthy eating habits and behaviour and help families gain awareness with a training based on the HPM that considers the age, physical condition and other accompanying medical problems of individuals.[12,13]

In Turkey, school nurses are only employed by (private) boarding schools or special needs schools. However, there are ongoing initiatives related to this issue. According to the Nursing Regulation enacted in April 2011, community health nurses have been made responsible for providing school health services. With this in mind, one of the many initiatives aimed at maintaining, sustaining and improving well-being in schools is to help students acquire healthy behaviours by providing health training.[13,14]

The current study was planned to determine the impact of health behaviour development training on healthy lifestyle behaviour amongst adolescents with obesity risk based on the HPM. It is thought that health behaviour development training can be effective and lasting in preventing obesity for students with obesity risk that were included in the study, and that behaviour change training for individuals can be more effective in childhood and adolescence.[15]

Subjects and Methods

This pre-experiment research study constructed on the pre-test-post-test system was conducted at a junior high school governed by Aydin Provincial Directorate of National Education in Aydin, Turkey, from November 2014 to December 2015, and comprised students.

There were a total of 1,042 students at the school, of which 518 were girls and 524 were boys. The study excluded sample calculation but included all the students with obesity risk (between 85th and 95th percentile) according to percentile curves determined for Turkish children.

All the students at school underwent anthropometric measurements (height, weight) in scope of the study.

The weight of each student was measured with a digital scale (F. Bosch) sensitive to 100 grams. Students were asked to step both feet on the centre of the platform and results seen on the screen were recorded in "kilograms".

Weight was measured while students wore their school uniform, which was assumed to be 525 grams (sample school uniforms were weighed before the study). Students were asked to remove their shoes before being weighed. Measurements were made 2 hours after eating time.

The heights of students were measured with a F. Bosch brand measure and flat digital measurement display. Each student was asked to remove any hair pins or hats, straighten shoulders, hold hands down, stand straight, equally distributing weight on both feet while looking forward. Once the aimed position was achieved the height measure was lowered to touch the head of the student and the determined value was recorded in centimetres (cm). The authors of the study performed all measurements.

The charts determined according to age and gender indicated in Neyzi et al.'s[16] body weight, height, head circumference, body mass index (BMI) reference values for Turkish children classify individuals between 85th and 95th percentile to be overweight. This study included children in the 85th to 95th percentile range.

Prior to the study, a preliminary practice was carried out at another school with similar characteristics to the sample group and the clarity of questions was evaluated. The study commenced after the necessary corrections were made on the questionnaire.

Official permissions were acquired from the relevant institution, students, their parents. The study was approved by the non-invasive clinical researches ethics committee of Adnan Menderes University's Faculty of Medicine (date: 26.12.2014; reference number: 56989545/050.04-366). More so, necessary permissions were acquired from the people performing the validity and reliability verifications on the scales used in scope of the study.

The questionnaire developed by the researchers consisted of the student, family, activity and lifestyle sections. The questions were prepared in accordance with literature review and the opinions of 4 specialists (at least doctorate level education and at least 15 years of work experience).[11,12,16]

The original version of the healthy lifestyle behaviour scale that was developed by Walker in 1987 consisted of 48 items and six factors (health responsibility, exercise, nutrition, self realisation, interpersonal support and stress

management).

The digital height and weight scale used for the study features a button operated height rod, automatic power off feature, a maximum weight capacity of 150kg and sensitivity of 0.1kg.

In the initial stages of the study all the students at the identified school underwent necessary measurements (height and weight). Students with obesity risk were asked to complete the questionnaire form, and Healthy Lifestyle Behaviours Scale II (HLBS II). All students with obesity risk were included in the study. The training based on Pender's HPM included the topics health responsibility, exercise, nutrition, interpersonal relations, morals and stress management and aimed at developing the student's well-being and improving his/her control over his/her own health.

The content of the training was developed in scope of literature review and the specialist opinions of 1 public health professional, 2 public health nurses and 2 paediatric nurses (persons indicated as specialists had at least doctorate level education and at least 15 years of work experience).

The primary author of the study provided the planned training at the school's educational hall. Photos, PowerPoint presentations, case studies and videos were used as educational material. Since the school operated on a two shift system two independent training programmes were carried out for morning and afternoon students.

The training offered to students took place in the school educational hall in 4 sessions (each session 40 minutes/1 class period).Each session consisted of two sections seeing the participation of 42 students who attended morning classes and 36 students who attended afternoon classes.

Under the heading 'physical activity' and 'healthy living', the first session of the training addressed the importance of regular physical activity, examples of physical activities for childhood and adolescence and the benefits of physical activity. Under the heading adequate and balanced diet, the second session addressed the concept of adequate and balanced diet, basic nutrients, the role and benefits of nutrients in the body, healthy eating suggestions, and points of consideration in buying healthy food. Under the heading health responsibility, the third session addressed the concepts of well-being and illness, the concept of health responsibility, basic health services, attitudes and behaviours that improve well-being and healthy lifestyle. The fourth session addressed the significance of spirituality, communication, elements of communication, verbal and non-verbal communication, stress, causes of stress, symptoms of stress, and methods of coping with stress.

The scale practice (HLBS II) was repeated after the training and 4 weeks after training.

Once the questionnaire stage of the study was completed, a brochure including all the topics covered in the training was provided to the students and posters summarising the training topics were displayed on each level of the school building (3 levels) with the permission of the school administration.

In the study the pre-training scale points of students with obesity risk were independent variables while the post-training (end of training, 4 weeks after the training) scale points were dependent variables.

SPSS 18 was used for data analysis. Data analysis employed basic statistical analyses and paired samples t-test.[17]

The evaluations were made with the normal distribution test (Kolmogorov-Smirnov). Parametric tests were employed because the HLBS II scale scores were compatible with normal distribution.

Results

Of the 1,042 students, 78(7.48%) were included in the study. Of them, 38(48.7%) were girls and 40(51.3%) were boys. The overall mean age was11.77±0.92 years. Moreover, 58(74.4%) students were born in Aydin, 36(46.2%) had spent most of their life in a metropolitan settings, 50(64.1%) had a brother or sister, 40(51.2%) were the eldest of siblings, 48(61.5%) had equal income and expenses and 62(79.5%) had social security. Also, 32(41%) students were fifth graders, 27(34.6%) were sixth graders and 19(24.4%) were seventh graders. Besides, 34(43.6%) students walked to school.

It was found that 8(10.3%) students had a chronic illness (bronchitis, dental treatment, gastritis, diplopia, stomach ache, asthma, anxiety, reflux, allergies) while 9(11.5%) regularly used some form of medication (singular, deposilin, parol, ventolin, prozoc). There were no students with physical disabilities.

There were 51(65.3%) students who had three meals a day while 42(53.8%) skipped a meal. The food of choice was milk for 29(37.2%) students, fruit and vegetables for 27(34.6%), dried legumes for 5(6.4%), grains for 4(5.1%) and meat for 19(24.4%).

Furthermore, 51(60.3%) students regularly took part in

Table: Comparison of student scores before the training, at first post-training observation and at second post-training observation together with HLBS II and Sub Factor Scores.

	Pre-Training			1st Post-training observation			2nd Post-training observation			F	P
	n	Range	M±SD	n	Range	M±SD	n	Range	M±SD		
HLBS II Total	78	77-206	140.89±25.96	75	87-208	151.96±25.28	76	78-208	152.80±27.72	6.22	0.003*
Health Responsibility	78	10-36	19.96±6.02	75	9-36	22.50±6.83	76	9-36	22.72±7.20	5.03	0.008*
Physical Activity	78	9-32	20.80±6.01	75	11-32	22.96±5.26	76	12-32	23.63±5.22	6.28	0.002*
Nutrition	78	13-34	22.39±4.44	75	12-36	23.85±5.25	76	13-36	24.76±5.28	5.70	0.004*
Mental Development	78	12-36	28.56±5.74	75	15-36	29.96±5.24	76	15-36	29.64±5.30	1.57	0.211
Interpersonal Relations	78	10-36	26.98±5.26	75	14-36	28.81±4.92	76	11-36	28.40±5.52	3.14	0.046*
Stress Management	78	10-32	22.17±4.85	75	13-32	23.86±4.50	76	10-32	23.63±5.30	3.05	0.050*

*p<0.050
HLBS: Healthy Lifestyle Behaviours Scale
M: Mean
SD: Standard deviation.

sports activities. On average, students spent 53.30±72.74 minutes on computer, 47.60±70.19 minutes playing outdoors a day and 1.76±1.77 days a week doing sports. In addition, 67(85.9%) students lived with their core family and 66(84.6%) lived in an apartment building. Moreover, 13(16.7%) students said they had an obese family member while 10(12.9%) had a family member with diabetes mellitus (DM). Besides, 5(6.4%) students stated that their mother was overweight while 18(23.1%) stated their father was overweight.

Health responsibility, physical activity, nutrition and HLBS II total scores at the first post-training observation and second post-training observation were higher compared to pre-training scores (p<0.05). Interpersonal relations and stress management scores at the first post-training observation were higher compared to pre-training scores (p<0.05 each).

The difference in mental development score was insignificant comparing pre-training, first post-training and second post-training observations (p>0.05) (Table).

Discussion

Healthy lifestyle is defined as the individual controlling all behaviours affecting his/her well-being and choosing behaviours that comply with his/her own health condition in organising daily activities. These issues have always been important when the objective is creating healthy societies. Reviewing available literature, it can be said that original studies on the topic focused on determining the health behaviours of societies, however, a shift can be observed towards interventional studies concentrating on improving healthy lifestyles, particularly in the last fifteen years linked to the urbanisation of society, sedentary lifestyles and evolving family dynamics. It is a known fact that training can improve healthy lifestyles regardless of the individual's culture, race, and social, occupational or economic characteristics.[18,19] Interventional studies focused on developing health behaviours become even more significant during adolescence, a period in life when intense changes and developments take place and permanent behaviours that affect the whole life are fostered. Acquiring such behaviours especially at the beginning of adolescence and for adolescents with obesity risk is of greater significance for community health.

The study found that HLBS II total, health responsibility, physical activity, nutrition, interpersonal relations and stress management scores improved after the health behaviours development training and that the effectiveness of training on health responsibility, physical activity and HLBS II total scores lasted for a considerable time (4 weeks).

Examining educational studies performed using the HLBS II scale in scope of literature review, it was found that, similar to this study, post-training scores were higher compared to pre-training scores.[11,12,20,22-24] It is thought that, besides its effectiveness, the reason for such an outcome from the training is attributed to its health-improving approach.

A review of literature studies suggests that interventional practices can develop healthy lifestyle and physical activity behaviour.[19] It has been found that the healthy eating behaviour of students is positively affected with initiatives aiming at improving nutrition levels.[18,19,21] It has also been reported that health development training aimed at adolescents improves health responsibility awareness.[20]

Existing literature has proven the effectiveness of interventional studies measured using the Healthy Lifestyle Behaviours Scale.[11,20,22,23] Similarly, Geckil and

Yildiz[11] reported that post-training nutrition sub-factor scores were higher compared to the pre-training scores. It has been found that trainings focusing on nutrition aimed at adolescents yields effective results. Besides being a topic addressing needs within a formal education setting, it is thought that the effectiveness also stems from the fact that school-age children are open to learning.

Besides improving health behaviour, interventional practices aimed at healthy eating and weight management have also been found to help reduce BMI.[18,19] Berry et al.[25] reported that the weight management programme carried out on obese children aged 7-17 years improved the BMI of students. Similarly, Tucker's[26] diet limitation and exercise programme on the 4-18 age group was found to be successful in reducing students' BMI values.

Nemet et al.'s[19] interventional study on diet, activity and behaviour was found to reduce students' BMI values.

Humans are social creatures, and one of the essential components of leading their lives is to have good interpersonal relations. There are several studies in literature that have been found to improve interpersonal relations. While some of them[11,20,22] were unable to verify a change in individuals' interpersonal relations after the intervention, a considerable majority[23] advocated that interpersonal relations could be improved with training. In this study, interpersonal communication improved after the training and this is in line with similar studies. It is thought that this is because of the content of the training and creating a positive group environment.

Another significant precondition necessary for humans to maintain a healthy life is demonstrating effective management in response to stressful incidents. While positive stress management skills can be acquired through experience throughout life it can also be developed with training. There are several studies in existing literature that support this idea.[11,20,22,23] These studies have reported similar findings to this study. Based on this, it is understood that methods of coping with stress discussed in the student training are easy to learn and simple to reflect on behaviours.

Finding improvements in post-training interpersonal relations dimension and stress management scores in this study suggested that interpersonal relations can be improved in adolescence. However, the absence of a significant difference in the follow-up propose that trainings should be repeated and be implemented for extended periods of time.

Mental development is defined as personal quests since birth in which the individual explores life, meaning and their relation with the divine.[27] In this context mental development continues from birth until death and can be influenced by the individual's religious beliefs, traditional values and cultural characteristics. While some of the interventional studies found in existing literature report mental development with training,[11,23] others have identified no change in this regard.[28] In this context a change might be impossible with short-term trainings.

The results of this study appeared to be in coherence with literature findings.

The current study had a few limitations as well. It was designed to be a single-centre study with a limited student sample. The portion of data obtained from the questionnaire was based on verbal declarations. The sample was limited because the number of students meeting inclusion criteria was low.

Conclusion

A comparison of pre- and post-training HLBS II scores found higher first and second observation scores compared to pre-test scores. However, no difference was found between post-training observation scores. Based on this result, it appears that the effect of training is lasting. The findings of this study must be tested and verified against studies on different sample groups and sizes. In scope of protective school health practices, there is a need to develop and disseminate trainings aimed at developing healthy lifestyle behaviours in adolescents with obesity risk.

Acknowledgments

We would like to thank the students and contributors taking part in this study.

Disclaimer: This paper was derived from the postgraduate thesis titled 'The Impact of Positive Health Behaviour Development Training on Healthy Lifestyle Behaviours and Physical Activity amongst Adolescents with Obesity Risk'.

Conflict of Interest: None.

Source of Funding: This study was supported within scope of the Academician Placement Programme.

References

1. World Health Organization. Reducing risk, promoting health life, 2002. [Online] [Cited 2017 Feb 10]. Available from URL: https://books.google.com.tr/books?hl=tr&lr=&id=epuQi1PtY_cC&oi=fnd&pg=PR9&dq=healthy+life&ots=N2M49YBgRp&sig=1WPld0L-vhBMAxauYJJkYKAYjLY&redir_esc=y#v=onepage&q=healthy%20life&f=false.
2. Stang J, Story M. eds. Guidelines for adolescent nutrition services.

Minneapolis, MN: Center for Leadership, Education and Training in Maternal and Child Nutrition, Division of Epidemiology and Community Health, School of Public Health, University of Minnesota, 2005.
3. World Health Organization. Global strategy on diet, physical activity and health:childhood overweight and obesity. [Online] 2016 [Cited 2016 Apr 2]. Available from URL: http://www.who.int/dietphysicalactivity/childhood/en/
4. Gunter KB, Abi-Nader P, John DH. Physical activity levels and obesity status of Oregon Rural Elementary School children. Prev Med Rep. 2015; 2: 478-82.
5. Shih SF, Liu CH, Liao LL, Osborne RH. Health literacy and the determinants of obesity: a population-based survey of sixth grade school children in Taiwan. BMC Public Health.2016; 16: 280
6. Ha K, Chung S, Lee HS, Kim C, Joung H, Paik HY, et al. Association of dietary sugars and sugar-sweetened beverage intake with obesity in Korean children and adolescents. Nutrients. 2016; 8: 1-11.
7. Ogden CL, Flegal KM. Changes in terminology for childhood overweight and obesity. National health statistics reports; no 25. Hyattsville, MD: National Center. [Online] [Cited 2016 Apr 21]. Available from URL: http://www.cdc.gov/nchs/data/nhsr/nhsr025.pdffor Health Statistics. 2010.
8. Karayagiz-Muslu G, Özsaker M, Yardimci F, Özalp-Gerceker G. The prevalence of overweight and obesity among school aged children in Aydin. Uluslararasi Hakemli Akademik Saglikve Tip Bilimleri Derg. 2012; 2:68-79.
9. Savashan C, Sari O, Aydogan Ü, Erdal M. Obesity frequency in primary school children and related risk factors. Türk Aile Hek Derg. 2015; 19:14-21.
10. Republic of Turkey Ministry of Health. Turkey nutrition and health survey, 2010. Ankara (Turkey): Hacettepe University, 2010 [Online] [Cited 2015 Sep 15]. Available from URL: http://www.sagem.gov.tr/TBSA_Beslenme_Yayini.pdf.
11. Geckil E, Yildiz S. Adölesanlarayönelikbeslenmevestreslebasetmeegitimininsagligigelistirmeyeetkisi. C.Ü. Hemsirelik Yüksek Okulu Dergisi. 2006; 10: 33-38.
12. Beydag KD, Ugur E, Sonakin C, Yürügen B. Saglikveyasamdersininüniversiteögrencilerininsaglikliyasambicimidavranislarinaetkisi. Gümüshane Üniversitesi Saglik Bilimleri Dergisi. 2014; 3:599-609.
13. Erdim L, Ergün A, Kuguoglu S. Cocuklardaobeziteninönlenmesiveyönetimindehemsireninrolü. HSP. 2014; 1: 115-26.
14. TürkiyeResmi Gazete Official Newspaper in Turkey 2011. Hemsirelikkanunu [Nursing law] [Online] [Cited 2017 Feb 9]. Available from URL: http://www.resmigazete.gov.tr/eskiler/2011/04/20110419-5.htm.
15. Pender NJ. The health promotion model manual. Ann Arbor (MI): University of Michigan; [Online] 2011 [Cited 2016 Jan 8]. Available from URL: https://deepblue.lib.umich.edu/bitstream/handle/2027.42/85350/?sequence=1.
16. Neyzi O, Günöz H, Furman A, Bundak R, Gökcay G, Darendeliler F, et al. Türkcocuklarindavücutagirligi, boy uzunlugu, bascevresivevücutkitleindeksireferansdegerleri. Cocuk Sagligive Hastaliklari Dergisi. 2008; 51: 1-14.
17. Field A. Discovering statistics using IBM SPSS statistics. 4th edition. Sage publications. 2013. [Online] [Cited 2016 Sept 8]. Available from URL: https://books.google.com.tr/books?hl=tr&lr=&id=c0Wk9IuBmAoC&oi=fnd&pg=PP2&dq=discovering+statistics+using+spss&ots=LaGkLFZuYJ&sig=OhHLnifbOR9slxhvIlvRyS231hQ&redir_esc=y#v=onepage&q=discovering%20statistics%20using%20spss&f=false.
18. Kang R, Zhong Y, Luo H, Jiang Y, Liu K, You C. Epidemiologic status andinfluencing factors of simple obesity in pre-school children. Chinese J Child Health Care. 2008; 6.
19. Nemet D, Geva D, Pantanowitz M, Igbaria N, Meckel Y, Eliakim A. Healt promotion intervention in Arab- Israeli kindergarten children. J Pediatr Endocrinol Metab. 2011; 24: 1001-7.
20. Altun I. Effect of a health promotion course on health promoting behaviours of university students. East Mediterr Health J. 2008; 4: 880-7.
21. Harrison M, Burns CF, McGuinness M, Heslin J, Murphy NM. Influence of a health education intervention on physical activity and screen time in primaryschool children: "Switch Off-Get Active". J Sci Med Sport. 2006; 9: 388-94.
22. Hsiao YC, Chen MY, Gau YM, Hung LL, Chang SH, Tsai HM. Short-Term effects of a health promotion course for Taiwanese nursing students. Public Health Nurs. 2005; 22: 74-81.
23. Karakoc-Kumsar A, Cinar S. Metaboliksendromlukadinlardahemsiredanismanligininsaglikliyasambicimidavranisikazanmadaetkinligi. Turkiye Klinikleri J Nurs. 2015; 7: 90-101.
24. Oyur Celik G, Malak AT, Bektas M, Yilmaz D, Sami Yümer A, et al. SaglikYüksekokuluögrencilerininsagligigelistirmedavranislarinietkileyenetmenlerinincelenmesi. Anatol J Clin Invest. 2009; 3: 164-9.
25. Berry D, Mary S, Gail M, Margaret G. An intervention for multi-ethnic obeseparents and overweight children. Appl Nurs Res. 2007; 2: 63-71.
26. Tucker S. Parents as agents of change for childhood obesity prevention: a clinical nursing research programme. Paediatr Child Health.2009; 19: 189-93.
27. Strang S, Strang P, Ternestedt M. Spiritual needs as defined by Swedish nursing staff. J Clin Nurs. 2002; 11: 48-57.
28. Tambag H, Turan Z. Ögrencilerin Saglikli Ya?am Biçimi Davrani?larýna Halk Sagligi Hem?ireligi Dersi'nin Etkisi. Turk J Res Develop Nurs. 2012; 14:46-55.