ORIGINAL PAPER

# The Effectiveness of Nutrition and Activity Programmes for Young Adults with Intellectual Dısabilities

**Medine Yilmaz, PhD, RN**
**Izmir Katip Celebi University, Health Sciences Faculty, Nursing Department, Izmir- Turkey**

**Hatice Yildirim Sari, PhD, RN**
**Izmir Katip Celebi University, Health Sciences Faculty, Nursing Department, Izmir- Turkey**

**G. Elif Ç. Serin**
**Special Educatior, Karşıyaka Vocational Training School, İzmir Vocational Training Centre**

**Sezer Seçkin Kisa,**
**Guidance Counselor, Karşıyaka Vocational Training School, İzmir Vocational Training Centre, Izmir- Turkey**

**Özgür Aydin**
**Sports Teacher, Karşıyaka Vocational Training School, İzmir Vocational Training Centre, Izmir- Turkey**

**Correspondence:** Medine Yilmaz, Assist. Prof, Izmir Katip Celebi University, Health Sciences Faculty, Nursing Department, Izmir- Turkey **e-mail:** medine1974@hotmail.com

**Abstract**

**Background**: Individuals with intellectual disabilities may have difficulties in maintaining a healthy lifestyle. One of the main health problems of individuals with intellectual disabilities is problems with nutrition and physical activity.
**Objective** of this study was to examine the effectiveness of a healthy dietary regime and activity programme for young adults.
**Methodology:**The study was conducted semi-experimentally on a single group (37 adults, had moderate intellectual disabilities and a BMI between 19.9 and 24.9.) in the form pre-test post-test. The subjects of the study were offered activity programmes and education on healthy eating for eight weeks. The Nutrition and Activity Knowledge Scale was used for data collection. The questionnaire was completed in face-to-face interviews with the individuals with intellectual disabilities.
**Results:**The mean age of those to whom the Nutrition and Activity Knowledge Scale was applied was 26.91 ± 7.55 (min-max: 18-46). Females were 38.3% (n = 36) of the total, and males were 61.7% (n = 58). The Cronbach alpha value of the 15-item form of the scale was found to be .70.Thirty seven of the intellectually disabled individuals who took part in the experimental part of the study also attended the education sessions and filled in the pre and post-tests. Scores on the Nutrition and Activity Knowledge Scale increased significantly after the education sessions. No significant difference by sex was found in mean scores in the pre-test
**Conclusions:** The results showed that knowledge scores increased significantly after education. Even though the sample was very small, the results of this study show the necessity of a special education programme for these individuals. Systematic education programmes can help these young adults to be less dependent in their choices of food. The Nutrition and Activity Scale can be used to test changes in knowledge levels in studies with a larger sample in the future.

**Key Words:**Intellectual disabilities, nutrition, young adults, activity programmes

## Introduction

A healthy lifestyle means the ability to control behaviour which can affect health and to choose daily activities which are suitable for the person's condition of health (Ocakci, 2002). Improving health by providing support to individuals in changing their lifestyles so that they can attain an optimal state of health is a basic concept in the Health Development Model developed by Pender (O'Donnell, 2009). According to Pender (1992), a healthy lifestyle has six subdimensions, which are health responsibility, spiritual development, interpersonal relations, stress management, nutrition and physical activity (O'Donnell, 2009). This study was conducted from the starting point of the lifestyle subdimensions of physical activity and nutrition.

For individuals to be able to sustain their own health, they must have sufficient knowledge about a healthy lifestyle, they must be able to take responsibility of their own health, and they must be motivated to live healthily. Looked at from this angle, it can be seen that individuals with intellectual disabilities may have difficulties in maintaining a healthy lifestyle.

It is now recognised that behaviour patterns such as exercise, diet, cigarette smoking and stress play a role in the development of many chronic diseases and affect mortality (Fleming & Marshall, 2008). Studies have shown that the early death of individuals with intellectual disabilities is related to decreased activity and nutritional problems (Eyman et al., 1988). This result draws attention to the importance of improving health in extending the life expectancy of individuals with intellectual disabilities. The International Association for the Scientific Study of Intellectual Disabilities (IASSID) has stated that measures to ensure the health of individuals with intellectual disabilities are insufficient and has proposed that such measures should be more widely applied (Scheepers et al., 2005).

Physical activity involves an individual taking part in light, moderate and vigorous exercise in an organised way. Nutrition shows the value of an individual's choice of meals, organisation and food choices. One of the main health problems of individuals with intellectual disabilities is problems with nutrition and physical activity (Robertson et al., 2010). In particular these individuals have overweight and obesity problems because motor disabilities and restricted movement result in a sedentary lifestyle for many (Robertson et al., 2000; Jansen et al., 2004). Obesity is a serious health problem for those with intellectual disabilities (Robertson et al, 2000; CDC 2006). Obesity is more often seen in people with intellectual disabilities than in the general population, and obesity increases the risk of chronic diseases such as diabetes and heart disease (Shin & Park, 2012). Health services have focused more on the disabilities of those with intellectual disabilities than on the maintenance of their general health (Doody & Doody, 2012). Studies in the literature conducted to improve the health of individuals with intellectual disability have shown that exercise is effective (Marshall, McConkey & Moore 2003; Paynor 2008; Marks, Heler & Sisirak 2010; Wu et al., 2010; Shin & Park, 2012). Robertson (2000a) stressed that increasing levels of moderate or vigorous physical activity was the best way of promoting health in individuals with developmental disabilities. The same researchers (Robertson et al, 2000) reported that the most effective way to protect the health of individuals with intellectual disabilities was first that they needed exercise and second that their diet should be regulated (correct consumption of protein and carbohydrate, and fruit and vegetables).

## Study Aim

In developed countries more work has been carried out in this field, while in Turkey no research was found relating to a health development programme including health and exercise education for individuals with intellectual disabilities. Therefore, the aim of this study was to examine the effectiveness of a healthy dietary regime and activity programme for young adults.

## Method

**Research type:** The study was conducted semi-experimentally on a single group in the form pre-test post-test between December 2012 and April 2013.

**Setting:** The study was conducted in two centres in Karşıyaka, Izmir (Karşıyaka Vocational Training School and İzmir Vocational Training Centre). These two schools are state-run schools where, in addition to academic education, vocational training is also provided. Adolescents and adults with intellectual disabilities are studying in these schools. At Izmir Vocational Training Centre, individuals with severe or moderate intellectual disabilities but who have completed primary school are provided with vocational education according to their interests and abilities to provide them with the skills for an independent life. At Karşıyaka Vocational Training School, intellectually challenged individuals between the ages of 16 and 21 are given education in vocational and academic fields. The school has 150 students and 15 teachers. There is a sports hall, various classrooms and workshops, and a large garden. Some of the students' expenses such as meals and transport are met by the government.

**Sampling:** In the first stage of the study, the Nutrition and Activity Knowledge Scale was filled in for 94 individuals who were over 18 years of age, who were intellectually disabled, and whose body mass index was normal, and the validity and reliability of the Turkish questionnaire was established. Thirty seven of these 94 people fitted the inclusion criteria, and these were chosen to participate in the education programme.

**Inclusion Criteria:** Individuals included were over the age of 18 years, and had moderate intellectual disabilities and a BMI between 19.9 and 24.9. They had no chronic diseases or physical disabilities and had a medical report stating that they could do exercise.

**Exclusion criteria:** Those with a BMI over 25 or a medical report stating that they could not participate in an exercise programme were not included in the research project. Other exclusion criteria were co-morbid chronic diseases and serious physical disabilities.

**Procedures:** The ***Nutrition and Activity Knowledge Scale*** was administered to the study group. A teaching programme of four lessons was offered to the families/care givers of the study group. The subjects of the study were offered activity programmes and education on healthy eating for eight weeks. The questionnaires were administered again at this stage to the case group (Figure 1).

**Educational Programme:** Two different educational programs, one for the families and the other for the individuals with intellectual disabilities, were applied (Figure 1).

***Nutritional Education for Families:*** The researchers gave a total of four sessions of interactive education to the families about the principles of healthy eating, food preferences, preparation and storage of food, nutritional problems of individuals with intellectual disabilities, and how to prevent behaviour-oriented nutritional problems.

***Nutritional and Activity Education for the Individuals with Intellectual Disabilities:*** The programme was prepared with regard to the curriculum *The Exercise and Nutrition Health Education Curriculum for Adults with Developmental Disabilities* developed by Heller, Marks & Ailey (2001). This programme has the objectives of understanding lifestyle, promoting health, giving motivation to promote healthy lifestyle behaviour, and increasing the performance of exercise. Each education module was carried out by a single researcher in order to avoid differences between the operators. The educational programme was performed using colourful illustrated educational materials. Educational programmes were carried out with groups of 3 to 5. Each session lasted from 25 to 30 minutes.

***Activity Programme:*** The activity programme was carried out by a physical education teacher. A group of 8 to 10 participated in exercise programmes with the aid of music to increase motivation for 3 days a week for 30 minutes each session. Exercises consisted of flexibility, steps, aerobic exercises, and athletics.

**Data Collection tool:**

***Nutrition and Activity Knowledge Scale:*** The scale developed by Illingworth, Moore and McGillivray in 2003 consists of 18 items. Each question has only one correct answer. Incorrect and/or incomplete answers are not given any points. As only correct answers are given points,

the lowest possible score on the scale is 0, and the highest is 18. Validity and reliability studies

| | |
|---|---|
| Ethical permission (September 2012) | |
| Height- Weight Measurement of 200 students ( November, 2012) | |
| **94 Yound Adults (BMI=19.9-24.9)**<br>**( Nutrition and Activity Knowledg Scale was applied)**<br>↓<br>No Chronic Disease<br>Who have " can do exercises"<br>Allowing family for participating to study<br>Participating all training<br>↓<br>**37 Male and Female Young Adults** | |
| **First week** | **PRE- TEST** (15-item questionnaire was applied ) |
| **NUTRITION and ACTIVITY EDUCATION** | |
| **First week** | Parent /Caregiver Education – Two Hours / Total Two days |
| **Second week** | Education (What is the health?) + Exercises |
| **Third week** | Education (What is the physical activity + Exercises |
| **Fourth week** | Education ( I think what I do before exercise) + Exercises |
| **Fifth week** | Education (The exercise is good) + Egzersiz |
| **Sixth week** | Education (Which changes does exercises make in my body?) + Exercises |
| **Seventh week** | Education (Good nutrition) + Exercises |
| **Eight week** | Education (How much I should get energy ?) + Exercises |
| **Ninth week** | Education (Healthy Choices) + Exercises program |
| **REINFORCEMENT EDUCATION** | |
| **Eleventh Week** | Education (Healthy Nutrition and Exercise )+ Exercises |
| **Thirdteenth Week** | Education ( Healthy Nutrition and Exercise ) + Exercises |
| **Fifteenth Week** | **POST-TEST** |

**Figure 1: Educational Programme Process**

of the scale were carried out for mildly and moderately intellectually disabled adults. The questions were prepared in the form of Clip-Art cartoons, and the respondent was expected to point at the suitable picture. Permission to use the scale was obtained from McGillivray by e-mail. The questionnaire was completed in face-to-face interviews with the individuals with intellectual disabilities.

***Language Validity***

Before administering the questionnaire, it was translated from English into Turkish and back from Turkish to English by a translator. After that, the researchers (a nurse, a special education teacher, a physical education teacher and a dietician) met to put the questions into a form which could best be understood by individuals with intellectual disabilities. All the researchers together decided on the pictures to be used as answers to the questions. The questionnaire was applied to five students, and changes were made to the statements and pictures as necessary. At the next stage, the questionnaire was given to the 94 individuals with intellectual disabilities and validity-relability analysis was made.

**Research Ethics**

Permission to carry out the study was obtained from the Ethics Committee for Non-Invasive Research of Kâtip Çelebi University, Izmir, and approval was obtained from the individuals with intellectual disabilities and their families.

**Statistical analysis**

The significant p value was set at $\leq 0.05$. Paired t-test was used in data analysis. The validity and reliability of the Nutrition and Activity Knowledge Scale was determined by carrying out Cronbach alpha coefficient and item-total correlation analysis.

**Results**

**I – Validity-reliability testing of the Nutrition and Activity Knowledge Scale**

The mean age of those to whom the Nutrition and Activity Knowledge Scale was applied was 26.91 ± 7.55 (min-max: 18-46). Females were 38.3% (n = 36) of the total, and males were 61.7% (n = 58). Items 12 and 18 relating to breakfast had a total score correlation result of .089 and were removed from the scale, and the total score correlation was recalculated. Then item 10, with a correlation of .014, was removed from the questionnaire. The total score correlations of the final 15-item questionnaire are shown on Table 1. The Cronbach alpha value of the 15-item form of the scale was found to be .70.

Thirty seven of the intellectually disabled individuals who took part in the experimental part of the study also attended the education sessions and filled in the pre and post-tests. Their mean age was 26.61 ± 7.87 (min: 18, max: 46); 47.% (n = 17) were female and 52.8% (n = 19) were male.

As Table 2 shows, scores on the Nutrition and Activity Knowledge Scale increased significantly after the education sessions. No significant difference by sex was found in mean scores in the pre-test (female: 24.52±3.69, male: 24.21±2.83, t:0.292, $p<0.005$) or the post-test (female: 28.88±8.23, male: 26.63±3.11, t=1.107, $p<0.005$).

Table 2 shows the comparison of the answers given on the pre and post-tests by the intellectually disabled individuals. Since the number of samples on the table was not enough, four-point chi-squared analysis could not be performed. No significant difference by sex was found in the answers given on the pre-test or the post-test. However, it was observed that the number of correct answers given to the questions on gaining and losing weight increased after the education.

**Discusion**

The results of the validity-reliability study of the Nutrition and Activity Scale carried out in the first stage of the study showed that the Turkish form of the scale was a valid and reliable means of measuring the knowledge levels of intellectually disabled individuals. It can be used to test changes in knowledge levels in studies with a larger sample in the future.

The basic result of this study, performed with the aim of investigating the effect of education on

nutrition and activity for individuals with intellectual disabilities, is that knowledge scores increased significantly after education. There are studies in the literature which support this result,

**Table 1. Total Score Correlation of the Items of the Questionnaire**

| Items | Item-total Ponit Correlation | Item deleted Cronbach's alpha value |
|---|---|---|
| 1. | .565 | .678 |
| 2. | .237 | .697 |
| 3. | .163 | .702 |
| 4. | .558 | .676 |
| 5. | .324 | .693 |
| 6. | .407 | .691 |
| 7. | .405 | .689 |
| 8. | .586 | .677 |
| 9. | .144 | .717 |
| 11. | .283 | .694 |
| 13 | .392 | .688 |
| 14. | .232 | .698 |
| 15. | .498 | .686 |
| 16. | .546 | .678 |
| 17. | .438 | .684 |

**Table 2. Comparison of Knowledge Levels Before and After Education**

| Test | Mean ± SD | t, p |
|---|---|---|
| Pre-test | 24.36 ± 3.22 | 3.352, 0.002 |
| Post- test | 27.69 ± 6.10 | |

**Table 3. Comparison of Answers Given to Questionnaire Items on the Pre-Test and Post-Test**

| ITEMS | | | PRE- TEST | | POST- TEST | |
|---|---|---|---|---|---|---|
| | | | **n** | **%** | **n** | **%** |
| A1 | If a person wanted to lose weight they should? | False | 11 | 30.6 | 7 | 19.4 |
| | | True | 25 | 69.4 | **29** | **80.6** |
| A2 | Which person might lose the most weight? | False | *19* | *52.8* | *26* | *72.2* |
| | | True | 17 | 47.,2 | 10 | 27.8 |
| A3 | Which activity needs the most energy? | False | 18 | 50.0 | 9 | 25.0 |
| | | True | 18 | 50.,0 | **27** | **75.0** |
| A4 | Which activity will cause the most weight loss? | False | 19 | 52.8 | 20 | 55.6 |
| | | True | 17 | 47.,2 | 16 | 44.4 |
| A5 | Which foods have the most sugar? | False | 25 | 69.4 | **32** | **88.9** |
| | | True | 11 | 30.6 | 4 | 11.1 |
| A6 | If a person wants to lose weight they should? | False | 29 | 80.,6 | **32** | **88.9** |
| | | True | 7 | 19.4 | 4 | 11.1 |
| A7 | Which burger do you think this fat man ate? | False | 7 | 19.4 | 3 | 8.3 |
| | | True | 29 | 80.6 | **33** | **91.7** |
| A8 | Which person will gain the most weight? | False | 12 | 33.3 | 7 | 19.4 |
| | | True | 24 | 66.7 | **29** | **80.6** |
| A9 | Which activity needs the most energy? | False | *9* | *25.0* | *33* | *91.7* |
| | | True | *27* | *75.0* | *3* | *8.3* |
| A11 | Which foods should you not eat too often? | False | 13 | 36.1 | 8 | 22.2 |
| | | True | 23 | 63.9 | **28** | **77.8** |
| A13 | Which is the healthiest breakfast? | False | 11 | 30.6 | 8 | 22.2 |
| | | True | 25 | 69.4 | **28** | **77.8** |
| A14 | Which food has the most fat? | False | 11 | 30.6 | 7 | 19.4 |
| | | True | 25 | 69.4 | **29** | **80.6** |
| A15 | Which foods help to keep your heart healthy? | False | 5 | 13.9 | 3 | 8.3 |
| | | True | 30 | 83.3 | **33** | **91.7** |
| A16 | Which foods put on the most weight | False | 14 | 38.9 | 6 | 16.7 |
| | | True | 22 | 61.1 | **30** | **83.3** |
| A17 | Which food has the most protein? | False | 21 | 58.3 | 15 | 41.7 |
| | | True | 15 | 41.7 | **21** | **58.3** |

and show the success of education (Humphries et al., 2008*;* Humpries et al,2009; Heller et al, 2011; Bodde et al., 2012). However, despite a long and comprehensive education programme, although the percentage of correct answers to some items was greater in the pre-test, the percentage of wrong answers was greater in the post-test. This may be related to the fact that processing information and learning is slower in individuals with intellectual disabilities, and to their difficulty in understanding abstract concepts or the importance of a topic such as health

preservation and development. Their intellectual disability makes it difficult to understand healthy nutrition, healthy life choices and the long-term effects of these.

Many studies have shown that regular physical activities can improve the health and well being of individuals with intellectual disabilities (Stanish, Temple, Frey 2006; Humphries et al., 2008; Humpries et al., 2009; Wu et al., 2010; Shin & Park, 2012). The results of a meta analysis by Shin & Park (2012) showed that exercise was effective for intellectually disabled individuals, and that exercise carried out four times a week for 30-61 minutes was more effective. In a study by Wu et al., in Taiwan in which 146 intellectually disabled individuals between the ages of 19 and 67 were monitored for six months, it was shown that a short period of exercise (three days a week for 30 minutes) had positive effects (Wu et al., 2010). Marshall, McConkey & Moore (2003) carried out a health improvement education programme over 6-8 weeks on 25 people between the ages of 30 and 39, and in an evaluation of the participants three months later found that the body mass index of 34% of them was reduced. Humphries, Traci, Seekins & Taylor (2008) gave an education programme to 32 intellectually disabled adults on such nutrition topics as menu planning, buying food and cooking, and reported that this education had positive effects. Humphries et al (2009) applied the programme Materials Supporting Education and Nutrition for Adults with Intellectual or Developmental Disabilities (MENU-AIDDs) for 8-16 weeks, and as a result reported an increase in the consumption of green/yellow/orange vegetables and low-fat protein by intellectually disabled adults. In the same study, a reduction in the consumption of high-fat protein, potatoes and 'junk foods' was observed. Bodde et al., (2012) carried out an education programme for slightly and moderately intellectually disabled adults using classroom video shows, pictorial memory tools, and interactive class activities. They applied the Nutrition Activity Knowledge Scale (NAKS) and the Physical Activity Recommendations Assessment (PARA) before and after the education programme, and also evaluated daily physical activity. It was found that after the programme the knowledge levels on nutrition and activity of the intellectually disabled individuals had increased significantly. In a study of 52 Down's syndrome adults in which the effectiveness of an exercise programme of 45 minute periods three times a week for 12 weeks was measured, Rimmer et al (2004) found that the subjects had lost a significant amount of weight.

Intellectually disabled individuals run significant health risks because of a lack of exercise, wrong nutrition, a lack of knowledge and low social interaction. Excessively sedentary behaviour (watching television, playing with the computer, etc.), and a lack of adequate sport and recreational activities increased their levels of obesity. It is natural that these individuals should not be aware of these health risks, because of their condition. Even though the sample was very small, the results of this study show the necessity of a special education programme for these individuals.

The basic knowledge requirements for individuals who are intellectually disabled to continue and develop a healthy life includes knowing about good nutrition and a balanced diet, how to make a choice of what to eat, and the food groups which should be eaten (Illingworth, Moore, McGillivray, 2003). From this viewpoint, it is of interest that the level of correct answers to the items on gaining and losing weight are high. It is thought that the constant admonitions of parents, teachers and the health team on gaining and losing weight have had an effect. Health workers should arrange education on preparing food, the choice of foods and the effects of food in order to meet the needs for knowledge of these individuals (Naidoo & Wills, 2009). It is predicted that instruction about food labelling, which is only now becoming widespread in this country, can open the way to healthy food choices. At the same time, it is important to take action to change behaviour regarding healthy food choices, and preparation and consumption, as giving information alone is not enough. Looking at the average age of the individuals in the study group, it can be seen that the group was composed of young people. Systematic education programmes can help these

young adults to be less dependent in their choices of food.

It is reported that the educational level of those caring for intellectually disabled individuals and their preferences regarding physical activity are variables affecting these individuals' habits of regular physical activity (Lin et al, 2010). From this viewpoint, it can be seen that the food choices and activity levels of the parents are important as a role model, so that it is necessary to include the parents in any educational programme. It is necessary to know just what the factors are which prevent the disabled from taking exercise, and work is needed on how exercise levels can be increased.

The design of this study did not look at data relating to changes in body mass index following education on nutrition and exercise activities. It is felt that another study should be made examining changes in body mass index resulting from a programme of nutrition and exercise activity.

According to the Social Learning Theory developed by Bandura, on which the Health Development model is based, the development of a behaviour pattern is dependent on an individual's adequacy, feedback and success in relation to that behaviour. For that reason it is important to give intellectually disabled individuals special education to develop healthy lifestyle behaviour patterns because of the health risks involved. It is even felt that inclusion of carers, families and teachers in such education programmes could help to reach the desired target, as repetition of the same message by so many people would act as reinforcement.

**Acknowledgements:**

We thank to dear Derya HOPANCI BIÇAKLI for opinions about pictures of Nutrition and Activity Knowledge Scale.

**References**

Bodde, A.E., Seo, D.C., Frey, G.C., Van Puymbroeck, M., Lohrmann, D.K. (2012). The Effct of a Designed Health Education Intervention on Physical Activity Knowledge and Participation of Adults with Intellectual Disabilities. *American Journal of Health Promotio*n, 26(5), 313-316. doi: 10.4278/ajhp.100408-ARB-112.

Centers for Disease Control and Prevention (2006). Disability and Health State Chartbook: Profiles of Health for Adults with Disabilities. US Department of Health and Human Services, Atlanta.

Doody, C.M. & Doody, O. (2012). Health Promotion for People with Intellectual Disability and Obesity. *British Journal of Nursing*, 21(8), 460-465

Eyman, R.K., Borthwick-Duffy, S.A., Call, T.L. & White, J.F. (1988). Prediction of Mortality in Community and Institutional Settings. *Journal of Mental Deficiency Research*, 32, 203–213.

Fleming, P., Marshall, G.(2008). Lifestyle Interventions in Primary Care. Systematic Review of Randomized Controlled Trials. *Canadian Family Physician*, 54, 1706-1713.

Heller, T., Marks, B.A. & Ailey, S.H. (2001). Heller T, Marks BA, Ailey SH. 2001. Exercise and Nutrition Health Education Curriculum for Adults with Developmental Disabilities. Chicago, IL: Rehabilitation Research and Training Center on Aging with Developmental Disabilities, University of Illinois at Chicago.

Humpries, K., Pepper, A., Traci, M.A., Olson, J., Seekins, T.(2009). Nutritional Intervention Improves Menu Adequacy in Group Homes For Adults with Intellectual or Developmental Disabilities**.** *Disability and Health Journal*, 2(3), 136-144.

Humphries, K., Traci, M.A., Seekins, T., P & Taylor, S.J. (2008).Nutrition Education and Support Program for Community-Dwelling Adults With Intellectual Disabilities. *Intellectual and Developmental Disabilities*, 46(5), 335-345.

Illingworth, K., Moore, K.A., & McGillivray, J.(2003). The Development of the Nutrition and Activity Knowledge Scale for Use with People with an Intellectual Disability. *Journal of Applied Research in Intellectual Disabilities*, 16, 159–166.

Jansen, D.E.M.C., Krol, B., Groothoff, J.W., & Post, D. (2004). People With Intellectual Disability And Their Health Problems: A Review Comparative Studies. *Journal Of Intellectual Disability Research*,48(2), 93-102.

Lin, J.D., Lin, P.Y., Lin, L.P., Chang, Y.Y., Wu, S.R., Wu, J.L. (2010). Physical Activity and its Determinants among Adolescents with Intellectual Disabilities. Research Developmental Disability, 31(1), 263-9.

Marks, B., Heler, T., & Sisirak, J.(2010). Health Matters: The Exercise, Nutrition, and Health Education Curriculum for People With Developmental Disabilities. Brokkes Publishing.

Marshall, D., McConkey, R., & Moore, G. (2003). Obesity in People With Intellectual Disability: The Impact Of Nurse-Led Health Screenings And

Health Promotion Activities. *Journal Of Advanced Nursing*, 41 (2), 147-153.

Naidoo, J., & Wills, J. (2009). Foundations for Health Promotion, 3rd edn. Bailliere Tindall Elsevier, London.

Ocakçı, A.(2002). Sağlığın Korunma ve Geliştirilmesinde Hemşirelik Hizmetlerinin Rolü.http://server.karaelmas.edu.tr/saglik/skg.htm. Access date: 01.11.2009. (In Turkish)

O'Donnell, M.P.(2009). Definition of Health Promotion 2.0: Embracing Passion, Enhancing Motivation, Recognizing Dynamic Balance, and Creating Opportunities. *American Journal of Health Promotion*, 24(1),iv.

Paynor, L. (2008). Steps to Fitness: a Health and Well-Being Pilot Project, Learning Disability Practice, 11(3), 10-15.

Pekcan, G.(2008). Beslenme Durumunun Saptanması. Ankara, 13-19.(In Turkish)

Rimmer, J.H., Heller, T., Wang, E. & Valerio I.(2004).Improvements in Physical Fitness in Adults with Down Syndrome. American Journal of Mental Retardation, 109(2), 165-74.

Robertson, J., Emerson, E., Gregory, N., Hatto, C., Turner, S., Kessissoglou, S., & Hallam, A. (2000). Lifestyle Related Risk Factors for Poor Health in Residential Settings for People with intellectual Disabilities. Res Dev Disabil. 2000 Nov-Dec;21(6):469-86.

Scheepers, M., Kerr, M., O'Hara, D., Bainbridge, D., Cooper, S.A., Davis, R., Fujiura, G., Heler, T., Holland, A., Krahn, G., Lennox, N., Meaney, J., Wehmeyer, M. (2005). Reducing Health Disparity in People with Intellectual Disabilities: A Report from Health Issues Special Interest Research Group of the International Association for the Scientific Study of Intellectual Disabilities. *Journal of Policy and Practice in Intellectual Disabilities*,2(3/4), 249–255.

Shin, I.S. & Park, E.Y. (2012). Meta-analysis of the Effect of Exercise Programs for Individuals with Intellectual Disabilities. Research and Developmental Diseases, 33(6), 1937-47.

Stanish, H.I., Temple, V.A. & Frey, G.C. (2006). Health-promoting Physical Activity of Adults with Mental Retardation. Mental Retardation Developmental Disabilitiy Research Review, 12(1), 13-21.

Tamar, H., McCubbin, J.A., Drum, C. & Peterson, J. (2011). Physical Activity and Nutrition Health Promotion Interventions: What is Working for People With Intellectual Disabilities?. *Intellectual and Developmental Disabilities*, 49, 1 (26-36) . doi:http://dx.doi.org/10.1352/1934-9556-49.1.26

Wu, C.L., Lin, J.D., Hu, J., Yen, C.F., Yen, C.T., Chou, Y.L. & Wu, P.H. (2010). The Effectiveness of Healthy Physical Fitness Programs on People with Intellectual Disabilities Living in a Disability Institution: Six-Month Short-Term Effect. Research Developmental Disability, 31(3), 713-7.