Appetite 57 (2011) 272–277

Contents lists available at ScienceDirect

Appetite

journal homepage: www.elsevier.com/locate/appet

Research report

Compliance with Mediterranean Diet Quality Index (KIDMED) and nutrition knowledge levels in adolescents. A case study from Turkey☆

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ARTICLE INFO

Article history:
Received 14 May 2010
Received in revised form 12 May 2011
Accepted 13 May 2011
Available online 20 May 2011

Keywords:
Adolescent
KIDMED
Nutrition knowledge
Nutrition habit
Nutrition education

ABSTRACT

Adopting an eating pattern complying with the Mediterranean diet not only decreases body fat mass and obesity risk, but also reduces development of various health problems. This study investigated the nutritional awareness and diet quality Mediterranean Diet Quality Index (KIDMED) of Turkish adolescents. The study was conducted with 890 voluntary participants (464 boys and 426 girls) aged 10–14 years. A questionnaire form was used to learn demographic characteristics of the participants. Participants' nutritional awareness was determined through a 20-item knowledge form and their nutritional habits through a 16-item Mediterranean Diet Quality Index (KIDMED). The average nutritional knowledge score was $X = 82.22 \pm 0.42$. Results indicated that 17.9% of the participants had a low quality diet ($\leq$3 points), 59.2% had a mid-quality/needs-improvement diet (4–7 points) and 22.9% had an optimal quality diet ($\geq$8 points). The study results showed that the subjects' diet quality was low and that their nutrition knowledge levels were related to their nutritional habits.

Introduction

Rapid developments in the food industry, as well as sociological and technological developments, have changed nutritional habits; many people are more likely to eat convenience (i.e. processed) foods (Horinger & Imoberdof, 2000; Serra-Majem et al., 2004). Eating patterns can have a significant positive effect on healthy growth and development during childhood and adolescence (Loewen & Pliner, 1999; Kroke et al., 2004) and on of health issues in later life (Garemo, Arvidsson Lenner, Karlge Nilsson, Borres, & Strandvik, 2007; Neumark-Sztainer, Wall, Perry, & Story, 2003).

There are many factors that contribute to obesity, including over-eating malnutrition and lack of physical activity. Additionally, other factors related to obesity are genetic, environmental, neurological, physiological, biochemical, socio-cultural and psychological. The overall global rise in obesity, particularly in childhood obesity, is too high to be explained by changes in genetic structure; prevailing beliefs are that environmental factors have a major role in obesity (Cowley, 2006; Dietz, 2004; Phips, Burton, Leithbridge, & Osberg, 2004; Rolls, 2009). The current prevalence of childhood obesity is 10 times higher than during the 1970s. In a country-wide study the prevalence of adolescent obesity (12–19 years old) was found to be between 5 and 17.6% in the USA (Ogden, Carroll, & Flegal, 2008); 15–20% in England (Lopstein, James, & Cole, 2003) and 12.6% in China (Luo & Hu, 2002). "Health Behavior in School-aged Children Survey (HBSC)", a large-scale study conducted in 2001–2002, of children aged 11, 13 and 15, from 41 countries showed that 24% of the girls and 34% of the boys in the 13-year old group and 31% of the girls and 28% of the boys in the 15-year old age group were overweight. In addition, 5% of the girls and 9% of the boys in the 13–15 year old age group were obese (HBSC, 1998). Data from the study "Have Healthy Diets Protect Your Heart" (conducted by the Ministry of Health of Turkey on 15,468 individuals over 30 years old) obesity prevalence was 21% for males and 41.5% for females; and childhood obesity had increased from 6–7% to 15–16% in the previous two decades (The Ministry of Health of Turkey, 2009). Obesity causes health problems: it has a negative impact on many of the body's systems (endocrine system, cardiovascular system, gastrointestinal system, skin, genitourinary system, and muscle-skeleton system) and on psycho-social status. Childhood obesity also leads to an increase in Type-2 diabetes and heart diseases (Dietz, 2004).

Providing nutritional information to children when they are young, and introducing good nutritional habits are important for optimal, healthy nutritional preferences (Fuhr & Barclay, 1998).

☆ The authors would like to thank the adolescents who participated in the study; the school managers and teachers, who gave consent for the administration of the questionnaire; and the graduate students who administered the study questionnaire. The essay was finalized after arrangements were completed in accordance with the opinions and suggestions of the referees. We are grateful to the journal editors and referees for their invaluable opinions and contributions.

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0195-6663/$ – see front matter © 2011 Elsevier Ltd. All rights reserved.
doi:10.1016/j.appet.2011.05.307

The nutritional choices made by an individual are directly related to the nutritional knowledge they possess (Manios, Moschandreas, Hatzis, & Kafatos, 1999; Pirouznia, 2001; Powers, Struempler, Guarino, & Parme, 2007).

Nutritional preferences and health problems vary from society to society; but population groups who adopt a Mediterranean diet are reported to experience lower rates of chronic diseases, myocardial infarction, arthritis, various tumors (such as breast, colon and prostate cancer), diabetes, other pathologies related to oxidative stress, childhood asthma and rhinitis (Barclay, 2008; Benetou et al., 2008; Martínez-Gonzalez et al., 2008; Muñoz, Fíto, Marrugat, Covas, & Schröder, 2009; Panagiotakos et al., 2009; Serra-Majem, 2001; Serra-Majem, Roman, & Estruch, 2006). This diet has a preventive role in the development of Alzheimer's disease and infections (Féart et al., 2009). A Mediterranean diet includes a high proportion of fruits, vegetables, unrefined natural cereals, legumes, dried nuts, poultry, eggs (3 times per week), fish, low-fat dairy products and a small quantity of red meat. This diet has positive effects on health. The fish and fruit in the Mediterranean diet provide antioxidant vitamins (E, C) and carotenes, and prevent insufficient micronutrient intake (Anonymous, 2000; Serra-Majem, Ribas, García, Pérez-Rodrigo, & Aranceta, 2003).

The Mediterranean eating pattern warrants attention because it has been repeatedly associated with protection against several chronic degenerative diseases and disorders. Although it is not yet clear which components of the diet provide the greatest health benefits, it is likely that certain components, eaten together, provide a dietary pattern that is highly protective. Several possible explanations and biological mechanisms have been proposed for these foods, against the pathogenesis of chronic disease (Brill, 2009).

Obesity has gradually become a public health problem, resulting in initiatives throughout the entire world to reduce it. In Turkey, nutritional education is not effective because there are not enough practical cooking classes and limited curriculum time devoted to this subject. The nutritional knowledge, attitudes and behaviors of students cannot be changed efficiently and permanently. This study was designed and conducted to determine the level of nutritional knowledge amongst adolescents living in Turkey, a country with borders on the Mediterranean Sea, and to detect the extent to which their diet complies with the Mediterranean Diet Quality Index (KIDMED).

Methods

Subject and procedures

The study was conducted in Ankara, the capital of Turkey, between January and May 2009. Turkey is partially European and nutritional habits from both the Mediterranean and Eastern world are represented here. While Mediterranean eating patterns prevail in the coastal regions of Turkey, central and southeastern regional eating patterns are based mainly on cereals, pastry and red meat, rather than fruit and vegetables.

This study, conducted to evaluate the nutritional status of children and adolescents, used KIDMED, which is a rapid and valid evaluation methodology. The required papers on the objective, the subjects and the method of the study; about the schools where the study would be conducted; and confidentiality for study participants were submitted to the Ministry of National Education and permission was obtained before starting the study. Students and their parents were informed and only voluntary participants were included in this study. The study group included 464 boys and 426 girls in the 12–14 age range (mean = 13 $\pm$ 0.82 years) (n = 890).

Instruments

The development of the KIDMED index is based on the principles of Mediterranean dietary patterns as well as the factors that undermine it. The index ranged from 0 to 12, and was based on a 16 questions test that could be self-administered or conducted via an interview (pediatrician, dietitian, etc.). Questions denoting a negative connotation with respect to the Mediterranean diet were assigned a value of -1, and those with a positive aspect were scored +1 (see Appendix A) (Serra-Majem et al., 2004).

According to the KIDMED index (16 questions):

$\geq$8 points shows "optimal" diet quality.
4–7 points "average" (improvement needed).
$\leq$3 points "very low" (diet quality).

In addition to the KIDMED index, a nutritional knowledge test developed by the researchers was used to determine the nutritional knowledge of participants. The nutritional knowledge test included 20 questions. Writers were asked to submit a questionnaire form with questions on nutritional knowledge. These questions were scored according to a 5-point Likert-type scale: very important = 5 points; considerably important = 4 points; important to some extent = 3; minimal importance =2 points; not important = 1 point. Potential scores ranged from 20 to 100 points. The validity of the nutritional knowledge questions was tested, and found to have a Cronbach's alpha score of 0.844.

Data collection

Questionnaires were administered face-to-face during course hours. First, participants were given information on the study and then the questionnaires were given to volunteer participants. Eight interviewers collected the study data, and then they distributed 112 questionnaires. Interviewers were trained postgraduates students who visited selected primary schools in Ankara, Turkey. The objective of the study was briefly explained to the girls and boys by interviewers. To guarantee anonymity of responses and easy identification of the questionnaires by individuals. Items in the questionnaire were explained when necessary and administered at one sitting as far as possible. Administering the questionnaire took between 10 and 15 min. Researchers collected them immediately upon completion.

Data analysis

The questionnaire responses were analyzed using SPSS version 16.0 (SPSS Chicago, IL, USA). The evaluation of the demographic characteristics of the participants was based on numbers and percentages. The means and SDs of each question on nutritional knowledge were measured. The t-test was used to evaluate nutritional knowledge habits (KIDMED index) and total scores according to gender One way ANOVA Analysis were used to evaluate factors including parents' educational status, whether meals were skipped, and the number of meals on the basis of KIDMED and knowledge scores. Tukey's test was used to determine the difference between the groups. In all analyses, a 5% and 1% significance level was used.

Results

Demographic characteristics

Demographic characteristics of the adolescents are presented in Table 1.