Research Article

Faster, Stronger, Healthier: Adolescent-Stated Reasons for Dietary Supplementation

Katja Zdešar Kotnik, BSc[1]; Gregor Jurak, PhD[2]; Gregor Starc, PhD[2]; Petra Golja, PhD[1]

ABSTRACT

Objective: Examine the underlying reasons and sources of recommendation for dietary supplement (DS) use among adolescents.

Design: Cross-sectional analysis of children's development in Slovenia in September to October, 2014.

Setting: Nationally recruited sample.

Participants: Adolescents aged 14–19 years enrolled in 15 high schools (n = 1,463).

Variables Measured: Reasons for and sources of recommendation for DS use, sports club membership, sports discipline, and extent of physical activity (PA) were self-reported data.

Analysis: Chi-square test of independence was performed to compare the prevalence of DS use between groups with different extents of PA and nonathletes/athletes, referring to 11 different reasons and 9 different sources of recommendation for DS use.

Results: Use of DS was widespread among adolescents (69%), athletes (76%), and nonathletes (66%). Higher prevalence of supplementation was observed in males, who justified it use for sports performance enhancement and better development and function of muscles. In contrast, females emphasized immune system improvement. Higher extent of PA was associated with a higher prevalence of DS use. This was especially evident in males, who participated in team sports. A high percentage of adolescents (41%) decided on their own to use DS and because of advice from parents or relatives (30%).

Conclusions and Implications: Several reasons for the widespread use of DS in adolescents were associated with sports participation. Therefore, educational programs regarding DS use should be targeted primarily to adolescents and their parents who are involved in sports, and especially team sports.

Key Words: dietary supplementation, physical activity, sports, adolescents (*J Nutr Educ Behav*. 2017;■:1-10.)

Accepted July 8, 2017.

INTRODUCTION

The high percentage of users of dietary supplements (DS) in the adolescent populations in developed countries (50% on average) is not surprising.[1,2] Several studies have revealed the lack of people's knowledge about DS in general,[3] misguided beliefs regarding their positive effects,[4,5] and ignorance about possible harm or drug interactions.[6] Scientific evidence does not support most of the alleged benefits of DS,[7,8] and there is known evidence regarding adverse or harmful effects of certain DS substances (cardiovascular, metabolic, neurological, and hematological problems).[9,10] In addition, many DS fail tests of safety, purity, and/or quality of ingredients.[11] Consequently, a balanced diet is emphasized by experts as the best source necessary nutrients, to limit the need for DS.[12-14]

Adolescents are the most susceptible and misinformed group of customers[15]; thus this population is the target market for the DS industry.[16,17] Athletes use DS more than most people,[1] although the range of reported prevalence of DS use is large. Studies conducted in the US,[18-22] Europe (Germany,[23,24] United Kingdom,[25] and Slovenia[26]), and Asia (Korea[27] and Singapore[28]) reported that 22% to 91% of adolescent athletes used DS, although the American Academy of Pediatrics strongly discouraged DS use.[14] Claims of increased energy levels, improved performance, and gains in muscular strength obviously appeal to this population,[17] and adolescent athletes generally believe that DS consumption enhances athletic performance and/or prevents illness and injuries.[17,18] In the context of a nonstop daily barrage of information, adolescents are likely to believe unverified sources of recommendation about DS instead of expert opinions.[17-20,24,25,29-31]

[1]Biotechnical Faculty, Department of Biology, University of Ljubljana, Ljubljana, Slovenia
[2]Faculty of Sport, Department of Physical Education, University of Ljubljana, Ljubljana, Slovenia

Conflict of Interest Disclosure: The authors' conflict of interest disclosures can be found online with this article on www.jneb.org.

Address for correspondence: Petra Golja, PhD, Biotechnical Faculty, Department of Biology, University of Ljubljana, Vecna pot 111, Ljubljana SI-1000, Slovenia; Phone: +386 (0)1 320 34 22; Fax: +386 (0)1 257 33 90; E-mail: petra.golja@bf.uni-lj.si

http://dx.doi.org/10.1016/j.jneb.2017.07.005

Sociodemographic and lifestyle factors determine the motivations for taking DS, which range from general health concerns to a desire to look and feel better and to enhance athletic performance.[4,13,17,18,22,25,29,31-33] Thus, it is not surprising that DS use among elite adolescent athletes was related to gender, type of sports, and weekly duration of sports activity.[24]

Because physical activity (PA) was reported to be one of the strongest factors for DS use among adolescents,[30] the vast majority of studies investigating external influences on DS use focused specifically on athletes.[17-19,22-25,29] In contrast, the prevalence of DS use is less frequent in the general population of adolescents,[4,26,34] and, to the best of the authors' knowledge, data are nonexistent on the extent to which the effect of PA is an external influence affecting DS use in the general adolescent population. Thus, the main purposes of the current study were to examine the underlying reasons and sources of recommendation for DS use in the general adolescent population and to relate these data to the extent of PA.

METHODS

Study Design and Study Sample

Data were collected within the Analysis of Children's Development in Slovenia cross-sectional study[35] in autumn, 2014. The study protocol was approved by the Ethics Committee of the Republic of Slovenia (52/03/14 and 66/11/12). A sample included participants enrolled in 15 public high schools who provided a consent form signed by their parents. From each of the 4 years of secondary school education, about 200 females and 200 males participated. A detailed description of the Analysis of Children's Development in Slovenia study design was published elsewhere.[35]

The sample was selected nationally with a 2-stage clustered and stratified sampling procedure. In the first stage, 16 of 170 secondary schools were selected according to the secondary school educational programs and sampling location (central, eastern, and western parts of Slovenia). To ensure the representativeness of the sample not only by gender, age, and geographical location but also according to the secondary school programs, the ratio of sampled students from various secondary school educational programs at the local level was maintained equal to this ratio at the national level in Slovenia (data of the Statistical Office of the Republic of Slovenia). In the second stage, a required number of classes from each school was randomly selected for participation. If the number of students from selected classes was insufficient owing to non-responsiveness or other reasons, additional students were randomly sampled from other classes of the same school. The entire population of secondary school students in Slovenia in 2014 was 75,325, and the required size of the sample to ensure national representativeness was estimated to be 384 students (95% confidence interval [CI], 379–389).

Data Collection

Data on DS use were collected with a guided, purposely designed electronic questionnaire prepared with One-Click Survey Web software (available on http://english.1ka.si/). Participants who reported DS use were asked to indicate the type (vitamins, minerals, multivitamins/multiminerals (MVMM), proteins and amino acids, and fats and fatty acids) and frequency (1–3 times/y, 4–11 times/y, 1–3 times/mo, 1–3 times/wk, 4–6 times/wk, every day, or more than once daily) of DS use in the past year for each DS separately. The DS users were then classified as those using DS: (1) at least several times per year, (2) at least once per month, (3) at least once per week, and (4) at least once per day (ie, daily users).

For each reported DS, the reasons for use were assessed. For each DS, participants selected ≥1 reasons for its use from a list of 10 predefined reasons and/or stated their own reasons. Similarly, for each DS, participants choose among 8 predefined sources of recommendation and/or stated their own.

The PA extent was determined with an adapted School Health Action, Planning, and Evaluation System PA electronic questionnaire,[36] with which 7-day recalls of vigorous and moderate physical activity were performed. Average daily PA (in hours) was then calculated according to Wong and Leatherdale,[37] as was average daily energy expenditure for PA (kcal · kg^{-1} · day^{-1}), which was used to classify participants as less active (LA), moderately active (MA), and vigorously active (VA).[37] Participants were also classified into nonathletes (nonmembers of any sports club) and athletes (sports club members).

The questionnaire included further questions about the categories of sport in which the athletes trained (ie, aerobic, strength and power, aesthetics, precision, other). Sports were classified according to the prevailing mechanisms that limited their performance and were the main target of training. Sports in which the capacity of transport of oxygen and nutrients to the muscles was the prevailing limiting factor were classified as aerobic sports. Sports in which the prevailing limiting mechanisms were the metabolic processes within muscles were classified as strength and power sports. Sports were further classified into two categories in which the main limiting mechanism was neuromuscular information flow: sports that focused on the aesthetic component were classified as aesthetic sports, whereas sports with a predominant focus on precision were classified as precision sports. Sports that did not fit in any of these categories were categorized as other sports. For detailed information on the inclusion of each sports discipline in a specific category of sports, see Table 1. Participants were also classified according to the type of sports in which they participated (ie, team or individual). All of this was performed separately for males and females.

Statistical Analysis

All data were analyzed with the statistical program IBM SPSS, version 22 (Armonk, NY). Statistical analysis was performed with either chi-square test of independence or Fisher exact test. In addition, the researchers performed binary logistic regression analysis adjusted for the extent of PA, with reason for DS use as the dependent variable and gender as the independent variable. The Enter method was used for the inclusion of variables into the model. The level of statistical