

THE INFLUENCE OF SIGNIFICANT OTHERS ON ATTITUDES, SUBJECTIVE NORMS AND INTENTIONS REGARDING DIETARY SUPPLEMENT USE AMONG ADOLESCENT ATHLETES

By: Michael S. Dunn, [James M. Eddy](#), Min Qi Wang, Steve Nagy, [Michael A. Perko](#), and R. Todd Bartee

Dunn, M.S., Eddy, J. M., Wang, M. Q., Nagy, S. J., & Perko, M. A. (2001). The Influence of Significant Others on Attitudes, Subjective Norms and Intentions regarding Dietary Supplement Use Among Adolescent Athletes. *Adolescence*, 36(143), 583-591.

Made available courtesy of Libra Publishers

***** Note: Figures may be missing from this format of the document**

Abstract:

Dietary supplement use has increased significantly over the past decade. The use of supplements among adolescents seems to be influenced by their beliefs and attitudes. The influence of coaches, parents, and athletic trainers also may be important. The purpose of this study was (1) to determine whether attitudes are a better predictor of adolescents' intentions to use dietary supplements than are subjective norms, and (2) to assess the influence of significant others (coaches, parents, and trainers) on attitudes, subjective norms, and intentions among adolescent athletes. Adolescents ($N = 1,626$) who were enrolled in grades six through twelve in nine public schools completed a self-report questionnaire that measured attitudes, subjective norms, and intentions regarding dietary supplement use. Results indicated that attitudes were a better predictor of intentions to use dietary supplements than were subjective norms. It was also found that trainers had more influence on the attitudes, subjective norms, and intentions of adolescents regarding supplement use than did parents and coaches. Implications for prevention are addressed.

Article:

Dietary supplement use has been on the rise in the United States (American Dietetic Association, 1994), with sales increasing from \$3.3 billion in 1990 to \$9 billion in 1997 (Klebnikov & Moukheiber, 1998). It has been estimated that between 42% and 56% of adolescents use dietary supplements (Kim & Keen, 1999; Krumbach, Ellis, & Driskell, 1999; Massad, Sheir, Koceja, & Ellis, 1996; Sobal & Marquart, 1994a). Reasons cited for supplement use include improving athletic performance, gaining muscular strength, and increasing energy level (Sobal & Marquart, 1994a). The use of supplements seems to be influenced by beliefs and attitudes; significant others also may be influential.

Only a few studies have assessed these sources of influence on dietary supplement use (Sobal & Marquart, 1994a, 1994b; Marquart & Sobal, 1993; Graves, Farthing, Smith, & Turchi, 1991; Krowchuk, Agnlin, Goodfellow, Stancin, Williams & Zinet, 1989). One study found that 62% of adolescent athletes believed supplements improve performance, with 50% consuming dietary supplements (Sobal & Marquart, 1994b). Another study found that 70% of adolescent athletes believed dietary supplements were effective, 72% felt it was appropriate to use dietary supplements, and 95% believed dietary supplement use presented little or no risk (Krowchuk et al., 1989).

Coaches have been cited as a prime influence in regard to dietary supplement use among adolescents (Douglas & Douglas, 1984; Krowchuk et al., 1989; Sobal & Marquart, 1994b), yet studies have shown that the majority of coaches have no formal training in nutrition (Graves, Farthing, Smith, & Turchi, 1991; Spear, 1994). Spear (1994) found that 32% of coaches in Alabama high schools recommended protein supplementation and had obtained their information from lay health and fitness magazines, 49% did not know the dangerous side effects of supplement use, and 62% instructed their athletes to take vitamin and mineral supplements. Sossin, Gizis, Marquart, and Sobal (1997) found that coaches felt responsible for providing nutrition information, although as

a group they scored only 59% on a nutrition knowledge test. Thus, coaches may not be qualified to provide dietary supplement information.

Parents have also been cited as a major influence (Douglas & Douglas, 1984; Krowchuk et al., 1989; Sobal & Marquart, 1994a). Parents seem to influence adolescents' supplement use through conversations about the possible positive effects. Krumbach et al. (1999) found that female athletes were most likely to receive dietary supplement information from family members.

Athletic trainers are a third source of influence. Studies have found that trainers are not as influential as coaches and parents, but they are better prepared to give nutritional advice (Graves et al., 1991; Marquart & Sobal, 1993). However, most middle school and high school athletic teams do not have full-time trainers. In most cases, they are available only on game days and thus have less opportunity to influence students.

Research has shown that a substantial number of adolescents use dietary supplements, but the factors influencing this behavior are still unclear. However, attitudes and beliefs about the positive aspects of supplement use and the influence of significant others seem to be important factors. The purpose of the present study was (1) to determine whether attitudes are a better predictor of adolescents' intentions to use dietary supplements than are subjective norms, and (2) to assess the influence of significant others (coaches, parents, and trainers) on attitudes, subjective norms, and intentions among adolescent athletes. Dietary supplements were defined here as products that are marketed as athletic performance enhancers (e.g., Creatine, Chromium Picolinate, Hotstuff, Andre, and GBL).

METHOD

Sample and Procedure

Data were obtained from students attending middle and high schools in the U.S. South. Teachers at selected schools administered the questionnaire, with all students in each surveyed class eligible to participate. The study sample consisted of 1,626 students enrolled in grades six through twelve in nine public schools.

Data collection took place during the winter and spring of 1999. All data were collected on-site at the participating schools. Prior to administering the questionnaire, a consent form was sent home for parents/guardians and students to sign and return. Names were not recorded on the questionnaire in order to ensure student confidentiality.

Instrument

The 44-item Survey to Predict Adolescent Athletes' Dietary Supplement Use (Perko, 1995) was used to obtain data. Eight items assess standard demographics, athletic/recreational participation, and dietary supplement use. Thirteen items measure intentions, 10 measure attitudes, and 13 measure subjective norms regarding dietary supplement use. This instrument was pilot tested with adolescents engaging in school sports to determine item response discrimination and internal consistency. Findings from the pilot study indicated that the instrument had high reliability ($\alpha = .9409$).

Statistical Analysis

Path analysis was used to determine whether attitudes are a better predictor of intentions to use dietary supplements than are subjective norms, and to assess the influence of significant others (coaches, parents, and trainers) on attitudes, subjective norms, and intentions among adolescent athletes. In path analysis, the strength of each relationship is shown by the path coefficient, which is obtained by linear regression analysis. Four path analyses were conducted: (1) attitudes by coach, parent, and trainer, (2) subjective norms by coach, parent, and trainer, (3) intentions by coach, parent, and trainer, and (4) intentions by attitudes and subjective norms.

Specifically, the coach, parent, and athletic trainer items in the analysis were as follows: (1) I would use dietary supplements if my coach gave them to me, (2) I would ask my coach if dietary supplements are safe, (3) I would ask my coach if dietary supplements work, (4) I would use dietary supplements if my parent(s) or

guardian(s) were taking them, (5) I would ask my parent(s) or guardian(s) if dietary supplements are safe, (6) I would ask my parent(s) or guardian(s) if dietary supplements work, (7) I would use dietary supplements if my parent(s) or guardian(s) bought them for me, and (8) I would use dietary supplements if an athletic trainer gave them to me. All attitude and subjective norm items were used. Intention to use supplements was assessed by the following item: I would use dietary supplements to improve my sports performance. Items pertaining to coaches' influence on dietary supplement use were combined into a composite score. A composite score was also calculated for parental items. Attitude items were combined to form a composite score, as were subjective norm items.

RESULTS

Table 1 shows the demographic data for the 1,626 students in the study. There were slightly more males (52.6%) than females (47.4%). The age range was 12 to 19 years, with approximately half being 15 or 16. Over a quarter were tenth graders, and 83.3% were White.

Figure 1 displays the beta coefficients for the path analysis. It was found that, in regard to attitudes, trainers ($b = .408$) were a better predictor than were coaches ($b = .074$) and parents ($b = .292$). In other words, trainers had the most influence on the attitudes of adolescents regarding dietary supplement use.

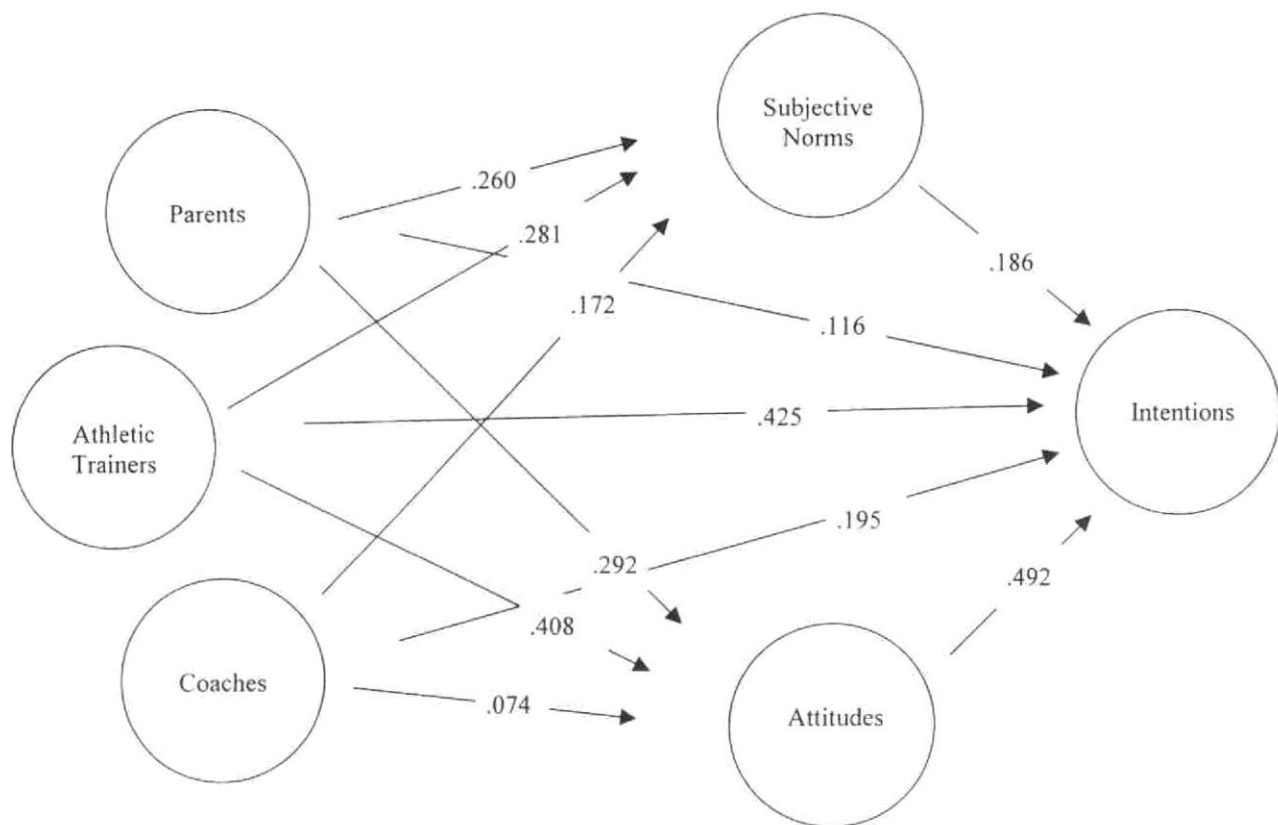
With respect to subjective norms, results indicated that trainers and parents were better predictors than were coaches. The beta coefficients (see Figure 1) were similar for trainers and parents (.281 and .260, respectively); the beta coefficient was .172 for coaches.

Results showed that trainers ($b = .425$) were a better predictor of intentions to use dietary supplements than were coaches ($b = .195$) and parents ($b = .116$). Thus, trainers' influence on intentions was greater than that of coaches, which in turn was greater than that of parents.

Table 1. Demographic Characteristics of the Sample

	%	<i>n</i>
Gender		
Male	52.6	854
Female	47.4	770
Age (in years)		
12	1.7	28
13	8.4	136
14	15.4	251
15	23.6	384
16	24.4	397
17	17.2	279
18	8.0	130
19	1.2	19
Grade		
7	6.0	98
8	12.9	209
9	19.2	311
10	26.5	430
11	20.2	327
12	15.1	245
Ethnicity		
American Indian	2.5	40
White	83.3	1348
Asian	1.7	27
Black	7.3	119
Hispanic	2.7	44
Other	2.5	41

Figure 1. Path Analysis of Influence of Significant Others on Attitudes, Subjective Norms, and Intentions (N = 1626)



Finally, it was found that attitudes were a better predictor of intentions to use dietary supplements than were subjective norms. The beta coefficient was .492 for attitudes, compared with .186 for subjective norms.

DISCUSSION

The findings of this study must be considered in light of its limitations. First, a convenience sample was used. Therefore, generalization of the findings must be made with caution. Second, data were collected via a self-report questionnaire, which may have resulted in some response bias. However, the students were assured that they would remain anonymous, and they were encouraged to respond to the questionnaire honestly. It was found that trainers were the greatest influence on attitudes, followed by parents and then coaches. Most studies have found that trainers are less influential than parents and coaches (Marquart & Sobal, 1993; Graves et al., 1991). This may be due to the fact that most schools do not provide full-time trainers, while the present study was conducted in schools that employed full-time trainers. It seems logical to conclude that if trainers are available on a continuous basis, they will have more opportunity to influence students regarding the use of sport-enhancing dietary supplements. Further, adolescents may be more likely to accept information on supplements from trainers than from coaches and parents.

Attitudes were found to be a strong predictor of intentions, whereas subjective norms were not. Anshel and Russell (1997) found that attitudes about the positive aspects of dietary supplement use, such as increased sports performance, motivated athletes to use supplements. Yordy and Lent (1993) found that attitudes were a better predictor of exercise behavior than were subjective norms. Wankel, Mummery, Stephens, and Cora (1994) reported similar results, in that attitudes were a better predictor of physical activity intentions than were subjective norms.

From a public health standpoint, it is important that adolescents make choices based on the positive or negative aspects of a particular behavior and not just the influence of a significant other. As such, information needs to be disseminated regarding the dangerous aspects of dietary supplements.

Some dietary supplements can cause death or disability as a result of improper use, such as consuming more of the product than is recommended. Fitzpatrick (1996) reported that the herbal dietary supplement ma huang, which claims to increase athletic performance, build muscle, and provide greater energy, has been associated with approximately 600 adverse health outcomes, including a number of deaths in Boston alone. Additionally, the Food and Drug Administration (FDA) has reported that supplements containing furanone di-hydro are potentially life-threatening, and they have been recalled. Furanone di-hydro, also referred to as GBL (gamma butyrolactone), was marketed as helping build muscle, reduce stress, and aid in sleep (National Nutritional Foods Association, 1999). In December 1999, Tom Gugliotta, a professional basketball player for the Phoenix Suns, suffered a seizure following the use of this substance.

Health promotion professionals need to be prepared for the next wave of dietary supplements, and intervene accordingly. Past studies have tended to present data on products that are being taken, and to propose interventions based on those particular products. However, interventions need to be developed based on why athletes use dietary supplements, as there will always be something new marketed with claims of meeting athletes' needs. In addition, more needs to be done to educate athletes about the possible dangerous consequences of dietary supplement use. Finally, prevention programs need to focus not just on use, but on attitudes, norms, and intentions.

REFERENCES

- American Dietetic Association. (1994). Positions of the American Dietetic Association: Enrichment and fortification of foods and dietary supplements. *Journal of the American Dietetic Association*, 88, 1589-1591.
- Anshel, M. H., & Russell, K. G. (1997). Examining athletes' attitudes toward using anabolic steroids and their knowledge of the possible effects. *Journal of Drug Education*, 27, 121-145.
- Douglas, P. D., & Douglas, J. G. (1984). Nutrition knowledge and practices of college athletes. *Journal of the American Dietetic Association*, 84, 1198-1202.
- Fitzpatrick, S. (1996, August 2). *DPH issues advisory on herbal dietary supplements containing ephedra* (press release). Massachusetts Department of Public Health.
- Graves, K. L., Farthing, M. C., Smith, S. A., & Turchi, J. M. (1991). Nutrition training, attitudes, knowledge, recommendations, responsibility and resource utilization of high school coaches and trainers. *Journal of the American Dietetic Association*, 91, 321-324.
- Kim, S. H., & Keen, C. L. (1999). Patterns of vitamin/mineral supplement usage by adolescents attending athletic high school. *International Journal of Sport Nutrition*, 9, 391-405.
- Klebnikov, P., & Moukheiber, Z. (1998). A healthy business. *Forbes*, 162, 89-92.
- Krowchuk, D. P., Agnlin, T. M., Goodfellow, D. B., Stancin, T., Williams, P., & Zinet, G. D. (1989). High school athletes and the use of ergogenic aids. *American Journal of Disease in Children*, 143, 486-489.
- Krumbach, C. J., Ellis, D. R., & Driskell, J. A. (1999). A report of vitamin and mineral supplement use among university athletes in a Division I institution. *International Journal of Sport Nutrition*, 9, 416-425.
- Marquart, L., & Sobel, J. (1993). Beliefs and information sources of high school athletes regarding muscle development. *Pediatric Exercise Science*, 5, 377-382.
- Massad, S. J., Sheir, N. W., Koceja, D. M., & Ellis, N. T. (1996). High school athletes and nutrition supplements: A study of knowledge and use. *International Journal of Sport Nutrition*, 53, 34-39.
- National Nutritional Foods Association. (1999). *Party drugs masquerading as dietary supplements*. www.pharmacology.about.com/library/99news/b19n1229a.htm.
- Perko, M. (1995). *Development of an instrument to assess intentions, attitudes, and beliefs of adolescent athletes regarding dietary supplement use*. Unpublished doctoral dissertation, The University of Alabama, Tuscaloosa, AL.
- Sobal, J., & Marquart, L. F. (1994a). Vitamins/mineral supplement use among athletes: A review of the literature. *International Journal of Sports Nutrition*, 4, 320-334.
- Sobel, J., & Marquart, L. F. (1994b). Vitamin/mineral supplement use among high school athletes. *Adolescence*, 29, 835-844.
- Sossin, K., Gizis, F., Marquart, L. F., & Sobal, J. (1997). Nutrition beliefs, attitudes, and resource use of high school wrestling coaches. *International Journal of Sport Nutrition*, 7, 219-228.

- Spear, B. A. (1994). *Nutrition knowledge, attitudes and practices among high school coaches in Alabama*. Unpublished manuscript, University of Alabama at Birmingham.
- Wankel, L. M., Mummery, K. W., Stephens, T., & Cora, C. L. (1994). Prediction of physical activity intention from social psychological variables: Results from the Campbell's Survey of Well-being. *Journal of Sport and Exercise Psychology, 16*, 56-69.
- Yordy, G. A., & Lent, R. W. (1993). Predicting aerobic exercise participation. *Journal of Sport and Exercise Psychology, 15*, 361-374.