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Psychosocial predictors of nutritional supplement use among leisure time exercisers

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ABSTRACT

The use of performance enhancement substances, such as nutritional supplements, is a growing phenomenon that pervades both competitive and non-competitive sports. The aim of the present study was to assess the interplay between social physique anxiety, nutritional supplement use and related social cognitions in leisure-time exercisers. The sample consisted of 196 gym users who completed a structured questionnaire including measures of social physique anxiety, supplement use and related social cognition variables. The results showed that about half of the respondents had used nutritional supplements at least once in the preceding year. Linear regression analysis indicated that social physique anxiety, past supplement use, attitudes, and personal norms predicted intentions to use dietary supplements. Multiple mediation modeling showed that the effect of social physique anxiety on supplement use intentions was fully mediated by past use. The present study provides novel findings about the effect of social physique anxiety and social cognitive processes on nutritional supplement use among leisure time exercisers.

1. Introduction

The use of nutritional supplements (also known as dietary supplements), such as minerals, multivitamins, creatine, amino acids and protein products, is widespread among adolescents and adult elite athletes, as well as leisure time exercisers (Bailey et al., 2011; Harrison, Holt, Pattison, & Elton, 2004; Hoffman et al., 2008). While athletes in competitive sports use supplements to maximize athletic performance, exercisers do so for weight management, improvement of physical stamina, building leaner muscle mass and burning fat, and to gain other assumed health benefits of supplement use, such as delay aging and improve sexual performance (McCreary, Hildebrandt, Heinberg, Boroughs, & Thompson, 2007; O'Dea, 2003; Ziegler, Nelson, & Jonnalagadda, 2003). Indeed, some nutritional supplements may increase athletic performance in some sports, promote muscle building, and lead quicker recovery following intensive training (Graham & Hatton, 1999; Jager et al., 2008). Nevertheless, despite their evidenced performance benefits a wide range of the marketed nutritional supplements may contain dubious ingredients or even substances that are officially banned from international sport organizations and the World Anti-Doping Agency (WADA), such as prohoromes, steroids, stimulants, and growth hormone (De Hon & Coumans, 2007; Geyer et al., 2004, 2008; Kohler et al., 2010). Also, according to the Dietary Supplement Health and Education Act of 1994 (DSHEA) regulatory authorities, such as the Food and Drug Administration, cannot control or regulate the ingredients used in dietary supplements before they are marketed.

Even if dietary supplements are free of any hazardous contaminants, their use can lead to detrimental health outcomes in at least three respects. Firstly, nutritional supplement users, and even more so adolescent users, are willing to engage in excessive use of supplements, or concurrently use different supplement combinations (stacking) in order to achieve their goals (e.g., leaner body, athletic performance) despite any potential health risks resulting from this practice (Hoffman et al., 2008). Secondly, recent findings point out that using nutritional supplement licenses health-risk behaviours, such as engaging in less exercise, and preferring unhealthy over healthy meals (Chiou, Yang, & Wan, 2011). Finally, recent studies have shown that nutritional supplement users may even endorse the use of illegal performance enhancement substances; thus, suggesting that legal supplements can serve as the gateway to illegal performance enhancement drugs (Backhouse, Whitaker, & Petroczi, 2011; Petróczi & Aidman, 2008).

These findings suggest that unless strict regulation is imposed in the labeling and packaging of nutritional supplements, and comprehensive education programs are in place about the safe use of nutritional supplements, this dietary practice may reflect a potential danger to public health, by outweighing the effects of physical activity and exercise on health. This calls for the need to assess

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the psychosocial correlates of supplement use, and accordingly develop education programs and policy recommendations promoting the safe use of nutritional supplements. In the available literature, the use of nutritional supplements has been associated with more favourable attitudes toward dietary supplementation, positive outcome expectancies (e.g., improved physique and athletic performance), as well as with social norms (Backhouse et al., 2011; Lucidi, Grano, Leone, Lombardo, & Pesce, 2004; Lucidi et al., 2008). Nevertheless, although we may know that more favourable attitudes toward nutritional supplements predict supplement use, we are not fully aware of the psychosocial variables that interact with attitudes and other social cognitions, and accordingly influence dietary supplementation. It has been argued that dietary practices, including nutritional supplement use, may stem from the need to improve social physique and feel comfortable with one's physical appearance or body image (Kyrejto, Mosewich, Kowalski, Mack, & Crocker, 2008; Lutz & Arent, 2008; McCreary et al., 2007).

In this respect, Social Physique Anxiety (SPA) is an important variable that may help researchers better understand the psychosocial processes underlying the use of dietary supplements (Lutz & Arent, 2008). SPA refers to the anxiety related to the anticipation of negative interpersonal evaluation of one's physique (Hart, Leary, & Rejeski, 1989), and reflects an affective dimension of body image (Bane & McAuley, 1998). Higher SPA scores have been associated with disordered eating attitudes and maladaptive responses to body image dissatisfaction (Diehl, Cheng, Roussel, & Sherr, 1998), and the drive for thinness, which is a risk factor for disordered eating patterns (Thompson & Chad, 2002). Among exercisers, SPA acts as a motive to improve appearance and perceptions of body image (Hausenblas & Mack, 1999). These findings suggest that SPA is associated with several practices toward achieving greater body image satisfaction, and this may even include the use of nutritional supplements. In support of this view, Hildebrandt et al. (2011) argued that there are higher rates of body image disturbances among nutritional supplement users, and that specific features of body image disturbances that are conceptually related to SPA (e.g., body checking, investment in appearance and negative emotionality tied to appearance) appear to be good indicators of dietary supplement use. However, to the best of the authors' knowledge, no studies have directly assessed the relationship of SPA with nutritional supplement use and related social cognitions.

As Preacher and Hayes (2008) noted "the discovery that two variables are related to each other is only one small part of the aim of psychology. Deeper understanding is gained when we comprehend the process that produces the effect" (p. 717). This assertion is also illustrated in several meta-theories and integrative theoretical approaches, such as the theory of triadic influence (TTI, Flay & Petraitis, 1994; Flay, Snyder, & Petraitis, 2009) and Fishbein's (2009) integrated model (IM), which try to explain a wide range of health-risk and substance use behaviors by distinguishing between ultimate, distal, and proximal predictors of behaviour. Ultimate predictors include broader contextual variables, such as social structure and community characteristics, whereas distal predictors reflect narrower characteristics of the person and the environment, including social norms, self-determination, and personality. Proximal predictors encompass affect and social cognitions, such as descriptive, personal, and injunctive social norms, self-efficacy, and attitudes. The proximal predictors shape behavioral intentions and engender 'trial behavior' under risk-conducive situations. Finally, as trial behaviors become more habitual, the relative strength of other influences decreases and future actions are predicted by past behaviour (Flay et al., 2009).

Several studies have shown that demographic variables, such as gender, may contribute in the prediction of doping and supplement use patterns in athletes (Mazanov, Petroczi, Bingham, & Holloway, 2008; Ronsen, Sundgot-Borgen, & Maehlum, 1999). Other studies addressing multiple risk factors showed that past behavior, social and personal norms, self-efficacy, and attitudes predicted intentions and actual use of nutritional supplements and doping behavior in both amateur and elite sports, and across age groups (Dunn, Mazanov, & Sithartan, 2009; Goulet, Valois, Buist, & Cote, 2010; Lazuras, Barkoukis, Rodafinos, & Tsorbatzoudis, 2010; Lucidi et al., 2008; Wiefferink, Detmar, Coumans, Vogels, & Paulussen, 2008). However, there is a relative paucity of research using integrative theoretical approaches that address the interplay between distal and proximal predictors of supplement use intentions in non-elite athletes and gym users, and the present study set out to fill in this gap by assessing the effects of SPA (distal predictor) and proximal predictors (past behaviour, attitudes, norms, and self-efficacy) of nutritional supplement use intentions. Based on the assumptions of the TTI (Flay et al., 2009) and the IM (Fishbein, 2009), it was hypothesized that SPA will act as a distal-level influence, and predict supplement use intentions indirectly through the effects of social and personal norms, attitudes, and self-efficacy Fig. 1. Following from past research, we also sought for gender differences in supplement use patterns and beliefs (e.g., Mazanov et al., 2008; Ronsen et al., 1999).

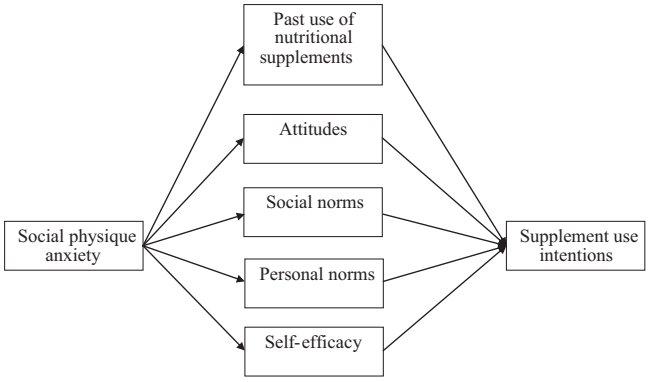

Fig. 1. Antecedents of supplement use among leisure time exercisers.

2. Methods

2.1. Participants

Overall, 350 adult gym users were approached and 212 agreed to participate in the study (response rate = 60.5%) by completing an anonymous questionnaire. The participants were recruited from five, randomly selected, gyms and fitness centers in the urban area of Thessaloniki – Greece's second largest city (approximately 1 m inhabitants). Of the returned questionnaires, 16 were excluded from further analyses because of non-completion of major parts of the survey. The final sample consisted of 196 participants (72.3% males) aged between 18 and 53 years old (M = 27.1 years, SD = 6.62), with an average of five years (Mode = 5.00, M = 6.32, SD = 5.28) of training in gyms and fitness centers.

2.2. Measures

The questionnaire comprised of measures of social cognitions (i.e., attitudes, subjective, descriptive, and personal norms, and self-efficacy), behavioural intentions, use of nutritional supplements, and the Social Physique Anxiety Scale (SPAS; Hart et al., 1989).

Attitudes: Attitudes toward the use of nutritional supplements were measured in two ways. The first measure included eight items reflecting different behavioral beliefs toward supplement use (e.g., "the use of supplements can help me improve my body's image"; "sports supplements can help me achieve my goals at the gym"),