



Nutritional, medicinal, and performance enhancing supplementation in dance



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ABSTRACT

The aims of the current study were to: (a) investigate the reported prevalence of nutritional, medicinal, and performance enhancing substance use in dance, including any gender or professional status differences, and (b) examine the amount of importance dancers place on potential sources of information regarding supplementation. Methods involved administering an anonymous survey to 371 male ($n = 83$) and female ($n = 286$) UK-based dancers ($M_{age} = 20.87$ years). Use of at least one supplement was reported by 91.9% of the dancers surveyed, and prevalence rates were highest for multivitamins, over-the-counter painkillers, and high energy drinks. Prevalence of use varied from low to high for specific nutritional and medicinal supplements, whereas very low levels of supplementation were seen for all performance enhancing supplements. Numerous forms of supplementation were more prevalent in male and professional dancers in comparison to female and amateur dancers, respectively. Across all categories of supplementation, physiotherapists and GPs/physicians were considered to be important sources of information on supplementation, whereas non-dance friends were considered to be the least important source of information. In conclusion, the current study provides much needed information on nutritional, medicinal and performance enhancing supplementation in dancers, and identifies key sources of information for dancers on all forms of supplementation.

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1. Introduction

Research in the athletic domain suggests athletes often look to support and facilitate their training and performance using a variety of nutritional, medicinal, and performance enhancing substances (e.g., de Hon, Kuipers, & van Bottenburg, 2015; Lazic et al., 2011). Regarding nutritional and medicinal substances, polypharmacy – or the inappropriate and excessive use of nutritional and medicinal substances (see Baylis, Cameron-Smith, & Burke, 2011) has been linked with an increased likelihood of potentially serious health consequences (e.g., Chen, Biller, Willing, & Lopez, 2004; Palmer et al., 2003; Yetley, 2007). Similarly, use of performance enhancing substances has also been associated with negative health consequences (Casavant, Blake, Griffith, Yates, & Copley, 2007). Although prevalence of and information sources for nutritional supplement use has started to be investigated in dance populations (Brown & Wyon, 2014), very little is known regarding the use of medicinal and

performance enhancing substances in this group, nor what information sources inform any use (see Sekulic, Peric, & Rodek, 2010). As such, the overarching aim of the current study was to investigate the prevalence of nutritional, medicinal, and performance enhancing substance use in dancers, as well as the importance placed on a range of potential information sources regarding use of these substances.

As alluded to above, it is possible to categorise substances taken to facilitate athletic performance into three broad categories: nutritional, medicinal and performance enhancing substances. Nutritional – or dietary – substances have been defined as orally consumed products taken for the purpose of supplementing one's normal diet and include substances such as vitamins, minerals, macronutrients (e.g., carbohydrate and protein supplements) and creatine monohydrate (U.S. Food & Drug Administration, 1994). In contrast, medicinal substances are defined as drugs or other preparations designed to prevent or treat disease (Oxford Dictionary, 2015) with a drug being defined as a chemical substance that through interaction with biological target/s can alter the body's biochemical systems and examples are painkillers, diuretics and decongestants (Mottram & Chester, 2015). Finally, performance enhancing substances are those that appear on the World

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Anti-Doping Agency (WADA) list of substances prohibited for use in sport (Mottram & Chester, 2015) and include substances such as ephedrine stimulants, oral and injectable anabolic androgenic steroids, and beta-blockers (WADA, 2015).

When considering prevalence of use for nutritional, medicinal and performance enhancing substances, availability is an important consideration. Although health (e.g., Casavant et al., 2007), moral (Erickson, McKenna, & Backhouse, 2015), and legal (Boardley & Grix, 2014) issues may potentially influence decisions regarding supplementation, ease of availability may also influence prevalence of use. As well as being easier to access, substances that are freely available may have an increased prevalence not just because they are easier to access, but because such availability may lead potential users to think they are safe to use. Availability is of particular relevance to medicinal supplements, as some are freely available (i.e., over-the-counter [OTC] medicines), whereas others require certification via a medical professional (i.e., prescription medicines; Petr czi & Naughton, 2009). Performance enhancing substances are also likely to be more difficult to obtain than nutritional supplements or OTC medicines. As such, availability may be an important consideration when considering prevalence of use for nutritional, medicinal and performance enhancing substances.

Research to date has highlighted the importance of determining prevalence of use for nutritional supplements in athletic domains. In the realm of sport, athletes from a variety of sports have reported rates of nutritional supplement use ranging from 32 to 90% (Baylis et al., 2011; Giannopoulou, Noutsos, Apostolidis, Bayios, & Nassis, 2013; Lazic et al., 2011; Ronsen, Sundgot-Borgen, & Maehlum, 1999; Schroder et al., 2002; Sundgot-Borgen, Berglund, & Torstveit, 2003). Such prevalence rates are important because research has shown more than 10% of freely available nutritional supplements may be contaminated with performance enhancing substances such as stimulants and anabolic steroids (Baume, Mahler, Kamber, Mangin, & Saugy, 2006; Geyer et al., 2004, 2008). As such, those who take nutritional substances may risk inadvertently taking substances they had not intended to.

As well as the potential for inadvertently taking unintended substances, it is also important to determine use of nutritional supplements due to the suggestion that such use may sometimes act as a gateway to the use of prohibited substances. For instance, Boardley and Grix (2014) and Martinez and Bilard (2003) have both described processes based upon athlete accounts whereby initial use of legal nutritional substances may lead to use of prohibited substances for some athletes. Support for such a process is seen in research that has shown that nutritional supplement users are more likely to be prohibited substance users and also have different attitudes towards doping in comparison to non-users of nutritional supplements (Backhouse, Whitaker, & Petr czi, 2013; Mazanov, Petroczi, Bingham, & Holloway, 2008; Papadopoulos, Skalkidis, Parkkari, & Petridou, 2006). As such, it is also important to understand prevalence of nutritional supplement use across different populations because such use may place users at increased risk of progressing to use of substances that may potentially be harmful to health when taken in certain combinations or quantities.

As identified earlier, dancers represent one population where there is limited knowledge available on nutritional supplement use. The first study to look at this was conducted by Stensland and Sobel (1992), who found 60% of US-based dancers reported use of vitamin or mineral supplements in a relatively small ($N = 106$) sample of ballet, jazz, and modern dancers. Next, in a study of UK dancers involving 1056 dancers from across a range of formats, Laws (2005) found 63% of dancers reported using supplements, with 56% reporting use of vitamin supplements, 20% iron supplements, and 20% calcium supplements. Subsequently, in a study of 127 adolescent ballet dancers, Burckhardt, Wynn, Krieg, Bagutti, and Faouzi (2011) found 57% of dancers reported taking multi-mineral supplements,

or both, whilst 13% reported using calcium supplements. Finally, Brown and Wyon (2014) used an online survey to collect data on nutritional supplement use in 334 dancers from 53 countries, finding 50% of dancers reported using nutritional supplements regularly. Of those reporting regular use, 60% reported using vitamin C, 67% multivitamins, 72% caffeine, 21% whey protein and 14% creatine. Thus, based upon the fairly limited information available, it would seem prevalence of nutritional supplement use in dancers is at a comparable level to that seen in sport. However, more research is needed to increase the available data, especially given two of these studies are over ten years old and as such prevalence rates may have changed since then.

Use of medication to support training and performance represents another potential form of supplementation that is currently understudied in dancers. Given the severe demands placed upon dancers that may put them at increased risk of injury (see Allen, Ribbans, Nevill, & Wyon, 2014; Jacobs, Hincapie, & Cassidy, 2012), dancers may at times use pain relief medications to help with pain management. Also, given dance represents a discipline that is thought to promote a focus on aesthetic build and low body weight (see Amorim et al., 2015), there may be an increased use of medicines (e.g., diuretics, laxatives) that may facilitate weight loss in dance populations compared to the general population. Evidence from other athletic disciplines such as elite sport suggests inappropriate and excessive use of medications does occur, and may make adverse drug events and interactions with potentially serious consequences more likely (e.g., Lazic et al., 2011; Tscholl, Feddermann, Junge, & Dvorak, 2008; Tscholl, Junge, & Dvorak, 2008). The work of Sekulic and colleagues also suggests medicinal substances may be used by dancers. For instance, in one study seven of 25 (i.e., 28%) professional Croatian ballet dancers reported using painkillers often or regularly (Sekulic et al., 2010). In contrast, only 10 of 43 (i.e., 23%) Latin and standard coupled dancers from Serbia reported any use of painkillers, with only one dancer reporting using them often (Sekulic, Kostic, Rodek, Damjanovic, & Ostojic, 2009). As such, research is needed using larger and more diverse samples to increase our knowledge of prevalence of medicinal supplementation in dance to determine whether some dancers may be putting themselves at risk through excessive or inappropriate use of such substances.

A third and final understudied form of supplementation in dance relates to the use of performance enhancing substances. The severe physical demands associated with dance mentioned previously may potentially lead to some dancers considering adopting their use. For instance, this may be driven by attempts to prevent or facilitate recovery from injury. Alternatively, such use could be driven purely by a desire to improve performance through an impact on physical attributes such as strength and power. Given dance is not a sport the use of such substances by dancers is not controlled under the auspices of WADA as it is in sport. However, any dancers who do use products such as ephedra, anabolic androgenic steroids, or beta-blockers to support their training and/or performances are still at increased risk for the harmful side effects reported by some users (e.g., Andrews, Sudwell, & Sparkes, 2005; Olrich & Ewing, 1999). Prevalence data from elite sport based upon self-reports has reported prevalence rates in the region of 5–15% (Laure, 1997). Within dance, 19% of Latin and standard coupled dancers from Serbia and 44% of professional Croatian ballet dancers acknowledged they would use performance enhancers in certain circumstances (Sekulic et al., 2009, 2010). Although these findings are informative, the small homogeneous samples involved mean further research that investigates the prevalence of performance enhancing substance use in dance populations is needed.

Importantly, prevalence for use of certain supplements may be moderated by gender. For instance, it is possible that differences between male and female dancers regarding the physical and

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