Development and validation of Performance Enhancement Attitude Toward doping Scale in Elite Athletes of Iran

Behzad Divkan, Farshad Tojari, Seyed Mohammad Kazem Vaez Mosavi, Farideh Ganjouei

1, 2, 4Department of Physical Education, Tehran central branch Islamic Azad University, Tehran Iran
3Department of Physical Education, Imam Hossein Comprehensive University, Tehran Iran

ABSTRACT

The purpose of the present study was to develop and validate an instrument that measures the nature of the Performance Enhancement Attitude toward doping. This study was carried out in an attempt to assess content, predictive, and construct validity, as well as internal consistency, of the Performance Enhancement Attitude toward doping Scale (PEAS), using 240 elite athletes of 16 field sport in Iran samples. Confirmatory factor analysis (CFA) was used to reduce the number of items, confirm the latent structure of the (PEAS). Results supported the multidimensional nature of the Performance Enhancement Attitude toward doping Scale. The latent structure of the (PEAS), was underlined by the latent variables of coaches’ and Performance Enhancement Attitude toward doping athletes’. Results also showed that reduced a 17-item pilot questionnaire to a 9-item instrument measuring Acceptance. A series of subsequent analyses resulted in the deletion of 8 items from the original 17-item PEAS scale.

INTRODUCTION

Beyond the exhilaration of witnessing individuals overcome enormous pressure and adversity to demonstrate their physical, technical, and mental ability is the economic, political, social, and philosophical significance of sporting activity. Although representing an integral component of many cultures around the world, there exists a major wound in sporting culture that is being treated yet remains unhealed. The use of performance-enhancing drugs (PEDs) in sport, or doping, is a worldwide, multidimensional, social phenomenon in which substances belonging to a prohibited class of pharmacological agents (e.g., amphetamines, erythropoietin) and/or methods (e.g., blood doping) are used by athletes in an attempt to enhance performance. In addition to the potentially serious health effects from engaging in PED use [5], doping violates the integrity, spirit and reputation of sport and has the potential for a flow-on effect whereby doping in elite sport may convey a message of legitimacy to younger athletes at the “grass roots” level.

Despite a shortage of empirical data about the specifics of drugs in sport, the literature on sport development and the history and evolution of drug use in sport suggests that sport is susceptible to drug use for two main reasons. First, sport has become heavily commercialized, and the rewards for success have escalated commensurately. The result has been a surge in demand for substances that might improve performance and provide a competitive edge.

Consistent with other attitudinal research, attitudes towards prohibited performance-enhancing substances have evidenced relationships with supplement use [11] and doping behaviour [12]. Other investigations, which have been guided by the theory of planned behaviour [1], have provided empirical support for the idea that attitudes play a central role in intentions to engage in PED use [9,10]; that is, intention to use doping substances increases with stronger attitudes in favour of doping. Attitudes to doping have also been shown to predict doping susceptibility (i.e., any level of consideration of engaging in doping activities), which, in turn, has been shown to predict actual doping behaviour [8].

A great deal of research into doping in sport has focused on athletes’ and, to a lesser extent, coaches’ and medical professionals’ attitudes towards doping to inform the design of such educational initiatives (Backhouse, McKenna, Robinson, & Atkin, 2007, for a review). It is not surprising then that attitudes play a central role in theoretical models pertaining to PED use in sport [12].

An attitude represents a summary evaluation of a psychological object, be it a person (e.g., coach) or group of people (e.g., athletes), a physical entity (e.g., Lord’s Cricket Ground), an institution (e.g., World Anti-Doping Agency), a policy (e.g., Illicit Drug Policy), a behaviour (e.g., doping), or any other discriminable aspect of an object. Attitudes have been shown to have a significant impact on behaviour, and in the context of doping, attitudes have been found to be predictive of intentions to use doping substances [9].

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individual’s world [2]. Meta-analyses have revealed that attitudes correlate, on average, between .45 and .60 with intentions for a wide variety of behaviours [1]. It is no surprise then that the attitude construct occupies a central role in theories and research regarding human behavior across a variety of settings (see Ajzen & Gilbert Cote, 2008, for a review). The purpose of this study At present, there is no specific measure for assessing PEAS among in elite athletes of Iran. This is a major gap in the literature, as the rigors associated with elite sport may create significant risk for elite athletes to experience Performance Enhancement drug attitude. In order to develop a measure of PEAS among elite athletes, it is important to first identify the dimensions of PEAS within this population.

MATERIALS AND METHODS

factor analysis, psychometric properties and the:

PEAS:

1.2. Participants:

Participants were 240 elite athletes. There was male athletes. Athletes ranged from 18 to 35 years of age, with a mean age of 22.3 years (SD = 4.6). Athletes represented 16 sports.

2.2. Materials:

Participants received demographic questions and the PEAS , The components of this questionnaire are described below.

Demographic and coaching-related information. Demographic questions were included to obtain information regarding.

3.2. Performance Enhancement Attitude Scale (PEAS; Petroczi & Aidman, 2009):

The 17-item of the PEAS was employed as a self-reported measure of generalized doping attitudes thought to be predictive of doping-related behaviours. Examples of PEAS items include “Doping is necessary to be competitive” and “Doping is an unavoidable part of competitive sport.” Participants responded to each item on a 7-point scale ranging from strongly disagree (1) to strongly agree (7). Previous research supports the unidimensional structure, reliability, and validity of the PEAS [13].

4.2. Reliability:

Internal consistency estimates were calculated to evaluate the reliability of the revised 17-item scale. Cronbach’s alpha coefficient for the total scale reliability was $r = .82$.

5.2. Data analysis:

Fit indexes. Various goodness-of-fit indexes were utilized to evaluate the adequacy of the factorial structure of the four competing models. The $\chi^2$ statistic (in this case, the Satorra–Bentler scaled $\chi^2$ as robust maximum likelihood was used) evaluates the absolute fit of the hypothesized model to the data. However, this statistic is very sensitive to sample size. Therefore, additional fit indexes were employed to evaluate model fit. The Robust Comparative Fit Index (CFI) and the Non-Normed Fit Index (NNFI) were utilized to compare the hypothesized model with the independence model. The Standardized Root Mean Square Residual (SRMR) was also employed, because it represents the average of the standardized residuals between the specified and obtained variance–covariance matrices. The Root Mean Square Error of Approximation (RMSEA) was also utilized to assess the Closeness of fit of the hypothesized model to the population covariance matrix. When the 90% confidence interval of the RMSEA contains 0.05, it indicates the possibilities of close fit. A simulation study by Hu & Bentler suggested new cut-off criteria for the various fit indexes. According to these new criteria, a good model fit is indicated when the CFI and the NNFI are close to 0.95, the SRMR is close to 0.08, and the RMSEA is close to 0.06. To compare the four models, $\chi^2$ difference tests were carried out. However, due to the sensitivity of the $\chi^2$ statistic, two more fit indexes were employed. The first one was the Akaike Information Criterion (AIC), which assesses whether a good model fit can be achieved with fewer estimated parameters. The second fit index was the Expected Cross-Validation Index (ECVI), which represents an approximation of the fit that the hypothesized model would achieve in another sample of the same size. The AIC and ECVI do not have a specified range of acceptable values, but amongst the competing models, the one with the lowest AIC and ECVI values would be the most parsimonious and most likely to replicate to other samples.

6.2. Results:

Result shows that we evaluated the measurement model of the PEAS using confirmatory factor analysis (CFA) and the maximum likelihood estimation with LISREL 8.8. Several types of indices for determining overall model fit for the PEAS measurement model were used including the $\chi^2$ goodness-of-fit statistic and several other fit indices e both absolute and incremental e that supplement the chi-square test. These indices are
the Goodness-of-Fit (GFI), the Adjusted GFI (AGFI), Normed Fit Index (NFI), and the root mean-square error of approximation (RMSEA). The RMSEA 90% confidence intervals are also provided to assist in interpreting these point estimates. An absolute fit index (e.g., RMSEA) assesses how well a model reproduces the sample data without comparison to a reference model, whereas an incremental fit index (e.g., CFI, TLI, and IFI) compares the target model to a more restricted baseline model (Hu & Bentler, 1999). Values on the GFI, AGFI, and NFI that are .91, .87, and .93 are generally taken to reflect acceptable and excellent fits to the data, respectively. For the RMSEA, values of .078 less indicate an adequate fit.

Table 1: Factor analysis (CFA) Enhancement Attitude toward doping Scale (PEAS)

<table>
<thead>
<tr>
<th>Variable</th>
<th>questions</th>
<th>Mean</th>
<th>ES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude to doping</td>
<td>ATD1</td>
<td>2.08</td>
<td>.69</td>
</tr>
<tr>
<td></td>
<td>ATD2</td>
<td>2.28</td>
<td>.71</td>
</tr>
<tr>
<td></td>
<td>ATD3</td>
<td>2.45</td>
<td>.60</td>
</tr>
<tr>
<td></td>
<td>ATD8</td>
<td>2.74</td>
<td>.43</td>
</tr>
<tr>
<td></td>
<td>ATD9</td>
<td>2.45</td>
<td>.45</td>
</tr>
<tr>
<td></td>
<td>ATD10</td>
<td>2.35</td>
<td>.34</td>
</tr>
<tr>
<td></td>
<td>ATD11</td>
<td>2.80</td>
<td>.69</td>
</tr>
<tr>
<td></td>
<td>ATD12</td>
<td>2.41</td>
<td>.40</td>
</tr>
<tr>
<td></td>
<td>ATD17</td>
<td>2.95</td>
<td>.44</td>
</tr>
</tbody>
</table>

Fig. 1: Results of the CFA Factor analysis illustrating the attitudes to doping scale (PEAS)

Table 2: Fit statistics for the competing model

<table>
<thead>
<tr>
<th>Model</th>
<th>NFI</th>
<th>AGFI</th>
<th>GFI</th>
<th>$\chi^2$</th>
<th>df</th>
<th>RMSEA</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.93</td>
<td>0.87</td>
<td>0.91</td>
<td>825/35</td>
<td>347</td>
<td>0.078</td>
<td>0.0001</td>
<td></td>
</tr>
</tbody>
</table>

Discussion:
Existing literature agrees that attitudes toward doping are likely to be a strong predictor of behavioural intention [9,10]. However, attitude measurement findings [18] are to be interpreted with caution, often due to the questionable reliability of attitude measures employed. This paper examined evidence of reliability and validity for the PEAS, which is intended to complement the existing ad hoc, “disposable” doping attitude measures. PEAS scores were normally distributed in most samples examined, indicating that the scale is tapping substantive individual differences. Over the repeated use, the mean PEAS scores remained under or were close to the theoretical mean, suggesting that athletes hold a generally non-endorsing explicit attitude toward doping, which is consistent with the existing literature [6,7].

The PEAS appeared to be reliable across several samples and in addition to its face validity, it showed encouraging convergent validity. An analysis of the one-factor, 17-item PEAS model [13] evidenced show model fit (see Table 1,2 & figure 1). As the a priori measurement model was of poor fit, items were considered for deletion if they displayed large standardized residuals (>2), if modification indices suggested that the error term of an item correlated with that of another item, or if an item had a low factor loading (<.40; Mullan, Markland, & Ingledeaw, 1997). Accordingly, we conducted a series of one-factor, congeneric analyses in which items were allowed to load on only one hypothesized factor (i.e., adequate indicators of the latent variable), and
error terms were not allowed to correlate until an adequate measurement model was obtained. A series of subsequent analyses resulted in the deletion of 8 items from the original 17-item PEAS scale. low factor loadings indicated that each of these eight - items did not correspond with the other items loading on the general attitudes to doping factor. The resultant nine-item, one-factor model showed excellent model fit and adequate internal reliability (a ¼ .74). Thus, the remaining items for the PEAS were I feel depressed when taking a break from exercise/training. I continue to exercise/train even when I’m physically injured. I continue to exercise/train even when I’m physically sick. I experience conflict with my family. I often feel anxious.. I often feel depressed. I engage in deception in order to exercise/train and I sometimes exercise/train in secret.

REFERENCES


Appendix A. Exercise Dependence and Elite Athletes Scale:

(EDEAS):
1. I feel depressed when taking a break from exercise/training.
2. I continue to exercise/train even when I’m physically injured.
3. I continue to exercise/train even when I’m physically sick.
4. I am inflexible with my exercise/training patterns.
5. I feel that the more exercise/training I do, the better my athletic performance will be.
6. I feel a need to exercise even when I have completed my exercise regime.
7. I don’t feel emotionally close to anyone.
8. I experience conflict with my family.
9. I often feel anxious.
10. I often feel depressed.
11. I engage in deception in order to exercise/train.
12. I sometimes exercise/train in secret.
13. I have engaged in more and more exercise/training over time.
15. I have experienced a recent decrease in athletic performance.
16. I severely restrict my calorie intake to alter my body shape and size.
17. I restrict my diet to only a few foods to alter my body shape and size.
18. I have a strong fear of failure and this motivates me to achieve.
19. I worry about a decline in athletic performance if I take time off from exercise/training.
20. I do not always report my injuries to coaches.
21. I feel guilty if I miss exercise/training.
22. I feel uncomfortable when engaging in recovery sessions.
23. I experience difficulty coping with tapering.
24. I experience conflict with my coaches.
25. I experience conflict with my teammates/training partners.
26. I don’t like tactical or technical training sessions.