

## A cross-sectional study on doping knowledge of national sports team athletes in Sri Lanka

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### Abstract

*Doping can be seen among athletes of different sport types, age categories, achievement levels and education levels. Doping is known as the use of illegal substances or methods by athletes to enhance performance during competition or out of the competition. The aims of this cross-sectional survey were to assess the knowledge level of Sri Lankan elite athletes towards doping and to study the influence of selected demographic factors on athletes' knowledge toward doping. A total of 308 national-level athletes representing 17 sports participated in the study. The study population consisted of 66% males and 34% females. Participants' age ranged from 15 to 42. Data gathered through a questionnaire on demographic information and knowledge. One-way ANOVA was used to compare mean knowledge scores among athletes representing different sports categories, age groups, achievement levels and education levels. Independent sample T-test was used to compare mean knowledge scores of male and female athletes. Post Hoc test used to identify dissimilar means within the groups. The overall mean scores for knowledge of the participants was 41.1%. Hence, it can be concluded that the participants' knowledge of doping is inadequate (mean knowledge score was below 50%). Mean knowledge scores of athletes representing different sports types, chronological age, the highest sports achievement and education level significantly affect athletes' knowledge towards doping ( $P < 0.05$ ). Further, gender and training age did not have a significant effect on athletes' knowledge toward doping ( $P > 0.05$ ).*

**Keywords—** Doping, Elite athletes, Doping Knowledge

### I. INTRODUCTION

Doping is the use, attempted to use or administration of drugs or other substances for performance enhancement in sports by athletes or other sport-related administrators. World Anti-Doping Agency (WADA) was established in 1999 to promote and coordinate the activities against

doping in sport internationally. At present "Doping" has become a global problem in the field of sports (World Anti-Doping Agency, 2018). The aim of this study was to assess the knowledge level of Sri Lankan elite athletes about doping, to investigate the relationships, difference and to study the influences of selected demographic factors on athletes' knowledge toward doping. Although Sri Lanka is a small nation in the sports world, still it has an effect from Performance Enhancing Substances (PES) use and violating WADA rules. Sri Lanka Anti-Doping Agency (SLADA) is the national authorized institute to act against doping practices in the sports field in Sri Lanka. According to SLADA reports from 2013 to the end of 2017 total of 665 athletes have been tested and 19 (2.9%) have been reported positive. Thus, the two years (2016-2017) out of 233 tests 10 (4.3%) have been reported positive (Sri Lanka Anti-Doping Agency, 2018). The major objective of this study is to investigate the level of knowledge of Sri Lankan elite athletes towards doping. The specific objectives of the study were to investigate the effect of different sports types, age, gender, training age, the highest recent sports achievement and the highest education level on doping knowledge.

### II. METHODOLOGY

This study was carried out as a cross-sectional survey study and focused on investigating the differences in knowledge of doping among national sports teams in Sri Lanka. This study focused on athletes of 17 national teams that represent Sri Lanka at international competitions. The 17 sports considered were categorized into 8 groups according to the nature of the sports as follows: athletics, ball games (basketball, football, netball and rugby), martial arts (judo, karate, taekwondo and wrestling), swimming, racket sports (badminton, table tennis), weight training sports (bodybuilding, weightlifting and powerlifting), cricket and gymnastics. A total of 453 athletes were approached. However, only 308 participants returned the completed questionnaire, which resulted in a response rate of 70%.

The data were gathered from a self-administrated questionnaire which has two parts. Orderly, Part I of the questionnaire consisted of questions on demographic information of the participants such as sport type, gender, chronological age, training age, highest sports achievement during 2014-2018 and highest education level. Part II was a knowledge questionnaire constructed by combining "Construction and validation of an original measurement tool and its applicability to Olympic Sailing" by Jursic and Sattler in 2015 and WADA Quiz (Jursic and Sattler, 2015; World Anti-Doping Agency, 2018). Part II had 16 questions focusing on knowledge about testing procedures, athletes' rights and responsibilities, supplement quality and trust, sanctions, prohibited substances and methods, side effects and common practices. One-way ANOVA, Tukey post-hoc and Pearson correlation tests were carried out for analysis. Statistical data analysis was conducted using SPSS version 22.0.

### III. RESULTS

A total of 308 participants responded to the questionnaire. Table 1 summarises the knowledge scores of athletes based on the demographic variables studied in this research.

The highest number of participants represented athletics ( $n=123$ ) whereas the lowest number of participants ( $n=9$ ) represented gymnastics. Out of 308 participants, 202 were male and 106 were female athletes. The chronological age of the participants ranged from 15 to 42. The majority of participants (77%) have participated in International competitions (Table 1).

The overall mean knowledge score of participants was 41%. Significant differences existed among athletes representing different sports types, chronological age groups, sports achievement levels and educational qualifications. The findings do not support significant differences ( $P>0.05$ ) among athletes representing different genders and training age groups with respect to doping knowledge (Table 1).

There was a significant difference ( $P>0.05$ ) in mean knowledge scores of athletes representing different sport types. Gymnasts and weight training-based athletes had higher knowledge scores were over 60% compared to athletes from other sports. The scores of athletes

participating in ball games, swimming, racket sports and cricket sport types were below 40% (Table 1).

With respect to chronological age, there was a gradual increment in doping knowledge with the increase of age. The highest ( $P<0.05$ ) knowledge score was recorded in athletes aged 35 or above. There were no differences in doping knowledge scores among athletes representing other age groups ( $P>0.05$ ) (Table 1).

Although the highest sports achievement level had a significant effect on doping knowledge of athletes ( $P<0.05$ ), the post-hoc tests confirmed that a significant difference can be seen only between South Asian Championship participant and Olympians ( $P>0.05$ ). Similar results were obtained for athletes having different educational qualifications where athletes with Diplomas or professional qualifications had higher ( $P<0.05$ ) knowledge scores compared to those who have completed only the school education (Table 1).

### IV. DISCUSSION

The overall mean knowledge about doping (41%) is inadequate ( $41% < 50%$ ). The previous studies carried out in Uganda, Poland and Kenya, revealed that the mean knowledge scores of participants were 37.7%, 45.2% and 46.4%, respectively. Therefore, it can be assumed that the athletes' knowledge about doping range from 35% to 47% in general (Chebet, 2014; Anti-doping, 2015; Muwonge, Zavuga and Kabenge, 2015). Poor knowledge about doping is common (Kim and Kim, 2017).

Apart from the Gymnasts and weight training sports athletes, other athletes possess an insufficient level of knowledge about doping (mean score less than 50%). However, some studies identified that there was no significant difference between individual and team sports with respect to doping knowledge of athletes (Kim and Kim, 2017).

Table 1 Mean doping knowledge scores of athletes based on different demographic factors

Factor	N	Doping Knowledge (%)
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<b>Sport Type</b>		
Athletics	123	43.8 <sup>a</sup>
Ball Games	43	29.7 <sup>a</sup>
Martial Arts	39	41.2 <sup>a</sup>
Swimming	36	35.7 <sup>a</sup>
Racket Sports	22	37.5 <sup>a</sup>
Weight training sports	18	61.1 <sup>b</sup>
Cricket	18	33.7 <sup>a</sup>
Gymnastics	9	63.2 <sup>b</sup>
<b>Gender</b>		
Female	106	41.0
Male	202	41.1
<b>Chronological Age</b>		
Age 19 ≥	95	38.4 <sup>a</sup>
Age 20-24	104	39.0 <sup>a</sup>
Age 25-29	74	41.6 <sup>a</sup>
Age 30-34	22	47.7 <sup>a</sup>
Age 35 ≤	13	62.5 <sup>b</sup>
<b>Training Age</b>		
Year 5 ≥	74	39.5
Year 6-10	80	46.1
Year 11-15	80	39.1
Year 16 ≤	74	39.2
<b>Highest Sports Achievement</b>		
Nationals	71	41.8 <sup>a, b</sup>
South Asian Championships	95	36.4 <sup>a</sup>
South Asian Games	20	42.2 <sup>a, b</sup>
Asian/Commonwealth Championships	40	46.4 <sup>a, b</sup>
Commonwealth/Asian Games	29	45.0 <sup>a, b</sup>
World Cup/ Championships	47	39.8 <sup>a, b</sup>
Olympic Games	6	57.3 <sup>b</sup>
<b>Education Levels</b>		
Below grade 11	11	37.0 <sup>a</sup>
Up to grade 11	34	34.0 <sup>a</sup>
Up to grade 13	149	37.8 <sup>a</sup>
Diploma/Professional qualification	41	52.0 <sup>b</sup>
Bachelor's Degree or higher	73	45.7 <sup>a, b</sup>

<sup>a, b, c</sup> Dissimilar superscripts indicates differences ( $P < 0.05$ ) in mean values within the same category.

This study revealed that gender does not significantly affect the doping knowledge of athletes ( $P > 0.05$ ; female 41%, male 41.1%). The reason for this observation may be because all athletes train together and both male and female athletes receive similar attention and opportunities from authorities. Thus, in the Sri Lankan sporting context, the female athletes have the same competitive environment as male athletes, which may be the reason for similar knowledge scores observed for both groups. A similar result was recorded by Fürhapter *et al.*

(2013), where gender had no effect on the knowledge of Austrian Junior athletes toward doping. However, two studies carried out in Kenya noted that male athletes scored higher in doping knowledge (Fürhapter *et al.*, 2013; Chebet, 2014; Siswa, 2014)

With regard to the chronological age of athletes, in this study, athletes aged 35 years or above were identified as the highest knowledgeable category about doping ( $P < 0.05$ ; mean score=38.4). This observation could possibly be explained by the fact that with age, the athletes are getting better exposed to more information, resulting in increased awareness. Similarly, Austrian elite junior athletes reported that their knowledge about doping is at a moderate level and it was shown that when athletes are getting mature, age has a positive influence on doping knowledge (Fürhapter *et al.*, 2013).

The training age did not have a significant effect on the knowledge scores of athletes participated in this study. In contrast to these results, a study done in Canada revealed that there is a knowledge gap between neo-pro triathletes and seasoned triathletes. Neo-pro players have shown lesser knowledge about doping compared to seasoned players (Butryn, 2012). In Poland, it was noted as athletes with more than 5 years long training ages 46% knowledge mean score slightly higher than the those who train the sport for less than 5 years (41%)(Rees, Zarco and Lewis, 2007).

In this study, Olympians had higher scores on doping knowledge (57.3%) compared to other athletes. No significant differences were observed among athletes participating in National and International level competitions other than Olympics ( $P > 0.05$ ). A study on Croatian athletes revealed that Olympic Games sailing athletes and their coaches have higher knowledge scores compared to non-Olympic level sailors and coaches (Jurisic and Sattler, 2015), which is in agreement with our findings. Further, a Kenyan study revealed that knowledge about performance-enhancing substances is significantly different among different competition levels. However, another Kenyan study reported contradictory results showing that the experience does not significantly affect athletes' knowledge of doping (Chebet, 2014; Siswa, 2014).

With respect to educational qualifications, athletes who have a higher education background possess greater mean knowledge scores compared to athletes who have

completed only the secondary studies. Athletes with Diplomas or professional qualifications such as NVQs level had a mean knowledge score of 52.0% whereas athletes having a Bachelor's Degree or higher educational qualifications had a mean knowledge score of 45.7%. Previous studies have also shown that the educational level has a significant effect on the knowledge of athletes toward doping. In a study based on athletes parents in Austria reported the education level has an influence on doping knowledge (Fürhapter *et al.*, 2013). In Kenya, the importance of educating school level athletes about doping and its prevalence discussed because they will be elite athletes in the future (Chebet, 2014).

## V. CONCLUSION

It can be concluded that the athletes representing national pools of 17 sports considered in this study do not possess sufficient knowledge about doping (the overall mean knowledge score is <50%). It can also be concluded that athletes' knowledge is affected by different demographic factors such as sports types, chronological age, the highest sports achievement and the highest educational qualification of the athlete. Further, athletes' knowledge about doping is not affected by gender and the training age. Since they are prone to be tested, they should aware of illicit performance-enhancing substances to make sure they are carrying a clean sport.

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