Prevalence of CBD Use in Elite Athletes

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Introduction

Cannabidiol (CBD) is the second most prevalent cannabinoid found in marijuana. Unlike Δ9-tetrahydrocannabinol (THC), CBD elicits no psychotropic effects[1]. CBD has shown potential therapeutic efficacy in seizure disorders, psychotic symptoms, anxiety, depression, inflammation, cancer, cardiovascular, disease, neurodegeneration, multiple sclerosis, and pain[2-10].

Cannabis (marijuana and all other cannabinoids) has been prohibited by the World Anti-Doping Agency (WADA) since 2004. In 2018, the World Health Organization (WHO) and the Food and Drug Administration (FDA) respectively issued statements affirming that "no public health problems have been associated with CBD use," and "there is little indication that CBD has abuse potential or presents a significant risk to public health… there is no evidence that CBD causes physical or psychic dependence." Since research has demonstrated that CBD use has no psychoactive effects, no associated health problems, and does not cause physical or psychological dependence, WADA removed CBD from the Prohibited List in 2018, thus opening the door for CBD use in athletes.(32)

Cannabis use and its ergolytic effects on physical performance have been studied in depth. However, objective data regarding the prevalence of use and the performance effects of CBD is scarce despite its growing popularity in the athletic community. As a result, concerns are being raised anew about whether or not CBD confers an athletic advantage in competition.

Methods

We developed a survey in order assess the prevalence of CBD usage among self identified current or former elite athletes as well as other characteristics, such as use of other supplements, reasons for use or lack thereof, effects experienced, and whether or not a participant felt CBD use conferred an advantage in sport. Survey respondents consisted of a convenience sample recruited voluntarily through personal contacts, social media posts, and the Yale University Athletics Department. The survey consisted of 28 multiple choice questions and free-text responses. The criteria for inclusion in the study were as follows: ≥18 years old, be a self identified elite athlete (defined as current or former professional, semi-professional, competitive, or college level), agree to informed consent to participate in the survey, and provide an answer to question 13, "Have you ever used CBD?" JMP Pro 15 software was used to conduct the data analysis. Bivariate comparisons were conducted using Likelihood-ratio and Pearson chi-square tests. Statistical significance was assessed as P < 0.05.

n total = 199	n (%)
Sex	
Male	122 (61.62)
Female	76 (38.38)
Age	
18-24	98 (49.75)
25-29	22 (11.17)
30-39	34 (17.26)
40-49	24 (12.18)
50-59	8 (4.06)
60-69	8 (4.06)
70+	3 (1.52)
Race	
White or Caucasian	172 (87.76)
Asian	12 (6.12)
Black or African American	6 (3.06)
American Indian or Alaskan Native	2 (1.02)
American Indian or Alaskan Native, Caucasian or White	2 (1.02)
Black or African American, White or Caucasian	1 (0.51)
Asian, White or Caucasian	1 (0.51)
Ethnicity	
Hispanic or Latino	17 (9.09)
Not Hispanic or Latino	170 (90.91)
Compensation	
Paid	24 (11.16)
Paid with product	17 (9.91)
Retired paid	6 (2.79)
Retired unpaid	8 (3.72)
Unpaid	160 (74.42)

Table 1. Survey Demographics

Results

A total of 237 survey responses were collected. Of these responses, 199 met the inclusion criteria. The remaining 38 responses were excluded from the analysis. The demographic make up of survey respondents are shown in Table 1. Responses were received from participants residing in 18 different countries including Brazil, Estonia, India, and Japan, with the majority (73.23%) residing in the United States (Figure 1). All respondents self identified as elite athletes in their chosen sport with 27 different sports represented. Individual and team sports were approximately equally represented in the sample (48.22% individual and 51.78% team).
Slightly more than one third (35.18%, n=70) of respondents reported having ever used CBD, with 15% having used within the last two weeks (Figure 2).
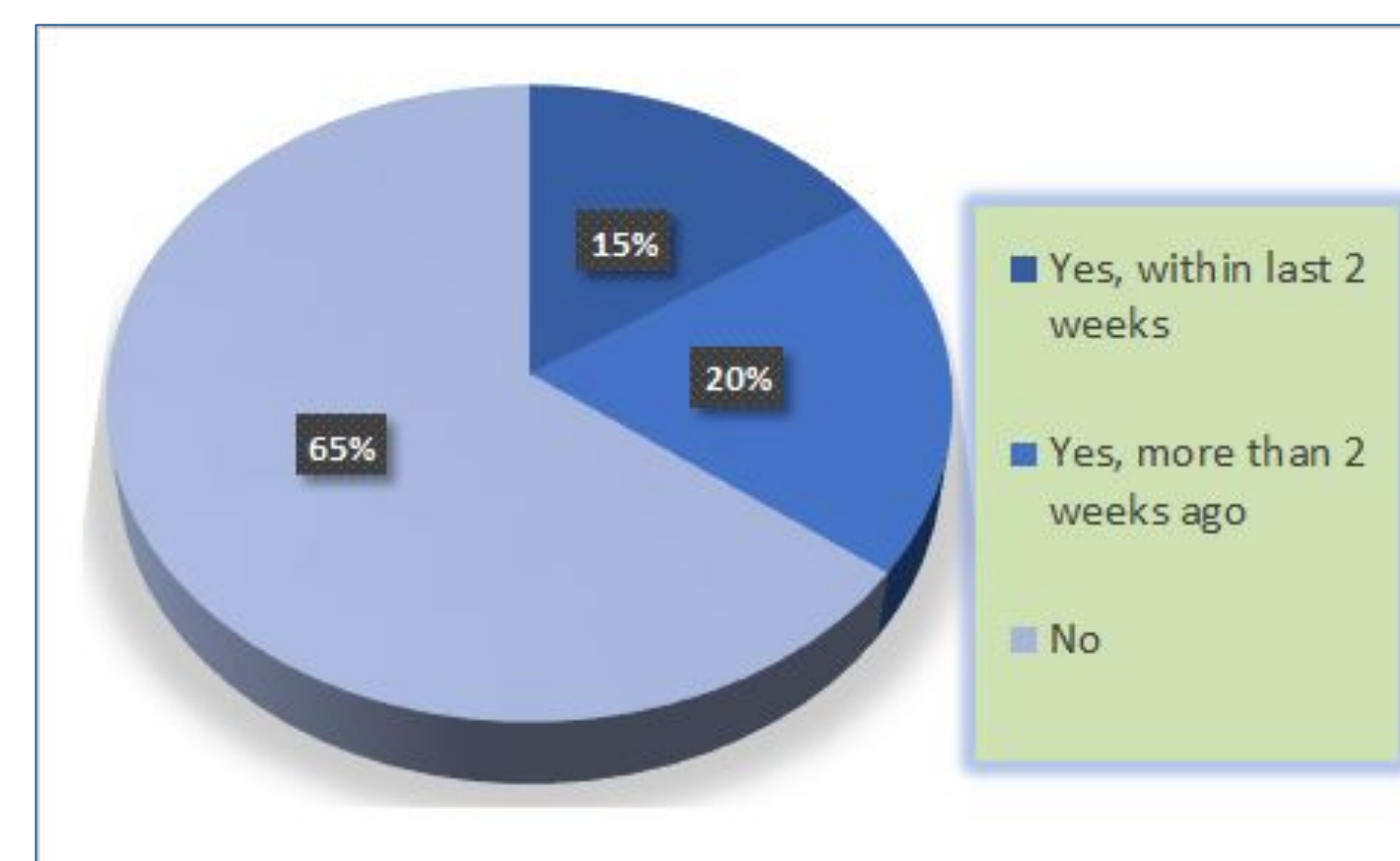

Figure 2. Have you ever used CBD?

There was no correlation between sex and CBD use. The top three reported reasons for using CBD were for muscle recovery (56.52%), anti-inflammatory (42.03%), and sleep (31.88%). Only 11.59% of respondents reported sports performance as a reason for using CBD. When asked if they thought CBD provides an advantage in their sport, 44.92% responded that it might or might not. The next most common responses were probably not (29.95%) and probably yes (11.23%). The absolute responses of definitely not (10.16%) and definitely yes (3.74%) were the least frequent (Figure 3). No correlation was found between reported use of CBD and belief that it provides an advantage in sport. Among effects of CBD use, anti-inflammatory (48.53%) and better sleep (45.59%) were the most reported, followed by decreased anxiety (38.24%) and faster muscle recovery (38.24%). Among the 122 respondents that had never used CBD, numerous reasons were cited (Figure 4). Friends (45.45%), social media (16.67%), and a scholarly article (15.15%) were the most frequently reported initial source of information about CBD (Figure 5). Of the 36 responses to "What brands of CBD have you used?", 27 unique individual brands were reported.
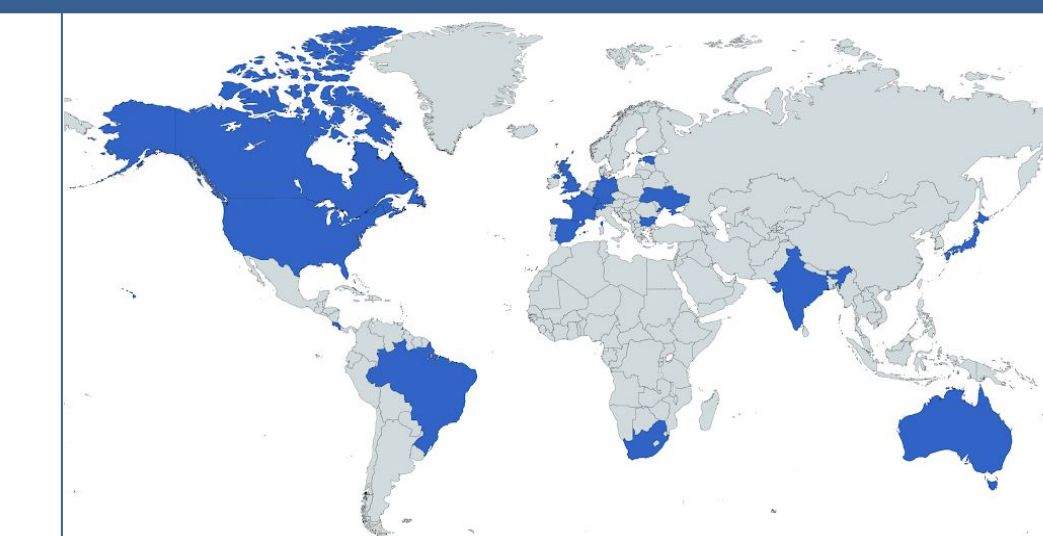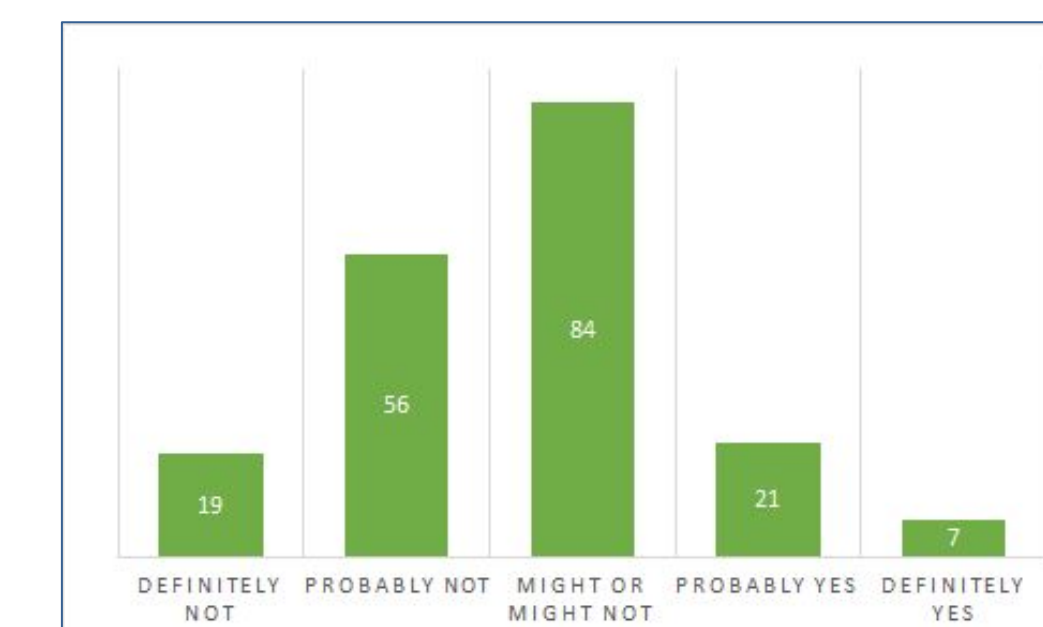

Figure 1. Countries represented

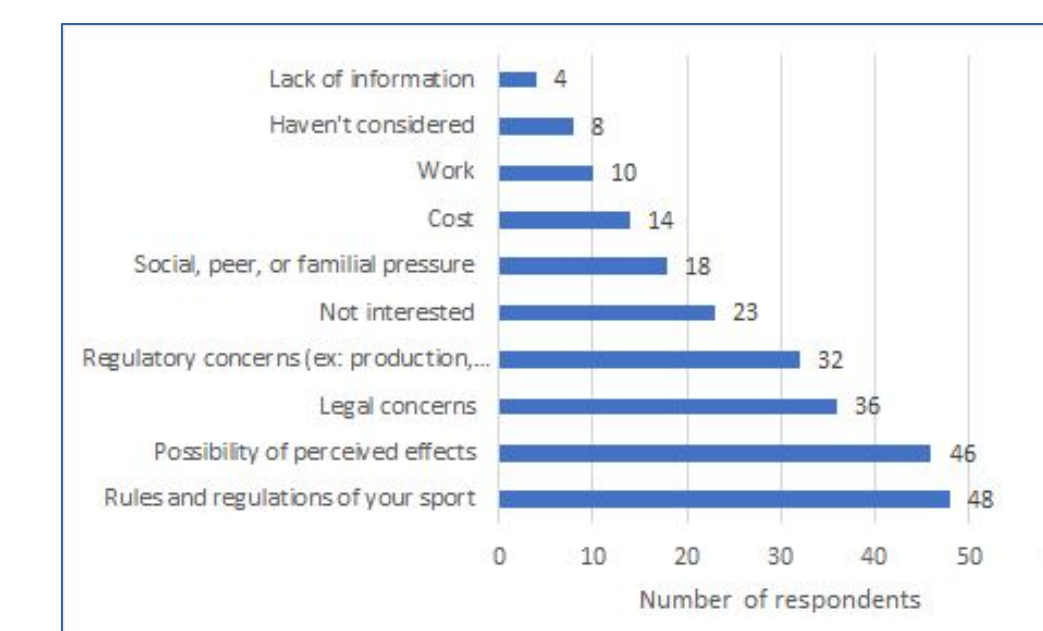**Figure 3.** Do you think CBD gives someone an advantage in their sport?

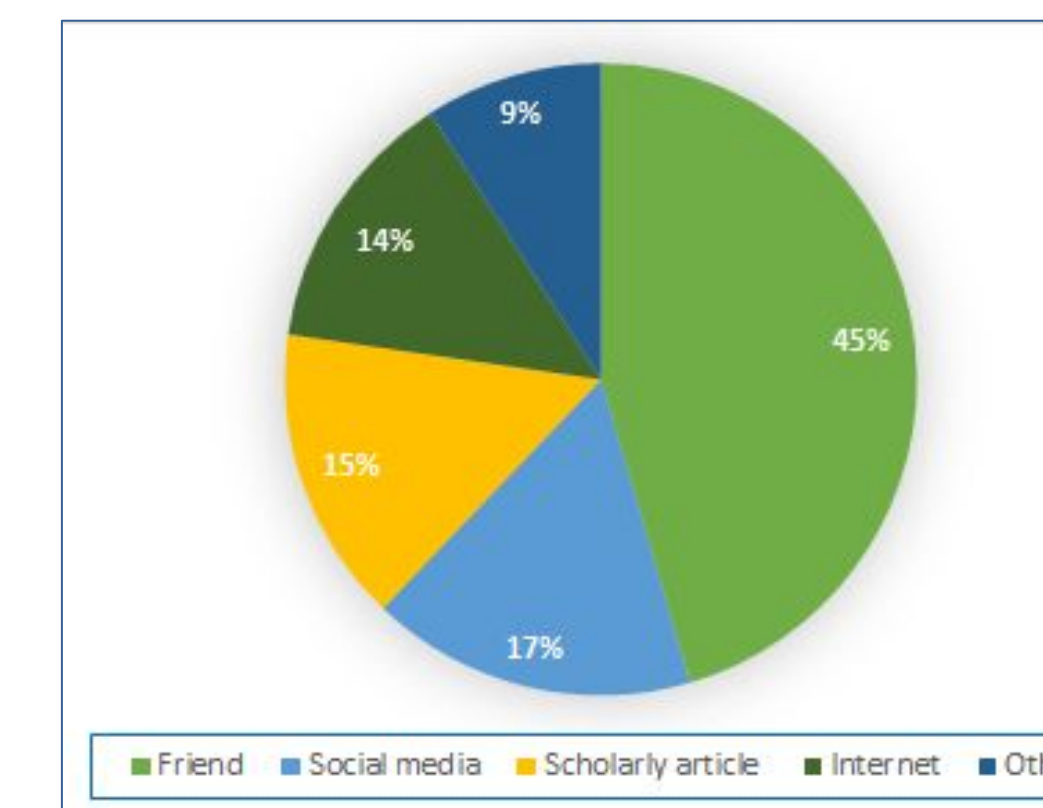**Figure 4.** If you have never used CBD, what has kept you?

Figure 5. How did you find out about CBD?

Conclusions

Despite growing interest in the general population, only 35% of elite athletes report having ever used CBD. Of that number, 43% had used CBD within the last two weeks. An elite athlete was more likely to have ever tried CBD if they used other supplements, and if CBD was legal in their country of residence. Of the athletes, 44% were unsure if CBD enhanced or hindered their performance, 23% thought CBD probably did not confer an athletic advantage, and 10% believe CBD definitely does not confer and athletic advantage. Though the general population claims that CBD can treat everything from acne to cancer, elite athletes report using CBD to treat and manage muscle recovery, pain, anxiety, and sleep cycle. Those who reported never using CBD listed rules and regulations of their sport (39.34%) and regulatory concerns (26.23%) as the most frequent reasons for not using CBD.

Due to lack of production and labeling accuracy, recommending use of CBD to elite athletes is premature. Though pre-clinical studies have shown that CBD has a benign safety profile, to include at high doses, more research needs to be conducted regarding the effects of CBD and its potential contaminants on athletic performance. Because athletes who use CBD are more likely to use other supplements, more research should be conducted to investigate drug-drug interactions of CBD, dietary supplements, and over the counter medications used for analgesia and sleep disturbances. Even though 89% of athletes report that they have not replaced other medications or supplements with CBD, research elucidating the efficaciousness of CBD compared to currently accepted treatments is needed to strengthen the overall body of knowledge surrounding this topic. Finally, due to vast legislative discrepancies worldwide, the removal of CBD from the WADA prohibited substances and methods list should remain a topic of continuing reevaluation based on the rapidly changing global climate surrounding cannabis and CBD product regulation. Athletes who choose to use CBD should remain diligent in their personal investigations of the sourcing and validity of their products to avoid regulatory complications with their sporting regulations.

Acknowledgments

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