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Research Article

**TO ASSESS THE EFFECTS OF PERFORMANCE  
ENHANCING DRUGS ON THE HEALTH OF MEDICAL  
STUDENTS: A CROSS-SECTIONAL STUDY**Dr Muhammad Saad<sup>1</sup>, Dr Mian Umair Ahmed Arif<sup>2</sup>, Dr Muhammad Usman Zia<sup>3</sup><sup>1</sup> Lahore Medical and Dental College, Lahore<sup>2</sup> BHU Dogramwala, Gujranwala<sup>3</sup> Multan Medical and Dental College, Multan**Article Received:** December 2019    **Accepted:** January 2020    **Published:** February 2020**Abstract:**

**Objectives:** The aim of the study was to find out the percentage of students from King Edward Medical University that are currently using Performance enhancing drugs, to find out the types of Performance enhancing drugs that are currently being used by the students and to find out the effects of these performance enhancing drugs on the health of the students.

**Study Design:** Cross sectional study.

**Setting and Study Period:** This study was conducted at King Edward Medical University, Lahore from August, 2018 to July, 2019.

**Materials and methods:** A total of one hundred medical students were anonymously given a 10-item questionnaire. 25 students each from 2nd year, 3rd year, 4th year and 5th year were involved in the study. The team randomly distributed the questionnaire among the students on alternative days. The completed questionnaire was sealed in envelopes and analyzed.

**Results:** The age of the students completing the Performa ranged from 19-25 years. In the male population the highest use of PEDS was observed in the age group of 22 years, while the lowest use of PEDS was observed in the age group of 19 years. The highest percentage of females that used PEDS was observed in the age group of 22 years as well like the male ratio of PEDS use at the high level. The lowest use of PEDS was observed at the age group of 19 and 25 which was 5 % in both age groups.

**Conclusion:** The results indicated that PEDS were used by the male students in a higher percentage as compared to the female students. The Caffeinated energy drinks were used more commonly. The results of this strategic survey have provided for the first-time valuable information about the use of PEDS by students of FMU to achieve desirable effects. It demonstrates that the use of PEDS in the students was high as compared to expected results; especially higher in those male students involved in sports or gym activities specifically bodybuilding athletes.

**Keywords:** Performance enhancing drugs (PEDS), anabolic steroids (AS).

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**INTRODUCTION:**

Performance-enhancing Drugs (PEDS) are substances used to improve physical/athletic performance or physical appearance. The most frequently used PEDS are anabolic steroids (AS) are used primarily by males, with prevalence estimates ranging from 4% to 6% [1]. In addition to illegal AS, there is an abundance of legal dietary supplements available that claim to improve athletic/physical performance. Some of the supplements available replenish nutrients lost during workout and are comparatively safe (e.g. creatine), while others mimic the effects of AS (e.g., Dehydroepiandrosterone) and have similar side effects [2].

The use of PEDS by teenagers has increased dramatically in the past decades. Lean mass builders, which drive or amplify the growth of muscle and lean body mass include AS that are synthetic derivatives of testosterone modified to enhance the anabolic [3] rather than the androgenic actions of the hormone. The anabolic effects are those promoting protein synthesis, muscle growth and erythropoiesis. There are numerous side-effects to anabolic steroids, including hypertension and atherosclerosis, blood clotting, jaundice, hepatic carcinoma, tendon damage, psychiatric and behavioral effects and, in males, reduced fertility and gynecomastia [4]. No doubt, androgens exert trophic effect on skeletal and heart muscles in patients with low circulating levels of testosterone e.g. pre-pubertal or hypo gonadal subjects of both genders [5]. Stimulants can enhance cognitive and athletic performance by increasing focus, energy, metabolic rate, and aggression, these include caffeinated energy drinks. The main ingredient of energy drinks is caffeine, along with others like taurine, pyridoxine, riboflavin, nicotinamide, vitamin B complex, and some herbal derivatives [6]. The acute and long-term effects results of chronic and excessive use of these drugs are not fully known. Analgesics help to perform beyond the usual nociceptive threshold. Some analgesics lead to high BP, which increases oxygen supply to muscles. Diuretics remove water from the body [7] and are often used by athletes who to meet weight restrictions, such as wrestlers.

The energy drink market has gained popularity rapidly. Dozens of brands are present in the market, which contain caffeine content ranging from a 50 to 505 mg per bottle [8] which is quite shocking. Due to regulatory oversight vigorous marketing of energy drinks, targeted specially toward young males, for performance-enhancing, psychoactive and stimulant drug effects. This has led to increasing cases of caffeine intoxication from energy drinks,

and it seems that problems like dependence and withdrawal of caffeine will also rise. Genetics may also be vital to a person's vulnerability to caffeine intoxication, dependence, and withdrawal. The combined use of caffeine and alcohol is increasing that may increase the incidence of alcohol-related injury [9]. Some studies also suggest that energy drinks serve as a gateway to other forms of drug dependence.

**METHODOLOGY:**

This cross-sectional study was held at King Edward Medical University, Lahore from August, 2018 to July, 2019. A total of one hundred medical students were anonymously given a 10-item questionnaire. 25 students each from 2nd year, 3rd year, 4th year and 5th year were involved in the survey. The survey team randomly distributed the questionnaire among the students on alternative days. The completed questionnaire was sealed in envelopes and analyzed.

For all reported estimates based on the total sample the confidence level is 99% and with a margin of error of less than  $\pm 1\%$ . A survey of this nature also has some shortcomings and limitations. Inaccurate answers to the questions were an obstacle. Students asked to report their use of prohibited substances such as anabolic steroids, may be expected to underreport such use. To minimize this potential all students were guaranteed full confidentiality and asked to complete the questionnaire anonymously.

Information was gathered regarding the student's knowledge and attitude regarding PEDS. Questions were also posed about the subject's behavior after taking the drugs. A probability sampling technique was used to select a survey population of 100. The year of the students was used as an approximation of age. The study population was between 19-25 years.

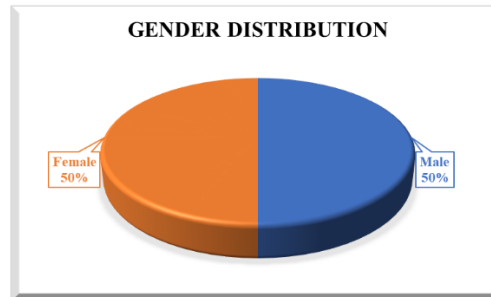
Painkillers and Sedatives were also included in the survey to permit an observation of the student's perceptions and level of knowledge of a range of substances including AS and energy drinks. The students were not told whether certain substances possessed performance enhancing properties; the intention was to ascertain what they taught and believed about these substances.

**RESULTS:**

Out of the total students (n=100) 50 were males and 50 females. The age of the students completing the Performa ranged from 19-25 years. In the male population the highest use of PEDS was observed in the age group of 22 years, while the lowest use of PEDS was observed in the age group of 19 years. The highest percentage of females that used PEDS was observed in the age group of 22 years as well like the male ratio of PEDS use at the high level. The lowest use of PEDS was observed at the age group of 19 and 25 which was 5 % in both age groups.

**Table No 01: Gender Distribution**

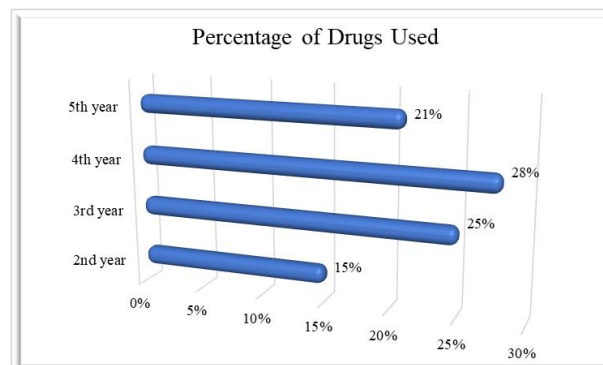
Gender	Qty	%age
Male	50	50%
Female	50	50%
Total	100	100%

**Table No 02: Substances Used as PEDS by Percentage**

Age	Caffeinated energy drinks	Painkillers	Sedatives	Anabolic steroids
Overall (Mean)	24.7	13.5	10.2	2.3
19 years	25.2	7.5	10.5	2.5
20 years	28.5	8.8	9.5	1.8
21 years	25.3	12.5	12.2	3.5
22 year	28.5	14.5	13.1	2.9
23 years	23.5	12.2	9.7	2.2
24 years	21.5	19.1	7.8	1.9
25 years	20.5	20.3	9.1	1.8

**Table No 03: Percentage of Drugs Used by the Students by Year**

Study Year	Percentage
2 <sup>nd</sup> year	15%
3 <sup>rd</sup> year	25%
4 <sup>th</sup> year	28%
5 <sup>th</sup> year	21%

**DISCUSSION:**

While the students were advised to complete the questionnaire anonymously, under reporting or misinformation might have been provided to some extent. The usage levels of caffeinated energy drinks

were the highest among all students, which was 24.7%. 13.5 % painkillers, sedatives 10.2 % and anabolic steroids was 2.3% AS and protein supplements were used by students involved in bodybuilding or athletics to gain better sporting

performances [10]. Educational programs regarding the use of AS must be carried out, providing information about the dangers and hazards of their continuous use. The excessive use of painkillers at such ages was quite alarming; given the stress of Medical studies and excessive exertion of their mind, headaches might be an obvious reason for their excessive use. There was no significant difference between the students who approved the use of PEDS and those who were against it. The highest percentage of drug use was found in the age range of  $21\pm 2$  and  $22\pm 2$  i.e in the students of 4th year.

The use of AS was less overall as compared to the other PEDS, but even this small percentage is alarming. This finding underscores the need for prevention programs directed at these AS users who might be termed "Body image" users. Indeed, education aimed at body image users should consider the experiences of those who have been addressing issues related to abuse of weight-loss products and stimulants.

In the design and delivery of any interventions aimed at curbing anabolic-androgenic steroids use, it must be recognized that such behavior often produces exactly the results intended by the user. Weight gain and change in body dimensions frequently follow AS use, and performance enhancement will occur because of the combination of AS and appropriate training regime. Because the desired effects of the drug are so evident to the user, it might be difficult to curb the user from taking such PEDS.

Educational programs aimed at decreasing the AS use must carefully address the potential health consequences, but the survey results suggest that other approaches may be beneficial. Some of the students for example believed that these AS were not harmful and were helpful in their bodybuilding process.

The high use of caffeinated energy drinks is alarming and caution should be taken in their use. These days the consumption of energy drink brands like Red Bull, Monster have become more of a fashion than a necessity [11]. The ingredients of these energy drinks contain high levels of stimulants, one of the most important being "taurine" [12]. But students feel comfortable with these drinks attributing its effects to be helpful in exam preparation for prolonged studying ability.

Painkiller use was also estimated to be quite high for such an age group of students. The high percentage of sedatives was also quite interesting, this might be regarded to the fact of stress or insomnia among the students might be a major factor of the use of these drugs.

## CONCLUSION

The results indicated that PEDS were used by the male students in a higher percentage as compared to the females specially Caffeinated energy drinks. The results of this strategic survey have provided a reliable measure of the use of PEDS by the students to achieve desirable effects. Use of PEDS in the students was high as compared to expected results; specially in those male students involved in sports, gym and bodybuilding.

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