PSYCHOLOGICAL EFFECTS OF CAFFEINE ON PLAYERS PERFORMANCE

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ABSTRACT

The present study conducted to check the effects of caffeine on players' performance through survey research. A caffeine-based 20 Statements (questionnaire) filed to the players, who were regular consumers of caffeine. 20 statements mentioned related to the positive effects of caffeine. Most of the players, who addicted to take caffeine on regularly basis approved all statements which showed that caffeine could affect the athlete's performance. The majority athletes agreed that caffeine enhanced their concentration, alertness and attention level. The primary effect of caffeine on vigilance granted by most of the players. Caffeine can enhance the working capacity of players by increasing their vigilances. Results show that caffeine helped them to train longer and harder which showed its benefits between male and female athletes, especially in off-season training periodization.

Keywords: *caffeine, caffeine effects, player performance.*

Introduction:

One of the most commonly consumed psychoactive products and central nervous system (CNS) stimulants in the world is a well-known drug called Caffeine (Pak *et al.,* 2020). It was legal and unregulated in almost all parts of the globe, unlike many other psychoactive drugs. The first German chemists who synthesized caffeine from its chemical components were Hermann et al. (1999) and determined its structural formula in 1985 and 1987. Fischer (1902) awarded the Nobel Prize for his research on caffeine in recognition of his work. Caffeine is a xanthene alkaloid that exists naturally in around 60 plant species, the most commonly understood of which are cocoa beans, kola nuts, tea leaves and coffee beans.

Caffeine normally ingested in complex form like coffee, tea, soft-drinks, chocolate and Candy Chewing Gum and it used by tri-Athlon (Pasman *et al.,* 1995) other athletes as a performance aid by utilizing caffeine (Jacobson *et al.,* 2002). Many players used coffee as a beverage on regular basis, instant coffee with one tea-spoon contain 60-70 mg of caffeine. Players also use soft

drinks and energy drinks to boost up their energy levels. The popular soft drinks are colas (Coca-Cola, Pepsi, Sprite, Fanta, Mountain Dew etc) and other sodas of different flavors (Alford *et al.,* 2001) are some of the most popular beverages on the market today. Caffeine is a central nervous system (CNS) and metabolic stimulant that has been used to ease physical fatigue, to improve mental alertness when unusual weakness or sleepiness occurs (Davis *et al.,* 2003). Caffeine first enhances the focal sensory system at higher levels, resulting in improved sharpness and focus, a stronger and clearer stream of thought, increased concentration and better control of the body, and then at higher doses at the level of the spinal cord (Graham and Spriet, 1991; Bell *et al.,* 2002; Fiala *et al.,* 2004). Caffeine is present in many consumer goods since it is difficult to meet the normal dose and typically a cup of brewed coffee contains approximately 100 mg of caffeine, compared to 80 mg for instant coffee and 30 mg for instant tea, 34 mg for Coca-Cola (Armstrong, 2002; Armstrong *et al.,* 2005). Caffeine added too many well-known soft drinks and is also part of numerous pharmaceutical products, including analgesics, medicines for cold and flu, diet medicines and diuretic (Dews *et al.,* 2002; Haspel *et al.,* 2002). Caffeine can cause different measurements of psychological effects depending on the person and the concentration. Low doses of caffeine cause increased alertness and decreased weariness. Caffeine can minimize symptoms of depression, sleeplessness and lower risk of suicide in moderate doses, whereas high dosages can induce the repulsive effects of the habit of caffeine (Lieberman *et al.,* 2002). Caffeine is not only used to enhance mental processing but also affects the brain, which believed to act as blocking the receptors of the neurotransmitter adenosine, enhancing brain excitability. Other neurotransmitters, including norepinephrine, dopamine, and acetylcholine, also affect caffeine. They also influenced mood and mental processing directly. For example, there was a consensus that caffeine enhances "lower" cognitive functions such as basic reaction time, while there was also debate about the effects of caffeine on "higher" cognitive functions such as problem solving and decision-making. The scientific consensus

on basic cognitive functions is that caffeine improves fundamental aspects of cognitive capacity, such as concentration, vigilance, and reaction speed, in doses from 32 to 300 mg (approximately 0.5-4 mg kg-1 for a 75 kg individual). In a dose-dependent way, caffeine enhances arousal; low doses may enhance hedonic tone and decrease anxiety, while high doses increase stress and symptoms of anxiety, nervousness and jitteriness, multiple positive reports of caffeine improvement on mood, mental alertness, decreased tiredness, and energetic arousal have reported (Hespel *et al.*, 2002).

Related literature:

J. Murdhoch Ritchie (1975) describes the psychological effects of caffeine first time in Goodman and Gill man's pharmacological text. They describe the effects of caffeine on the nervous system. According to his research high dose of caffeine stimulates the nervous system especially cortex and Modula (Fatolahi, *et al.,* 2020). The equivalent of one or two cups is enough to induce the effect of caffeine on mental progress, it also showed improved work performance and time to exhaustion in studies involveing endurance exercise (Graham *et al.,* 1998). Caffeine also increased performance by approximately 5 minutes during serious, short-term cycling and running activities (Engels *et al.,* 1999; Doherty *et al.,* 2004; Anderson *et al.,* 2020). However, during sprint and strength exercise that lasted less than 3 minutes, positive ergogenic results were equivocal, likely because of the small number of investigations and various protocols used (MEDICA-TORINO, 1997). Caffeine enhanced peak power output, speed and isokinetic intensity in sprint and power events based primarily on the phosphagen system (10 seconds) (Fatolahi *et al.,* 2020). During a 6-second Wingate test with ingestion of 250 mg of caffeine, one study reported a 7 percent rise in peak power output, while another recent study showed increases in intermittent sprint ability (during 4-second sprints) in soccer players when 6 mg 21 kg of caffeine was consumed (Corti *et al.,* 2002; Hindmarch *et al.,* 2000).

Research Question

"Is Caffeine being helpful to enhance the performance of various athletes in sports and there was no difference in the perfor-

mance of male and female athletes by utilizing caffeine."

Objectives

- ✓ To check the perception of athletes who used caffeine regularly.
- ✓ To explore that caffeine effected the performance of athletes from grass root to elite athletes.
- ✓ To discover that caffeine is necessary for sports personnel.
- ✓ To find out the effect of caffeine between male and female performance.

Validity and reliability of data collection. The validity and reliability of inspection instrument was granted by exploiting pilot testing and expert impost. To grantee the unweaving quality of the instrument the Cronbach's alpha (reliability coefficient) measured through SPSS software.

Table 1. Reliability Statistics

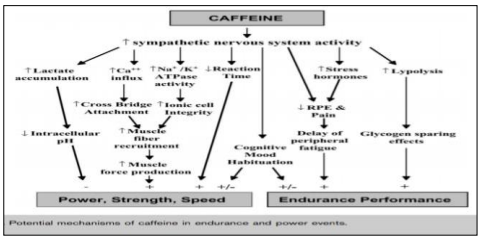
Cronbach's alpha	Statements
.906	25

The Table-1 showed the reliability coefficient calculated through SPSS and its value was .906 of twenty-five statements. The statement showed a high level of reliable researching tool.

Mechanism

For a single biological mechanism, such as glycogen sparing, increased intracellular Ca++ concentration or modified excitation-contraction coupling and associated with the mechanism for enhanced endurance, sprint and power efficiency. In fact, the caffeine paradigm should be multifactorial for enhanced athletic performance, extend beyond any single biological mechanism, and include cognitive awareness and habit (Figure 1).

(Figure 1) (Bell *et al.*, 2002)



To enhance endurance efficiency, the activation of the sympathetic nervous system by caffeine works on several metabolic pathways. Until recent years, improved lipolysis of adipose and intramuscular triglycerides and preservation of carbohydrate stores (i.e. glycogen sparing effects of caffeine) for later use during endurance exercise have considered to be the mechanism for improved endurance efficiency.

Hypothesis

The study hypothesized that Caffeine affects the performance of athletes and is it effective on both male and female performance.

Methodology:

The study used the Survey research method to find the psychological effects of caffeine on the players performance. The population was the players of Punjab University, Govt College University, University of the Central Punjab, The University of Lahore and athletes performing activities in different clubs and gymnasium. Purposive sampling technique was used and sample size was 300 which comprised 58% males and 42% females. The data was collected within players of three different age groups which are following Table 1;

Table 2. Showed Age, Frequency and Percentage of athletes (Male and female)

Age	Frequency	Percentage
18-22	121	60
22-24	54	25
24-above	25	12

The statements (20 questionnaires) used as a tool of data collection. Data collected from those athletes which was regular consumer of caffeine and intake caffeine directly or indirectly before and after the training. The questioners were filled from 300 (Male and Female athletes) to check the effects of caffeine on player performance. The data analyzed through SPSS (Statistical Package for Social Sciences) v.22.

Data was analyzed through Statistical Package for Social Sciences (SPSS) version 22. Mean, Standard Deviation and t-test was utilized to measure mean difference among male and female. Chi-square test was done to analyze individual items.

Gender	N	Mean	Std. Deviation	F	Sig. val
Male	174	2.88	1.783	12.98	0.001
Female	136	2.40	1.419		

Thus, the result concluded that there was a difference in the performance of male and female athletes by utilizing caffeine.

State. No	Questions	SA	A	N	D	SD	X^2	Sig
1	I feel more alert after consuming caffeine.	---	---	---	---	---	3.5	0.004
2	It improved by agility level by regular inges-tion of caffeine.	---	---	---	---	---	3.7	0.002
3	A cup of tea picks me up when I am feeling tired.	---	---	---	---	---	5.5	0.000
4	I feel less sleep after consuming coffee.	---	---	---	---	---	3.8	0.002
5	Caffeinated drinks incr-ease my arousal level.	---	---	---	---	---	4.8	0.003
Total Range	----------	17% to 33%	34% to 55%	1% to 2%	3% to 4%	4% to 6%		

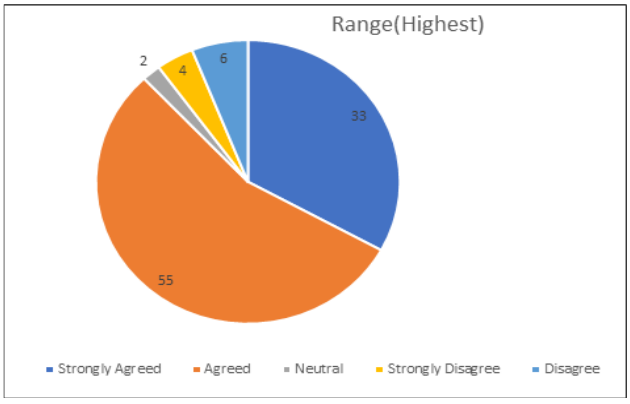
SA=Strongly Agreed, A=Agreed, N=Neutral, D=Disagree and SD=Strongly Disagree

The above statements showed the chi square values among statements and in the bottom of the Table 3 showed the range values of all the statements.

Table-4 Showing the range values of all the statements in percentage

Scale	Statements S1 to S20 Range % (Lower to Higher)
Strongly Agreed	17% to 33%
Agreed	34% to 55 %
Neutral	1% to 2%
Strongly Disagree	3% to 4%
Disagree	4% to 6%

Figure-2: Showed the percentage of Higher % values of all statements



Results & Discussion:

Result found by apply chi square method which showed the association between the statements, how much player strongly agree, agree, neutral, disagree and strongly disagree with the help of statements showed in the result of the following table.

The t-test showed highly sig value which showed that there was a significant difference in the performance of the male and female athletes which could also observe through results.

After collection of the data it observed that among 20 statements the range (17% to 33%) strongly agreed, range (34 to 55)% agreed with the statements which indicated that caffeine affects the player's performance. The range (1% to 2%) induced or neutral, range (3% to 4%) strongly disagreed and (4% to 6%) were disagree with the statements, respectively. They approved that they felt more alert after consuming caffeine. All above results showed that caffeine had positive effects on players performance player should use a specific quantity of caffeine to increase their performance. On the basis of the data resulted that caffeine effected the performance of athletes (Male and Female).

Conclusion

The study concluded most athletes at elite level were in the favor of taking caffeine on a regular basis but they also agreed to take in the offseason training zone.

Recommendations:

Players should use caffeine to improve their performance. On the basis of result, it is recommended that if a player intake 210 to 400 mg caffeine per day, it will improve their performance. Player should intake 3mg per kg of their body weight. If a player is of 150 pounds, he should take 400mg caffeine per day. Although it had an effect of doping on performance of athlete but it used probably in off season training. It should also recommend not to use an extra amount of caffeine it will show negative mental and physical symptoms. Because ***"excess of everything is bad"***

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