CHAPTER II: LITERATURE REVIEW

2.1 Introduction

This chapter discusses the highlights of the literature on Performance-Enhancing Drugs (PEDs) and related theory to it. This study focused on the exploration and understanding of the phenomenon of athlete's usage on PEDs even though various initiatives have been highlighted to prevent the matter. Therefore, the past studies that are highlighted are not an absolute basis for testing the theories put forward by researchers, but as guidelines for analysing the causes and effects of PEDs among athletes in Malaysia. The highlights of this literature are divided into three parts, the first of which is doping history; while the second part focuses on the explanation of PEDs by athletes, and the third part focused on the theory applied in this study.

2.2 Doping History

All sports and most types of competition deal with performance–enhancing drugs. For a wide variety of purposes, such as performance improvement, a self-treating psychiatric condition that would otherwise go untreated, and coping with pressures like pressure to succeed, accidents, physical discomfort, and retiring from the sport, an active lifestyle may result in drug usage. This section looks at the chronology of doping in sports, the impacts of various doping substance categories, adverse reactions of doping, the function of anti-doping organizations, and how afflicted athletes are treated.

Prior to the creation of organized sports, doping had a long history. The usage of Performance-Enhancing Drugs has developed over time, with advances in doping

tactics being fueled by better drug testing detection techniques and improvements in a biomedical study that may uncover and enable the use of later-banned compounds. Performance-Enhancing Drugs use is now prohibited by many sporting organizations, and anyone found taking them to face harsh penalties. There is conflicting evidence concerning the negative consequences and performance-enhancing properties of the different doping agents. Primary prevention, education, behavior modification, and, when necessary, pharmaceutical therapies should be used to combat drug usage in athletes.

The assumption that doping is a relatively new occurrence brought about by the rising economic advantages given to contemporary professional athletes is untrue (Baron *et al.*, 2013). Doping predates organized sports. To boost their performance, ancient Greek Olympians from the third century BC consumed hallucinogenic mushrooms and sesame seeds as well as other brandy and wine mixtures. Athletes who were injured might still compete thanks to the consumption of various herbs to reduce pain and increase speed and stamina. Doping was nevertheless viewed as reprehensible even in ancient times. For instance, fraudsters were turned into slaves in ancient Greece (Yesalis, 2002).

The unauthorized drugging of racehorses in the early 1900s marked the beginning of the current era of doping. The first mention of its use at the Olympics was in 1904. Higher-level sportsmen frequently used combinations of strychnine, heroin, cocaine, and caffeine until the 1920s. Performance-enhancing drug (PED) usage during the Tour de France had become widespread by the 1930s, and when the race switched to national teams which were paid for by the organizers, the laws of the game that was

given to the bicyclists by the organizer emphasized that substances would not be among the supplies they would receive (McGann & McGann, 2006).

The specific drugs utilized to forcibly boost quality have changed over time. Better drug screening detection techniques have contributed to the "advances" in doping tactics. Different parties have created ever-complicated doping methods to avoid exposure. Furthermore, new doping techniques can emerge because of improvements in biomedical studies that could uncover and enable the usage of later-banned substances (Teale *et al.*, 2012). Cycling has experienced more high-profile doping claims than any other sport over the past 150 years. Nevertheless, there aren't many sports where doping by athletes hasn't been discovered.

2.3 Performance – Enhancing Drug Use by Athletes.

There is evidence to support the claim that several doping substances enhance efficiency (Kelland, 2012; (Handelsman, 2020) (Mayo Clinic, 2022). Doping may be used by athletes to obtain a competitive advantage through substance abuse. Alternately, it may involve the use of substances like alcohol or cannabis without the intention of enhancing performance, as athletes are just as susceptible to substance use disorders as non-athletes. Athletes may use substances to contend with a variety of stressors, including performance pressure, injuries, physical pain, and retirement. What is crucial is the diversity of performance-enhancing drugs available. PEDs are not limited to illicit drugs, prescription drugs, dietary supplements, online-sold drugs, etc. There are several types of different classes of drugs often used by athletes such as Androgens, growth

hormones, Stimulants, Anabolic – Androgenic Steroid (AAS), Nutritional Supplements and other recreational drugs.

2.3.1 Androgens

Exogenous testosterone, synthetic androgens like danazol, nandrolone, and stanozolol, androgen precursors like androstenedione and dehydroepiandrosterone, as well as various types of androgen stimulation, are all examples of androgens. The latter types of drugs have been utilized by athletes to enhance endogenous testosterone to get over the World Anti-Doping Agency's (WADA) prohibition on either natural or synthetic androgens.

It has been demonstrated that testosterone dosages over those ordinarily seen in the human body promote muscle mass and strength. For instance, 43 men were randomly assigned to four groups in a typical randomized, double-blind research: testosterone enanthate 600 mg once weekly of strength training workout; placebo with strength training workout; testosterone enanthate 600 mg once weekly with no workout; and testosterone enanthate 600 mg once weekly with no workout. This important study showed that testosterone treatment boosted muscular endurance and fat-free mass in all receivers, particularly in those who exercised. Approximately five years later, the very same researchers carried out another research that further confirmed the dose-response link between testosterone and endurance (Bhasin *et al.*, 2001).

No government has authorized the use of selective androgen receptor modulators in humans, but athletes can still buy these drugs online. There have

been no clinical studies that examined the impact of specific androgen receptor modulators on muscle mass or endurance (Kohler *et al.*, 2009). Exogenous human chorionic gonadotropin, antiestrogens like tamoxifen, clomiphene, and raloxifene, and aromatase inhibitors like testolactone, letrozole, and anastrozole are some more types of androgen stimulation. The serum testosterone level may rise because of this substance (Handelsman, 2008). Androgens come in a variety of forms, and while they have been demonstrated to increase muscle strength and mass, they have not specifically been shown to increase whole-body endurance (Basaria, 2010).

2.3.2 Growth hormone and growth factors

WADA also forbids the use of growth hormones and growth supplements. Synthetic human growth hormone has been shown to reduce fat tissue and increase muscular mass. In one noteworthy trial, male leisure athletes were randomly assigned to receive growth hormone subcutaneously twice daily, testosterone intramuscularly once weekly, a mixture of the two therapies, or a placebo. Growth hormone 2 mg per day or placebo was randomly assigned to female leisure athletes (Meinhardt *et al.*, 2010). Growth hormone was linked to a considerable reduction in fat mass, an increase in lean body mass, and an improvement in sprint performance in both males and females (although with no change in strength, power, or endurance). Once growth hormone and testosterone were provided concurrently to males, the improvement in sprint ability was significantly larger. Insulin and insulin-like growth factors are examples of growth factors. Though they have not been researched in athletes, it is assumed

that they have effects like those of growth hormones. Due to these compounds' alleged anabolic effects on muscle, athletes use them (Holt & Sonksen, 2008).

2.3.3 Stimulants

Amphetamine, D-methamphetamine, methylphenidate, caffeine, dimethyl arylamine, ephedrine, pseudoephedrine, strychnine, and modafinil are examples of stimulants. According to research, stimulants increase anaerobic performance, minimize fatigue symptoms, enhance response speed, boost alertness, and promote weight loss (Eichner, 2008). Although WADA forbids the use of stimulants as a group, it does permit the usage of caffeine. The amino acids taurine and L-carnitine, glucuronolactone, ginkgo biloba, ginseng, and other ingredients are increasingly frequently found in energy drinks in addition to caffeine. Per can or bottle, there may be up to 500 mg of caffeine. The other components of energy drinks may have performance advantages, but this is uncertain. For instance, taurine may increase exercise capacity by reducing the DNA damage caused by exercise, although the concentrations found in common beverages are probably far lower than those required to have a performance-enhancing effect (Higgins *et al*., 2010).

Notably, there has been a noticeable rise in the number of athletes, particularly at the highest levels of competition, who have been found to be using stimulant drugs recently. The National Collegiate Athletic Association in the USA recognized that there has been a three-fold increase in the number of student-athletes testing positive for stimulant medicines in recent years (NCAA,

2010). The unsuitable use of stimulants in major league baseball in the USA has also raised concerns. In 2008, 106 players - representing 8% of major league baseline players - obtained therapeutic use exemptions for stimulants, a significant rise from 28 players in 2006, according to a report published in January 2009 (Shaikin, 2009). If a doctor certifies that they should for medical reasons, therapeutic use exemptions allow athletes to take substances that are often prohibited and that enhance performance.

2.3.4 Anabolic-androgenic steroids (AAS)

According to Lamb, (1984). It is normal practice for athletes, particularly top-weight-trained athletes to make use of anabolic medicines to increase their percentage of lean body mass and boost their muscular strength. This is especially prevalent among athletes who compete in weight-class competitions. Steroid doping often entails combining injectable and oral formulations of steroids in doses that are 10–40 times greater than what would be regarded therapeutically suitable. Steroids can also be taken in combination with other performance-enhancing drugs. In addition, most of the scientific research that has been done on the use of steroids by healthy male athletes has been done with doses of steroids that were significantly lower than those used by many players. This is because most of the research has been done on the use of steroids by healthy male athletes. The results of this study suggest that throughout steroid treatment, most individuals would gain an average of 2.2 kilograms (kg) of lean body weight; nevertheless, there are huge individual differences in the increases in strength that are created by steroids. Even if the remaining investigations show

indeterminate effects, approximately half of them reveal that steroid treatment leads to significant gains in strength evaluations. There is not a single reliable piece of evidence that supports the usage of anabolic steroids to improve aerobic work capacity. Anabolic steroids lead to virilization and stunted growth in children, birth defects in the fetus, severe virilization in women, and atrophy of the testicles and lower blood levels of gonadotropins and testosterone in adult males. In children, anabolic steroids also cause virilization, and they cause birth abnormalities. Additionally, virilization can occur in youngsters who take anabolic steroids.

The findings from the study carried out by the other researcher (Haupt & Rovere, 1984) indicate that the use of anabolic steroids by athletes is a contentious topic. On the one hand, many athletes are under the assumption that using steroids will boost their athletic performance, and as a result, those who do so will have an advantage over those who do not use steroids. On the other hand, the scientific and medical communities are of the opinion that the amount of scientific evidence to support the claim that anabolic steroids can improve athletic performance is insufficient, whereas the amount of scientific evidence to demonstrate the adverse effects of using them is overwhelming. As a direct result of this, there is a substantial information and trust gap on anabolic steroids between the communities of sportsmen and those in the medical and scientific fields.

2.3.5 Nutritional supplement

Vitamins, minerals, botanicals, extracts, and metabolites are examples of nutritional supplements (Higgins *et al.*, 2010). It's important to note that the purity of these substances cannot be guaranteed, so they might contain illegal substances without the athlete or manufacturer knowing. Numerous nutritional supplements bought offline or online have been found to contain illegal steroids and stimulants, according to studies (Judkins & Prock, 2012). As a result, athletes may wind up failing doping tests without intending to consume illegal substances. The most widely used nutritional supplement for performance enhancement is creatine, which is not currently on the WADA's list of substances to be avoided (Fernandez, 2009). Studies show that creatine increases lean body mass and maximum power output. As a result, while some nutritional supplements that are legal may have ergogenic benefits, there may not be enough proof to support those effects for them to warrant a ban (Kendall *et al.*, 2009).

2.3.6 Other recreational drugs

Alcohol, cannabis, opioids, and nicotine are examples of recreational substances that might be used to improve performance (Morse, 2013). Cannabinoids and drugs are now prohibited by WADA, while nicotine is not. Six sports only allow alcohol consumption during competition. Although using any of these medications to lower anxiety may be a type of performance enhancement, there is little evidence that doing so actually improves performance. To reduce discomfort during training or playing, narcotics are employed. Nicotine may promote weight loss and increase focus (Bailey *et al.*, 2009).

2.4 An Islamic Viewpoint on Doping in Sports

According to research by Al-Dafrawi (2020). Islam advises its followers to take care of their bodies so that they can experience complete health and forbids them from doing anything that could put their own soul (an-Nafs), which resides within their bodies, in jeopardy. Islam also advises its followers to take care of their bodies so that they can experience complete health. This part tries to present the viewpoint of Islamic Shariah in connection to Performance-Enhancing Drugs (PEDs) that are used in sports competitions. Performance-Enhancing Drugs (PEDs) are defined as any substance that improves an athlete's ability to compete. This can be performed by providing evidence that demonstrates how the consumption of illegal substances and the practice of criminal behaviours constitutes fraudulent activity. In addition to this, it has a detrimental influence not only on the right to life but also on the right to keep one's bodily integrity. This is a fundamental human right.

The problem is that some athletes partake in the practice of using banned substances and believe that it is inescapable considering the widespread trend of globalization. This is the root of the problem. This is the fundamental cause of the issue. Despite this, it is a well-established fact that this kind of behavior is in violation of Islamic ethics and laws, both of which forbid dishonesty in some form or another. The most important thing that can be learned from this study is that cheating in sports, and particularly doping in sports, is a persistent issue that requires novel ways to its resolution. This is the most important thing that can be learned from this study. Additionally, any reputable athlete, whether male or female, who is taking Performance-Enhancing Drugs (PEDs) should quit doing so because doing so is considered cheating, causes damage to the body and puts the life of the user in jeopardy.

This applies to both male and female athletes. Therefore, someone who engages in the consumption of substances that are prohibited by the law is acting in a manner that is contrary to both the Islamic Shariah and the rules of the secular state. In addition, the individual who is the subject of this inquiry is deserving of the punishment that is suggested by the two legal norms taken together.

2.5 Theories and Model Related to the Study

Albert Bandura's Social Learning Theory. The identity theory was used as the theoretical foundation for an investigation of cases of PEDs among Malaysian athletes, specifically in terms of their emotions, behaviour, and the sporting environment in which they compete.

In Social Learning theory, the researcher focuses on behaviour therapy that practices directly observable behaviour, current determinants of behaviour, learning experience that promotes change, and tailoring treatment strategies among athletes in Malaysia. The behaviorism hypothesis asserts that human habits and behavior are formed because of the outcome of the learning process and the evolution of the surrounding environment.

According to Mahamood (2013), one of the earliest hypotheses in the field of psychology postulated that a person had a greater risk of developing a dependency on a substance if they were doing so during a time when they were experiencing heightened amounts of pleasure, excitement, or pleasant thoughts (pleasurable effects). On the other hand, everything that can result in unfavorable experiences (sometimes referred to as "negative reinforcement") or punishment will be circumvented. To put it another way, all the behaviours that lead to a pleasurable experience will be repeated due to the consequences that these behaviours bring about. In the meantime, regarding those that

aren't, it has been decided that they won't be repeated. The evidence is laid forth in table 2. The frequency with which a behaviour is repeated is influenced both by the reinforcements that follow an action as well as the effects of that activity. Athletes regularly experiment with drugs because these substances create a sensation of triumph and admiration, which motivates them to try new things. While under the influence of drugs, athletes report experiencing feelings of increased strength and prowess (positive reinforcement). Additionally, it protects them from the severe agony and the feeling of loss that would otherwise be experienced (negative reinforcement) Mahamood, (2013). It is natural that when athletes have reached a level of victory, they will feel happy if they win again and again taking the substance will maintain that pleasure. In a summary, the pattern of PEDs behavior that has been observed among the sportsmen has not changed in any way, suggesting that the problem is just becoming worse and continuously.

Table 2
The consequence of the Response

(Outcome)	**(Stimulus presented a consequence)**	**(Stimulus removed a consequence)**
(Behavior Increases)	(Positive Reinforcement	(Negative Reinforcement)
(Behavior Decreases)	(Punishment)	(Response Cost)

Source: Adapted by Journal Mahamood, Y., (2013).

According to Bandura (1997), the major method by which people acquire new behaviours is through the process of observation. A visual picture of how the interaction between internal (personal) variables (thinking, biology, and genetic status), and environmental (environmental) aspects (society), resulting in human behaviour is provided in Figure 1. According to Akers and Sellers (2004), the concept is based on

patterns of drug use that are linked to social structures such as families, schools, and other institutions. In other words, the theory is founded on the assumption that social structures have a role in how people use substances. The concept is based on patterns of drug use that are linked to social structures such as families, schools, and other institutions. In other words, the theory is founded on the assumption that social structures have a role in how people use substances. It covers the reasons why people participate in criminal conduct or other deviant behaviours such as substance misuse, among other topics, and provides illustrations of these reasons. When it comes to the usage of substances, the athletes were significantly impacted by the behaviours of their friends and rivals in the sport. For example, a sportsperson who had no prior experience with drugs found that using them helped them maintain their stamina, which ultimately led to them winning the competition. As a direct consequence of this, most athletes make the decision to take it, and many of them eventually become dependent on it. Mahamood, Y., (2013.

This study explores the involvement of PEDs in sports among Malaysian athletes. At the same time to investigate the effects of Performance-Enhancing Drugs among Malaysian athletes that contribute to Malaysian athletes' intake in the future.

2.6 Theoretical Framework of The Study

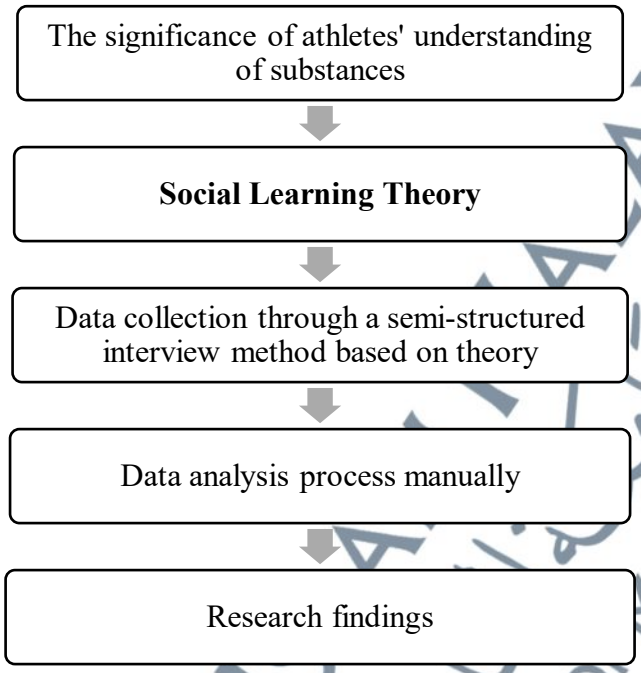

Figure 2: Theoretical framework of the study