THE RELATIONSHIP BETWEEN AGGRESSION, IMPULSIVITY AND ALEXITHYMIA AMONG THE MIXED MARTIAL ARTS ATHLETES AND TRAINEES IN LEBANON

A Thesis

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In Partial Fulfillment

of the Requirements for the Degree

Master of Arts in Psychology - Educational Psychology

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by

ASSAAD AL ASSAAD

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Abstract. Mixed Martial Arts (MMA) is an athletic discipline that requires strength and can cause serious injuries to athletes. It is therefore very controversial and discussed by many as being very aggressive. Furthermore, there is very limited academic research on the topic of MMA and aggression in Lebanon. The present study aims at exploring the relationships between alexithymia, aggression, and impulsivity among the MMA athletes in Lebanon through a correlational design by testing the following four hypotheses: (H_1) Higher levels of alexithymia in MMA athletes predict more injuries, and this relationship is mediated by aggression displayed by the athlete in the practice of MMA. (H_2) Higher levels of alexithymia predict more aggression, and this relationship is mediated by the impulsivity displayed by the athlete in the practice of MMA. (H_3) Higher levels of alexithymia predict more impulsivity, and this relationship is moderated by the years of experience of the athlete. (H_4) Higher levels of impulsivity predict more injuries, and this relationship is . Data was collected from 60 MMA athletes, who have been training in Lebanese gyms for at least 6 months, using surveys in the form of hard and soft copies translated to both Arabic and English. The survey included 3 parts: demographic questionnaire, sport questionnaire, and the scales to test the 3 psychological variables (Toronto Alexithymia Scale, Barrat Impulsivity Scale, and Buss-Perry Aggression Scale). Results showed that alexithymia and aggression are likely to decrease with years of experience, and, there has been an approved cause-effect relationship between alexithymia and aggression, and this relationship is mediated by impulsivity; however, impulsivity did not show a significant relationship with years of experience, and it scored right on the critical value with alexithymia. Recommendations for future research were discussed such as educating the coaches about the importance of academic research in the

field of sport. In addition, the sample size should have been larger to generate stronger results. When it comes to the implications, theoretical as well as practical implications were offered to help the coaches and the athletes make the best use out of the MMA practice and maximize the athletic performance.

CHAPTER ONE: INTRODUCTION

1.1. Study Outline

This study explores the psychological profile of Mixed Martial Arts (MMA) athletes in Lebanon through an empirical observation of a population of 60 participants. It is presented in a thesis of 5 chapters as follows. Chapter 1 provides the theoretical background and problem in the current conditions of MMA in Lebanon. It exposed the problematic that will be developed throughout the thesis. This chapter also contains the objectives, the research questions, and the proposed hypotheses. It will also discuss the significance of this research and its practicality in the field of sport. Finally, it will offer the theoretical and conceptual frameworks to help in understanding the suggested relationships between the psychological constructs.

The second chapter offers a literature review of the main psychological constructs at study, as they have previously been studied in the field of combat martial arts, with focus on their prevalence in MMA sport: alexithymia, aggression and impulsivity. This will help in laying the operational definitions of these constructs and justifying the choice of research hypotheses. The second chapter also includes a list of findings of some previous research, which either support or refute the hypotheses proposed in this research.

Chapter 3 contains a detailed report of the research design and methodology used to conduct the study. Specifically, it includes information about the participants recruited for the data collection. It also includes a description of the tools used in the study including the adaptations and psychometric properties of the selected instruments. The procedures and relevant ethical considerations are also reported in this section.

The fourth chapter offers a detailed description of the statistical procedures performed to analyze the collected data, as well as the results obtained. The results presented will be divided into descriptive and inferential statistics.

The last chapter is a general discussion of the results obtained from the study, which puts them in perspective with the main objective of this thesis. In addition, the fifth chapter presents a summary of the study, a conclusion, and a discussion about the practical application of the research findings in the field of MMA. Finally, the chapter will include the limitations and implications for future studies.

1.2. Background of the study

Since Mixed Martial Arts (MMA) was launched in the USA in 1993, it has always been judged by its increased level of aggression and hostility, as well as the athletes' high exposure to head injuries (Fares et al., 2020). With all the rules and regulations the concurrent MMA has adopted (Maher, 2009), this sport has arguably been labeled as one of the most physically aggressive martial arts, which requires further safety standards and preventive measures to ensure athletes' safety and reduce the risk of injuries (Fares et al., 2020). MMA athletes are relatively at a high risk of having head injuries, and, according to the same study, Traumatic Brain Injury (TBI) is the most common type of head injuries, which occur in MMA competitions. Such incidents could occur because of the minimal use of protection, along with the inclusion of striking techniques from several disciplines allowing the athlete to strike the opponent's head with their fist, elbow, foot or knee (Fares et al., 2020; Souza-Junior et al., 2015).

Considering such major risks, it would be interesting to study the psychological background of MMA athletes. More specifically, we are interested in learning (1) what

motivates an athlete to practice and pursue MMA, (2) what makes competing in MMA psychologically rewarding, and (3) what makes one athlete more successful than others. The following subsections provide previous research findings about aggression, alexithymia and impulsivity and their manifestation in the field of sport.

1.2.1. Aggression research background

To begin with, Graczyk et al. (2010) studied the evolution of aggression in combat martial arts using a sample of 80 participants practicing Boxing, Aikido, Taekwondo and Karate. The age of the participants fell between 22 and 38 years old. This study used the Z. gas's Inventory of Psychological aggression syndrome (IPSA) for testing. Research findings suggest that, on the long-term and at advanced or mastery levels, combat martial arts can decrease aggression. However, the level of physical aggression can be different from one sport to another, with boxing having the highest level of physical aggression.

Woodward (2009) reviewed the effects of martial arts and wrote that martial arts, in general, do not seem to attract only aggressive people. Many choose martial arts for different reasons such as learning self-defense, increasing their self-confidence, or just for exercising and fitness. Moreover, MMA, among other martial arts programs, was found to decrease aggression and hostility with time. Technically speaking, martial arts instructors encourage their students to develop attitudes compatible with the sport if they wish to achieve higher levels. In addition to the sport's technical skills, martial arts practitioners need to be psychologically fit to be able to compete, and one of the major required mental conditions is a decrease in aggression.

A meta-analysis, which combined 12 studies and targeted a total of 507 participants between 6 and 18 years old, studied how problematic behaviors can be affected by

martial arts. The results showed that participation in martial arts programs has a positive effect in reducing problematic externalizing behaviors such as aggression. Furthermore, the effect can be moderated by the duration of practice. As such, a minimal effect was found in youth who participated for only two weeks and a half, while the effect was significantly increased when they practiced for10 months (Harwood et al., 2017).

In his book *Sport Psychology: A students Handbook*, Matt Jarvis (2006) elaborated on the relationship between aggression and combat sports and exposed two different opinions about it. The first opinion supports the positive relationship between aggression and combat sports, while the other supports the fact that, with time and expertise, athletes will demonstrate a decrease in aggressive behavior.

Those who argue that combat sports can increase aggression among athletes and practitioners follow the social learning theory, which contends that if individuals get involved in an aggressive sport, they are likely to adapt new aggressive behaviors. If this theory is correct, then it is expected to see that levels of aggressive behavior will increase with training through interaction and modeling. In this perspective, we know that learning by observation and following a role model play a major role in acquiring skills in sports. In combat martial arts generally, and in MMA specifically, people get more attracted to the most entertaining fighter, who can create "hype and enthusiasm" among the fans. Therefore, when practitioners take a martial arts fighter as a role model, they will try to learn and copy the techniques which were most effective in the fight.

Link between Alexithymia, Emotion Dysregulation, Impulsivity and Aggression.

Alexithymia, emotional dysregulation, impulsivity and aggression were studied by Velotti et al. (2015). The study suggests that aggression is likely to be predated by mechanisms such as impulsivity, emotional recognition, and alexithymia, which is the ability to distinguish emotions. In this case, when people find themselves in a relatively risky or dangerous situation, they can feel an emotional arousal without being able to specify or label it. Accordingly, they will not have the necessary adaptive skills to cope with the specific distressful situation. As a result, the possibility of "attacking" or fighting back as a response for coping, safety, or protection will increase. This research studied the relationship between alexithymia, impulsivity, aggression, and emotion dysregulation among a psychiatric sample of 257 participants, and a community sample of 617 participants. The clinical sample scored significantly higher than the community sample on alexithymia, impulsivity, aggression and emotional dysregulation. The research findings suggest that the three variables are potential predictors of aggression in both the clinical and community samples. In other words, people with less emotional regulation and emotional recognition skills, with a mediation by impulsivity, are the ones who might struggle in monitoring their aggressive behavior.

Link between Aggression and Impulsivity

In a study on the link between aggression and impulsivity, Seager (2005) mentioned that boxers and martial arts practitioners agree that quick and automatic decision making in aggressive confrontations and street fights are necessary. The winner in such situations is commonly the one who strikes first and causes damage to the opponent. Whereas delayed responses, after which it will be too late, can have "costly consequences." This

explains why, in such situations, impulsive, also referred to as automatic, responses can be more rewarding than the delayed ones.

1.2.2. Alexithymia Research Background

A bulk of research shows that alexithymia was mainly used to determine the relationship between high-risk sports, such as rock climbing, skydiving, and martial arts, and anxiety, emotional regulation and sports addiction.

According to Vaughan et al. (2019), experience in the field is correlated with emotional regulation skills, where the more experienced athletes get, the more they acquire control over their emotions. In addition, this emotional control enables athletes to perform and compete with stability and ignore the distracting factors around them. This fact can be beneficial in (1) winning more frequently in competitions and (2) following up with the coach's instructions (Piedmont et al., 1999; Steca et al., 2018).

Another study by Woodman et al. (2009) reveals that the purpose of participating in high-risk activities is to continuously stimulate the emotional arousal of alexithymic people. Considering that these people tend to experience emotional emptiness in their daily lives, they are more likely to be attracted to high-risk sports, skydiving for example, due to the intense emotional experience associated with them. Participants in high-risk sports commonly report that it is emotionally satisfying to go through the fluctuation of anxiety levels from high, during the activity, to low, after the activity is accomplished. This rewarding emotional experience explains why alexithymic people tend to participate recurrently in such types of sports.

Another study related to alexithymia mainly discusses the act of risk taking in sports (Barlow et al., 2015). Alexithymic people are known to have difficulty identifying

and regulating their emotions, the reason for which they have the tendency to participate in high-risk activities, including combat sports. This helps them experience more intense emotions such as fear and excitement, which become easier to label and identify. However, the same research suggests that practitioners, who have progressed in a sport which involves risky behavior, start increasing their exposure to danger, without using protection and adhering to safety measures, due to the continuous search for extreme emotions. This fact will definitely lead to increased risk of experiencing accidents and injuries in the sport.

1.2.3. Impulsivity Research Background

MMA opens the topic of impulsivity as various studies have shown different results, which can be contradictory sometimes. Accordingly, MMA has been reported to decrease impulsivity in some studies, while it has been reported to increase it in others.

Recent research findings state that repeated head traumas are correlated with chronic trauma encephalopathy (CTE), a progressive neurodegenerative disorder predominantly observed in professional athletes in high contact sports such as boxing. Symptoms associated with this disorder are commonly depression, impulsivity and aggression. Boxing and MMA athletes are highly exposed to head traumas, which cause damage in many brain structures (caudate, hippocampus, and thalamus) leading to CTE. This damage leads to impairment in emotion-regulation, and thus, an increase in impulsivity levels (Banks et al., 2014).

In the study about the effects of practicing martial arts, Woodward (2009) mentions that following instructions and commands in this activity enhances concentration and discipline. Moreover, it has been used to treat behavioral problems in children diagnosed

with Attention-Deficit/Hyperactivity Disorder (ADHD). However, this topic requires further research to prove the effectiveness of martial arts practice on ADHD.

In his book *Introducing Sport Psychology: A Practical Guide*, Dr. Arnold Leunes (2011) mentions, referring to the cathartic theory, that practicing aggressive sports helps in getting rid of aggressive impulses and in rendering behaviors more adaptive. So, with time and practice, practitioners learn that the gym could be considered as a safe place, where one can let anger and hostility out, knowing that safety measures and regulations are supposed to prevent any physical injuries. When it comes to MMA, for example, the trainee can always train on a boxing bag or spar with someone else, while wearing protection gear and, most importantly, under the coach's supervision.

Link between impulsivity, alexithymia and risk taking

Panno et al. (2018) gathered data from 113 participants to study the effect of alexithymia on risk-taking. For this purpose, the study used the Toronto Alexithymia Scale (TAS-20), impulsivity and venturesomeness measures, and, after one month, the questionnaire on Cognitive Appraisal of Risky Events (CARE). The results of the study suggest that two alexithymia facets, Externally Oriented Thinking (EOT) and Difficulty Identifying Feelings (DIF), positively affect risk-taking in illegal/aggressive conduct and in reckless academic/work attitude. Also, the externally oriented thinking (EOT) facet of alexithymia is highly associated with risky sexual behaviors.

Impulsivity levels can differ from one person to another, especially when it is related to fields such as goals planning or seeking emotional arousal. Interestingly, impulsivity has been proven to have a direct influence on risk-taking behavior, where increased impulsivity predicts an increase in risk-taking behavior. Furthermore, people

who are unable to name, distinguish and process effectively their emotions, people who experience low emotional regulation skills, and people with negative affectivity such as anger, are more likely to show increased risk-taking behaviors (Panno et al., 2019; Lauriola & Weller, 2018).

Link between Impulsivity and Aggression

The definitions of aggression usually include different dichotomies such as hostile vs instrumental, reactive vs proactive, and impulsive vs premeditated. These dichotomies are, to a certain degree similar, and they are likely to show overlap. "Affective aggression," also referred to as emotional, hostile and thoughtless aggression, is usually known as impulsive and unplanned aggression. It stems from a specific trigger or provocation, usually associated with anger, and it is likely to inflict harm and damage. This type of aggression is spontaneous and automatic, and it lacks the consideration of potential consequences. In parallel, there is the premeditated aggression, also known as thoughtful, instrumental, and proactive. This type of aggression is affectless, and it usually occurs without provocation or triggering. Moreover, in such a case, the individual has most likely planned for it and taken the consequences of their action into consideration (Anderson & Huesmann, 2007).

1.3. The Statement of Problem

Knowing that MMA is an intense and a full contact sport, the athletes are always expected to show a certain level of aggression during workouts and competitions. According to Endersen and Olweus (2005), practicing power sports has a positive effect on antisocial behaviors, which means that practitioners are more likely to get involved in aggressive and other problematic behaviors. However, according to Abrahams (2004) and

Zivin, et al. (2001), there has been some evidence that practicing MMA teaches athletes how to control and condition their aggression. Furthermore, Rosario, Kerr, and Rhodius (2014) argued that athletes did not show any aggressive behaviors outside the gym settings. The same study suggests that it is good for MMA athletes to have a certain level of aggression while training and competing. However, aggression can help athletes succeed only if used moderately and adaptively. Otherwise, excessively aggressive performance can backfire, and it will negatively affect success in the sport.

To conclude, the relationship between aggression and combat martial arts, especially MMA, can be affected by several extraneous variables that can interfere with this cause effect relationship. According to Kusnierz, Cynarski and Litwiniuk (2014), the relationship between practicing MMA and aggression can be influenced by the age, level of expertise, social environment, and many other variables.

No studies have been conducted on the MMA athletes in Lebanon. As such, there is no academic source that discusses the psychological variables in relationship to this sport. Therefore, we cannot confirm any assumptions that relate the psychological background of the athletes in Lebanon with the MMA practice.

1.4. Significance of the Study

Knowing that the field of sports psychology is not active enough in Lebanon, there is no available academic research that discusses the psychological background of MMA athletes in Lebanon. Accordingly, this research serves as an academic reference, which can be used for future studies.

Being the first focusing on MMA athletes in Lebanon, this research has a big potential in activating a new field of research in the country. Hopefully, it will become a

starting point for a series of studies in Sports Psychology, which could be conducted on athletes in the field of martial arts in Lebanon.

Also, this research will be offering scientific information about the mental components which are likely to predict athletic success and increase athletic performance. Such information come in handy in the sports field for athletes, as well as coaches, especially when it comes to training and preparing for competitions.

Finally, MMA in Lebanon has been a debatable subject for the last few years. We are hopeful that this research will provide administrators and policy makers with scientific evidence about the psychological background of MMA, which is the best way to settle this debate once and for all.

1.5. Objectives of the Study

1.5.1. General Objectives

This study is part of the research efforts in the field of "sports psychology," more specifically the psychology of Mixed Martial Arts (MMA). It aims at exploring the relationship between aggression, impulsivity, and alexithymia among the MMA athletes in Lebanon. It also aims at understanding how the standing level of expertise of these athletes, whether beginner, elite or professional, and their years of experience influence these variables. Other variables such as age frequency of training and injuries will also be considered.

1.5.2 Research Questions

In accordance with the previously proposed objectives, the study is looking for answers to the following questions:

1. Are athletes who present higher rates of alexithymia more prone to using aggression in their game and, therefore, exposed to more injuries?
2. Are athletes who present higher rates of alexithymia more prone to being impulsive in their game and, therefore, exposed to more injuries?
3. Are athletes who present higher rates of alexithymia prone to becoming more impulsive? Is the relationship between alexithymia and impulsivity contextualized by the years of experience?
4. Are athletes who present higher rates of impulsivity prone to being more aggressive and, therefore, exposed to more injuries?

1.5.3. Specific Objectives

The specific objective of this study is to test the significance of the following hypotheses throughout the analysis of data collected from MMA athletes and practitioners.

H_1: Higher levels of alexithymia in MMA athletes predict more injuries, and this relationship is mediated by aggression displayed by the athlete in the practice of MMA.

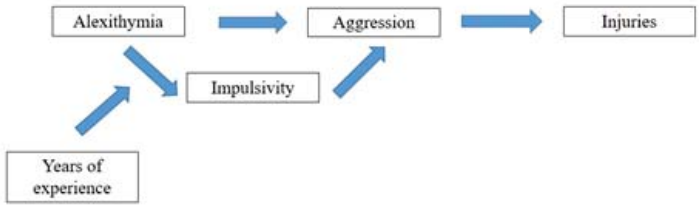
H_2: Higher levels of alexithymia predict more aggression, and this relationship is mediated by the impulsivity displayed by the athlete in the practice of MMA.

H_3: Higher levels of alexithymia predict more impulsivity, and this relationship is moderated by the years of experience of the athlete.

H_4: Higher levels of impulsivity predict more injuries, and this relationship is mediated by the aggression displayed by the athlete in the practice of MMA.

1.6. Conceptual Framework (Model)

Figure 1



The listed hypotheses will be tested according to two classifications:

- Depending on the affiliation of the athletes (Beginner – Elite – Elite Professional)
- Depending on the athletes' years of experience

The above model illustrates the hypotheses proposed in the study, and it shows the suggested relationships between the research variables.

CHAPTER TWO: LITERATURE REVIEW

2.1. Mixed Martial Arts: History and Definition

2.1.1. History of Martial Arts

Although it is difficult to find a specific date, it seems that the first forms of martial arts appeared in China around 3000 years ago. Martial arts were known as structured and organized self-defense systems, which were used back in those days (Moody, 2012). With time, more traditional martial arts systems and schools started appearing around the world. Different countries had different martial arts systems such as Shaolin Kung Fu and Wushu in China, Judo, Karate and Aikido in Japan, Taekwondo in Korea, and Jiu-Jitsu in Brazil. Interestingly, these traditional martial arts were not only limited to fighting techniques, rather they gradually got integrated into the cultural heritage of their countries of origin (Partikova, 2019). For example, Kung Fu became a lifestyle by itself. It included spirituality, schools of thought, philosophy and even traditional dances (Daly, 2012).

In 648 BC, the first martial arts event, the "Pankration," was introduced into the Greek Olympic Games. Pankration, in Greek, means all the power, where "pan" means all, and "kratos" means power. This sport involved striking using arms to punch and legs to kick, and wrestling techniques such as grappling and neck choking. Every behavior was permitted in Pankration except biting, gouging and striking the genitals. The traditional Greek Pankration is no longer practiced; however, it has inspired many countries to accept martial arts as a recognized sports competition and to develop different styles. Even more, the historical influence of Pankration on what we call today "Mixed Martial Arts" (MMA) has become obvious.

It has been argued that MMA is one clear adaptation of Pankration, and today's events are strongly inspired and modeled by this ancient Greek martial art. In fact, both sports include striking techniques using kicks and punches to knock out the opponent, in addition to grappling and wrestling techniques using body weight and articulation to submit the opponent (Stenius, 2013).

2.1.2 Founding of MMA

In 1973, Jim Arvanutis, a Greek American professional martial arts trainer, founded the Neo-Pankration combat sport, an adaptation from the traditional Pankration which blends boxing, Muay-Thai, Greco-Roman wrestling, and other forms of martial arts. He was able to do so after he extensively studied the history of martial arts, especially the Pankration that was practiced by his direct ancestors.

It was not until the early 1990s that MMA was recognized in its modern form. On the 12th of November 1993, the first event of the Ultimate Fighting Championship (UFC) was organized in the United States. Since then, the community of this sport started growing internationally, especially after other countries such as Australia and Canada started organizing MMA events and tournaments. However, the first UFC event did not include weight divisions, between-rounds breaks, or referees in the octagon. Although the only fouls were biting and eye gouging, there were no other restrictions in the game (García & Malcolm, 2010).

Two years later, Belgium hosted the first event in Europe in 1995 known as the "Cage Fight Tournament," and then it was followed by other European countries such as Germany, Netherland, United Kingdom, etc.

The emerging martial art received a lot of criticism from policy makers and sports administrators due to the increased rates of injuries and violence on the one hand, and the absence of formal regulations to insure the safety of participants on the other. Consequently, in 1996 the game got banned in 36 states in the USA (Ford & Kerr 2011).

2.2. MMA in Lebanon

Although MMA was legally practiced in Lebanon in 2017, the Lebanese MMA federation was dissolved, the reason why there is no official information about its history and its current practice. The following information were provided during a personal interview on May 9th, 2020, with Dr. Nadim Nassif, former consultant for the Lebanese MMA Federation.

MMA was first introduced in Lebanon in 2007; however, it was practiced under the Lebanese Federation of Judo. In 2012, MMA got separated from the Judo Federation and started being practiced independently until 2015. The first MMA federation was established on the 20th of October 2015, after which the game started expanding throughout the country, and more gyms started adopting the sport, and organizing local events and tournaments.

On the 23rd of February 2017, Mr. Mohammed Fneish, the Minister of Youth and Sports, decided to ban MMA, including all combat sports events and competitions which use the cage or the octagon. This decision was followed by two justifications. First, Mr. Fneish claimed that it is inhuman to have two fighters in a cage competing without meeting safety standards, which can be observed in the increased injury rate and, violence, especially for children and young athletes. The second reason, which Nassif considers to be the most important, is the fact that the federation has been going through

technical difficulties since its beginning. Indeed, the laws concerning sports require that at least five academies be officially registered at the ministry, while there were only four registered MMA academies.

The other concern was the fact that the MMA Federation was, to a large extent, affected by the various political parties running the country. This situation affected the performance of the federation as an administrative community, where it could no longer host and organize enough events. This shortage can be traced back to many reasons, and one of them is the increase of injury rate and violence associated with the game. In other words, we are talking about the effects of political corruption, not only on MMA, but on other sports also.

The effects of corruption on the sport system in Lebanon were studied by Nassif (2014) in an article which suggests that this corruption is highly related to the confessional system running in the country, where religious parties are distributing institutional and political power. In other words, this system is being translated into a strive for "communitarian" over-representation. This behavior illustrates the actual difficulties that the federations, including that of MMA, can face in the Lebanese sport system. Therefore, this can explain the under-achievement of Lebanese athletes on the international level.

Banning MMA in Lebanon triggered a lot of objections and negative reactions around the country by the administrators and policy makers although it is not the only combat martial art in the country. This decision indicates a lack of background knowledge about the game as any other full-contact sport, such as basketball or football, can be considered as risky as MMA. Woodward (2009) mentions that martial arts have

recently become safe games when practiced properly with adherence to rules and regulations and effective protection gear.

In the present days, the game is still practiced in some Lebanese martial arts academies and teams such as Tristar, Louaize and Bou Serhal, and it is still available for those who are interested. However, it is temporarily going under “Free Fight” as the case is being studied by the new minister of youth and sports to form a new federation for the game. Locally, we see small-scale MMA events for amateur athletes to compete occasionally. Yet, elite and professional athletes are required to travel outside the country to participate in tournaments under MMA rules.

2.3. Rules and Regulations and Safety Standards of Contemporary MMA

2.3.1. Rules and Regulations

Due to the many criticisms the game received, MMA went through another determining milestone, which focused on setting the rules, regulations, and safety standards of contemporary MMA.

To establish the new set of rules and regulations for MMA, the UFC started hiring trained referees and judges. They started adapting regulatory frameworks and unified rules and conditions, which continuously evolved until MMA took the form we know of today (Berg & Chalip, 2013). With the new set of rules and regulations, MMA started to shift from being a wild confrontation between two opponents, to a regulated competition between two athletes (Maher, 2009).

Today, MMA is defined as a combat martial art, which includes techniques mainly of Jiu-Jitsu, Muay Thai, Boxing, Kickboxing, and others depending on the athletes’ specific expertise or background. As such, the most skilled athletes in this are

the ones able to “fight with a style” and find the best fighting strategies, along with the most effective combinations of all the above-mentioned fighting styles, to win the match (Souza-Junior et al., 2015). The match can be won through one of the following ways: knockout, submission, technical knockout, judges’ decision, or other specific cases depending on the referees’ judgment.

Among the earliest modifications that happened to MMA rules is the implementation of weight categories for the athletes participating in competitions, where each category is limited by a maximum and a minimum value. In other words, the participants are classified within those categories according to their weight, and the winner holds the title of his or her weight category in the UFC.

Moreover, new rules were made by the UFC organizers to determine time frames to the games. The title games are usually five rounds, five minutes each, with one-minute breaks between rounds. However, for an amateur game, it usually does not exceed three rounds, each lasting three minutes. Of course, these rules might change from one competition to another (Miarka et al., 2015; Souza-Junior et al., 2015).

2.3.2. Safety Standards

As a legitimate sport today, MMA is expected to meet some specific standards, and every MMA event should meet the following rules and regulations, which can be classified into three groups: (1) safety, (2) true and fair contests, and (3) relationships between the athletes, also referred to as conflict of interest. However, in this research the main focus will be on the first group.

In order to secure athletes’ safety, every fighter should be equipped with MMA gloves, a mouthpiece, a groin protector for males, and shin pads for amateur players

before entering the octagon. In addition to the previously declared inappropriate behaviors such as biting, gouging and hitting the genitals, a new list of 25 behaviors, as presented by the MMA New Jersey's Unified rules, are considered hostile and prohibited. Some examples of such behaviors are headbutting, joint manipulation, throat strikes, kicking or kneeing the head of the opponent while on the ground, purposefully placing a finger in a contender's orifice, and many others on this list.

The prohibition of Performance Enhancing Drugs (PED) is also another safety standard, which should be maintained, considering that PEDs can have harmful side effects on the long-term; moreover, they, being more exposed to injuries themselves, may also inflict serious injuries upon their opponents in the octagon. When athletes are under PED effect, they are more likely to be pushing their performance to the limits or to lose control over their impulses.

Another safety standard states that every competing athlete should go through a medical procedure in order to ensure that there is no chronic physiological problem be it cardiac, respiratory, or anything else. Any athlete who shows positive results for any medical condition is considered an at-risk athlete and is prevented from participating in any MMA competition.

Another important MMA safety standard confirms that during a game, the referee or the "corner man" has the right to stop the fight immediately. This should be the case when an athlete is losing, and he/she is not able to perform properly or not able to keep up with the opponent. In this case, the losing athlete is considered in a high-risk situation, and the fight should be stopped to prevent damage or serious injuries (Maher, 2009).

2.4. Theoretical Framework

The following four theories (Skinner's behaviorism, cognitive theory, psychodynamic approach, humanistic approach) formulate a framework, which explains some specific aspects of sports psychology. Each of these psychological theories approach sports from a different perspective to explain psychological functioning of athletes in sports. These theories help in creating a theoretical framework that justifies the choices of the psychological constructs and connects them together. In addition, they help in formulating the hypotheses proposed in the research. More theories and applications that can be listed, but for the purpose of this research, these four are chosen to provide a theoretical background for our chosen research variables knowing that they can provide explanations for specific aspects in the practice of MMA. For example, the process of new skills acquisition is explained in behaviorism, remembering acquired skills and applying emotional regulation skills explained in cognitive theory, expressing physical aggression in sports adaptively, and finally, understanding human motivation and self actualization as explained in the humanistic approach.

2.4.1. Skinner's Behaviorism

First, the behavioral theory accounts only for what is observable and measurable, which explains why Skinner attributed the human body to a "black box." Skinner believed that it was more important to study the external actions and behaviors, rather than the internal mechanisms of the body. The behavioral theory basically assumes that new skills and behaviors are acquired through what he called Operant Conditioning. In other words, it mainly consists of reinforcing behaviors which are desired and punishing those which are not although research has shown that reinforcement is more effective than punishment. According to Annesi (2005), the application of this theory in sports

psychology emerges when athletes are acquiring new skills and techniques and, simultaneously, learning how to minimize undesired behaviors such as aggression and impulsivity.

2.4.2. Cognitive Theory

Unlike the behavioral theory, the cognitive theory focuses on internal mechanisms. The theory suggests that external behaviors and emotions are dictated by cognitive functioning. As such, it is important to understand the brain mechanisms and processes to be able to measure, interpret, and comprehend human's behaviors and emotions. In sports psychology, this theory can explain some psychological phenomena experienced by athletes like fear, anxiety, and motivation. It can be applied to explain memory and emotional regulation as well. According to Zimmerman et al. (2005), people with high levels of alexithymia are more likely to experience difficulties in coping with stressful situations. Therefore, the same experience applies for MMA athletes as they go into the octagon and face their opponents.

2.4.3. Psychodynamic Approach

The psychodynamic approach focuses mainly on the unconscious, on the previous experiences and on the natural instincts of the individual. It is important for psychodynamic theorists to understand how we are influenced by our unconscious mind and how we are driven by our instincts, needs and desires. One possible explanation of contact sports suggests that it is a sublimation of aggression, which consists of displacing our hostile and destructive emotions and behaviors into adaptive activities, so we can avoid unpleasant consequences. In sports psychology, kicking and tackling, in football, are aggressive and possibly destructive behaviors, which are instinctively directed to

other humans. But by focusing on the ball, we are sublimating this aggressive instinct into a more adaptive and acceptable activity, which, on a superficial level, does not seem to generate adverse consequences (LeUnes, 2011).

2.4.4. Humanistic Approach

One last theory worth mentioning in this study is the humanistic. This theory focuses on intrinsic and extrinsic motivation. It also focuses on how individuals set goals and strive for growth and success. Here comes the importance of Maslow's Hierarchy of Needs, which consists of the requirements necessary for our success and self-actualization. In sports psychology, the humanistic approach is mainly used to study how athletes are intrinsically or extrinsically motivated. In addition, it can be used to explain athletes' success and ambition in sports. This theory can also investigate athletes' motivation for self-actualization and highest achievement. This can serve as a predicting factor for the level of expertise and professionalism the athletes might reach (McLeod, 2007).

2.5. Operational Definition of Variables

The following section will provide detailed definitions of the research variables aggression, alexithymia, and impulsivity. These definitions are adopted in other studies, which are, to a large extent, related to our research topic. In addition, there will be a discussion on the manifestation of the research variables in the sports field, and, finally, there will be a discussion on the subtypes of these variables.

2.5.1. Aggression

Aggression is known to be one of the most controversial topics in contact sports, specifically combat martial arts. Therefore, it is almost impossible to study the

psychology of combat martial arts without taking into consideration their aggressive aspect. The following is a comprehensive definition of aggression, which will be followed by the definitions of the subtypes of aggression known as hostile aggression and instrumental aggression.

Aggression is any intentional action done by an individual, in an open or symbolic form, to cause harm or pain to another individual or group of individuals. It can be expressed physically or verbally and directly or indirectly (Graczyk et al, 2010). Makarowski (2013) acknowledged that the intensity of aggression can be measured using these 4 criteria: (1) an antecedent factor such as the athlete getting provoked or frustrated, (2) a rewarding factor such as pleasant emotional consequences and release of frustration, (3) a social factor such as a feeling of belonging to certain groups, (4) and a biological factor, otherwise known as temperament. Furthermore, hostile aggression and instrumental aggression are considered as the two different subtypes, which will be discussed below (Graczyk et al, 2010; Roland & Idsøe, 2001).

Hostile aggression, also known as reactive aggression, refers to violent attitudes or actions that are associated with anger and a desire to dominate a certain situation. This type of aggression displays itself in verbal, non-verbal and physical ways and holds the intention of causing harm (Lickley & Sebastian, 2018).

Instrumental aggression, also known as proactive aggression, refers to aggressive behaviors intended to achieve a specific goal, keeping in mind that such action might accidentally cause pain or harm to the others. This type of aggression is not preceded by anger; however, it is likely to be followed by anger depending on the severity of its negative effects (Graczyk et al, 2010; Roland & Idsøe, 2001).

A link between aggression and the field of sports can be established by exposing contradictory opinions about the role of aggression while athletes are competing. On the one hand, aggression is considered as an important factor for winning. On the other hand, many believe that sportsmanship is considered more important for winning than aggression. Finally, the role of assertiveness in sports will be discussed.

Aggression is a Key for Winning

According to Leo Durocher, a baseball coach, "nice guys always lose their matches" (Graczyk et al, 2010, p. 3). Therefore, aggression is considered as one component of success and winning in sports. Similarly, in his book *Undisputed Truth*, professional boxer Mike Tyson speaks about the teachings of his legendary boxing coach Cus D'Amato. He declared that Cus always told him that "a fighter must not only win, but he must win in an exciting manner. He must throw punches with bad intentions" (Tyson, M, 2013, p. 83).

Hurting the Opponent Does not Predict Winning

In his book *Introducing Sport Psychology: A Practical Guide*, Dr Arnold LeUnes (2011) explains that it is good, and sometimes even admirable, to hate the opponent, but this is not the right thing to do. Coaches have to constantly reinforce sportsmanship and decrease hatred. So, it is very important for athletes to separate between "hateful aggression" and "winning directed aggression."

Obviously, aggression is a broad term, and each coach perceives and treats it differently. It is very important to be aware of the sub-types of aggression previously listed.

Adaptive Form of Aggression

Along the same lines, it is worthy to talk about assertiveness in sports competitions. Assertiveness can be defined as the most adaptive and acceptable facet of aggression because it is non-destructive and goal oriented. Assertiveness is only concerned with motivation to winning and high achievement, rather than harming the other competing opponents (Graczyk et al, 2010). As such, in sports, assertive athletes can be observed as winning oriented people, who are able to show competitive levels of courage and confidence enough to boost their performance with as little harm as possible (Makarowski, 2013; Basiaga-Pasternak et al, 2020).

LeUnes (2011) discusses the relationship between aggression and sports in his book *Sport Psychology: A Practical Guide*. He illustrates this relationship in several sports, which include physical contact or relatively high-risk behavior such as American football and basketball. Interestingly, he presents two scenarios related to boxing.

In the first scenario, boxing is illustrated as a hostile sport and a highly controversial one. He also mentions that many sports psychologists avoid working in this field due to the boxers' aggressive drive and their harming intentions.

In the second scenario, boxing requires high levels of discipline and self-control. In other words, it takes intelligence and hard work to become a successful boxer. Along with physical workout at the gym, every athlete must learn sportsmanship inside and outside the ring. This is often obvious when athletes show respect to their opponents, hold them or help them up when they fall or get knocked out.

2.5.2. Alexithymia

Alexithymia has been shown to be common among the athletes who seek practicing high-risk sports (Barlow et al., 2015; Woodman et al., 2009). In addition,

according to Velotti et al. (2016), there has been a proven cause-effect relationship between alexithymia, an independent variable, and aggression, a dependent variable. Knowing that MMA is relatively a high-risk sport and the fact that it has aggressive aspects, it would be interesting to include alexithymia and study it among the MMA athletes and practitioners in Lebanon.

Before delving into alexithymia, an introductory definition of emotions according to previous research and specialized psychologists will be provided.

Definition of Emotions

The literature shows that there is no one definitive and ultimate definition for emotions. One study, conducted by Izard (2010), consisted of finding a "Definition, Function, Activation, and Regulation" for emotions. This study collected data from 35 psychologists concerned with the above listed properties of emotions. As expected, the received answers were different to a certain degree, but the comprehensive definition affirms that an emotion is a form of neural functioning, response mechanism, and a state that stimulates and organizes cognition and behavior. Accordingly, a feeling is a cognitive state which predicts a specific behavior such as fight or flight.

However, it is important to differentiate between a feeling and an emotion. Antonio Damasio (2013) elaborated about the importance of feelings and suggested that there is a difference between feelings and emotions. An emotion is the component that comes as an answer to a specific stimulus or incident, whereas a certain feeling is the addition of our own perspective and experience to a certain emotion. For example, 'I am scared of dogs' is an expression of emotion, fear, while 'it makes me feel terrified or

anxious' is the expression of feelings. In other words, a feeling can be considered as the subjective reaction to a certain event.

Antonio Damasio (2013) defined feelings and emotions as the mental and cognitive translations of body states. Feelings and emotions appear whenever the brain analyzes the state of the body elicited by a specific action. However, it is well known that emotions are relative, and emotional regulation skills can differ from one person to another for various reasons, which are not included here in the literature of this study. Therefore, different people have different abilities of processing their emotional states. This means that the same stimulus can elicit different feeling states among individuals, with different levels leading to different reactions. The theory of emotional relativity mainly suggests that people are more likely to adopt different scales to interpret and perceive emotions, which can be predicted by the level or intensity of previous experiences. Also, the research findings of the study done by Izard (2010) suggest that emotional regulation is the result of an interaction between emotion and cognition.

Definition of Alexithymia

The origin of alexithymia goes back to the year 1973, when Sifneos attributed it to patients diagnosed with psychosomatic diseases affecting their skills in describing and differentiating their feelings during psychotherapy. They had difficulties in expressing their feelings with words and in paying attention to their emotional world (Serafini et al., 2020). Thus, one suggested definition for alexithymia is that it is a dysfunction in attributing cognition to emotions. In other words, it is a deficit in the emotional regulation skills (Taylor et al., 1991).

Alexithymia has two major components: (1) the emotional component, which is related to description and labeling of emotions, and (2) the cognitive component, which is related to deficit in introspective thinking or examination of one's own psychological state (Farges et al., 2004).

Alexithymia is usually measured on self-reported scales. Consequently, it might differ from one person to another depending on the scoring level and the degree of severity. Alexithymia has been found to be related to other psychiatric disorders such as anxiety disorders, psychosomatic disorders, eating disorders, post-traumatic stress disorders, major depressive disorder, and others (Leweke et al., 2012) . So different scores on the scale can indicate different psychological diagnoses.

Based on the above definitions, this study aims at understanding how alexithymia is related to other personal variables among athletes who practice high risk sports like MMA. Mainly, this literature review will focus on specific personal constructs like anxiety, emotion regulation and body perception among the athletes.

Study of alexithymia in high-risk sports

To begin with, Amemia and Sakairi (2015) suggest that there is a negative correlation between the athlete's level of mindfulness and burnout and that this relationship is mediated by alexithymia. In this case, the increase in alexithymia scores confirms the athlete's tendency to fall into burnout. However, an increase in the athlete's attention, awareness, and emotional regulation skills can be translated negatively in terms of score on alexithymia, which is more likely to decrease burnouts.

When it comes to anxiety, Woodman et al. (2009) suggests that people who score high on alexithymia have a difficulty in distinguishing between emotions. This explains

why they are likely to experience a flow of emotion without knowing exactly what they are going through, and this can be referred to as undifferentiated emotions. The same study collected data from people who practice skydiving. The results showed that alexithymic sky divers experienced a significant change in anxiety levels over the course of skydiving; however, non-alexithymic sky divers did not experience it at all. This justifies the direct positive relationship between alexithymia and anxiety levels experienced in high-risk sports.

Caretti and La Barbera (2005) and Ferrari (2011) confirm that alexithymia and sports dependent behavior are strongly correlated due to the positive feelings and the rewards generated out of exercising. Accordingly, there has been a proven relationship between alexithymia and dysfunctional bodily perception among people diagnosed with alexithymia, where we commonly observe avoidance, compulsive self-monitoring, and body uneasiness.

Iacolino et al. (2017) conducted a study including 200 participants divided into two groups: sportive and non-sportive. Among these two groups, the study aimed to look for a relationship between alexithymia, emotional regulation, and sports addiction. The results in this study suggested that people scoring high on alexithymia showed a correlation between lack of emotional recognition and bodily dis-perception, also known as Body Dysmorphic Disorder in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5). In this case, we are talking about the probability of developing exercising and sports addiction among the population scoring high on alexithymia.

Many studies have shown that MMA has a relatively high rate of injuries compared to other styles of martial arts, especially when it comes to head injuries (Fares

et al., 2020), which is why it is definitely considered as one of the high-risk sports. Along these lines, Barow et al. (2014) studied the sports preferences of people who face difficulties in defining and regulating their emotions. Interestingly, such people were found to have more interest in participating in high-risk sports due to the intense and extreme emotional experiences generated out of the participation in such activities. According to the authors, the emotional after-effects generated out of such activities are strong enough to be easily distinguished, analyzed, and perceived by the participants. This creates some kind of rewarding emotional gratification for people scoring high on alexithymia, and, according to this research, such a process can be a motivator, which drives them to continuously seek such risky experiences.

2.5.3. Impulsivity

In addition to the previously listed psychological constructs, impulsivity is also worth discussing in this research because of (1) the enormous and significant role it plays in the field of combat martial arts and (2) its relationship with aggression. According to Anderson and Huesmann (2007), aggression can sometimes be fast and unplanned, and it shows up as an automatic reflex regardless of the consequences following the behavior. This type of aggression is referred to as impulsive aggression.

Impulsivity is a psychological construct characterized by multi-facets correlated with different psychiatric diagnoses (Hamiliton et al., 2015). Generally, “impulsive” individuals are known for their rapid actions, with a lack of forethought and account of the following consequences. Research has shown that impulsivity can be associated with substance use, gambling addiction, aggression, deliberate self-harm, and other conditions (Hamiliton et al., 2015).

Different studies suggest different classifications and operational definitions for impulsivity. However, Hamiliton (2015) divides impulsivity into two distinct factors: (1) Choice Impulsivity, known as the lack of patience and ability to tolerate a delayed gratification and (2) Rapid-Response Impulsivity (RRI), which is the immediate behavior that is usually not compatible with the context, along with a lack of consideration of future consequences.

According to the DSM-V, under the "Disruptive, Impulse-Control, and Conduct Disorders," one diagnosis, called Intermittent Explosive Disorder, has interesting diagnostic criteria worth discussing in this research. Under this diagnosis, individuals are likely to fail in controlling their verbal and behavioral impulses, which can be considered aggressive and can cause damage to objects, animals, or other individuals. Such impulses can also be labeled by having an intensity, usually not proportional with the stimulus that provoked them, which means that the person is using his or her excessive power inappropriately to deal with a specific situation. In addition to the previous symptoms, the observed impulses, also referred to as outbursts, seem to be very random. In other words, their purpose does not seem to be explicitly linked to any goal or achievement.

In conclusion, these outbursts are not adaptive and can be considered, to a certain extent, problematic to individuals due to their negative influence on their social and professional life.

Impulsivity in Sport

When it comes to impulsivity in sports, it is very important to talk about attention, self-regulation, automaticity, and inhibitory control skills, all of which guarantee the

ability to plan and manage cognition, emotions and behaviors for a professional athlete while performing.

Siekanska and Wojtowicz (2020) confirm the suggestion that while successful athletes scored higher on impulsivity than other less successful athletes, they also scored higher on other neurotic components such as emotional regulation, attention, self-efficacy, and self-awareness, which are not measured in this research. The listed qualifications can be reflected on many dimensions in the athlete's career. (1) Successful athletes are more able to commit to their sport for a long-term, (2) they're also able to develop advanced skills to compete on professional levels, (3) self-efficacy and self-awareness can decrease the negative outcomes of impulsivity by controlling the reflexes and impulses, which emerge under stressful situations, and (4) emotional regulation gives athletes the ability to keep their anxiety level under control when they find themselves in a stressful situation (Jonker et al., 2010; Jonker et al., 2012). This applies to the previous discussion about the three scenarios, where the athletes lost control and showed hostility toward their opponents.

Vaughan et al. (2019) mention that experience and the athlete's exposure in sports play a very important role in developing cognitive skills related to decision making and emotional regulation. In such cases, athletes will become more capable of measuring the consequences of their moves while performing, and they will be more careful in considering their choices. In other words, they are more likely to take the least risky shots.

In parallel, athletes' increased exposure to the sports can create what we call automaticity. In their book *The Sport Psychologist's Handbook: A Guide for*

Sport-Specific Performance Enhancement, Anshel & Payne (2006) mention that many martial arts athletes practice specific exercises to decrease their controlled thinking and increase their automaticity. Such a phenomenon can be frequently observed in sparring at the gym, when the trainee practices avoiding punches and landing accurate, fast, and effective punches upon the opponent.

Johnstone (2021) conducted an experiment in this context to measure the difference between automated response, known as reflex, and the thought preceded response. The participants were divided into two groups: martial artists vs non-martial artists. The experiment consisted of a green shape (Go) and a red one (NoGo), which will appear on a screen. The participant should press the spacebar only when the green shape appears. Surprisingly, the martial artists committed more errors than the non-martial artists by pressing the spacebar on the red-light, which confirms that martial artists had poorer inhibitory control than non-martial artists. In other words, martial artists are more likely to use automated responses. This experiment illustrates the difference between the automated response and the thought preceded response, where martial artists tend to be more "on the go" mindset and more likely to have the fastest response to the stimulus.

As a conclusion, impulsivity does not necessarily indicate something negative in sports or something that requires psychological therapy. Even more, impulsivity can have positive outcomes, especially when it is correlated with other neurotic components, which might help the athlete to "be impulsive" in an adaptive and effective way. Briefly, any athlete competing at a professional level requires a certain degree of impulsivity to take rapid and firm decisions to come up with functional strategies in every opportunity (Dickman, 1990).

2.6. Hostile Incidents in Sports

Considering the definition and literature that we previously offered on aggression, the following section will expose three famous incidents in the history of sports. The purpose of mentioning these incidents is to show a clear distinction between hostile and instrumental aggression in the behavior of elite professional athletes. Instrumental aggression can be observed when the athlete is aiming at winning, while hostile aggression can be observed when the athlete is aiming to hurt the opponent, regardless of whether he or she will win the competition or not.

Throughout the three incidents, we will be able to observe that the athletes were triggered, and their behaviors were preceded by anger. Accordingly, they were all aiming at inflicting intentional harm and pain onto the opponent. Furthermore, these three incidents share a common factor: the high level of stress that athletes went through at that time due to the sensitivity of the competition in their athletic career.

2.6.1. Incident Number One

Mike Tyson, a retired professional American boxer, was active in the game between 1985 and 2005. Tyson had an intimidating attitude and boxing style in the ring. Accordingly, he had different nicknames such as" kid dynamite," "the baddest man on the planet," and "Iron Mike." He was the youngest player to win the world heavyweight championship at the age of 20 years old. Tyson played 58 fights during his professional career scoring fifty wins, six losses, and two games with no contest. In the 48th game, Tyson shocked everyone with a hostile behavior when he attempted to bite the ear of his opponent, Evander Holyfield. Consequently, Tyson lost the game by disqualification. Later, in his televised interview with Winfrey in 2009, Tyson acknowledged that he was

in rage and explained that he got angry and frustrated because Holyfield provoked him through several headbutts during the game. Although Tyson wanted to inflict pain on Holyfield, at which he succeeded, he mentioned that he would like to have the opportunity to shake Holyfield's hand and apologize to him.

2.6.2. Incident Number Two

Khabib Nurmagomedov and Conor Mcgregor faced each other in the UFC 229 in Mixed Martial Arts, one of the most famous fights in MMA. Khabib, a professional Russian mixed martial arts athlete, won the UFC lightweight title, and he twice won the Combat Sambo World Championship. Khabib has a current score of 28 wins and no losses. Conor is an Irish professional mixed martial arts athlete and boxer holding numerous titles in UFC.

Their fight was preceded by intense trash talking during a press conference, after which Khabib claimed that Conor offended his family and his religion, and this is going way beyond the game itself. After Khabib won the game by submission, he jumped over the cage and offended Conor's teammate Dillon Danis. This was followed by actions and interference from both sides, causing a complete mess in the octagon. Consequently, the Nevada State Athletic Commission (NSAC) agreed on a penalty for both players. In his post-fight interview (UFC, 2018), Khabib started by apologizing to the NASC for his hostile behavior. He justified his actions by saying that he got triggered, and this was a spontaneous reaction after the other team offended his nation, religion, and his family. He added that MMA is a respectful game and not just about trash talking as it appears on social media.

2.6.3. Incident Number Three

Zinedine Zidane, a former professional football player from France, is currently managing La Liga club in Real Madrid. During the epitome of his career as an athlete, he was known as one of the best football players around the world. He played a total of 185 games and won a percentage of 66 percent, which is a relatively high number in this game.

In 2006, France was facing Italy in the world cup, when Zidane attempted to headbutt the Italian player Materazzi in the chest. As a result, Materazzi was sent out of the game, and of course, Zidan got fouled for his behavior as it was considered hostile.

In the post-match interview, Zidane declared that Materazzi insulted him and his family, which provoked him, and his behavior was a reaction to this provocation. However, Zidane admitted that he is sorry to all his fans and the young players who consider him as a role model. Yet he has no feeling of guilt because he was defending the honor of his family (Canal Plus, 2006).

CHAPTER THREE: METHODS

3.1. Participants: A Review of Previous Studies

Before setting a classification or grouping for our sample, we have to keep in mind that different MMA academies have different opinions on this topic. Some academies have adapted a belt system to record the levels and progress of the students. For example, one common belt system is White, Yellow, Orange, Green, Blue, Purple, Brown, Black, and Red. Some academies offer it as a solid color, while others represent it with a stripe.

Other academies did not adopt any belt system, rather they just label their students as Beginner/Amateur, Semi-Professional, and Professional levels. Knowing that MMA is a combination of different martial arts, many players might have different "backgrounds" in fighting styles and might have different levels in each style of martial arts. For instance, someone might have a Brown belt in Karate and Blue belt in Jiu Jitsu. As such, it would be inapplicable to give the athlete a belt color in MMA.

Previous studies, which used MMA athletes as samples, have, to a certain extent, similar classifications for the participants. For example, in one of the studies, James et al. (2016) studied the physiological characteristics among successful MMA players. The participants in this study were classified according to the type of sports they practice in parallel with MMA as it is likely to contribute to their success in the game. This second sport can be a martial art or a non-martial art.

Another study focused on the mental toughness of MMA fighters belonging to different ranking levels in the game. So, the participants in this study had to meet two selection criteria. The first criterion is having competed at any tournament in the past

year, while the second one is having competed in at least two fights in the ranking level that they belong to. And these levels are amateur, semi-professional, and professional (Chen & Cheesman, 2013).

A third study conducted in this field was interested in assessing the prevalence of injuries and their severity among MMA athletes. The participants were both men and women holding amateur or professional status. The demographic part of the questionnaire took into account their age, background in martial art style, hours of working out per week, experience (in years), and use of protection equipment (Rainey, 2009).

3.2. Sample Recruitment

The participants in this study were MMA trainees and fighters divided according to their record in the game using the following measures. The first one takes into consideration the participants' years of experience in MMA, and the second one takes into consideration their highest level of achievement, according to the following classification. The first category is that of the elite fighters who participated in international competitions. Here we must keep in mind that elite-professional fighters get paid for their participation, while elite-amateur fighters do not. The second category is that of the non-elite fighters who practice the sport only on the local level; however, they do not get paid for any activity related to MMA.

Non-elite athletes were not able to compete in the octagon for a while, considering that the Lebanese MMA Federation was dissolved in 2017 and that there were no local tournaments running in the country at that time. However, non-elite athletes are still considered active in the game as long as they have been practicing for the last six months or have participated in friendly matches, which are usually organized at their

gyms or martial arts academies. Such matches are not considered as part of any tournament or competition.

To be eligible for this study, all the athletes had to be adults (18 years old or above), and must have been practicing MMA in Lebanon at least for the past six months. The participation in the study was on a voluntary basis, and participants were asked to read and sign the informed consent form prior to responding to the questionnaires. Participants did not receive any type of incentive or compensation for their contribution.

3.3. Sample Characteristics (Demographics)

The sample recruited in this study was described according to the following sociodemographic variables : the age in years and their nationality. Also, the data was classified according to the martial arts that they practice in parallel with MMA. Then, another classification of the data depends on the frequency of training (in terms of days per week) and the duration of training in hours. Finally, the participants were grouped according to their years of experience in the sport, and their athletic standing in MMA (amateur, elite, elite pro).

The data collected for the study was obtained from 60 participants (51 males; 9 females) distributed over several gyms and teams in the country, namely: Tristar team, Knockout team, Elite fight Academy, Asmar Team and Louaize Team. The listed teams are considered active in the field of MMA in Lebanon, knowing that they sponsor athletes to compete under their names.

The mean age for all participants is M=25.12; SD = 5.4. Around 83% of the participants were Lebanese; specifically, the sample included four Syrians, one Lebanese-Russian, one Lebanese-British and one Lebanese-Argentinian.

According to the data gathered, in parallel with MMA, Brazilian Jiu Jitsu, Muay Thai, and Boxing were the most common martial arts styles among the participants. Few practiced other martial arts styles with MMA such as Kickboxing, Taekwondo, Kung Fu, Wrestling, Judo, and Karate.

When it comes to the frequency of training in a gym, 25 participants reported that they practice from 3 to 6 times per week. Seventeen participants stated that they practice daily. Sixteen participants practice 1 or 2 times per week, while 2 people reported that they practice less than once per week. Details can be found in Table 1.

Table 1
The Frequency of MMA Practice per Week

	Frequency	Percent	Cumulative Percent
less than once a week	2	3.3	3.3
once or twice a week	16	26.7	30.0
three to six times a week	25	41.7	71.7
everyday	17	28.3	100.0
Total	60	100.0	

Note. This table shows the participant's frequency of training (days per week).

Concerning practice duration in hours, the majority, 44 participants, reported that they spend 1 to 2 hours at the gym, 12 participants spend 3 to 4 hours, and 4 participants spend less than one hour practicing. Details can be found in table 2.

Table 2

The Duration of MMA Practice Sessions

	Frequency	Percent	Cumulative Percent
less than one hour	4	6.7	6.7
one to two hours	44	73.3	80.0
three to four hours	12	20.0	100.0
Total	60	100.0	

Note. This table shows the duration that the participants spend while practicing.

Among these 60 participants, 17 have been practicing the sport for less than 1 year, and 13 have been practicing from 1 to 3 years. Twelve participants have between 4 and 6 years of experience, while 18 participants had an experience of 6 years and above. Details can be found in table 3.

Table 3

The Participants' Years of Experience in MMA

	Frequency	Percent	Cumulative Percent
less than one year	17	28.3	28.3
one to three years	13	21.7	50.0
four to six years	12	20.0	70.0
six years or more	18	30.0	100.0
Total	60	100.0	

Note. This table shows the distribution of the participants according to their year of experience.

As mentioned previously in the Methods section, in parallel with the years of experience, the participants will be classified according to their highest achievement in the game (amateur, elite, and elite professional). The sample included 36 non-elite participants, who are active only on a national level, 10 elite-amateur participants, who are internationally active but don't get paid for their performance, and 14 elite-professionals, who practice on an international level and get paid for their performance. Details can be found in tables 4 and 5.

Table 4

The Athletes' Participation in International Competitions

	Frequency	Percent	Cumulative Percent
elite	24	40.0	40.0
non-elite	36	60.0	100.0
Total	60	100.0	

Note. This table shows how many athletes compete on a national level (non-elite) and international level (elite).

Table 5

Number of Elite Professional Athletes

	Frequency	Percent	Cumulative Percent
elite-professional	14	23.3	23.3
not elite-professional	46	76.7	100.0
Total	60	100.0	

Note. This table shows how many participants get paid for competing (elite-professional) or do not get paid (not elite-professional).

3.4. Materials

A survey, which takes on average 10 to 15 minutes, was distributed to the participants. This survey included a demographics questionnaire, along with instruments intended to test the discussed variables.

Concerning demographics in the first part, participants were asked questions about their age and current level in MMA. They were also asked whether they are currently active in any martial arts other than MMA. If so, they had to specify their level and their activity status in this sport. More details about the demographics questions can be found in the attached Appendices C and D.

The following part of the survey is the sport questionnaire. It asked the participants about their frequency of training, their professional level in the sport, the belts they earnt in the field of martial arts, their medical injuries, etc. More details about the sport questionnaire can be found in the appendices C and D.

The third part of the survey, focused on testing the research variables as follows: alexithymia, impulsivity and aggression.

3.4.1. Toronto Alexithymia Scale Test to Measure Emotional Regulation (TAS-20)

The Toronto Alexithymia Scale (REF) is specialized in measuring one's ability in describing and labeling positive and negative emotions using a 5-choice Likert scale between 1 (strongly disagree) and 5 (strongly agree). It measures three dimensions of alexithymia: difficulty identifying feelings, difficulty describing feelings, and externally oriented thinking. The items are distributed on the three subscales as follows: the

difficulty describing feelings subscale (2, 4, 11, 12, 17). The difficulty identifying feeling subscale(1, 3, 6, 7, 9, 13, 14). Finally, the externally oriented thinking subscale (5, 8, 10, 15, 16, 18, 19, 20).

This test includes 5 reversed items, where scores are expected to be between 20 and 100, with higher scores indicating more severe cases. Participants having a score equal to or less than 51 reveal non-alexithymia, while scores equal to or greater than 61 reveal alexithymia. Scores of 52 to 60 indicate the possibility of alexithymia.

TAS is composed of 20 items distributed on three subscales. the first subscale tests for the difficulty describing feelings, for example “It is difficult for me to find the right words for my feelings”. The second subscale tests for the difficulty identifying feelings, for example “I prefer to analyze problems rather than just describe them”. The third subscale tests for the externally oriented thinking, for example “I often don’t know why I am angry,” and “I can feel close to someone, even in moments of silence.” In other words, people who score high on alexithymia are likely to have difficulty paying attention to their emotional conditions and difficulty in accurately assessing what those states are.

In the cross-validation study (El Abiddine, 2017), a sample of two groups had to fill a questionnaire. The first 2221 participants, who were from Arab countries (Algeria, Gaza, and Oman), had to fill an Arabic version of the questionnaire, while the other 2220 participants from Canada had to fill an English version. Goodness of Fit, Adjusted Goodness of Fit, Root Mean Square Residual, and Root Mean Square Error Approximation were used as parameters to check the psychometric power of the test. The TAS has been used in many studies conducted with Lebanese participants, all in which

Chronbach $\alpha > 0.7$ proved strong enough to be used (Zakhour et al., 2021; El Frenn et al., 2022).

3.4.2. Barratt Impulsivity Scale (BIS-11)

Barrat Impulsivity Scale (BIS-11; Patton et al., 1995) is a self-report questionnaire composed of 30 items that measure impulsivity whether in clinical settings or for research purposes. The answers are scored on a 4-point range. One being rarely/never, 2 being occasionally, 3 being often, and 4 being almost always/always.

The items of the scale are distributed on the factors as follows (Items marked with * are reverse score items): The factor of attention is divided in 2 subscales, attention and cognitive instability. The attention items are (5, 9*, 11, 20*, 28). An example from this subscale is "I don't pay attention". The cognitive instability items are (6, 24, 26). An example from this subscale is "I have racing thoughts". The Motor factor is divided in 2 subscales, motor and perseverance. The items of motor subscale are (2, 3, 4, 17, 19, 22, 25). An example from this subscale is "I do things without thinking". The items of perseverance subscale are (16, 21, 23, 30*). An example from this subscale is "I change jobs". The non-planning factor is divided into 2 subscales, self-control and cognitive complexity. The Items of self-control subscale are (1*, 7*, 8*, 12*, 13*, 14). An example from this subscale is "I plan tasks carefully". The items of cognitive complexity subscale are (10*, 15*, 18, 27, 29*). An example from this subscale is "I save money regularly".

A version of this test has been adapted by Ellouze, 2012. The authors translated the original items from English to Arabic and then back to English, after which it was administered to a sample including 134 participants. The scale is designed to measure three aspects of impulsivity. An exploratory factor analysis was performed and

Chronbach α was calculated for each factor: 0.66 for attention, 0.72 for motor impulsivity, 0.61 for lack of planning. These values fall within an acceptable range of internal consistency, which means that the Arabic version of BIS-11 is reliable and can be used with the Arabic speaking population.

3.4.3. Buss-Perry Aggression Questionnaire- Short Form (BPAQ-SF)

The BPAQ-SF (REF) is a scale that is designed to measure physical aggression, berbal aggression, anger, and hostility. is composed of 12 items such as "I have threatened people I know" and "I flare up quickly but get over it quickly." This short form is derived from the original BPAQ, which includes 29 items. The operational definition of aggression in this scale is distributed on four subscales or factors of aggression: physical aggression, verbal aggression, anger, and hostility.

This test follows a 5-point Likert scale ranging between 1 (not like me) and 5 (like me). The sum of all scores is the result. High score results indicate higher levels of aggression.

The items of the questionnaire, derived from the full version questionnaire, are distributed on the aggression subscales as follows: the physical aggression subscale (1, 2, and 3). The verbal aggression subscale (4, 5, and 6). The anger subscale (7, 8, and 9). Finally, the hostility subscale (10, 11, and 12)

A cross-cultural study has been conducted in 2013 to adapt an Arabic translation of this questionnaire, and it included two samples: a total of 460 Egyptian teenagers and a total of 410 Omani teenagers, and both were divided into males and females. Interestingly, the scale showed psychometric properties and a Cronbach $\alpha>0.77$ all throughout the study (Abd-El-Fattah, 2013).

3.5. Procedure

The participants were introduced to the purpose of this research as part of a student's master's program in Educational psychology at Notre Dame University - Louaize. The interested participants had the opportunity to choose between English and Arabic as a preferred language to fill in the survey. In this part specifically, the coaches' attitude had a major influence on their students' participation in the survey. In other words, interested coaches motivated their students to take time and fill in the survey, and the opposite applies for uninterested coaches.

The survey was available in both versions, soft copy and hard copy. The nearby clubs received a hard copy at the gyms, and the remote gyms received by whatsapp a soft copy prepared on google forms, that they can access on their cellphones. While filling in the survey, I was available either physically or virtually to answer any technical questions.

To ensure confidentiality, the participants were told that all the surveys were anonymous, and the data will only be used for research purposes (knowing that only the researcher and their team had access to the data). The recruited participants were individually asked to voluntarily fill out the survey. The questionnaires approximately take 15 minutes to fill out.

For every completed survey, the data was scanned and added to the SPSS spreadsheet. The incomplete surveys, or the surveys not filled properly were eliminated from the study.

The questionnaires were divided into two sections: (1) Demographic variables: This part includes general information about the participants such as age, gender,

nationality, etc. (2) Psychological variables: This part of the survey mainly focuses on measuring the psychological variables previously listed in the literature, which are Aggression, Impulsiveness, and Alexithymia. It is therefore presented in this order (add name of scales)

Participants were thanked for their contribution to the research.

CHAPTER FOUR: RESULTS

4.1. Design

This research follows a correlational design. This means that no experiments were conducted and that there is no manipulation of the variables by the researcher. Accordingly, and since most variables are continuous, regression analysis, including mediation and moderation analysis, were used to study the different relationships between the research variables and how independent variables can predict change in the dependent variables. All the steps for data entry and data analysis were performed on SPSS version 24.

4.2. Normality of Data

Normality of the collected data was verified using Kolmogorov-Smirnov and Shapiro-Wilk after the total of the three continuous variables at study (alexithymia, aggression and impulsivity) were computed.

Kolmogorov-Smirnov is used to test the normality of data when the sample size in the research is bigger than 50 participants. The null hypothesis of this test assumes that the data is normally distributed. When performed, the significance value obtained for the 3 variables (alexithymia, aggression and impulsivity) is sig = 0.200 > .05, which means that we fail to reject the null hypothesis; therefore, the data is normally distributed. However, for the number of injuries variable, sig = 0 < .05, which means that the null hypothesis is rejected, therefore the data is not normally distributed.

Shapiro-Wilk is another test that can be used to test the normality of the collected data. This test is usually used in the researches that have a sample size less than 50 participants, however it still can show significance with bigger samples. The null

hypothesis of the test assumes that the data is normally distributed. Since the sample size in this research is 60, we also performed the Shapiro-Wilk test, and the significance values obtained are 0.378 (alexithymia), 0.694 (aggression), and 0.602 (impulsivity). All the listed values are significantly bigger than 0.05; accordingly, we fail to reject the null hypothesis of the test. These results, which were obtained by the Kolmogorov-Smirnov test, confirm that the data is normally distributed. However, for the number of injuries variable, sig = 0 < .05, which means that the null hypothesis is rejected, therefore the data is not normally distributed.

4.3. Correlation Matrix

In this paragraph, we are going to expose the correlation matrix of all the scales and the subscales included in this research. Table 6 shows all the correlations suggested by the research hypotheses.

Table 6. Means, standard deviations and correlations between the research variables

	1	2	3	4	5	6	7	8	9	10	11	12
TAS												
BPAS	.492**											
BIS	.359**	.522**										
TAS DDE	.737**	.452**	.364**									
TAS DIE	.861**	.569**	.405**	.543**								
TAS EOT	.472**	-0.074	-0.074	-0.039	0.156							
BIS A	.414**	.508**	.800**	.404**	.507**	-0.115						
BIS M	.324*	.483**	.829**	.254*	.344**	0.037	.496**					
BIS NP	0.049	0.123	.585**	0.182	0.057	-0.147	.399**	0.13				
BPAQ P	.374**	.779**	.296*	.291*	.465**	-0.039	.325*	.290*	0.014			
BPAQ V	0.107	.683**	.498**	.346**	0.089	-.255*	.472**	.363**	.284*	.408**		
BPAQ A	.438**	.853**	.458**	.289*	.576**	-0.032	.424**	.528**	-0.044	.560**	.475**	
BPAQ H	.551**	.764**	.354**	.456**	.575**	0.051	.350**	.281*	0.154	.463**	.296*	.551**

M	2.6462	2.9656	2.4298	2.885	2.5429	2.5815	2.4651	2.3359	2.5021	3.0056	2.9833	2.9028	2.9492
SD	0.55844	0.86819	0.31021	1.00014	0.88542	0.56491	0.41308	0.51718	0.30457	1.04781	1.00923	1.24884	1.17414

Bivariate correlations of study variables. *Note. N = 60.* $*p < 0.05$, $**p < 0.01$. TAS = Toronto Alexithymia Scale, BPAS = Buss Perry Aggression Scale, BIS = Barrat Impulsivity Scale, DDE = difficult describing emotions, DIE = difficulty identifying emotions, EOT = externally oriented thinking, A = attentional, M = motor, NP = non-planning, P = Physical, V = Verbal, A = Anger, H = Hostility.

According to the table, there is a mild correlation between alexithymia and aggression is significant where r = 0.492 and p = 0.

The correlation between alexithymia and aggression is previously discussed in the previous hypothesis. Moreover, the correlation between alexithymia and impulsivity is significant where r = .359 (relatively weak correlation) and p = 0.05. Also, the correlation between impulsivity and aggression is significant where r = 0.522 (mild correlation) and p-value = 0.

According to the table, the correlation between impulsivity and alexithymia is significant as previously discussed. In addition, there is a significant correlation between the years of experience and alexithymia. This correlation is significant at the 0.05 level of confidence interval with p = 0.031 and r = -0.279 (negatively correlated).

In order to compute the correlation matrix provided in this section, the mean values of the three variables aggression, alexithymia and impulsivity were calculated in the SPSS data file attached to this research.

4.4. Data Analysis

The main objective of this study is to test the model previously presented in the conceptual framework section (figure 1) following 2 classifications: the participant's highest athletic achievement, and the participant's years of experience in the sport.

Considering the classification of the data according to the participant's highest achievement, no significant results could be derived due to the small sample size. In other words, when the participants were divided into groups, Amateur (n= 36) Elite-Amateur (n=10), and Elite-Professional (n=14), the number of participants in each group was too small for the statistical tests to run (regression, independent samples t-test, Sobel test for mediation, bivariate correlation, moderation effect).

Alternatively, the hypotheses of the study were also tested following the participant's "years of experience". This time, the data was divided according to two groups. The first group included the participants who had less than three years of experience (n=30), and the second one included the participants who had three years and above of experience (n=30). Also, the global model was tested for the whole research sample as one group (n=60).

4.5. Hypothesis H_1

The first hypothesis suggested that higher levels of alexithymia in MMA athletes predict more injuries, and this relationship is mediated by aggression displayed by the athlete in the practice of MMA. To test this hypothesis following Baron and Kenny's (1986) mediation analysis, first, the main effect of the regression between alexithymia as an independent variable and aggression as a dependent variable showed the following results:

For the group having 3 years of experience and less (B = 0.063, p > 0.05) which is not significant.

For the group having 4 years of experience and above (B = 0.373, p > 0.05) which is not significant.

For the complete research sample (B = 0.050, p > 0.05) which is not significant.

In the three groups of participants, the regression between alexithymia and injuries did not show any significance, so aggression cannot be a mediator in this relationship. Therefore, Baron and Kenny's (1986) analysis of mediation is not applicable. Such results can be explained by the fact that the variable number of injuries is not normally distributed.

4.6. Hypothesis H_2

The second hypothesis suggests that higher levels of alexithymia predict more aggression, and this relationship is mediated by the impulsivity displayed by the athlete. Following Baron and Kenny's (1986) mediation analysis, this hypothesis will be tested with the following 3 groups consecutively:

For the group having 3 years of experience and less: Results of the regression between alexithymia and aggression showed (B = 0.506, p = 0.052 > 0.05). This value is very close to 0.05, but it still falls within the rejection area of the null hypothesis. Therefore, the regression is not significant and there is no need to test for impulsivity as a mediator.

For the group having 4 years of experience and above, the results showed that there is a significant total effect between alexithymia and aggression (B = 0.983, p < 0.005), and path a (i.e., alexithymia on impulsivity) (B = 0.244, p = 0.05) and path b

(impulsivity on aggression) (B = 1.730, p < 0.05) were both significant. Finally, when impulsivity entered the relationship between alexithymia and aggression, the direct effect (B = 0.675, p <.005) was significant. In addition, the Sobel test for the indirect effect is z = 1.797, p >.005; therefore, it was concluded that Impulsivity does not mediate the relationship between alexithymia and aggression.

For the entire research group, the results showed that there is a significant total effect between alexithymia and aggression (B = 0.765, p < 0.05), and path a (i.e., alexithymia on impulsivity) (B = 0.199, p = 0.05) and path b (impulsivity on aggression) (B = 1.461, p < 0.05) were both significant. Finally, when impulsivity entered the relationship between alexithymia and aggression, the direct effect (B = 0.545, p <.005) was significant. In addition, the Sobel test for the indirect effect is z =2.256, p <0.05; therefore, it was concluded that a partial mediation occurred between alexithymia and aggression.

4.7. Hypothesis H_3

The third hypothesis suggests that higher levels of alexithymia predict more impulsivity, and this relationship is moderated by the years of experience of the athlete. To test this hypothesis, there are several steps that should be followed.

Starting with the interaction effect, this method consists of computing a new variable (M) which is the multiplication of the independent variable (alexithymia) by the moderator variable (years of experience). Then, a linear regression is calculated between the computed variable and the dependent variable (impulsivity).

Starting with the group having 3 years of experience and less, the regression between M and impulsivity had $p > 0.05$ which is not significant. Therefore years of experience does not show a moderation effect for this sample of participants.

For the group that has 4 years of experience and more, the regression between M and impulsivity had $p > 0.05$ which is not significant. Therefore years of experience does not show a moderation effect for this sample of participants.

For the complete research sample, the regression between M and impulsivity had $p > 0.05$ which is not significant. Therefore years of experience does not show a moderation effect for this sample of participants.

Another way can be used to test for the moderation effect of years of experience in the relationship between alexithymia and impulsivity is the hierarchical regression. This statistical analysis is very similar to linear regression, where we test for the regression between the IV (alexithymia) and DV (impulsivity), in addition, we control for alexithymia throughout the years of experience. Moreover, in hierarchical regression we should test for multiple collinearity between the predictor variables.

For the three groups of participants, alexithymia and years of experience did not show a significant collinearity, and the results showed that $p > 0.05$ which means that years of experience does not moderate the regression between alexithymia and impulsivity.

4.8. Hypothesis H_4

The fourth hypothesis suggests that higher levels of impulsivity predict more injuries, and this relationship is mediated by the aggression displayed by the athlete in the practice of MMA. To test this hypothesis following Baron and Kenny's (1986) mediation

analysis, first, the main effect of the regression between impulsivity as predictor variable and injuries as dependent variable showed the following results:

For the group that has 3 years of experience and less ($B = 0.391$, $p > 0.05$), which is not significant.

For the group that has 4 years of experience and above ($B = 0.505$, $p > 0.05$), which is not significant.

For the whole research sample ($B = 0.297$, $p > 0.05$), which is not significant.

In the three groups of participants, the regression between impulsivity and injuries did not show any significance, so aggression cannot be a mediator in this relationship. Therefore, Baron and Kenny's (1986) analysis of mediation is not applicable. Such results can be explained by the fact that the variable number of injuries is not normally distributed.

CHAPTER FIVE: CONCLUSION

5.1. Summary of the Research

This research includes a general introduction on the history of martial arts and the appearance of MMA, along with the different evolutions the game went through until it reached the sport that we know today.

The literature review chapter presents previous research findings on the following variables: alexithymia, aggression, and impulsivity. It also explains the role of such variables in sports, in general, and in MMA, specifically.

The aim of this research was to investigate the relationship between the following variables: alexithymia, aggression, and impulsivity among MMA athletes and

practitioners in Lebanon. In addition, this research took into consideration the role of some grouping variables in data collection and analysis such as: age, years of experience, highest achievement in MMA, number of injuries, practicing any martial art other than MMA, etc.

The data for this research was collected by the administration of a survey adapted to both Arabic and English, and the selected participants were free to choose the language they are most comfortable with. This survey included 3 sections: (1) a demographics section, (2) a sports questionnaire section, and (3) the Toronto Alexithymia, Barrat Impulsivity, and Buss-Perry Aggression scales.

To analyze the data according to the relationships suggested by the research hypotheses, the regression, mediator, and moderator procedures were computed on SPSS. Out of the four suggested hypotheses, the second hypothesis ($H_{2)}$ was the only one that showed significance, suggesting that alexithymia, as an independent variable, has a direct effect on aggression, as a dependent variable, with Pearson correlation being positive. Moreover, this relationship is mediated by impulsivity. However, the other proposed three hypotheses were rejected, meaning that no significant results could be generated.

5.2. Discussion

It is worthy to note that the classification of the data according to the participants' highest achievement did not return any significant results due to the small number of participants in each group (amateur, elite-amateur, and elite-professional). However, it would have been interesting to test the evolution of the cause-effect relationships between alexithymia, aggression and impulsivity depending on the athletes' highest achievement.

To begin with, the studies reviewed to write this literature all agree that alexithymia is likely to be common among people who participate in high-risk sports, such as sky diving and combat martial arts. Generally, people with alexithymia have weak emotional recognition and perception skills. For this purpose, their involvement in high-risk sports can generate strong emotions, which can be easy for them to perceive and analyze. High-risk sports can be referred to as emotional coping mechanisms for people scoring high on alexithymia (Barlow et al. 2015; Woodman, 2009; Woodman et al. 2010). Remarkably, the results of this research supported this literature and showed a significant cause-effect relationship between years of experience in MMA and alexithymia, with a significant negative correlation. This means that when the years of experience in MMA increase, athletes are more likely to show a decrease in the symptoms of alexithymia. Consequently, athletes become more capable of developing more emotional recognition skills.

When it comes to aggression, previous studies suggested different classifications of the subtypes of aggression, but these studies all agree on the important role of these subtypes in analyzing athletes' performance in MMA. As previously discussed in the literature, to understand the aggressive behavior of the athlete, we want to understand whether this athlete is aiming to win (instrumental aggression) or aiming to hurt the opponent (hostile aggression), taking into consideration that hostile aggression can be proceeded by anger. The successful athlete in this case is the one able to use aggression effectively in favor of winning, even under the most stressful situations (Velotti et al., 2016; Graczyk et al. 2010; Collier et al., 2011).

According to our data, there has been an approved cause-effect relationship between alexithymia and aggression, and this relationship is mediated by impulsivity. In other words, the correlation is positive, which predicts that a decrease in the symptoms of alexithymia (with years of experience) will lead to a decrease in aggression, and this relationship is explained by the level of impulsivity. Other studies in the field also support the suggestion that practicing martial arts can lead to a decrease in aggression, and, in addition to the role of alexithymia, this decrease can be explained in more than one way. On one hand, one cannot deny that fear has always had an effect on the athlete's performance. The athlete's biggest fear in martial arts is getting injured for the simple reason that the inactive recovery period, before being able to practice again, will most probably decrease the athlete's aggressiveness. On the other hand, taking into consideration that aggression can have different facets, martial arts are likely to interfere in decreasing, as well as "controlling," the athlete's aggression. This means that the athlete will learn how to become aggressive without being violent; thus, more assertive and winning oriented (Stark, 2010; Andrade et al., 2020; Rosario et al., 2014).

In this research, impulsivity played the role of the mediator variable. According to the data collected, impulsivity showed a significant mediation between alexithymia and aggression. In this context, the decrease in the level of alexithymia symptoms (with years of experience) will predict a decrease in aggression, and this relationship can be explained by the level of impulsivity.

Nevertheless, according to the data collected, impulsivity did not show a significant relationship with years of experience, and it scored right on the critical value with alexithymia. In addition, the subtypes of impulsivity (motor, attentional and

non-planning) did not show any significant regression with years of experience, which is contradictory to the findings included in the literature review.

In my opinion, impulsivity is a broad variable that can be looked at from different perspectives. This is why it needs to be further studied and measured in detail to understand how it can evolve with years of experience and interact with the other research variables.

Furthermore, impulsivity can be considered negative, only when it backfires on the athlete. This means that when the athletes miscalculate their next moves and take rapid decisions without weighing their consequences, the opponent will most probably take advantage and respond with an effective counterattack, which can be "damaging." In this case, impulsivity plays against the athlete, and it can lead to the loss of the match. Yet, impulsivity in martial arts does not necessarily have to be a negative factor, and it needs to be treated. Athletes are required to have some type of automaticity in taking decisions, otherwise it will be "too late" for them to perform their effective strikes and combinations. For this purpose, MMA athletes do specific conditioning exercises, which are likely to increase their spontaneous reflexes.

Finally, the results generated in this research provide an added value to the literature studying impulsivity, alexithymia, and aggression together. The positive regression between alexithymia and impulsivity shows that both variables are contributing factors leading athletes to take risky behaviors while performing, specifically those behaviors which fall under hostile and impulsive aggression (Seager, 2005; Panno et al., 2019; Anderson & Huesmann, 2007; Banks et al., 2014; Siekanska & Wojtowicz, 2020; Johnstone, 2021).

5.3. Significance of the Study

There is a consensus that sports psychology plays a huge role in the athlete's performance, whether mentally, emotionally, or physiologically. Moreover, sports psychology can determine, to a certain degree, the success of athletes. Therefore, every athlete, especially the elite and the professional, should consider being psychologically and physically prepared to compete. So, the results of this research indicate that the variables alexithymia, aggression, and impulsivity play a major role in determining the levels of success and effectiveness of athletes' performance.

5.4. Challenges and limitations to this Study

5.4.1. Challenges

As no research in this field was previously done in Lebanon, there is no official source of information we could rely on for backup information and MMA records in the country.

Another challenge was that the majority of the coaches addressed for data collection were not aware of the benefits of academic research on the sport. This explains why they were not very welcoming and cooperative throughout the data collection. Such lack of cooperation was illustrated through specific behavior such as hanging the phone, missing appointments, and not encouraging their students to participate in the data collection.

In many cases, the coaches' attitudes were reflected in their students' behavior. In other words, if the coaches were not so welcoming for the data collection, their students either did not take the survey seriously or refrained from filling it in.

Around half of the outreached participants agreed to fill in the survey, which is relatively a low engagement rate.

Generally, the sample size was relatively small, which makes it difficult to divide the participants into different groups and affiliations. In this case, we would be affecting the significance of the results.

5.4.2. Limitations

Although some relationships between the research variables were proved to be significant, Pearson correlation of these relationships were ranging between weak and moderate. This means that the change in the independent variables does not completely explain the change in the dependent variables. This cause-effect relationship can be affected by several limitations in the study. Starting with the sample size, it is considered relatively small, taking into consideration the challenges faced to recruit the research participants. This limitation has led to insignificant results in the independent samples t-test and regression analyses when the data was grouped according to the athletes highest achievement in the sport (amateur, elite, and elite-professional).

Another threat to the internal validity of this research can be linked to the self-report questionnaires used in the survey. This indicates that the answers of the participants can be subjective to a certain degree. Specifically, the data collected for injuries did not show a normal distribution. according to previous studies (Thomas & Thomas 2018; Fares et al., 2021), there are other ways that could be more accurate to collect data related to physical injuries such as: injury kind and location, occurrence of the injury during a fight or during workout, athletes' weight division, interpretation of the ringside medical report.

In addition, the confounding and extraneous variables such as emotional intelligence, motivation, and gender can be additional threats to the internal validity of this research. These variables are likely to contribute to the cause-effect relationships suggested by the hypotheses but they are not included in the research model.

When it comes to the external validity of this research, the findings of this research agree to a certain degree with the findings of other research conducted in the same field. This means that the research sample can represent the population of the MMA athletes in Lebanon, especially when it comes to the effect of years of experience on the athletes' level of aggression, and the relationship between alexithymia and aggression.

5.5. Recommendations and Future Research

Knowing that sports psychology is not yet very common in Lebanon, there should be more awareness about this field among the game administrators, coaches, and athletes.

For future research, there should be more focus on the importance of academic research in improving the sports practice while approaching the coaches, since they have a big influence on their students and are in direct contact with them. This attempt should guarantee a higher engagement rate in the survey on the participants' behalf.

Considering that the small sample size was one of the major limitations of this research, any future research should definitely have a bigger sample size to be able to generate more significant results from the data, especially when it comes to the classification of the participants in different comparison groups and to the analysis of the data related to the impulsivity variable.

5.6. Implications

From a theoretical perspective, this research offers a rich background about alexithymia, aggression and impulsivity. In addition, it discusses the evolution of these variables with years of experience. This research helps in explaining and predicting the athletes' performance in sports by understanding the role of the listed psychological variables. For example, according to the research findings, the advanced and experienced MMA athletes are expected to show more discipline and low levels of aggression compared to inexperienced MMA athletes. In addition, the decrease in alexithymia symptoms can lead to a decrease in the athletes' aggression, and this relationship can be explained through the mediation of impulsivity. These significant findings can be explained by referring to the theories previously discussed: Skinner's behaviorism and psychoanalysis. The basic assumption of Skinner's behaviorism (previously discussed in the theoretical framework) shows up when the coaches teach their students about minimizing undesired behaviors such as hostility and impulsivity, and dealing with their emotional states while practicing and competing. When it comes to the theory of psychoanalysis, the sublimation occurs when the athletes learn throughout the years of practice how to use aggression adaptively in the context of sport. This means that with more experience, the athletes are more likely to show adaptive use of aggression.

Theoretically, the previous research reviewed in the literature (Barlow et al. 2015; Woodman, 2009; Woodman et al. 2010) agree that high risk sports are likely to attract people who score high on alexithymia. Interestingly, the findings of this research support this idea, considering that practicing MMA becomes like a coping mechanism for the athletes who score high on alexithymia. In addition, the results of this research suggest

that practicing MMA can indirectly decrease the level of aggression among the athletes. This agrees with the suggestions provided by previous research, meaning that practicing martial arts teaches the athletes how to use their aggression adaptively in the context of sport (Stark, 2010; Andrade et al., 2020; Rosario et al., 2014). The discussed findings of this research provide a valuable asset for the field of research in sport psychology in Lebanon knowing that till today, still there is no academic research in sport psychology conducted on MMA athletes in Lebanon.

Practically, this research provides valuable advice for the coaches and athletes about the importance of psychology in martial arts, this is why they should be made aware of the importance of theory and research in improving athletic performance in parallel with the sport practice at the gym. For example, all the athletes who participated in MMA competitions agree that entering the MMA octagon generates very strong emotions, and sometimes it is very challenging to perform effectively under such high levels of emotional stress. Here comes the role of the coaches in educating the athletes about the subtypes of aggression, alexithymia and the emotional regulation skills.

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APPENDIX A

Consent Form in English

Thank you for accepting to take part in our study. The purpose of this study is to explore the role of selected psychological factors on the performance of Mixed Martial Arts (MMA) athletes.

By agreeing to participate, you will have to fill a questionnaire (approximately 30 minutes) composed of questions discussing your participation in the MMA sport. You will have the opportunity to learn about yourself and gain knowledge about the different psychological variables likely to affect your performance.

Your participation in this study is entirely voluntary and you may refuse to answer any questions that you are uncomfortable with. The study is confidential meaning your name will not appear anywhere, instead, a number will be used for identification purposes. No one will have access to neither your information nor identity apart from the researchers on the project.

For any question or further inquiries, kindly contact:

Mr. Assaad Al Assaad: Asassaad@ndu.edu.lb under the supervision of Dr. Patricia Eid: peid@ndu.edu.lb

APPENDIX B

Consent Form in Arabic

شكراً على مشاركتك في هذا البحث. الهدف من الدراسة هو إستكشاف تأثير بعض العوامل النفسية في أداء رياضيي الفنون القتالية المختلطة.

بالموافقة على الاشتراك، عليك أن تملا الإستمارة (حوالي النصف ساعة) التي تضم اسئلة حول ممارستك للفنون القتالية المختلطة. عبر المشاركة، ستتعلم عن نفسك وتكتسب المعرفة عن عدة عوامل نفسية ممكن أن تؤثر على أدائك الرياضي.

إن مشاركتك في هذه الدراسة هي طوعية و لديك الصلاحية بعدم الاجابة على أي سؤال قد يشعرك بعدم الراحة. هذه الدراسة هي في غاية السرية، ما يعني أن اسمك سيبقى مجهول الهوية، ويستبدل برمز تسلسلي. لن يكون هناك وصول إلى معلوماتك الشخصية وهويتك سوى من قبل الباحثين في هذه الدراسة.

في حال وجود أي اسئلة و استفسارات، يرجى التواصل مع:

السيد أسعد الأسعد Asassaad@ndu.edu.lb

تحت اشراف الدكتورة باتريسيا عيد peid@ndu.edu.lb

APPENDIX C

The Survey in English

Demographics

1. How old are you?_____

2. What is your gender

   Male

   Female

3. What is your sexual orientation?

   Heterosexual

   Homosexual

   Other

   Prefer not to say

4. What is your highest completed level of education?

   Brevet

   Terminal

   Undergraduate (BS or BA)

   Masters

   Doctorate degree

5. Are you of Lebanese Origins?

   Yes

   Other:_____

Sports Questionnaire

The following questions ask about some behaviors and activities related to exercising MMA. For every question, please choose the answer that describes you.

1. How many times per week do you practice or train for MMA?

   Less than once a week

   Once or twice a week

   Three to six times a week

   Every day

2. When you practice MMA, how much time do you spend, on average, per day?

   Less than one hour

   One to two hours

   Three to four hours

   Five or more hours

3. An Elite MMA athlete is a person who competes in fights at an international level. Do you consider yourself an Elite MMA athlete?

   Yes

   No

4. If you answered yes to the previous question. An Elite-Professional MMA athlete is an elite MMA fighter who gets remunerations (money) for his performance. Do you consider yourself an Elite-Professional MMA athlete?

Yes

No

5. How many years have you been practicing MMA for?

   Less than a year

   One to three years

   Four to six years

   Six years or more

6. Do you practice any martial arts other than MMA?

   Yes

   No

7. If yes, what other martial art do you practice (write as many as you do)

8. If yes, what is the color of your belt in this/these other martial art(s)?

9. How many major injuries have you suffered since you began practicing?

   None

   One to two

   Three to four

   More than four

10. In case you had any injuries in the sport, can you name the type(s) of your injury? (Head injuries, teeth/bones fractures…)

Toronto Alexithymia Scale

The following items ask about emotional regulation. For each one of them, please answer using one of the 5 choices: strongly disagree=1, moderately disagree=2, neutral=3, moderately agree=4, strongly agree=5.

Items	1	2	3	4	5
I am often confused about what emotion I am feeling.					
It is difficult for me to find the right words for my feelings.					
I have physical sensations that even doctors don't understand.					
I am able to describe my feelings easily.					
I prefer to analyze problems rather than just describe them.					
When I am upset, I don't know if I am sad, frightened, or angry.					
I am often puzzled by sensations in my body.					
I prefer just to let things happen rather than to understand why they turned out that way.					
I have feelings that I can't quite identify.					
Being in touch with emotions is essential.					
I find it hard to describe how I feel about people.					
People tell me to describe my feelings more.					

I don't know what's going on inside me.					
I often don't know why I am angry.					
I prefer talking to people about their daily activities rather than their feelings.					
I prefer to watch "light" entertainment shows rather than psychological dramas.					
It is difficult for me to reveal my innermost feelings, even to close friends.					
I can feel close to someone, even in moments of silence.					
I find examination of my feelings useful in solving personal problems.					
Looking for hidden meanings in movies or plays distracts from their enjoyment.					

Barrat Impulsivity Scale

The following items ask about impulsivity. For each of them, please answer using one of the following choices: rarely/never=1, occasionally=2, often=3, almost always/always=4

Please answer quickly and honestly. Do not spend too much time on any statement.

Items	1	2	3	4
I plan tasks carefully.				
I do things without thinking.				
I make-up my mind quickly.				
I am happy-go-lucky.				
I don't "pay attention".				
I have "racing" thoughts.				
I plan trips well ahead of time.				
I am self-controlled.				
I concentrate easily.				
I save money regularly.				
I "squirm" at plays or lectures.				
I am a careful thinker.				
I plan for job security.				
I say things without thinking.				
I like to think about complex problems.				
I change jobs.				
I act on "impulse".				
I get easily bored when solving thought problems.				

I act on the spur of the moment.				
I am a steady thinker.				
I change residences.				
I buy things “on impulse”.				
I can only think about one thing at a time.				
I change hobbies.				
I spend or charge more than I earn.				
I often have extraneous thoughts when thinking.				
I am more interested in the present than the future.				
I am restless at the theater or lectures.				
I like puzzles.				
I am future oriented.				

Buss-Perry Aggression Scale

The following items ask about aggression. For each one of them, please answer using the 5 following choices: not at all like me=1, not much like me=2, neutral=3, somewhat like me=4, very much like me=5.

Items	1	2	3	4	5
Given enough provocation, I may hit another person					
There are people who pushed me so far that I came to blows.					
I have threatened people I know.					
I often find myself disagreeing with people.					
I can't help getting into arguments when people disagree with me.					
My friends say that I'm somewhat argumentative.					
I flare up quickly but get over it quickly.					
Sometimes I fly off the handle for no good reason.					
I have trouble controlling my temper.					
At time I feel I have gotten a raw deal out of life					
Other people always seem to get the breaks.					
I wonder why sometimes I feel so bitter about things.					

APPENDIX D

The Survey in Arabic

الأسئلة الديمغرافية

1. كم عمرك؟

2. ما هو جنسك ؟

3. ما هو توجهك الجنسي؟

   a. متغاير الجنس
   b. مثلي الجنس
   c. غير ذلك
   d. افضل عدم القول

4. ما هو أعلى مستوى تعليمي اكملته؟

   a. البروفيه
   b. ثانوي
   c. درجة البكالوريوس
   d. ماستر
   e. درجة الدكتوراه

5. هل أنت من أصول لبنانية؟

   a. نعم

   b. غير ذلك_____

الاستمارة الرياضية

الإستمارة التالية تسأل عن بعض الخصائص المتعلقة بممارستك لرياضة الفنون القتالية المختلطة. لكل سؤال، من فضلك إختر الإجابة المناسبة لك.

كم مرة في الأسبوع تمارس الفنون القتالية المختلطة؟

أقل من مرة في الأسبوع

مرة واحدة أو مرتين في الأسبوع

من ثلاث إلى ستة مرات في الأسبوع

كل أيام الأسبوع

هل تمارس فنون قتالية أخرى إلى جانب الفنون القتالية المختلطة؟

نعم

كلا

عندما تمارس الفنون القتالية المختلطة، بمعدل كم ساعة تتمرن في اليوم؟

إن أجبت بنعم، ما هي أنواع الفنون القتالية التي تمارسها، أذكر جميعها.

أقل من ساعة

من ساعة الى ساعتين

من ثلاث إلى أربعة ساعات

خمس ساعات وما فوق

لاعب الفنون القتالية المختلطة "النخبة" هو شخص ينافس إذا كنت تمارس فنون قتالية أخرى، ما هو لون حزامك في على مستوى رفيع (مستوى دولي). هل أنت تنتمي الى هذه الرياضة أو الرياضات هذه الفئة؟

نعم

كلا

إذا جاوبت نعم على سؤال السابق. اللاعب النخبة إلى كم إصابة بالغة تعرضت منذ بدأت ممارسة لعبة والمحترف هو لاعب يتقاضى أجراً مقابل اداءه. هل تعتبر الفنون القتالية المختلطة؟ نفسك لاعب نخبة و محترف؟

نعم

كلا

منذ كم سنة كنت تمارس الفنون القتالية المختلطة؟

منذ أقل من سنة

من سنة إلى ثلاث سنوات

من أربعة إلى ست سنوات

منذ أكثر من ست سنوات

من فضلك أذكر أنواع الإصابات التي تعرضت لها (في حال وقوعها) . مثلا: اصابت في الرأس، كسر في الأسنان/العظام ...

التنظيم العاطفي

الإستمارة التالية تسأل عن قدرتك على تنظيم عواطفك. لكل سؤال، من فضلك أجب مستعيناً بل إحتمالات الخمسة.

1= اختلف بشدة، 2= اختلف قليلاً، 3= محايد، 4= أوافق قليلاً، 5= أوافق بشدة

الأسئلة	5	4	3	2	1
غالبًا أشعر بالحيرة حول ماهية الشعور الذي اشعره.					
يصعب عليّ أن أجد الكلمات المناسبة لمشاعري.					
لديّ أحاسيس جسدية حتى الأطباء لا يفهمونها.					
أنا قادر على وصف مشاعري بسهولة.					
أفضّل تحليل المشاكل بدلًا من مجرد وصفها.					
عندما أكون منزعجاً، لا أعرف إن كنت حزيناً أو خائفاً أو غاضباً.					
أكون في كثير من الأحيان مشوّشًا جراء الأحاسيس في جسدي.					
أفضّل فقط أن أدع الأمور تحدث بدلًا من أن أفهم لماذا تحوّل مسارها بهذه الطريقة.					
لدي مشاعر لا أستطيع تحديدها تمامًا.					

أن أكون على اتّصال بالعواطف أمر ضروري.					
أجد صعوبةً في وصف شعوري تجاه الناس.					
يطلب مني الناس أن أصف مشاعري أكثر.					
لا أعرف ماذا يجري في داخلي.					
أنا غالبًا لا أعرف لمَ أنا غاضب					
أفضل التحدث إلى الناس عن أنشطتهم اليومية بدلاً من مشاعرهم.					
أفضل مشاهدة عروض ترفيهية "خفيفة" بدلًا من الدراما النفسية.					
أواجه صعوبة في الكشف عن مشاعري العميقة، حتى لأصدقاء مقرّبين لي.					
يمكن أن أشعر بالقرب من الشخص، حتى في لحظات الصمت.					
أجد أنّ فهم مشاعري مفيد في حلّ المشاكل الشخصية.					
البحث عن معاني خفية في الأفلام أو المسرحيات يحوّل الانتباه عن التمتع بها.					

الاندفاعية

الإستمارة التالية تسأل عن الاندفاعية. لكل سؤال، من فضلك أجب مستخدماً أحدى الإحتمالات التالية: 1= قليلاً/أبداً، 2= من حين إلى أخر، 3= غالباً، 4= أغلب الأحيان/دائماً.

الأسئلة	4	3	2	1
أُخطّط للمهامّ بعناية.				
أقوم بالأشياء من دون تفكير.				
احسم أمري بسرعة.				
أنا سعيد ومحظوظ.				
أنا لا أستطيع أن أركز.				
لدي أفكار متسابقة.				
أخطّط لنزهاتي مسبقًا.				
أسيطر على نفسي.				
أركّز بسهولة.				

أدّخر بانتظام.				
أشعر بقلة الصبر خلال المسرحيات أو المحاضرات.				
أنا مفكّر حريص.				
أخطّط لأمني الوظيفي.				
أتفوّه بأمور من دون تفكير.				
أحب أن أفكر بالمشاكل المعقّدة.				
أغيّر الوظائف.				
أتصرّف باندفاع.				
أشعر بالملل بسهولة عند التفكير بأمور معقدة.				
أتصرف دون سابق تصور و تصميم.				
أنا مفكر منتظم.				
أغيّر أماكن سكني.				
أشتري أشياءً باندفاعية.				

أستطيع أن أفكر فقط بشيء واحد في آن واحد.				
أغيّر هواياتي.				
أنفق أو أتكلّف أكثر ممّا أكسب.				
تساورني غالبًا أفكار غريبة عند التفكير.				
أنا مهتم بالحاضر أكثر من اهتمامي بالمستقبل.				
أكون مضطربًا في المسرح أو أثناء المحاضرات.				
أحبّ الألغاز.				
أنا موجّه نحو المستقبل.				

السلوك العدواني

الإستمارة التالية تسأل عن السلوك العدواني. لكل سؤال، من فضلك أجب مستخدماً أحدى الإحتمالات التالية: 1=لا يشبهني أبداً، 2= لا يشبهني كثيراً،= 3 حيادي، 4= يشبهني بعض الشيء، 5= يشبهني كثيراً.

الأسئلة	5	4	3	2	1
عندما يقوم شخص بإستفزازي، قد أسيء إليه جسدياً.					

هنالك أشخاص دفعوني بسلوكهم الى الانفعال والغضب الشديد (حتى الغليان).					
لقد هددت أشخاصاً أعرفها.					
أجد نفسي، في كثير من الأحيان، معارضا وجهات نظر الأشخاص الاخرين.					
لا أستطيع تجنب الجدال مع الآخرين اذا اختلفنا في وجهات النظر.					
يقول أصدقائي أنني جدلي إلى حد ما.					
استشيط غضباً بسرعة، ثم أتخطى حالة الغضب بسرعة.					
أحياناً أفقد صوابي من دون سبب وجيه أو لأسباب تافهة.					
أواجه صعوبة في التحكم بغضبي.					
أشعر أحياناً أنني مُنِحتُ حياة غير منصفة/غير عادلة.					
يبدو أن الأشخاص الآخرين دائمًا يحصلون على فرص أفضل مني.					
أحياناً أتساءل لماذا أشعر بالحزن تجاه بعض الأمور.					

Correlations

		Toronto Alexithymia Scale	Buss-Perry Aggression Scale	Barrat Impuslivity Scale	TAS Difficulty describing emotions	TAS difficulty identifying emotions	TAS externally oriented thinking	BIS Attentional	BIS motor	BIS non-planning	BPAQ physical	BPAQ verbal	BPAQ anger	BPAQ hostility
Toronto Alexithymia Scale	Pearson Correlation	1	.492**	.359**	.737**	.861**	.472**	.414**	.324*	.049	.374**	.107	.438**	.551**
	Sig. (2-tailed)		.000	.005	.000	.000	.000	.001	.011	.711	.003	.417	.000	.000
	N	60	60	60	60	60	60	60	60	60	60	60	60	59
Buss-Perry Aggression Scale	Pearson Correlation	.492**	1	.522**	.452**	.569**	-.074	.508**	.483**	.123	.779**	.683**	.853**	.764**
	Sig. (2-tailed)	.000		.000	.000	.000	.577	.000	.000	.348	.000	.000	.000	.000
	N	60	60	60	60	60	60	60	60	60	60	60	60	59
Barrat Impuslivity Scale	Pearson Correlation	.359**	.522**	1	.364**	.405**	-.074	.800**	.829**	.585**	.296*	.498**	.458**	.354**
	Sig. (2-tailed)	.005	.000		.004	.001	.574	.000	.000	.000	.022	.000	.000	.006
	N	60	60	60	60	60	60	60	60	60	60	60	60	59
TAS Difficulty describing emotions	Pearson Correlation	.737**	.452**	.364**	1	.543**	-.039	.404**	.254*	.182	.291*	.346**	.289*	.456**
	Sig. (2-tailed)	.000	.000	.004		.000	.768	.001	.050	.165	.024	.007	.025	.000
	N	60	60	60	60	60	60	60	60	60	60	60	60	59
TAS difficulty identifying emotions	Pearson Correlation	.861**	.569**	.405**	.543**	1	.156	.507**	.344**	.057	.465**	.089	.576**	.575**
	Sig. (2-tailed)	.000	.000	.001	.000		.235	.000	.007	.665	.000	.497	.000	.000
	N	60	60	60	60	60	60	60	60	60	60	60	60	59
TAS externally oriented thinking	Pearson Correlation	.472**	-.074	-.074	-.039	.156	1	-.115	.037	-.147	-.039	-.255*	-.032	.051
	Sig. (2-tailed)	.000	.577	.574	.768	.235		.383	.779	.262	.767	.049	.809	.703
	N	60	60	60	60	60	60	60	60	60	60	60	60	59
BIS Attentional	Pearson Correlation	.414**	.508**	.800**	.404**	.507**	-.115	1	.496**	.399**	.325*	.472**	.424**	.350**
	Sig. (2-tailed)	.001	.000	.000	.001	.000	.383		.000	.002	.011	.000	.001	.007
	N	60	60	60	60	60	60	60	60	60	60	60	60	59
BIS motor	Pearson Correlation	.324*	.483**	.829**	.254*	.344**	.037	.496**	1	.130	.290*	.363**	.528**	.281*
	Sig. (2-tailed)	.011	.000	.000	.050	.007	.779	.000		.322	.025	.004	.000	.031
	N	60	60	60	60	60	60	60	60	60	60	60	60	59
BIS non-planning	Pearson Correlation	.049	.123	.585**	.182	.057	-.147	.399**	.130	1	.014	.284*	-.044	.154
	Sig. (2-tailed)	.711	.348	.000	.165	.665	.262	.002	.322		.916	.028	.737	.245
	N	60	60	60	60	60	60	60	60	60	60	60	60	59
BPAQ physical	Pearson Correlation	.374**	.779**	.296*	.291*	.465**	-.039	.325*	.290*	.014	1	.408**	.560**	.463**
	Sig. (2-tailed)	.003	.000	.022	.024	.000	.767	.011	.025	.916		.001	.000	.000
	N	60	60	60	60	60	60	60	60	60	60	60	60	59
BPAQ verbal	Pearson Correlation	.107	.683**	.498**	.346**	.089	-.255*	.472**	.363**	.284*	.408**	1	.475**	.296*
	Sig. (2-tailed)	.417	.000	.000	.007	.497	.049	.000	.004	.028	.001		.000	.023
	N	60	60	60	60	60	60	60	60	60	60	60	60	59
BPAQ anger	Pearson Correlation	.438**	.853**	.458**	.289*	.576**	-.032	.424**	.528**	-.044	.560**	.475**	1	.551**
	Sig. (2-tailed)	.000	.000	.000	.025	.000	.809	.001	.000	.737	.000	.000		.000
	N	60	60	60	60	60	60	60	60	60	60	60	60	59
BPAQ hostility	Pearson Correlation	.551**	.764**	.354**	.456**	.575**	.051	.350**	.281*	.154	.463**	.296*	.551**	1
	Sig. (2-tailed)	.000	.000	.006	.000	.000	.703	.007	.031	.245	.000	.023	.000	
	N	59	59	59	59	59	59	59	59	59	59	59	59	59

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).