

RESILIENCE IN HIGH-LEVEL INJURED ATHLETES

Survey of the athletes of the senior national karate and vovianamviet vo dao teams

المرونة النفسية لدى رياضي المستوى العالي المصابين

دراسة ميدانية متمحورة حول أعضاء الفرق الوطنية لرياضتي الكاراتي دو و الفوفيانام فيات فو داو

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Abstract : The practice of high level sport is considered as a factor of sports injuries and also as one of the most difficult stages to cross for an athlete, because it affects the psychological side as much as the physical side.

However, athletes' reactions to these injuries are different, and this is linked to a dynamic process known as psychological resilience which allows the individual to show behavioral adjustment when faced with a difficult or traumatic situation.

The present research retraces a survey carried out on (21) athletes exercising at the level of the national teams of Karate and vovianamviet vo dao and having suffered a physical injury.

Also, the purpose of this study is to measure the level of resilience in these injured athletes, as well as to identify if there is a relationship between the level of resilience and gender factors as well as the duration of the injury.

Keywords: resilience, injury, top athlete

الملخص : تعتبر ممارسة الرياضة في المستوى العالي عامل يعرض الرياضي الى الاصابات، حيث تمثل هذه فترة الاصابات أصعب المراحل التي يمر بها الرياضي. إذ انها تؤثر على الجانب النفسي بقدر ما تؤثر على الجانب العضوي له. تختلف ردود أفعال الرياضيين تجاه هذه الاصابات، ويرتبط ذلك بعملية دينامية تمكن الأفراد من اظهار التكيف السلوكي عندما يواجهون مواقف صعبة أو صادمة، وتدعى بالمرونة النفسية.

من خلال دراستنا هذه، التي أجريتها على 21 عضو من الفرق الوطنية للكاراتي و الفوفيانام فيات فو داو متعرضين لإصابة بدنية، نهدف الى قياس مستوى المرونة النفسية لديهم و ابراز وجود أو غياب فروق في المرونة النفسية حسب متغيري الجنس و العلاقات الاجتماعية.

- الكلمات المفتاحية : - المرونة النفسية، الإصابة الرياضية، رياضي المستوى العالي

- **The methodological steps followed in a scientific paper:**
- **Theoretical chapter**
- **Introduction:**

The injury in athletes is considered one of the experiences encountered during their journey. However, he recognized that this can have a profound psychological impact, symbolizing a failure or renouncing their ambitions. It may be responsible for a collapse in self-esteem, the appearance of emotional disturbances and conflicts with those around them. From there, athletes, to cope with the stress of competition and the pressure caused by the injury, they must show courage and determination in order to maintain their place on the podium or to reach it.

Resilience, in this case, which is defined as the capacity for resistance and mental recovery, is also qualified by certain neuropsychiatrists as (resumption of development after a traumatic psychic agony). It is defined as the responsible procedure for these reactions to these events there is not a physical dimension to the level of the athlete, because it is also and above all sometimes a psychological and mental question.

- **Problematic:**

Today, due to the increasing demands of performance, the practice of a sports activity is often accompanied by the risk of injury which remains high among elite athletes. Because, their commitments and exhibitions are very unlike sports enthusiasts.

Top athletes are extremely involved in their sports. As a result, they have a very strong athletic identity, which in turn leads to massive investment in sport (**Brewer, Van Ratte and Petit pas, 2000**).

Involvement in sports activity and athletic identity are therefore strongly linked. Generally speaking, athletes who have a strong athletic identity will tend to

preserve in sport. However, these athletes have more difficulty adapting when 'They have to deal with an injury. (**Brewer, 1993**)

Athletes have various psychological reactions when they are injured. They often see their fears and anxieties increase, their confidence and their performance decrease (**Anis ben jebli, 2005**).

Injury is the cause of the most frequently cited causes, such as that which can lead to the cessation of an athletic career (**Ogilvie and Taylor, 1993**). It is one of the most emotionally and psychologically traumatic events that an athlete can undergo. The injury remains, however, a major challenge that must be overcome.

When athletes have to interrupt their participation due to an injury, they sometimes suffer a loss of identity; in other words, they lose a significant part of themselves and their self-concept is seriously affected (**Petit pas and Danish, 1995**).

And as **Brewer** describes, when athletic identity is high, the athlete perceives the injury as a threat.

At the end of the rehabilitation, the resumption of training and competitions will be a source of stress, because the fear of injury again often suffers (**Kvist, EK.Sporsted and good, 2005, Tripp and Al, 2007**). When the severity of the injury results in the end of the career, thus sweeping away years of investment, it raises the problem of the transition to (ordinary) life (**Wylleman, De Knop, Menkehorst, Theeboan, and Annerel, 1993**).

After a physical or psychological trauma, new behaviors can appear as risky behaviors, altruistic commitments, even creative skills (**Serge Tisseron, 2017**).

However, some athletes succeed after each injury in maintaining a certain balance which maintains their goals, as well as their family and social ties, even

sometimes strengthening them. Consequently, these same athletes will rise and overcome the obstacles which block their career.

Psychoanalysts will assert that injured athletes have known how to use a variety of defense mechanisms, flexible and varied, which preserve their psychic integrity, in addition to the personal determinants that distinguish practitioners of combat sports, which he emphasized in the results of its study to arrange them as follows: training design, the need for achievement, self-confidence and self-control (**Ben hamed, p 87, 2013**).

Cognitive-behavioralists will speak of the appropriate use of effective coping strategies, which will have enabled them to cope with the event. However, there is a concept from the current of positive psychology, which has reversed the idea that an unfavorable environment systematically leads the individual to develop a pathology which is called **resilience**.

According to a definition based on the synthesis of two hundred and seventy (270) articles, resilience is a set of processes, consisting of managing, negotiating and adapting to stressful or traumatic situations. The assets, the resources of individuals and their environment facilitate this ability to adjust in the face of adversity and to rebound. Resilience can therefore vary over the course of life (**Windle, 2010**), it's also a dynamic process that enables individuals to demonstrate behavioral adaptation when faced with stressful, traumatic, or threatening situations. (**Luthar, Cicchetti, Becker, 2000**).

To understand this resilience and to apprehend it well, several authors have wondered how certain children were able to adapt to very difficult living conditions and then live satisfactorily (**Marilou B.S and Emilie Boujot, 2014**).

A British child psychiatrist, Michael Rutter, studied the factors protecting children suffering from severe deficiencies and described some individual and contextual factors of psychological resilience (**Rutter, 1985, 1994**). According to

Rutter, the resilient individual gives meaning to the responsible value systems and experience that have been supported by a positive emotional bond with another person who has provided regulation and support.

As for Warner (1995), she will underline that the essential factors having protected the children whom she had observed, had a positive self-concept, privileged links with at least one emotionally stable person, the community or the bets (Luthar, Swayer & Brown, 2006).

Windle's (2010) definition of resilience includes social resources (support received), individual dispositions (personality), transactional processes (ability to assess the situation as manageable, to adjust to it, to solicit and receive support) and some outcomes.

Finally, a physical injury in a high level athlete is defined as a tragic event which may leave psychic disorders that will affect this athlete's life. However, some, despite the trauma caused by the injury, they managed to continue their careers normally. This gives an astonishment impression, and leads us to ask the following question:

What is the level of resilience that characterizes injured elite athletes? And what are the factors responsible for the difference in these levels?

Hypothesis:

1. The level of resilience in injured high performance athletes is characterized by a high degree;
2. There are statistically significant differences in the level of resilience in injured high performance athletes by gender variable;
3. There are statistically significant differences in the resilience level in injured high performance athletes depending on the duration of the injury.

The goals of the research were to measure the level of psychological resilience of the injured high-level athlete, and to detect the presence of statistically differences in the level of psychological resilience of the injured high-level athlete, according to the sex variables and the duration of the injury.

In regards to Importance of this research , it was determined in the importance of this topic, which was not discussed extensively in the sports field, as it contributes to more understand and recognize the psychological resilience term and its important role in developing mental health among athletes to prevent falling into depression or surrender when facing stressful events. The study also seeks to reveal the effect of both the sex variable and the duration of the injury on this psychological resilience, which could constitute a platform to design and suggest programs that enhance the psychological care that this athlete can receive..

The practical chapter :

1- Followed Methodologies

Survey study:

Before starting on the field study, we undertook an exploratory study to know the nature of the sample and its response to the research tools that we will use. The sample was represented by 6 athletes members in the national teams of each of the karate do, judo and Vovianam Viat Vo Do, where we distributed psychological resilience to them and through it, we were able to confirm the validity of this scale, and then we distributed the scale in its final form to the research sample.

Research fields:

The spatial area of study is at the headquarters of the National Karate wich is located in Cheraga and the National Team for the Vuvianam Viat Vo Do, in Dar El Beida.

Concerning the time range, it took place during December 2019 and January 2020.

Means of verification:

The measurement instrument used in this study is the EHR Resilience Scale (Echelle Hardiesse-Résilience) (2008) (Pascale Desrumaux, 2008). This questionnaire consists of twenty-three (23) questions divided into three dimensions which are:

- ✓ **The feeling of efficiency:** (twelve questions), refers to a mixture between the feeling of having control over the event and of getting involved in resolving the situation;
- ✓ **Growth:** (five questions), it corresponds to the individual's ability to rebound forcefully following the stressful situation;
- ✓ **Optimism:** (six questions), it is identified by the individual's ability to see the stressful event in a positive way (Tabachnick and Fidell, 2001).

The evaluation of the degree of the resilience was by answering the scale statements according to the following alternatives (always, much, sometimes, rarely, never).

Study population and sample

Inclusion criteria:

- Be a member of the national team and practice a martial art, senior category;
- Having suffered a physical injury (ruptured cruciate ligaments in the knee, leg and arm fractures and ruptured tendons);
- The cessation of training lasting more than 15 days (where the sequels begin to appear on the body of the athletes).

Discipline \ Gender	Women	Men	Total
Karate	4	7	11
Vovianamviet vo dao	2	8	10
Total	6	15	21

Statistical methods:

we used a SPSS app to calculate both :

- Arithmetic average;
- Deviation standard;
- Correlation coefficient;
- Single-phase analysis of variance (ANOVA) to denote differences in the overall score of the resilience scale.

2- Exposure , analyses and result exam :

Table 01: Measure of the resilience level in athletes

Mean values and standard deviation of the sample members:

Variable \ Scale	Sample	Arithmetic Average	deviation standard	hypothetical medium
(EHR)	21	100.38	15.08	77

According to the analysis of the results illustrated in the table above, the arithmetic mean value which reaches (100.38) and the estimated standard deviation at (15.08), the level of resilience in injured and high performance athletes comparing the arithmetic mean with the hypothetical medium which lies in (77), we find that the arithmetic mean is greater than the value of the hypothetical medium. This indicates that injured high performance athletes have a high level of resilience.

Table 02: the level of resilience according to the gender variable (sex)

Calculation of the arithmetic means, the standard deviation, and the value of T to determine the differences between women and men.

It is clear from Table (02) that there are no statistically significant

Variable Scale	Sex	Sample	Arithmetic Average	Deviati on standar d	Freedom Degree	Value of T	Value of probabil ity	Significa nce Level
(EHR)	Man	15	92.26	15.64	19	0.583	0.567	0.05
	Woman	6	87.83	16.04				

differences in the level of freedom (19) and the significance level (0.05) between the specific arithmetic means of the total degree of resilience of the injured high-level athletes, due to the difference in the sex variable, knowing that the arithmetic mean for men has reached (92.26) and the standard deviation (15.64). At the same time, the arithmetic mean for women is (87.83) and the standard deviation (16.04), as the value of (T) is (0.583) considered not significant, because the probability value (0.567) is greater than the level value of significance.

Table 03: the level of resilience according to the injury duration variable

Arithmetic mean and standard deviations of the total score for the measurement of psychological resilience as a function of the injury duration variable.

Injury time	Sample	Arithmetics Averages	Standart Deviations
Less than 1 month	09	104.8889	5.66667
1 to 3 months	07	88.8571	5.45981
Mores than 3 months	05	69.0000	6.55744
Total	21	91.0000	15.48548

From the analysis of the results illustrated in Table 03, it appears that there are apparent differences between the arithmetic means specific to the total score for resilience in injured athletes, due to the difference in the duration of the injury.

Note that in athletes who sustained an injury lasting one (1) month or less, they had an average score of (104.88) and a standard deviation (5.66). Whereas in athletes who suffered an injury lasting between one (01) month and three (03) months, the arithmetic mean was (88.85) and the standard deviation was (5.45). athletes injured for more than three (03) months had an average score of (69.00) and a standard deviation of (6.55).

And to reveal the importance of the aforementioned apparent differences, the monovalent variation (ANOVA) of the overall level of the test of the resilience of injured athletes was analyzed according to the variable of the duration of the injury illustrated in the following table:

RESILIENCE IN HIGH-LEVEL INJURED ATHLETES

Variable	Source of difference	Sum of Squares	DF	Mean Squares	Value of « F »	Level of significance
(EHR)	Between Sets	4188.254	2	2094.127	62.023	0.05
	In Sets	607.746	18	33.764		
	Total	4796.000	20	//		

After applying the ANOVA test, to analyze the variance it was found that the value of "F" had reached (62.023) and that its significance value was (0.000), which is less than the limit defined by (0.05) This indicates the presence of statistically significant differences in significance (0.05) in the estimates of the individuals in the study sample for resilience, according to the injury duration variable.

And in order to determine the source of these differences and injury period for which the difference was for his favor, we use the test « Scheffe » for dimensional comparison, as indicated in the following diagrams.

Injury time	Differences between averages		
	Less than 1 month	1 to 3 months	More than 3 months
Less than 1 month	//////////	16.03175	35.88889
		0.000	0.000
1 to 3 months	-16.03175	//////////	19.85714
	0.000		0.000
More than 3 months	-35.88889	-19.85714	//////////
	0.000	0.000	
Injury time	Sample	Signification level 0.0.5	

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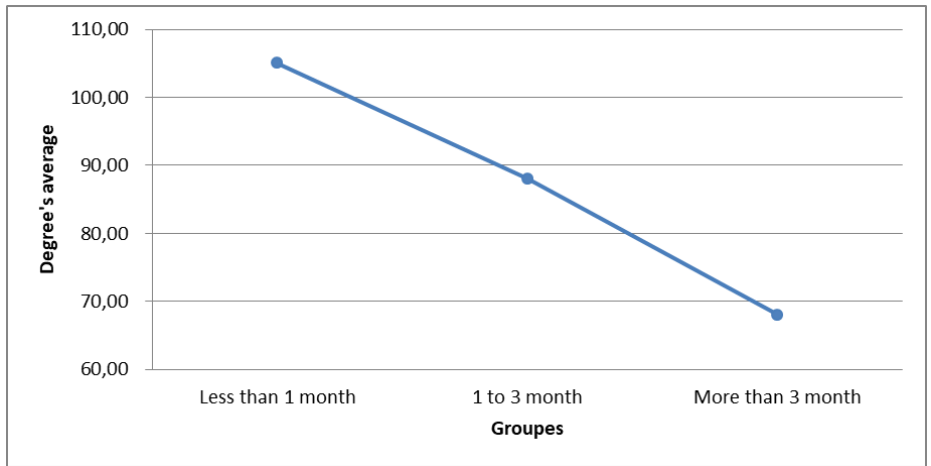
		1	2	3
More than 3 months	05	69.0000		
1 to 3 months	07		88.8571	
Less than 1 month	09			104.8889

According to the results illustrated in the diagrams above, it is noted that statistically significant differences exist in the significance value (0.05) in the resilience between athletes who suffered from an injury which lasted:

- Less than one month and between one month and three;
- Less than one month and more than three months;
- Between one month and three months or more.

It seems that the difference was in the favor of the athletes who were injured for less than 1 month. This means that estimations of the level of resilience among high performance athletes with an injury of less than 1 month were high compared to that of athletes with an injury of 3 months or more.

Plots of averages:



Discussions:

Hypothesis 01:

Our study made it possible to measure the degree of resilience in these athletes is high.

When the athlete faces difficult situations, mental strength will automatically be called upon (Marie-EVE Turgeon, 2008). Following the work of Connanghton and Al, it was possible to define mental strength. Indeed, the latter is recognized as a natural or acquired psychological advance, which in general helps the athlete to better cope with situations of stress and pressure that are present in high level sport.

Also, in 2011, according to Parkes and Mallet, mental strength is considered to be the most important element which improves the performance of high level athletes, and the result of the study of Tegar and Saidi also confirm that the mental skills of combat sports athletes are superior to individual and team sports practitioners (Tagar et Saidi, 116,2018).

The results of Marie-Eve Turgeon's study indicate that faced with these difficult situations, mentally trained athletes would have a three-dimensional reaction mode, characterized by several processes, including resilience (Marie Eve

Turgeon, 2009). According to the researchers, resilience is defined as a favorable response, a positive adoption of the individual following an injury, a prolonged dearth or following a failure (**Stumpfer1999, mentioned by Galli and Vealey 2008**).

Another study on resilience in the field of sport was carried out by Galli and Veally (2008) on athletes of professional level explained during their career, they developed and demonstrated resilience. Following the results of this study, we see that during the career, athletes have to face many and overcome several challenges. This adversity, very present in sport, which causes a period of restlessness in athletes who use different behavioral or cognitive strategies to manage the latter, at the end of which the athletes will have benefited from several positive aspects of their difficult experiences and will have learned to become strong.

Hypothesis02:

For this second part of our study, we wanted to identify the existence of differences in the athlete's resilience level according to the gender variable (Sex). Reading the results displayed in Table 02, it indicates that there are no significant differences in the athlete's resilience level according to the gender variable.

The same result was demonstrated by studies established by Fahdjan on a sample that includes teachers of special education in Ghaza, in 2010, Abu nada in 2015, on all employees of the hospital Kamel Adouan, Abidineen 2016 on students of the faculty of education of Alessandria, as well as by Abu Elqamsan in 2017 on divorced women. Therefore, it becomes obvious to conclude that the gender variable (sex) has no impact on resilience. And this is what was explained by a study from the University of Rochester, carried out by psychology professor Harry Reis and Bobbi Caarothers data analyst at the University of Washington (center for public health system science), that man and woman would not have

so distinct psychological characteristics. So, they came to the conclusion that the attributes we traditionally associate with a gender, do in fact exist in both (ErikW.Dolan, 2013).

Hypothesis 03:

Regarding this third part of the study, we wanted to identify the existence of differences in the level of athlete's resilience according to the difference in durations of the injury.

According to the studies published by Tukoen1981, the results obtained by Kubler-Ross and Weberg in 1997, athletes who suffer an injury, especially those who cause them to stop practicing for a well defined period, have difficulties in accepting their situations, and are psychologically affected, to varying degrees.

According to the study published in (Journal of Affective Disorders), established on adults who had to practice physical activity for at least thirty (30) minutes, three (03) times a week, and this for three (03) months before stopping abruptly, the researchers found that stopping sport led to a significant increase in depressive symptoms after only three (03) days for some. For others, it was only after one to two weeks, from where doctor Bernhard Baune estimated that it is quite fast (Lauren Williamson, 2018).

Moreover, as previously mentioned, the extreme implication of high level athletes in their sport and also their high recognized athletic identity, lead them to a critical psychological condition when facing an injury (Danish et petit pas, 1995).

In the other hand, according to Gerard Lopez (198), the injury of an athlete with the same symptoms as those of a psychological traumatism is considered as such. Each sudden pressure resulting from a physical injury which exceeds the tolerance of the individual defenses and causing to him a trouble is a psychological traumatism.

And according results synthesis of Mihoubi Redouan research, it was established that the wounded Algerian athlete faces an unbalanced psychological condition which is reflected in a series of behaviors and reactions. Thus, the injury duration has an important impact on this psychological condition. According to the results, our research and also of those obtained after case study by the researcher quoted above, it is suitable to conclude that: "More the duration of the injury is long, more the athlete loses hope for recovery and self-confidence and also his capabilities. This generates to a decline of the individual resilience level".

Conclusion:

As to conclude, this study aims to measure the resilience level of high level athletes who faced a physical injury and in addition to reveal if the resilience degree varies according to sex factors and injury duration.

As previously mentioned, the injury is one of the worst events that can meet the athlete of high level. Since the consequences of this tragedy are so important and can have impacts which can lead to pains and even physical and psychological traumatism.

Reactions caused by this injury, vary from an individual to another. For some, it symbolizes a failure, a destruction of a build career after a long labor, sacrifices and an enigmatic future. Which push them to depression and renouncement. For others, they can transcend obstacle and consider it as a transition needed to experiment new methods to enter in relation with oneself and the others. Therefore, accept and fit with the new situation.

In this case, the resilience is the most acceptable concept, since it suggests recovery after a traumatism and implicates the adaptation in case of a threatening or dangerous situation.

Then, it is important and necessary to improve the clarity of the resilience concept, and therefore, to well determine the different factors which influence it

in order to develop this process for the athletes in order to give them best ways to face different situations that threaten their careers.

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