

Mental Strength and Coping Strategy of Confined Athletes Dealing with COVID-19

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Abstract Due to this unexpected pandemic situation, the objective of this study is to explore the mental strength of elite athletes and their coping strategies to manage stress in different types of sports and according to their level of competition. 344 competitive athletes responded to a questionnaire on the training characteristics during this period, a Sports Mental Toughness Questionnaire to assess mental strength and coping strategies to manage stress was assessed by the Athletic Coping Skills Inventory ACSI-28. The data were analyzed by ANOVA. We found that the coping strategies adopted by elite athletes during this pandemic period vary significantly depending on the type of sport practiced, namely in terms of confidence and achievement motivation, freedom from worry and coping with adversity. We also found that coping strategies to manage stress have significant relationship with level of competition in terms of goal setting and mental preparation. For mental strength we found significant variation in self-confidence and control depending on the type of sport practiced. Also, depending on the level of competition, the control dimension varied significantly. It is suggested that the mental health for professional athletes be carefully managed during confinement to anticipate a possible recurrence of this epidemic.

Keywords COVID-19, Mental Strength, Coping Strategy, Elite Athlete

1. Introduction

The world is increasingly affected by an outbreak of the new coronavirus-2019. The World Health Organization (WHO) has assessed the COVID-19 outbreak as a pandemic [1]. The number of cases increased exponentially. However, the rate of spread of this epidemic is not the same. The two shores of the Mediterranean, for example, have different figures in terms of the number of cases of contamination, deaths and health and sanitary conditions on both sides of the Mediterranean.

In order to contain the outbreak of the new coronavirus pandemic, many countries have developed a series of containment methods. However, this period of crisis could generate, in addition to the risk of death following an infection, incredible psychological pressure on the population in general [2,3]. Indeed, Cyrus SH Ho and his team mentioned that the increasing risk of this epidemic leads to a climate of anxiety and depression following the disruption of projects, social isolation and overload of information in the media. In the same line of research, a recent study revealed that the rate of vicarious trauma caused by this situation of COVID19 among the general public is significantly higher than among the medical staff dealing with this epidemic [4].

Athletes cannot escape the continuous evolution of the epidemic, the strict isolation measures, the closure of training grounds and sports spaces are causing a brutal and

lasting disruption to their competition rhythms, their training habits, their relationships with their coach and teammates, which requires great adaptability at the individual and collective level and could impact their mental health. Indeed, in the literature review by Simon M. Rice and his co-authors, elite athletes are a population vulnerable to a range of mental health problems related to both sports and non-sports factors [5].

Furthermore, in order to maximize their chances of sporting success, athletes must deal with these various sources of stress and anxiety fuelled by this pandemic situation in order to improve their mental skills, which represent one of the most important objectives of psychological and mental training in sport, particularly in elite sport [6]. Two mental attitudes are in high demand: adaptability and mental strength. On the one hand, in order to explain the complex relationship between stress and psychological adaptation, strategic coping plays a major role both in optimising performance and in preventing mental health risks [7]. According to Lazarus and Folkman, coping represents "the set of constantly changing cognitive and behavioural efforts made by the individual to manage specific internal and/or external demands, assessed as consuming or exceeding his resources" [8]. On the other hand, mental strength, which is considered a prerogative of elite athletes [9], is defined by Jones and his co-authors as "the psychological advantage that enables one to cope with the demands of competition, training, and lifestyle; and to be more consistent and better than the opponent's coping mechanisms. It helps the athlete to remain determined, focused, confident and in control under pressure".

Several studies have examined the impact of this epidemic and its influence on the mental health and psychological aspects of the general public [10], medical personnel [11], children and adolescents [12], the elderly [13] and university students [14]. However, to our knowledge, no studies have been conducted to date on the mental skills of competitive athletes who are facing the stressful disruptions of this epidemic. In this study, we have profiled and evaluated the differences in adaptive capacity and mental strength between elite and subelite athletes in different types of sports in Morocco during this COVID-19 epidemic on the one hand, and on the other hand, to be able to present a theoretical basis for possible interventions with elite athletes, particularly in periods of de-confinement.

2. Methods

2.1. Participants

A total of 344 competitive athletes participated, of which 43.7% were women, who are experienced in their field of sports of 8.18 (± 4.79). This sample is composed of elite athletes participating this year in international,

Olympic or continental competitions (36.9%), national (47.1%) and regional (16.0%). They represent 7 categories of sports: athletics (29.1%), volleyball (19.4%), handball (16.5%), martial arts (16%), rugby (9.2%), football (4.9%), other sports (4.9%).

2.2. Procedure

After five weeks of the lockdown condition, social distancing and confinement, the information from this study was collected online. All the questionnaires were completed through Google form and were communicated to the athletes through their coaches or teammates. All respondents provided informed consent.

2.3. Measuring Instruments

2.3.1. Sport Training Characteristics Questionnaire

In order to collect demographic information and training characteristics of our sample, we used a questionnaire that covered age, gender, type of sport practiced, level of competition. The data collected related to training are: the frequency and intensity of training sessions before and during confinement, the time of training, the state of personal training spaces for athletes, the availability of training equipment.

2.3.2. Sports Mental Toughness Questionnaire

In order to be able to discern the mental strength of athletes during this pandemic period, we used the Sports Mental Toughness Questionnaire (SMTQ) [15]. The SMTQ evaluates three variables related to mental strength, namely confidence, consistency and control, and includes a measure of emotions and control of negative energy that characterizes mental strength [16,17]. The concept of SMTQ refers to the work of Seligman and Csikszentmihalyi (2000), who called "positive psychology". A frame of reference that considers that stressors are attached to the human condition and may even play a role in the growth and strengthening of individuals [18]. People in general, and athletes in particular, who are mentally strong have the ability to recover quickly and effectively from stressful experiences, such as competitive situations or the current pandemic situation. With this in mind, Mr. Sheard and his team constructed the SMTQ, which is a measurement instrument consisting of a 14-item questionnaire that participants are asked to answer using a 4-point Likert scale ranging from not at all true to totally true.

2.3.3. Athletic Coping Skills Inventory

We assessed athletes' coping strategies using the Athletic Coping Skills Inventory (ACSI-28) in order to discover the level of athletes' ability in this particular pandemic event. This inventory consists of 28 items that reflect 7 sport-specific subscales, namely; concentration,

confidence and motivation for success, overcoming, and coping. Participants are asked to indicate the frequency of their own similar experiences on a 4-point scale ranging from 0 (almost never), 1 (sometimes), 2 (often) to 3 (almost always). For each subscale the scores range from 0 to 12, with the total scale score as high as 84. Higher scores mean greater strength (Smith et al., 1995).

2.4. Data Analysis

The results for each parameter presented as mean \pm standard deviation (continuous variables), and frequency and percent (categorical variables) are processed by the one-factor ANOVA analysis. The purpose of this analysis

is to examine the effect of sport type and level of competition on scores of Mental strength, coping strategy and training characteristics. Post hoc analyses were then performed using the Bonferroni test to identify significant differences between categories.

3. Results

3.1. Characteristics of Sports Training

Descriptive statistics for gender, type of sport and level of competition with respect to frequencies, durations and competition training spaces are presented in Table 1.

Table 1. Variation of training parameters by ANOVA analysis.

Training parameters.	Variations	% (N)	Gender effect	Team Effect	Type of Sport Effect	Level of Competition Effect
Training frequency before confinement	3 times	23,3% (80)				
	4 to 5 times	45,1% (155)	,018*	,000*	,000*	,000*
	More than 5 times	31,7% (109)				
Training frequency during confinement per week	3 times	42,2% (145)				
	4 to 5 times	43,3% (149)	ns	ns	ns	,002*
	More than 5 times	14,5% (50)				
Training frequencies during confinement per day	1 time	88,1% (303)				
	Twice.	10,8% (37)	ns	ns	,006*	ns
	3 times	1,2% (4)				
	45 minutes	1,7% (6)				
Training duration before confinement	1h	9,9% (34)				
	1h30	27,6% (95)	ns	,000*	,000*	ns
	2h	45,1% (155)				
	More than 2 hours	15,7% (54)				
	45 minutes	32,3% (111)				
Training duration during confinement	1h	38,1% (131)				
	1h30	20,3% (70)	ns	ns	ns	ns
	2h	6,7% (23)				
	More than 2 hours	2,6% (9)				
Training space: Convenient	Very convenient	8,1% (28)				
	Convenient	43,3% (149)				
	Neither nor	23,8% (82)	ns	,004*	,017*	ns
	Unconvenient	16,3% (56)				
Availability of training equipment at home	Highly inconvenient	8,4% (29)				
	Disponible	27,0% (93)				
	Not disponible	73,0% (251)	ns	ns	ns	ns

The results of our statistical analyses revealed that prior to confinement, 76.8% of our sample had a training frequency greater than or equal to 4 times per week. With a significant superiority of 17% (boys vs. girls) in terms of frequency of training per week. Also, before confinement, the frequency of training per week ($\chi^2= 53,731$, $df= 2$, $P= .000$) is significantly higher by 20% (individual sport vs. team sport). Post hoc analyses showed significant increases in training frequency equal to or greater than four times per week ($\chi^2= 96,686$, $df= 12$, $P= .000$); between different types of sport, respectively, contact sport 8.2%, referral sport 9.9%, demarcation sport 10.5%, combat sport 11% and track and field 31.4% and between levels of competition, respectively, 10.2% at the regional level, 32.5% at the national level and 34% at the international level.

While during confinement, there was no significant variation in frequency, except by level of competition ($\chi^2= 16,880$, $df= 4$, $P= .002$) with an increase of 23.8% (international vs. regional athletes) and 2.5% (international vs. national athletes).

Before confinement, in terms of training duration, our results showed that 60.8% of our sample trained for 2 hours or more, with significant variations depending on the type of sport practiced ($\chi^2= 27,543$, $df= 4$, $P= .000$). Post-hoc analyses showed us a 10% increase (individual sports vs. team sports) in training durations exceeding 90 minutes. More precisely, athletics (29.7%) requires the most training time in excess of 90 minutes. However, during confinement, no significant variation was found in the athletes' training time.

As for the training space during confinement, 48.6% of the athletes expressed dissatisfaction with their training space. Analysis of the statistical results revealed that this

dissatisfaction ($\chi^2= 15,343$, $df= 4$, $P= .004$) increases significantly depending on the type of sport practiced (individual vs. team sports)

3.2. Mental Parameter Variation

The results of the analysis of athletes' mental skills during confinement, their mental strength and the coping strategies they adopt during this period according to the type of sport practiced and their levels of competition are presented in Table 2.

Mental strength during confinement

During this period of confinement, analysis of the components of mental strength of athletes revealed that confidence varies significantly ($P=.005$) between individual and team sports. Team athletes develop 8.06% more self-confidence than individual athletes. We observed through our post hoc analyses that the confidence component in handball players is 19.36% higher than in martial arts athletes. For the control component, it is significantly higher in athletes than in volleyball players ($P= .025$) with an advantage of 29.96% compared to athletes. Also, we observed highly significant variations in control according to the level of competition in which the athletes participate ($P=.001$). In fact, post-hoc analyses have shown that elite athletes who compete in Olympic and international competitions develop this control component 24.25% more than athletes who compete at the national level and 20.14% more than athletes at the regional level of competition. In terms of the consistency component, we found no significant variation among athletes during this pandemic period.

Table 2. Variation of mental parameters by ANOVA analysis.

Mental parameters Variations	M (\pm SD)	Effect of team	Effect of type of sport	Effect of competition level
Mental strength				
Confidence	4,15 (\pm 1,14)	,005	,000	NS
Control	2,29 (\pm 1,49)	NS	,025	,001
Consistency	4,22 (\pm 1,23)	NS	NS	NS
Coping strategies				
Goal Setting/mental Preparation	3,92 (\pm ,98)	NS	NS	,050
Confidence and Achievement Motivation	4,12 (\pm 1,03)	,001	,003	NS
Peaking Under Pressure	2,49 (\pm 1,48)	NS	NS	NS
Concentration	2,94 (\pm 1,56)	NS	NS	NS
Freedom From Worry	3,08 (\pm 1,57)	NS	,002	NS
Coachability	4,06 (\pm 1,26)	NS	NS	NS
Coping With Adversity	4,20 (\pm 1,10)	,010	,000	NS

Coping strategies to manage stress during confinement:

In terms of coping strategies of athletes during the confinement period, the results of our analyses show that the sub-scale of goal setting/ mental preparation ($P=.050$) varies significantly according to the level of competition. Regional athletes performed significantly better, developing 8.78% more than international athletes. During this period of confinement three other subscales varied significantly by type of sport practiced. Confidence and motivation for success ($P=.003$) varied significantly by type of sport performed. Post hoc analyses revealed that rugby players developed 17.30% more confidence and motivation for success than martial artists. Also, the absence of worry ($P=.002$) varied significantly as post hoc analyses highlighted that martial artists outperformed handball players by 27.89% in freedom from worry. Also, the subscale of the ability to cope with adversity ($P=.000$) varies significantly. In fact, volleyball players are able to cope with adversity by 19.09% more than karate players and combat sports in general. However, the sub-scales of peak pressure, concentration and coachability showed no significant variation in this period of confinement.

4. Discussion

The mental and psychological skills of Moroccan athletes at different levels of competition, in different types of sports, in this pandemic period of COVID-19, were investigated in this study. We analyzed and compared the scores of mental strength and coping strategies of the athletes during this period of confinement across their respective subscales. The results showed a significant difference in the profiles of coping strategies between sports during the confinement period. Indeed, we found that the profile of athletes who practice a team sport is characterized, on the one hand, by a significant advantage in terms of adversity coping and confidence and motivation to succeed in terms of coping strategies adopted and, on the other hand, by a significant higher prevalence of the control and confidence components in terms of mental strength compared to the profile of athletes who practice an individual sport. However, the profile of the latter is characterized by a significant superiority in terms of the Freedom from Worry (FFW) subscale. These differences in psychological and mental skills can be explained by the nature of the sport practiced, the sports program/ organization, the type of training and the sporting adversity [19]. In the same line of work, our results are consistent with a previous study that compared psychological skills in team and individual sports [20,21], which highlighted the significant difference in psychological skills between team and individual sports. The advantage of team sports can be explained, in part, by the additional social dimension of team sports [22].

Belonging, support and relationships within a team promote acceptance and a sense of comfort, which has a positive impact on trust and contributes to the reduction of emotional problems and insecurity, which in turn helps to better control fear [22,23]. As for the difference in engagement, it can be justified by the dominant nature of the type of motivation of individual sports athletes, which is centred on the achievement of objectives, unlike team sports athletes who are more focused on the pleasure dimension [21]. Also, individual sport athletes devote all their energy to the success of a single activity, so they are too focused on results [24], which may justify the disadvantage in adversity coping compared to team athletes who can count on the support of their teammates.

Furthermore, the present study suggests a significant difference between the different level of competition, during this period of confinement, only in the factor of goal setting and mental preparation in terms of coping strategies adopted and the control component in terms of mental strength. These results are consistent with the findings of several studies [25-27] that emphasize that goal setting and mental preparation are among the attributes that enable elite athletes to cope with difficult training and competition situations. The results of the present study, however, show a significant advantage of regionally based athletes over international athletes in this regard. This contradiction can be explained by the results of the systematic review conducted by Rice et al. on the mental health of elite athletes, which highlighted the presence of a high prevalence of a risk similar to the mental disorders of elite athletes compared to the general population [5]. In addition, the level of adoption of coping strategies to manage stressful situations varies, among other things, according to the level of anxiety [28].

Also, as a result of experience and level of competition, our results in this pandemic period do not agree with some previous studies which indicate that the most experienced athletes have higher concentration and confidence scores [29] and have more advantage in freeing themselves from worries and concerns and also tend to perform under pressure [30,31]. These divergences can be explained by the atypical disruptions caused by this unprecedented lifestyle situation of COVID-19 and its impact not only on the psychological [2,32-34], but also on the physiological [35], economic [36,37] and social [38] sides.

On the other hand, our study did not show any significant effect, neither of the level of expertise nor of the type of sport practiced, in this period of confinement on the level of the four other psychological components, namely performance under pressure, concentration and coachability in terms of coping strategies and constancy in terms of mental strength. These results, particularly related to this pandemic period, can be explained by difficulties in concentration and reaction under pressure due to current distractions, especially when athletes are not living up to their potential, according to a study on the

psychological characteristics of Olympic champions [19].

5. Conclusions

In conclusion, in the ongoing context of COVID-19, elite athletes must receive individualized psychological support in order to maintain their mental health, following the example of the Consensus Recommendations Document on Mental Health for High Performance Athletes, which emphasizes the primary role of mental health on performance. This study also suggests that the adoption and management of this competitive athlete pandemic situation could be differentiated using the mental component. The results have implications for the understanding of the adoption of appropriate psychological, mental and physical support strategies for professional athletes not only to cope with this pandemic but also to anticipate and promote the de-confidence of athletes.

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Conflict of Interest Statement

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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