

Evaluation of the precompetitive state anxiety of cyclists

Bessam Khalid, Abouqal Redouane, Hassar Mohammed, Ahid Samir

Abstract—we assessed the precompetitive state anxiety experienced by male cyclists during the 2013 Tour of Morocco, its fluctuation and the factors influencing it. It is a prospective study using two types of questionnaires CSAI-2 or EEAC with a collection of cyclists sociological and sport data. The race had 10 stages with a total of 1 610 km and a slope of 6 783 m. Sixty one male cyclists participated in the study; average age was 25.07 years. The number of hours of training per week was 22.0 h [19.50 to 24.00h]. Precompetitive state anxiety levels have decreased over the 10 stages of the race while confidence has increased. The slope had a negative effect on the level of anxiety. In multivariate analysis, the elites had a high level of cognitive anxiety and low self-confidence ($p < 0.001$) as opposed to local cyclists who had a low level of cognitive anxiety ($p < 0.05$). More trained cyclists had a high level of cognitive and somatic anxiety and a low self-confidence ($p < 0.001$). Cyclists with a mental coach had a high level of cognitive and somatic anxiety ($p < 0.001$) and ($p = 0.001$) respectively. Cyclists attended by a medical staff during the tour had a high level of cognitive and somatic anxiety as well as a high self-confidence ($p < 0.001$). In this competition, the cyclists' adaptation to the environment and the slope had a role in the fluctuation of the precompetitive state anxiety levels. Coaching cyclists by a sports psychologists and a qualified medical staff is essential for best performance

Index Terms— Precompetitive anxiety; CSAI-2; EEAC; Cycling

1 INTRODUCTION

It has been recognized for many years that psychological factors, such as anxiety, play an important role in competitions [2], [3], [9], [30]. They can influence athletes' performance before and during the competition [4], [8], [14], [19], [30]. Cognitive anxiety is characterized by subjective sensations, conscious apprehension and tension caused by pessimistic expectations about the success or by negative self-evaluations [5]. Somatic anxiety corresponds to physiological events provoked by the autonomous excitation process, such heart rate increase, muscle tension or sweaty palms. Self-confidence is the belief or the certainty that one has the ability to successfully perform a given activity [5]. Among the factors that influence the fluctuation of precompetitive state anxiety in athletes, some authors have demonstrated a significant relationship between the age and performance of athletes [27] also the variation of the state of anxiety during the competition stages.

Thuot S. et al found out a low somatic anxiety level and a high level of confidence among basketball players at home [29]. The audience support during home games results in low

reported that experienced athletes had a lower level of cognitive and somatic anxiety than less experienced ones [12]. Also, the level of confidence was higher in athletes with more years

of experience [11], [21], [23], [31]. It is interesting to note that in the field of sport psychology, no study had focused specifically on the fluctuations of the precompetitive state anxiety (cognitive anxiety, somatic anxiety), nor on the self-confidence of high-level cyclists during a stage race.

The aim of our study was to evaluate the pre-competitive state anxiety during a stage race and to look for the influencing factors.

2 METHODS

This was a prospective cohort study conducted during the 2013 tour of Morocco staged from 29-03 to 07-04-2013. We used the CSAI-2 Scale in English (27 items) [4], [6] or the EEAC scale in French (23 items) to quantify in a reliable and valid way the level of anxiety of individuals when competing in a sporting event [5]. Socio-sporting data were collected from the cyclists. We excluded the cyclists who did not master one of the two languages (English or French), those who did not fill out all the questionnaires and those who did not finish the race. A day before the race, a meeting was held with representatives of each team and their medical staff to explain the purpose and interest of our study and to go through the questionnaires and manual [15]. The questionnaires were distributed 2 hours before the start of each stage of the race. The race covered 1610 km and had a total vertical slope of 6783m. It consisted of 10 stages ranging from 120 to 198 Km and 421 km of land transportation of cyclists between some

- Bessam Khalid. Médecin du Sport. Laboratory of Epidemiology and Clinical Research, Medical and Pharmacy School. Mohammed V University - Rabat, Morocco. E-mail: drkhalidbessam@yahoo.fr
- Redouane abouqal. Laboratory of Epidemiology and Clinical Research, Medical and Pharmacy School. Mohammed V University - Rabat, Morocco. E-mail: r.abouqal@um5s.net.ma
- Mohammed Hassar. Pharmacoepidemiology & Pharmacoéconomics Research Team. Medical and pharmacy School. Mohammed V University - Rabat, Morocco. E-mail: hassarm@yahoo.fr
- Ahid Samir 1. Laboratory of Epidemiology and Clinical Research. 2. Pharmacoepidemiology & Pharmacoéconomics Research Team. Medical and pharmacy School. Mohammed V University - Rabat, Morocco. E-mail: s.ahid@um5s.net.ma

cognitive and somatic anxiety [1], [17], [21], [24], [29]. Krane V

stages, ranging from 50 to 158 Km.

3 RESULTS

We started with a sample of 92 high level male cyclists but only 61 voluntary and anonymous cyclists finished the study.

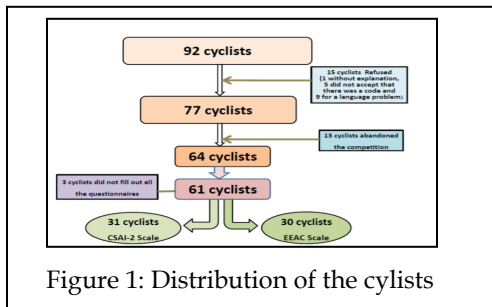


Figure 1: Distribution of the cyclists

The average age of the 61 cyclists was 25.07 years \pm 5.14 years). We divided them into 4 categories according to age: Youth (n = 1) 1.63%, Junior (n = 1) 1.63 %, Under 23 (n = 21) 34.42% and Elite (n = 38) 62.29%.

TABLE 1
CYCLISTS DATA

Characteristics	N(%)
Number of years of practice	10,4 \pm 4,41
Number of hours of training/week	22,0[19,50 -24,00]
Number of hours of sleep	8,3 \pm 0,91
Category	
- < 17 years = youth	1(1,63)
- 17-18 = Junior	1(1,63)
- 19 - 22 = Under 23 years(U23)	21(34,42)
- \geq 23 years = Elite	38(62,29)
Membership	
- Locals	12(19,67)
- Visitors	49(80,32)
Marital status	
- Married	53(77,94)
- Single	8(13,11)
Awards	
- local	2(3,27)
- national	15(24,59)
- international	44(72,13)
Mental coaching	10(16,39)
Medical staff	17(27,86)
Medical staff assistant	28(45,90)

Values are expressed as mean + / - standard deviation, median [quartiles] or strength (percentage).

They belonged to 16 teams- Algeria, Bahrain, Denmark, Egypt, Spain, Germany, Great Britain, Morocco (2 teams), Nederland, Libya, Poland, Slovakia (2 teams), Turkey, and USA).

During the 10 stages of the competition, the level of cogni-

tive and somatic anxiety increased to reach a maximum in the second stage and then it gradually decreased by the 10th stage. However, on the other hand, some studies showed that the level of somatic anxiety tended to decrease at the beginning of the competition, while the level of cognitive anxiety remains stable. The level of confidence showed a net decrease during the second stage, and then it increased until the penultimate stage with a drop during the 6th stage and a slight decrease during the last stage.

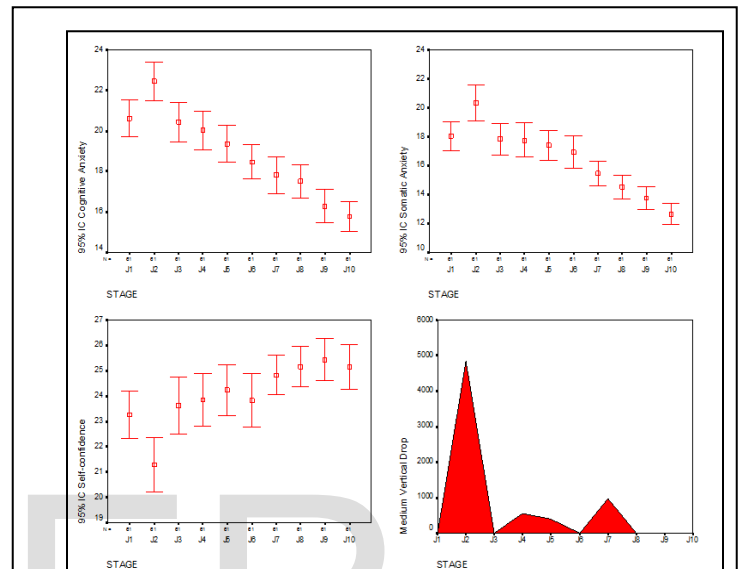


Figure 2: Fluctuations in the level of cognitive anxiety, somatic and self-confidence / slope drop through the 10 stages of the competition.

Data were collected and analyzed using SPSS 13.0 software. Qualitative variables were expressed as effective and percentages and quantitative variables as mean and standard deviation or median and quartile. In order to verify the internal consistency of the two questionnaires, the Cronbach alpha value was calculated. This demonstrated a value of 0.700 for the French questionnaire and 0.61 for the English questionnaire, which are considered accepted standards. A non-parametric Friedman test was used for comparison of pre-competitive state anxiety during the 10 stages.

In univariate analysis, a mixed model was performed to find the factors influencing the level of precompetitive state anxiety. Only variables with a significance level of <0.25 were included in the multivariate analysis. The significance level was set at 0.05.

In multivariate analysis, factors increasing the level of cognitive anxiety were the youth category (B=9.14 and P<0.001), Junior (B=5.90 and P<0.001) and U23 (B=3.86 and P<0.001) as regard to Elites; local (B=0.99 and P<0.05) as opposed to visitors, cyclists with a high number of training hours per week (B=0.29 and P<0.001) as opposed to those with less hours of training, cyclists with a mental Coach (B = 2.17 and P < 0.001) as opposed to cyclists who don't have one and cyclists who were assisted by medical staff (B = 2.06 and P

< 0.001) as opposed to those who did not have support.

TABLE 2

FACTORS INFLUENCING COGNITIVE PRECOMPETITIVE ANXIETY

Independents Variables	Unvaried analyze			
	B	SD	P	IC 95%
Categories				
-Youth [1,31;6,73]		4,02	1,37	0,004
-Junior	1,60	0,73	0,031	[0,14;3,05]
-U23	0,49	0,71	0,491	[-0,91;1,90]
-Elite	1	1	1	1
Membership				
-Local	1,55	0,38	<0,001	[0,79;2,30]
-Visitor	1	1	1	1
Marital statutes				
-Single	0,68	0,46	0,137	[-0,21;1,59]
-Maried	1	1	1	1
Experience (in years)	-0,12	0,03	0,001	[-0,19;-0,05]
Number of training hours/ week.	0,18	0,03	<0,001	[0,11;0,26]
Awards				
-Local	0,48	0,88	0,579	[-1,24;2,22]
-National	-0,03	0,36	0,922	[-0,75;0,68]
-International	1	1	1	1
Mental coaching	-0,03	0,36	0,922	[-0,75;0,68]
Medical staff	0,48	0,34	0,163	[-1,16;0,19]
Assistant medical staff	2,10	0,29	<0,001	[1,51;2,69]

TABLE 3

FACTORS INFLUENCING COGNITIVE PRECOMPETITIVE ANXIETY

Independents Variables	Multivariate analyze			
	B	SD	P	IC 95%
Categories				
-Youth	9,14	1,52	<0,001	[6,15;12,13]
-Junior	5,90	0,90	<0,001	[4,12;7,69]
-U23	3,86	0,75	<0,001	[2,37;5,34]
-Elite	1	1	1	1
Membership				
-Local	0,99	0,46	0,035	[0,07;1,90]
-Visitor	1	1	1	1
Marital statutes				
-Single	--	--	--	--
-Maried	--	--	--	--
Experience (in years)	0,09	0,04	0,063	[-0,005;0,18]
Number of training hours/ week.	0,29	0,03	<0,001	[0,22;0,36]
Awards				
-Local	--	--	--	--
-National	--	--	--	--
-International	--	--	--	--
Mental coaching	2,17	0,46	<0,001	[1,27;3,07]
Medical staff	--	--	--	--
Assistant medical staff	2,06	0,34	<0,001	[1,38;2,75]

TABLE 4

FACTORS INFLUENCING SOMATIC PRECOMPETITIVE ANXIETY

Independents Variables	Unvaried analyze			
	B	SD	P	IC 95%
Categories				
-Youth	2,36	1,54	0,125	[-0,66;5,39]
-Junior	1,04	0,82	0,207	[-0,57;5,39]
-U23	0,88	0,80	0,395	[-0,892;2,25]
-Elite	1	1	1	1
Membership				
-Local	-0,67	0,42	0,118	[-1,51;0,16]
-Visitor	1	1	1	1
Marital statutes				
-Single	2,45	0,49	<0,001	[1,48;3,42]
-Maried	1	1	1	1
Experience (in years)	-0,07	0,03	0,041	[-0,15;-0,005]
Number of training hours/ week.	0,16	0,04	<0,001	[0,08;0,24]
Awards				
-Local	-0,23	0,96	0,806	[-2,12;1,65]
-National	-0,16	0,39	0,750	[-0,90;0,65]
-International	1	1	1	1
Mental coaching	1,57	0,45	0,001	[0,67;2,47]
Medical staff	-0,16	0,37	0,669	[-0,90;0,58]
Assistant medical staff	1,71	0,33	<0,001	[1,05;2,37]

TABLE 5

FACTORS INFLUENCING SOMATIC PRECOMPETITIVE ANXIETY

Independents Variables	Multivariate analyze			
	B	SD	P	IC 95%

of somatic anxiety were marital status, single cyclists (B = 3.37 and P <0.001) as opposed to married cyclists , the cyclist having more number of hours of training per week (B = 0.18 and P = 0.001) as opposed to those with less hours , cyclists with a mental coach (B = 0.43 and P <0.001) as opposed to those without one , and cyclists who were attended by a medical staff (B = 2.32 and P <0.001) as opposed to those who did not have support

In multivariate analysis the factors which increased the level

Categories				
-Youth	--	--	--	--
-Junior	--	--	--	--
-U23	--	--	--	--
-Elite	--	--	--	--
Membership				
- Local	--	--	--	--
- Visitor	--	--	--	--
Marital statuses				
- Single	3,37	0,49	<0,001	[2,39;4,36]
- Married	1	1	1	1
Experience (in years)	-0,01	0,03	0,787	[-0,08;0,06]
Number of training hours/ week.	0,18	0,03	<0,001	[0,11;0,26]
Awards				
- Local	--	--	--	--
- National	--	--	--	--
- International	--	--	--	--
Mental coaching	1,47	0,43	0,001	[0,62;2,32]
Medical staff	--	--	--	--
Assistant medical staff	2,32	0,33	<0,001	[1,66;2,98]

	B	SD	P	IC 95%
Categories				
-Youth	0,53	1,34	0,693	[-2,10;3,16]
-Junior	-2,70	0,77	0,001	[-4,22;-1,18]
-U23	-3,27	0,75	<0,001	[-4,74;-1,80]
-Elite	1	1	1	1
Membership				
- Local	0,39	0,43	0,36	[-0,45;1,24]
- Visitor	1	1	1	1
Marital statuses				
- Single	--	--	--	--
- Married	--	--	--	--
Experience (in years)	--	--	--	--
Number of training hours/ week.	-0,15	0,03	<0,001	[-0,22;-0,07]
Awards				
- Local	--	--	--	--
- National	--	--	--	--
- International	--	--	--	--
Mental coaching	--	--	--	--
Medical staff	--	--	--	--
Assistant medical staff	1,52	0,36	<0,001	[0,81;2,24]

In multivariate analysis the factors decreasing the level of confidence were the junior category (B= -2.70 and P=0.001) and U23 (B= -3.27 and P<0.001) as opposed to the elites, the cyclist having more number of hours of training per week (B= -0.15 and P<0.001) as opposed to cyclists with less hours. On the contrary, cyclists assistance by a medical staff increased the level of confidence (B=1.52 and P<0.001).

TABLE 6

FACTORS INFLUENCING PRECOMPETITIVE SELF CONFIDENCE

Independents Variables	Unvaried analyze			
	B	SD	P	IC 95%
Categories				
-Youth	1,60	1,33	0,231	[-1,02;4,22]
-Junior	-1,14	0,71	0,109	[-2,55;0,25]
-U23	0,88	0,80	0,395	[-0,892;2,25]
-Elite	1	1	1	1
Membership				
- Local	-0,65	0,38	0,085	[-1,40;0,44]
- Visitor	1	1	1	1
Marital statuses				
- Single	-0,31	0,45	0,48	[-1,19;0,56]
- Married	1	1	1	1
Experience (in years)	-0,01	0,03	0,60	[-0,08;0,05]
Number of training hours/ week.	-0,14	0,03	<0,001	[-0,21;0,06]
Awards				
- Local	-0,69	0,85	0,42	[-2,37;0,99]
- National	0,22	2,35	0,52	[-0,47;0,91]
- International	1	1	1	1
Mental coaching	-0,31	0,41	0,45	[-1,13;0,49]
Medical staff	0,19	0,34	0,57	[-0,47;0,85]
Assistant medical staff	-0,85	0,30	0,005	[-1,44;-0,25]

TABLE 7

FACTORS INFLUENCING PRECOMPETITIVE SELF CONFIDENCE

Independents Variables	Multivariate analyze			
------------------------	----------------------	--	--	--

4 DISCUSSIONS

This is the first study assessing pre-competitive anxiety state in cyclists during a stage race. It was conducted during the 2013 tour of Morocco. The gradual decline of the cognitive and somatic anxiety levels and the gradual increase of the self-confidence levels seem to be related to the cyclists' adaptation with the race environment - influence of travel for visiting teams, pressure by coaches, competitors, spectators, topography of the stages, weather, the importance of the event, officials, media hype...

The sharp increase in the level of cognitive and somatic anxiety and the low level of confidence in the 2th stage could be related to the degree of the slope which was very important compared to the other stages of the race. As for the two slight decreases in the level of confidence, they could be explained for the first one in the 6th stage by the psychological repercussions of the 4th stage (the cyclists went on strike due to " bad weather ") and for the second one in the 10th stage by the fact that it was the last stage of the race.

We found that older cyclists had lower levels of cognitive anxiety and higher level of confidence. This is in accordance with the findings of Sultana. F et al. that showed that levels of sports performance changed in a linear way with age on the one hand and the level of anxiety on the other hand [27].

Local cyclists in our study had a higher level of cognitive anxiety than visitors. These results should be interpreted with caution since they do not take into account the competence of the cyclists. Several studies have demonstrated the advantages for local teams [1], [25], [28], [29], while other studies have found no significant difference between the locals and the visitors [3]. Only one study showed advantages for the visitors [28].

Multivariate analysis of the cyclists' experience showed no significant difference in the level of cognitive anxiety (p = 0.063) and the level of somatic anxiety (p = 0.787). Our results concurred with a study with swimmers [10], however other

studies have shown that the more experienced athletes had a higher level of cognitive and somatic anxiety than the less experienced [12].

Cyclists who had a higher number of hours of training per week had a higher level of cognitive and somatic anxiety and a lower level of self confidence. It could be explained by the degree of anxiety that is linked to great effort.

Cyclists supported by a mental coach in order to achieve the best results had a higher level of cognitive and somatic anxiety. These results were not expected and we did not find comparative studies in the literature. It must be noted that sport psychology is practiced by many professionals-coaches, assistants, doctors, psychologists, psychiatrists [13], [14], [19], [20], [22], [26].

For cyclists attended by medical staff during the Tour [15], [16], [24], their level of cognitive and somatic anxiety and their self confidence are higher. A study on young elite tennis players clearly demonstrated the effectiveness of the program of mental preparation [7], [14], [26].

5 LIMITATIONS OF THE STUDY

Cyclists who participated in the study were from different nationalities and could not respond to questionnaires because of the constraint of the language (French, English). Also, it would have been better to start the study a few days before the competition and review cyclists few days after for reevaluation, but time constraints did not allow it (arrivals and departures of the cyclists was already programmed). Also, when collecting the socio-sports data, the majority of cyclists did not respond to questions about the quality of mental coaching and medical staff assistance.

6 CONCLUSION

This study showed that the level of precompetitive state anxiety of cyclists is significantly reduced and the slope is a variable that is closely linked to the fluctuations seen during the 10 stage of the Tour of Morocco. Elites and more experienced cyclists had a low level of pre-competitive state anxiety and a high level of confidence. A contradictory finding was that cyclists supported by a mental coach and assisted by a medical staff had a high level of anxiety in the different stages of the tour. So, what were the profile and the professional qualifications of these athletes' companions? Surely, an accompanying of sportsmen by a sports psychologist such as a mental coach and a qualified medical staff would be needed for best performance.

Additional studies are needed in other sports with multiple stages to analyze and compare the pre-competitive anxiety levels in order to improve athletes' performance.

ACKNOWLEDGMENT

The authors wish to thank the medical staff coverage of the Tour, the Moroccan Royal Federation of Cycling, and the Cycling Federations of the countries taking part in this event as well as the volunteers who participated in this study.

CONFLICT OF INTEREST:

The authors declare no conflict of interest on this article.

REFERENCES

- [1] Aupetit. S, 2008. Influence du lieu de la rencontre sur la performance sportive (match à domicile ou à l'extérieur : une analyse critique), cairn.info ; EDP Sciences/Movement & Sport Sciences, n° 65, p. 9-34.
- [2] Bray, S. R., Martin, K. A. & Widmeyer, W. N. 2000. The relationship between evaluative concerns and sport competition state anxiety among youth skiers. *Journal of Sports Sciences*, 18(5), 353-361.
- [3] Bray, S. R., & Martin, K. A. 2003. The effect of competition location on individual athlete performance and psychological states. *Psychology of Sport and Exercise*, Volume 4, Issue 2, 117-123.
- [4] Craft. LL, T. Magyar. M, Becker. B J and Feltz. DL. 2003. The Relationship between the Competitive State Anxiety Inventory-2 and Sport Performance: A Meta-Analysis. *Journal of Sport & Exercise Psychology*, 25, 44-65.
- [5] Cury. F, Sarrazin. P, Pèrès.C, Famose. J-P. 1999. Mesurer l'anxiété du sportif en compétition : Présentation de l'échelle d'état d'anxiété en compétition (EEAC). Dossier EPS n°43. Paris. Eds Revue EPS.
- [6] Debois. N. 2003. De l'anxiété aux émotions compétitives : Etat de la recherche sur les états affectifs en psychologie du sport, cairn.info/De Boeck Supérieur/ Staps, no 62, p. 21-42.
- [7] Heuzé. J-P. 2009. Intervention psychologique auprès d'une équipe sportive professionnelle. cairn.info/revue-bulletin-de-psychologie 4, page335-341.
- [8] Houston. M & Martin. SB. 2011. Survey results of the training, nutrition, and mental preparation of triathletes: Practical implications of findings. *Journal of Sports Sciences*. Volume 29, Issue 10. Pages 1019-1028.
- [9] Jones. M. V., Bray. S. R, & Bolton. L. 2001. Game location and officiating bias in English Club Cricket. *Perceptual and Motor Skills*, 93(2), 359-362.
- [10] Jones G, Hanton S, Swain A. November 1994. Intensity and interpretation of anxiety symptoms in elite and non-elite sports performers. *Personality and Individual Differences ; Sports Science & Recreation Management*; Volume 17, Issue 5, Pages 657-663
- [11] Koivula. N, Hassme'n. P, Fallby. J. 5 April 2002. Self-esteem and perfectionism in elite athletes: effects on competitive anxiety and self-confidence. *Personality and Individual Differences*. Volume 32, Issue 5, Pages 865-875.
- [12] Krane. V; Williams. J. M. Apr-Jun 1994. Cognitive anxiety, somatic anxiety, and confidence in track and field athletes: The impact of gender, competitive level and task characteristics. *International Journal of Sport Psychology*, Vol 25(2), 203-217.
- [13] Lincheneau. P M, Franques. P, Auriacombe. M, Tignol. J. 2002. Psychopathologie du sport. *Encyclopédie Médico-chirurgicales*. 37-887-A-10.
- [14] Mamassis. G & Doganis. G. 2004. The Effects of a Mental Training Program on Juniors Pre-Competitive Anxiety, Self-Confidence, and Tennis Performance. *Journal of Applied Sport Psychology*. Volume 16, Issue 2. Pages 118-137.
- [15] Martinez. J.M. 2006. Medical coverage of cycling events. *Curr Sports Med Rep*. May; 5(3):125-30.
- [16] Menetrey. J. 2008. Supervision médicale d'une manifestation sportive ou d'une équipe de sport. *Rev Med Suisse*; 4: 1717-1722.
- [17] Nevill. A. M., Holder. R. L. October 1999. Home Advantage in Sport. *Sports Medicine*, Volume 28, Issue 4, pp 221-236.
- [18] Palazzolo. J, Arnaud. J. July 2012. Anxiété et performance : de la théorie à la pratique. *Annales Médico-psychologiques, revue psychiatrique*. Volume 171, Issue 6, Pages 382-388.

- [19] Papastergiou. L ; Proios. M ; Yiannakos. A ; Galazoulas. C. Oct 2010. Differences in pre-competitive anxiety between the athletes in the category of young handball players in relation to their performance. *Physical Training*.
- [20] Ponnelle. S. 2012. Relations entre le vécu émotionnel et les stratégies d'ajustement en situation de compétition. *Pratiques psychologiques*; 18, pp. 333-352.
- [21] Rokka, S., Mavridis, G., Bebetos, E., & Mavridis, K. 2009. Competitive state anxiety among junior handball players. *The Sport Journal*, 12. 1543-9518.
- [22] Rosnet. É. I, 2005. Intérêts, difficultés et enjeux de l'évaluation psychologique des sportifs, [Cairn.info/revue bulletin de psychologie](http:// Cairn.info/revue-bulletin-de-psychologie). Numéro 475, p. 113-117.
- [23] Ruedl. G, Schobersberger. W, Pocecco. E, Blank. C, Engebretsen. L, Soligard. T, Steffen. K, Kopp. M, Burtscher. M. 2012. Sport injuries and illnesses during the first Winter Youth Olympic Games 2012 in Innsbruck, Austria. *Br J Sports Med*; 46:1030-1037.
- [24] Salmi. M, Pichard. C, Jousselin. E. February 2010. Psychopathologie et sport de haut niveau. *EM-Consulte, Science & Sports*; Volume 25, Issue 1, Pages 1-10.
- [25] Scanff. C. L. 2005. Les bases de l'entraînement mental. [Cairn.info/revue-bulletin-de-psychologie](http:// Cairn.info/revue-bulletin-de-psychologie). Numéro 475, 101-105.
- [26] Sez nec. J-C. December 2008. Le suivi psychologique de sportifs de haut niveau : enjeux et réalité. *Annales Médico-psychologiques, revue psychiatrique*. Volume 166, Issue 10, 2008, Pages 833-837.
- [27] Sultana. F, Brisswalter. J, Lepers. R, Hauswirth. C, Bernard. T. 2008. Effet de l'âge et du sexe sur l'évolution des performances en triathlon olympique. *Science & Sports* 23 130-135.
- [28] Terry. P. C; Walrond. N; & Carron. A. V. 1998. The influence of game location on athletes' psychological states. *Journal of Science and Medicine in Sport*, 1(1), 29-37.
- [29] Thuot. S. M; Kavouras. S.A; & Kenefick. R. W. 1998. Effect of perceived ability, game location, and state anxiety on basketball performance. *Journal of Sport Behavior*, 21(3), 311-321.
- [30] Woodman. T; and Hardy. L. 2001. Stress and anxiety. In R.N. Singer, H.A. Hausenblas and CM. Janelle (Eds.), *Handbook of sport psychology*, 2nd ed., p 290-318. New York: Wiley.
- [31] Woodman T; Hardy L. 2003 Jun. The relative impact of cognitive anxiety and self-confidence upon sport performance: a meta-analysis. *J Sports Sci.*; 21(6):443-57.

IJSER