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Could low fat mediterranean diet improves competitive anxiety in young sailors?: cross-sectional study according to the STROBE statement

¿Puede la dieta mediterránea, baja en grasas, mejorar la ansiedad competitiva en regatistas jóvenes?: Estudio transversal según el manifiesto STROBE

¿Pode a dieta mediterránea, baixa en grasas, melhorar a ansiedad competitiva em regatistas jovens ?: Estudio transversal como o mani esto STROBE

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Abstract: In dinghy sailing, there are many factors all of which affect to sailor performance: experience, training, nutrition and psychological condition. The main aim of this report was to know sailor's anxiety levels according to eating habits, nutritional condition, training, experience and type of vessel. 77 Laser (4.7 and Radial) and 470 sailors filled up CSAI-2 and PREDIMED questionnaires to determine competitive state anxiety and low fat diet adherence. They showed higher BMI the sailors with higher low fat diet adherence, higher experience, higher ranking position and Radial's sailors. Under-16 sailors showed less competitive anxiety. Overweight sailor got less cognitive anxiety. Sailors who trained more times per week got best results. Sailors with higher BMI will get best results with strong wind because they will keep the boat horizontal more easily. Radial's sailors have higher BMI due to their age. Under-16 sailors show less competitive anxiety due to lower demand for results. Overweight sailor show less cognitive anxiety due to lower expectations. Sailors who train more times per week get best results. Low fat Mediterranean diet not seem conditioned competitive anxiety in sailors. Sailing performance seems to be conditioned by sailor weight, wind conditions, training frequency and experience.
Key words: food habits, nutrition, sport performance, psychology, body mass index.
Resumen: En vela hay muchos factores que afectan al rendimiento del regatista, cómo la experiencia, el entrenamiento, la nutrición y el estado psicológico. El objetivo de este estudio fue conocer los niveles de ansiedad en regatistas según hábitos alimentarios, estado nutricional, entrenamiento, experiencia y tipo de embarcación. Participaron 77 regatistas de clase Laser (4.7 y Radial) y 470, rellenaron los cuestionarios CSAI-2 y PREDIMED, para determinar estado de ansiedad competitivo y adherencia a la dieta baja en grasa. Mostraron mayor IMC los regatistas con mayor adherencia a la dieta baja en grasas, mayor experiencia, mejor clasificación, y los de clase Radial. Los sub-16 presentaron menor ansiedad competitiva. Los regatistas con sobrepeso obtuvieron menor ansiedad cognitiva. Los regatistas que realizaban más entrenamientos por semana obtuvieron mejores resultados. Los regatistas con mayor IMC obtendrán mejores resultados con viento fuerte, debido a que mantendrán el barco horizontal con mayor facilidad. Los regatistas de clase Radial tienen mayor IMC debido a su edad. Los regatistas sub-16 muestran menos ansiedad competitiva debido a menor exigencia de resultados. Los regatistas con sobrepeso presentan menor ansiedad cognitiva debido a una menor expectativa. Los regatistas que entrenan entre semana obtienen mejores resultados. La dieta baja en grasa no parece condicionar la ansiedad competitiva de los regatistas. El rendimiento en la navegación parece estar más condicionado por el peso del regatista, las condiciones de viento, la frecuencia de entrenamiento y la experiencia.
Palabras clave: hábitos alimentarios, nutrición, rendimiento deportivo, psicología, índice de masa corporal.
Resumo: Em vela há muitos fatores que afetam ao rendimento do velejadores, como a experiência, o treinamento, a nutrição e o estado psicológico. O objetivo deste estudo era saber os níveis de ansiedade em velejadores de acordo com hábitos alimentares, estado nutricional, enquanto treinando, experimente e faça tipo. Eles participaram 77 velejadores de Laser de classe (4.7 e Radial) e 470, eles encheram os questionários CSAI-2 e PREDIMED, determinar estado competitivo de ansiedade e aderência à baixa dieta em gordura. IMC maior mostrou os velejadores com mais aderência para a baixa dieta em experiência gordurosa, maior, classificação melhor, e esses de classe Radial. Esses substituto-16 eles apresentaram ansiedade menor competitiva. Os velejadores com sobrepeso obtiveram cognitiva de ansiedade menor. Os velejadores que você / eles levaram a cabo mais treinamentos por semana obtiveram resultados melhores. Os velejadores com mais IMC obterão resultados melhores com vento forte, porque eles manterão o navio horizontal com mais facilidade. Os velejadores de classe Radial têm IMC maior devido à idade deles/delas. Os velejadores substituto-16 eles mostram competitivo menos ansiedade devido a demanda menor de resultados. Os velejadores com preponderante apresenta cognitiva de ansiedade menor devido a uma expectativa menor. Os velejadores que treina entre semana obtém resultados melhores. A baixa dieta em gordura não parece condicionar a ansiedade competitiva do velejadores. O rendimento na navegação parece ser condicionado mais pelo peso do velejador, as condições de vento, a frequência de treinar e a experiência.
Palavras teclam: hábitos alimentares, nutrição, rendimento desportivo, psicologia, índice de massa corporal.

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Introduction

At sailing many conditions determine performance reached by sailors, as sea conditions, wind speed or direction and the unpredictable behaviour of the rest of competitors (Araujo, Davids & Serpa, 2005). Sailors need to adjust the boat controls according to external conditions, which change constantly, trying to take the most appropriate decision.

There are many investigations that try to explain the abilities that determine a competitive sailor of dinghy boat. Physical fitness, tactical intelligence, physiological characteristics, sailing technique, injuries, experience, psychological factors or nutrition, among others, affect the performance of sailors (Araujo Davids & Serpa, 2005; Araujo & Serpa, 1998; Bertrand, 1993; Manzanares, Segado & Menayo, 2012; Spurway, Legg & Hale, 2007).

At dinghy sailing, there are many boat classes, each one requires different physical, psychological and cognitive abilities on the part of sailors. Consequently, it is necessary to study the needs that each boat class demand to sailors in order to obtain high-level performance (Allen & De Jong, 2006).

At different sports, authors showed a positive relationship between cognitive and somatic anxiety and cortisol levels in athletes. Cortisol is a steroid hormone which appears at competition environment, and it has negative consequences in sport performance (Arruda et all., 2014; Papacosta, Nassis & Gleeson, 2016). In this sense, anxiety is commonly linked to a negative pre-performance stress (Judge et al., 2016). But it is necessary to define and clarify anxiety levels to know the severity of the symptoms and their role in athletic performance. Up to date there is not any research related to competitive anxiety among dinghy sailors. There is only one case in which some authors evaluated anxiety state of sailor crossing the Pacific Ocean sailing a cruise catamaran, and described that anxiety was within acceptable limits (Hagin, Gonzales, Candau & Groslambert, 2012).

At sports in which weight is controlled, anxiety is influenced by body composition and eating habits in order to reach a certain weight to improve athletic performance (Escobar-Molina, Rodríguez-Ruiz, Gutiérrez-García & Franchini, 2015). At sailing, weight can also become one of the conditioning factors of regatta performance, but it highly depends on wind conditions. Some authors suggest that there is probably a relationship between anxiety levels and body mass index (BMI), although it is a complex association and it should be studied deeply (Haghighi et al., 2016). The present study also tries to find out if there is a relationship between the levels of competitive anxiety and BMI among young sailors, because there is not any evidence in this field.

Mediterranean diet, as well as healthy eating habits, highly contribute to benefit health status and to achieve quality of life (Sofi, Macchi, Abbate, Gensini & Casini, 2014). The last meta-analysis of Mediterranean diet (Fiore et al., 2015) showed its importance to reduce risk and incidence of severe diseases (cardiovascular, cancer, Parkinson, Alzheimer...) and it also proved to prevent chronic diseases. Furthermore, it has been shown that Mediterranean diet has been associated to lower prevalence of obesity. Mediterranean diet adherence seems to not improve sport performance and body composition (Alacid, Vaquero-Cristobal, Sanchez-Pato, Muyor & López-Miñarro, 2014; Rubio-Arias et al., 2015). Nevertheless, a recent study about body composition and Mediterranean diet adherence among young Mediterranean boys and girls concluded that it is associated to BMI and body composition (Mistretta et al., 2016).

The main aim of this cross research was to know the anxiety levels of sailors depending on diet habits, nutritional condition, training sessions, expertise level and dinghy boat class.

The hypothesis was that sailors increase their anxiety level with an inadequate diet strategy, as well as with an overweight nutritional condition; on the contrary, expertise level and the number of training sessions reduce competitive anxiety.

Material and methods

Participants

Seventy-seven (n=77) sailors from 3 different boat classes took part in the study, 52 males and 25 females with a sailing experience of 6.68 ± 3.91, aged 16.52 ± 5.083, height 171.78 ± 8.219 and weight 62.43 ± 9.683. All of them participated on the "Gran Trofeo de Valencia". At this regatta most of the sailors from Región de Murcia and Comunidad Valenciana took part, due to the nearness between the above mentioned communities. Forty-five of them sailed on Laser 4.7 class (n=45), this class is the commonest one, because it is the main boat for transition from the initiation class. Twenty-two sailors from Laser Radial class (n=22) and ten sailors from 470 class (n=10). Laser 4.7 and Laser Radial are individual dinghy boat. The difference between both boats is the main sail size, being bigger on Laser Radial, demanding a higher physical performance or heavier sailors. 470 class is the double hander boat for young sailors. This boat demand different behavior depending on the position of the sailor, prow and skipper. All the participants gave their consent to participate in the research as well as their parents or legal guardians did. The research was approved by the Ethics Committee of the Catholic University San Antonio of Murcia.

Measurement

All data collection was done during "Gran Trofeo de Valencia". This regatta was carried out on the Royal Nautical Club

of Valencia during one weekend, 23rd and 24th April 2016. Wind condition during both days was 32 km/h (16 knots) of intensity from west. This type of wind condition is strong, because it requires a high physical performance on the part of the sailors to control the heel angle of the boat. With strong wind conditions sailors that have better physical conditions and/or higher weigh have an advantage over lighter sailors.

It is necessary to explain that a regatta of these characteristics has a duration of two days, during which 6 races are carried out, 3 each day. The punctuation of the sailors at the end of the day is the sum of the positions on each race. The winner is the one who has the lowest punctuation.

Questionnaires were supplied to sailors before starting the competition, in the moment of inscription and boat inspection. Since a effort to reduce potential source of bia related to good or bad experience at firsts races.

Instruments

To determine competitive state anxiety the Competitive State Anxiety Inventory-2 (CSAI-2) (Martens, Burton, Vealey, Bump & Smith, 1990) was used. This inventory differences three parameters: cognitive anxiety (CA), somatic anxiety (SA) and self-confidence (SC). CA represents the perception of anguish and loss of concentration related to sport performance; SA is related to the activation of the autonomous nervous system that provokes physiological responses, and SC refers to positive perspective of athletes, regarding success and confidence in their skill performance (Cheng, Hardy & Markland, 2009; Tsopani, Dallas & Skordilis, 2011). Also, CSAI-2 results can provide information about intensity (dimension) and directionality (personal appretiation) of anxiety (Jones & Swain, 1992). In total, CSAI-2 contains 17 items. Values of each item of intensity (between 1:none to 4:high) and directionality (-3: harmful to +3:beneficial) were differentiated.

Total body weight and height was measured following International Society for the Advancement of Kinanthropometry guideliness (Marfell-Jones, Olds, Stewart & Carter, 2006). Tanita BC-418 MA (Tanita Corporation, Arlington Heights, IL) to the nearest 0.1 kg (Kelly & Metcalfe, 2012). Standing height was measured using a Seca 202 stadiometer (Seca, Hamburg, Germany) to the nearest 0.1 cm. Body Mass Index (BMI) was calculated using the equation weight (kg)/ height^2 (m). BMI was categorized attending World Health Organization for age 5-19 years old (Butte, Garza & de Onis, 2007).

To measure low fat diet adherence (LFDA) of sailors PREDIMED inventory was used (Estruch et al., 2013). There are nine questions in LFDA questionnaire about food habits related to fat intake. The highest score is nine points, and it corresponds to high low fat diet adherence.

STROBE statement checklist (von Elm et al., 2007) for the appropriate reporting of cross-sectional studies was performed. These recommendations, collected in 22 items, describe the proper way of reporting the title, abstract, introduction, methods, results, discussion and funding.

Statistics

SPSS IBM Statistics version 24 for Windows package (Illinois, USA) was used to process data obtained from the volunteers. Standard descriptive statistics were presented as mean ± standard deviation (SD). One-sample K-S test (Kolmogorov-Smirnov test) was performed in order to assess if each variable fits a normal distribution. Parametric T-test for independent samples and ANOVA were used to compare data between different subgroups. Same non-parametric test was used to compare means in case variables did not have a normal distribution. Cronbach´s alpha was performed to analyze internal validity and consistency of CSAI-2. Pearson correlation test was computed for correlations between variables. Values with a $p<0.05$ were considered significant. The effect size (ES) was calculated using Cohen's d (1988). ESs were considered negligible (<0.2), small (0.2–0.50), moderate (0.50–0.80), and large (>0.80).

Results

Cronbach´s alpha to measure internal validity and consistency of the CSAI-2 questionnaire showed SA=.78, CA=.76) and SC=.83 (intensity) and SA=.77, CA=.80 and SC=.79 (directionality).

Table 1. Description and comparison of participants.

	LOW LFDA (n 48)		HIGH LFDA (n=29)		Age £ 15 (n=40)		Age > 15 (n=37)		Normal weight (n=71)		Overweight (n=6)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
SA (INT)	1,95 ±	0,71	1,76 ±	0,46	1,73 ±	0,62*	2,04 ±	0,63*	1,88 ±	0,65	1,89 ±	0,44
SA (DIR)	0,15 ±	0,88	0,01 ±	0,93	0,20 ±	0,95	-0,01 ±	0,82	0,10 ±	0,87	0,14 ±	1,25
CA (INT)	2,50 ±	0,67	2,76 ±	0,56	2,60 ±	0,69	2,59 ±	0,58	2,62 ±	0,66*	2,31 ±	0,29*
CA (DIR)	-0,09 ±	1,03	-0,25 ±	1,01	-0,16 ±	1,06	-0,14 ±	0,98	-0,19 ±	1,04	0,33 ±	0,54
SF (INT)	2,946 ±	0,58	3,076 ±	0,68	3,010 ±	0,61	2,978 ±	0,64	2,983 ±	0,59	3,133 ±	0,95
SF (DIR)	0,80 ±	1,17	1,11 ±	1,30	0,93 ±	1,17	0,91 ±	1,28	0,90 ±	1,21	1,13 ±	1,47
LFDA	4,04 ±	1,09	6,90 ±	0,86	5,08 ±	1,70	5,16 ±	1,76	5,10 ±	1,73	5,33 ±	1,75
Age	16,04 ±	2,63	17,31 ±	7,58	14,40 ±	0,78	18,81 ±	6,59	16,23 ±	5,15	20,00 ±	2,28
Weight	62,07 ±	9,70	63,02 ±	9,80	59,20 ±	7,90	65,92 ±	10,30	61,24 ±	8,98	76,50 ±	6,16
Height	173,13 ±	7,13	169,57 ±	9,47	170,03 ±	7,64	173,69 ±	8,49	171,97 ±	8,45	169,57 ±	4,43
BMI	20,67 ±	2,81*	21,85 ±	2,34*	20,45 ±	2,14	21,84 ±	3,03	20,65 ±	2,21	26,58 ±	1,44
N Training	2,31 ±	1,17	2,28 ±	1,10	2,40 ±	1,15	2,19 ±	1,13	2,35 ±	1,15	1,67 ±	0,82
Expertise	6,30 ±	3,01	7,31 ±	5,05	5,48 ±	2,20	7,99 ±	4,86	6,44 ±	3,85	9,50 ±	3,78
Ranking	19,23 ±	14,18	16,31 ±	14,15	24,60 ±	15,09**	11,14 ±	8,89**	19,04 ±	14,30**	7,33 ±	5,20**

SA: Somatic Anxiety; Int: Intensity; Dir: Direccionality; CA: Cognitive Anxiety; SF: Self-Confidence; LFDA: Low Fat Diet Adherence; BMI: Body Mass Index, N: Number; * :p value <0.05; **:p value £0.01.

There are statistical significant differences on BMI between low fat diet adherence group 20.67 ± 2.81 and high fat diet adherence 21.85 ± 2.34 (p = 0.045, d =0.456) (see table 1).

Regarding the category sub16, the group below 16 had 5.48 ± 2.20 experience years and finished the regatta at 24.60 ± 15.09 average position in ranking, whereas the group over 16 had 7.99 ± 4.89 years of experience and an average ranking position of 11.14 ± 8.89, appearing significant differences within this results (p = 0.000, d =0.665 and p = 0.000, d =0.700 respectively) (see table 1). Among the same groups distribution, significant differences were found regarding somatic anxiety, sub16 group had 1.73 ± 0.62 and over16 group had 2.04 ± 0.63 (p = 0.033, d =0.495).

Significant differences were also found(p = 0.049, d =0.608) on cognitive anxiety between groups of different body weight, being higher within normal weight group (2.63 ± 0.66) than in overweight group (2.31 ± 0.29) (see table 1). The overweight group was ranked in average position of 7.33 ± 5.20, while normal weight group was ranked in 19.04 ± 14.30 (p = 0.001, d =1.088).

Table 2. Description and comparison of participants (continue).

	Laser 4.7 Boat Class (n=45)			Laser Radial Boat Class (n=22)			470 Boat Class (n=10)			N Training £ 2 (n=65)			N Training >2 (n=12)			Experience years £ 6 (n=29)			Experience years > 6 (n=48)			Middle and Botton Ranking (n=60)			Top Ranking (n=17)		
	Mean	±	SD	Mean	±	SD	Mean	±	SD	Mean	±	SD	Mean	±	SD	Mean	±	SD	Mean	±	SD	Mean	±	SD	Mean	±	SD
SA (INT)	1,90	±	0,70	1,84	±	0,50	1,87	±	0,62	1,84	±	0,65	2,06	±	0,50	1,75	±	0,57	1,95	±	0,66	1,86	±	0,68	1,92	±	0,48
SA (DIR)	0,13	±	0,94	0,08	±	0,87	-0,02	±	0,79	0,14	±	0,92	-0,11	±	0,75	0,16	±	0,89	0,06	±	0,90	0,04	±	0,89	0,29	±	0,93
CA (INT)	2,69	±	0,70	2,52	±	0,52	2,35	±	0,52	2,56	±	0,64	2,76	±	0,66	2,54	±	0,70	2,63	±	0,61	2,64	±	0,66	2,44	±	0,54
CA (DIR)	-0,24	±	1,05	-0,07	±	0,98	0,10	±	0,98	-0,10	±	1,02	-0,40	±	1,00	-0,05	±	0,92	-0,21	±	1,08	-0,24	±	0,99	0,17	±	1,07
SF (INT)	2,987	±	0,67	2,964	±	0,57	3,100	±	0,54	3,025	±	0,63	2,833	±	0,56	3,138	±	0,60	2,908	±	0,63	2,953	±	0,64	3,141	±	0,54
SF (DIR)	1,00	±	1,30	0,67	±	1,13	1,08	±	1,06	1,02	±	1,15	0,35	±	1,49	1,26	±	1,14	0,71	±	1,23	0,85	±	1,20	1,15	±	1,31
LFDA	5,13	±	1,79	5,50	±	1,57	4,20	±	1,48	5,05	±	1,76	5,50	±	1,45	5,03	±	1,94	5,17	±	1,59	5,08	±	1,73	5,24	±	1,71
Age	14,84	±	1,02	20,05	±	8,22	16,30	±	3,30	16,68	±	5,47	15,67	±	1,87	15,38	±	2,24	17,21	±	6,12	15,72	±	2,51	19,35	±	9,41
Weight	58,51	±	7,37	71,41	±	7,35	60,30	±	11,01	61,85	±	9,86	65,58	±	8,31	58,74	±	8,29*	64,66	±	9,86*	60,95	±	8,78*	67,65	±	11,13*
Height	169,51	±	8,04	176,20	±	6,76	172,30	±	8,62	171,64	±	7,81	172,58	±	10,54	170,45	±	7,08	172,59	±	8,81	170,99	±	8,19	174,59	±	7,93
BMI	20,35	±	2,12**[1]	23,05	±	2,57**[1,*2]	20,29	±	3,29*[2]	20,95	±	2,79	22,02	±	1,89	20,20	±	2,40*	21,67	±	2,72*	20,81	±	2,43	22,19	±	3,30
N Training	2,40	±	1,23	2,14	±	1,13	2,20	±	0,63	1,88	±	0,38	4,58	±	1,16	2,03	±	0,63	2,46	±	1,34	2,13	±	0,89	2,88	±	1,65
Expertise	5,83	±	2,46**[1]	9,55	±	5,25**[1]**[2]	4,20	±	2,10**[2]	6,65	±	4,21	6,83	±	1,47	3,57	±	1,37	8,56	±	3,74	5,96	±	2,56	9,24	±	6,27
Ranking	24,62	±	14,65	9,77	□	7,23	7,30	□	2,75	19,68	±	13,82*	9,75	±	13,42*	22,41	±	14,52*	15,54	±	13,41*	22,38	±	13,19	3,12	±	1,54

SA: Somatic Anxiety; Int: Intensity; Dir: Direccionality; CA: Cognitive Anxiety; SF: Self-Confidence; LFDA: Low Fat Diet Adherence; BMI: Body Mass Index, N: Number; * :p value <0.05; **:p value £0.01; [1]: Differences beetwen Laser 4.7 Boat class and Laser Radial Boat Class; [2]: Differences beetwen 470 Boat class and Laser Radial Boat Class.

In relation to sailors from different boat classes, there are significant differences on BMI and Experience between sailors from Laser 4.7 that had 20.35 ± 2.12 BIM and 5.83 ± 2.46 experience years and sailors from Laser Radial that had 23.05 ± 2.57 BMI and 9.55 ± 5.25 years of experience (p = 0.000, d =1.146 and p = 0.000, d =0.907 respectively) (see table 2). The same statistical differences were found between sailors of Laser Radial and 470, sailors from 470 boat had 20.29 ± 3.29 BIM and 4.20 ± 2.10 experience years (p = 0.010, d =0.934 and p = 0.000, d =1.338 respectively).

The group that trained 2 or less times per week, got an average ranking position of 19.68 ± 13.82, while the sailors who trained more than 2 days per week, got an average ranking of 9.73 ± 13.42, being statistically significant those differences (p = 0.025, d =0.728) (see table 2).

Sailors with more than 6 experience years had a higher weight and BMI (64.66 ± 9.86 kg and 21.67 ± 2.72 BMI) than sailor with 6 or less years of experience (58.74 ± 8.29 kg and 20.20 ± 2.40 BMI), being statistically significant those differences (p = 0.009, d =0.649 and p = 0.018, d =0.573 respectively). Besides, the most experienced group was ranked on a averaged position of 15.54 ± 13.41 while less experienced group got an average of 22.41 ± 14.52 position (p = 0.038, d =0.491) (see table 2).

Sailors that got a position of middle and bottom ranking had an average weight of 60.95 ± 8.78 kg, while top ranking sailors had 67.65 ± 11.13 kg average (p = 0.011, d =0.668) (see table 2).

In order to investigate the relation between cognitive anxiety, fat diet adherence, expertise level and body composition variables, a correlation analysis was carried out. There is a positive correlation between low fat diet adherence and sailor´s BMI (r = .280; p = .014). A negative correlation was found between cognitive anxiety (int) and weight (r = -.218; p = .046) and a positive correlation between weight and cognitive anxiety (dir) (r = .205; p = .044). There is a positive correlation between Age and BMI (r = .357; p = .001) and a negative correlation between Age and Ranking position (r = .280; p = .014). Regarding the BMI, a positive correlation with expertise level (r = .369; p = .001) and with ranking position (r = .388; p = .000) had been found. Finally, the ranking position shows a positive correlation with number of training days per week (r = .256; p = .025) and with expertise level (r = .334; p = .003).

Discussion

Sailors with the largest adherence to low fat diet have high value of BMI, within normal weight parameters. A higher weight, within normal weight values, provides sailors with advantages on sailing situations with medium and strong wind condition, because when the boat is horizontal (flat) in relation to the water, less friction and higher performance sailors will get (Sprada et al., 2007); being the weight of sailors and their ability to performance and maintain the hiking position the only way to resist the strength that wind applies on the sail (Castagna & Brisswalter, 2007).

Sailors below 16 have a lower level of anxiety focused on competitive stress. This is related to the performance expected. Sailors over 16 experience a higher pressure, on the part of coaches and family, because they expect a higher performance form them in relation to younger sailors. On the other hand, they are close to the professional ages and it can affect to their anxiety level and their self-demand.

Overweight sailors show a CA lower level of intensity, related to negative thinking about how to cope with the competition. It can be influenced by two factors. The first one is related to sailor's performance expectations; an overweight sailor does not have the same expectations as one who is in an optimum competition weight, since in most of sailing conditions his or her boat will get a lower performance, therefore his or her anxiety towards competition results is lower. The second factor is related to wind conditions present during this research was carried out; medium and strong wind conditions (between 20 and 35 km/h or 12 to 18 knots). Overweight sailors have the advantage of resisting wind strength more easily, decreasing effort perception, both, physical and psychologically. On the contrary, lower weight sailors show an important handicap towards this issue, before starting the regatta, since they know it will be a conditioning factor.

There is a correlation between body weight and anxiety towards achieving a higher performance. Sailors with a higher weight usually show a handicap in almost all wind conditions, however, with strong wind conditions they show the advantage of their weight, as mentioned above, therefore, they find their opportunity to get good results. In this sense, they increase their anxiety directionality towards activation, in order to take advantage of this situation. Some studies presented that athletes consider positive certain anxiety levels for performance, according to the directionality of anxiety and psychophysiological arousal (Englert & Bertrams, 2012; Hill & Shaw, 2013; Papacosta, Nassis & Gleeson, 2016). Top raking athletes in other sports presented higher self-ratings of cognitive anxiety in the morning of the competition, increasing cortisol levels without negative consequences at performance. For this reason, evaluation and control of anxiety levels in athletes is important.

At sailing, as in any team sport, it seems there is no difference at ranking position in SA or CA and SC (Milavic, Jurko & Grgantov, 2013). Regarding body mass composition, Laser Radial sailors have a higher BMI than Laser 4.7 and 470 sailors. This difference appears due to the fact that Laser Radial is a single handle?? Boat, which requires a higher physical performance on the part of the sailor, since its sail surfa-

ce is larger than in laser 4.7. Moreover, there is only one sailor while in 470 there are two sailors. There is also a difference in relation to expertise level. Before sailing Laser Radial sailors might have previously sailed a minor boat as 4.7 or a double handle boat as 470. It can be stated that Laser Radial sailors were previously laser 4.7 sailors.

Sailors who train twice or more a week are those who get a higher performance, getting a top position in ranking. At sailing, as any other sport, expertise defines performance level, the higher number of experiences, the better response sailor will be able to have during a regatta and, therefore, there is a higher probability of getting good results. In the case of sailing, training usually takes place at weekend, thus, training during week days is scarce, without taking into account training days when climate conditions are not adequate for training practice. Due to those factors, sailors who train during week days make a great difference in opposition to those who only train at weekends, since the former can double experience and level of training hours in short periods. If there is an interest at increasing sailors' performance, they should train during week days.

More experienced sailors (6 or more years of sailing) have a higher weight and BMI, due to their age and boat demands, since they sail Laser Radial. They also get a greater performance during the race. Therefore, more experienced sailors get a better ranking position. This fact is linked to the above mentioned information, sailors are more experienced, they have performed more training sessions and have lived more experiences.

Top ranking sailors have a greater BMI. As it has already been mentioned, strong wind applies a great strength over sails and, therefore, when sailors have a greater BMI, it will be easier for them to resist those wind conditions, sailing in a flat position (horizontal) and, consequently, a greater performance (Sprada et al., 2007).

Related to limitations, there is a need to value body composition using kinanthropometry or densitometry. Indeed, for future investigation, the possibility to include evaluations of diet-nutritional strategies of sailors during training days and competitions will be considered. Moreover, how sailors increase or decrease their weight to obtain advantages over their boat category will be studied; as in other sport, it can involve different diet strategy.

In conclusion, low fat Mediterranean diet does not seem to condition competitive anxiety among young sailors. Performance at sailing could be mainly affected by body weight, related to wind conditions and other parameters for training, such as frequency or experience. Nutritional education programs will be especially important for young sailors, because a greater dietary knowledge seems to be related to healthier eating habits and furthermore, it helps to reach optimal body composition.

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STROBE Statement—Checklist of items that should be included in reports of ***cross-sectional studies. V***: Consider or present; ***x***: No, not necessary or not relevant.

	Item No	Recommendation	
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	*V*
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	*V*
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	*V*
Objectives	3	State specific objectives, including any prespecified hypotheses	*V*
Methods			
Study design	4	Present key elements of study design early in the paper	*V*
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	*V*
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	*V*
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	*V*
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	*V*
Bias	9	Describe any efforts to address potential sources of bias	*V*
Study size	10	Explain how the study size was arrived at	*V*
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	*V*
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	*V*
		(*b*) Describe any methods used to examine subgroups and interactions	*V*
		(*c*) Explain how missing data were addressed	*x*
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	*V*
		(*e*) Describe any sensitivity analyses	*V*
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	*V*
		(b) Give reasons for non-participation at each stage	*x*
		(c) Consider use of a flow diagram	*x*
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	*V*
		(b) Indicate number of participants with missing data for each variable of interest	*x*
Outcome data	15*	Report numbers of outcome events or summary measures	*V*
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	*V*
		(*b*) Report category boundaries when continuous variables were categorized	*V*
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	*x*
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	*V*
Discussion			
Key results	18	Summarise key results with reference to study objectives	*V*

	Item No	Recommendation	
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	*V*
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	*V*
Generalisability	21	Discuss the generalisability (external validity) of the study results	*V*
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	*V*

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.