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Importance of use external hearth rate monitor in popular racing population

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Abstract

Background: Healthy lifestyle habits more to combat the sedentary lifestyle, results in the increase in the practice of physical activity (PA) in the current population. In the past 10 years, sports racing achieved its greatest exponent; meanwhile there is a lack of cardiovascular monitoring by the participants. The aim of this study is to know the perception of the importance of cardiovascular risk control during workouts and popular races.

Methodology: A cross-sectional epidemiological study was developed, through an "ad hoc" questionnaire in a sample of 380 non-professional runners who took part in Donostia half marathon in the last month of 2017.

Result: The use of the heart rate monitor is predominant in 63% of the runners, and 68% never controls their pulse before training. In relation to the importance of the use of the heart rate monitor to run, 30.4% considers it nothing important. The type of technique or device used for monitoring heart rate 57.1% is controlled by breathing and 36.6% by mobile applications.

Conclusion: There is a discrepancy between the perception of the cardiovascular risk factors control expressed by participants, and the lack of cardiovascular monitoring, prior to and during the race training.

Keywords: Runners, Injuries, Amateurs, Heart rate, Cardiovascular risk

Introduction

Running popularization is reflected in the large number of popular races held throughout the world (Aschmann et al, 2018). More than two million people run daily in Spain (Ministry ot Education, Culture and Sport,2017), and the great number of fans targeting

this type of physical activity (PA) is a way to combat the sedentary lifestyle that presents the population in general. This trend in the increase of people who frequently run and participate in sporting events linked to the running, either in racing on foot from short, medium or long distance increases exponentially every year in European countries (Krawczyk & Wilamowski, 2017). People engaged in running routinely have lower risk of death from heart disease (Lee et al,2017), memory improvement, socialization, self-esteem and encourages increased; and other aspects as the purely physical showing (10). However, to our knowledge there are no studies that deepen on the self-perception of the importance of these controls in non-professional runners.

From the point of view of health prevention, the promotion of strategies that allow minimizing the risks of individual and community, justifies preventive activities. Therefore, this work adheres to the initiatives of prevention of cardiovascular risk in the population, specifically non-professional individuals who participate in popular careers and lack of a prior medical examination, together with the absence of a optimal cardiovascular control linked to the world of running. The objective of this study was to know the perception of the importance of the use of cardiac monitoring in runners of popular races, and learn about methods of control of cardiovascular risk.

Data and Methods:

A cross-sectional epidemiological study was made through an Ad Hoc questionnaire. The questionnaire consisted of several parts, a first that included socio-demographic variables and a second on training, cardiovascular control and participants lifestyle habits. The sample was obtained from participants in the half marathon of Donostia, held by the October of 2017. Data collection took place during the two months following the race through auto-completing the through questionnaire survey online in Google Doc. The size of the total population was 15,000 registered subjects. The calculated was performed using the equation: n = [EDFF * Np (1-p)] / [(d2/Z21-α/2 * (N-1) + p *(1-p))]; for a CI = 95%, SD = 5% and a Z score = 1.96, Error of estimate of 50%. The necessary sample size was 375. A total of 500 surveys were sent through the coordination of the event electronically to the post selected randomly. It is obtained a rate response of 76% (380 surveys).

Contact with runners was conducted through their corresponding e-mails and a letter; they were invited to participate and explained the main features and objectives of the study, together with the annex of the informed consent document. All the documentation was registered in the Health Science department.

Reliability and construct of the instrument, the Kaiser - Meyer - Olkin test was performed. A non-parametric test, the test was used for statistical contrast U Mann - Whitney, while to study the perceptions of the importance of the use of the heart rate monitor was carried out tests of normality and bivariate contingency tables analysis with the statistical package SSPSS 21.

All the participants were informed of the study objectives and we ensured the anonymity and confidentiality of the data, as well as voluntary participation.

Results

The total sample size was 380 runners. A 59.7% were men and 38.9% women; the average age of the males of 35.2 (D. T = 9.3) and females of 32.9 (D. T = 8.8) years. The average height of men was 169.4m (D. T = 22.9) and 171.9m women (D. T = 18.1); the weight average men of 67.3Kg (D. T = 12.9) and an index of muscle mass (IMC) of 22.5 and the women of 68.56 Kg (D. T = 13.15) with a BMI of 22.7.

In relation to data on smoking habits, a 76.8% declared non-smoked, and a 21.2% declared smoking occasionally. Also, a 45.8% stated have not consumed alcohol in the past month, a 29.7% only the weekend, a 16.8% occasionally. With respect to the routine of training or preparation for the race, 98.2% of respondents referred to run on a regular basis from which 50% of men and 48% women.

On terms of the age of their practice, 60.4% of runners wore doing running more than one year. As to participation in popular races it was noted that the majority of this population,

declared having participated in various sporting events of this type in the past year, still the most frequent between 2-4 popular races / year for both sexes. Distance traveled while you go running, 46.6% of the women performed an average of 5-9 km away, while 43.8% of men said to be between 10 - 14 km. The importance's of the views concerning the cardiovascular control are shown in table 2.

Importance of the use of the heart rate monitor for jogging: 30.4% of the runners said nothing important, compared to the 6.9% stated as an extremely important tool. The use of the heart rate monitor in popular races a 63%, compared with 13.3% that said use it always, with a higher frequency in male gender.

These figures were increased in longer distance races, like the half marathons a, registering use 21.8% of the participants. It was found that 68.5% of the runners never control your heart rate before the training and only 5.1% in addition, measured their heart race

Table 1. Training Routine

Variables		Total		Mens		Womens	
		N	%	N	%	N	%
Regular runner		373	98.2	223	98.2	145	98
Days of week of training	1	9	2.4	6	2.6	3	2
	2	26	6.8	19	8.4	7	4.7
	3	143	37.6	77	3.,9	62	41.9
	4-5	186	48.9	114	50.2	71	48
	6-7	16	4.2	11	4.8	5	3.4
Since you've been running	1-6 months	8	2.1	6	2.6	2	1.4
	6-12 months	79	20.8	54	23.8	23	15.5
	1-2 years	124	32.6	63	27.8	60	40.5
	2-5 years	116	30.5	72	31.7	43	29.1
	>de 5 years	53	13.9	32	14.1	20	13.5
At what speed it runs	< 4 min/km	8	2.8	8	4.8	0	0
	4-4min/km	87	31	51	30.9	36	32.1
	5-5mn/59sc	110	39.1	57	34.5	51	45.5
	6-6mn/59sc	62	22.1	39	23.6	21	18.8
	>7 min/km	14	5	10	6.1	4	3.6
Participation popular races in the last year	1-2 time	43	11.6	28	12.7	15	10.3
	2-4 time	188	50.7	103	46.8	81	55.5
	5-6 time	94	25.3	55	25	38	26
	6-10 time	39	10.5	28	12.7	11	7.5
	None	7	1.9	6	2.7	1	0.7
Distance most frequently made on popular race	1-4 km	3	0.8	2	0.9	1	0.7
	5-9 km	169	45.4	97	43.9	68	46.6
	10-14 km	163	43.8	101	45.7	61	41.8
	15-20 km	1	0.3	1	0.5	0	0
	21 km	36	9.7	20	9	16	11

(HR) at the end of training. The type of device used for the monitoring of

Table 2. Perception of the importance of using the heart rate monitor and cardiovascular risk control

Variables		Total		Men		Women	
		N=376	%	N=225	%	N=146	%
Heart race monitoring Importance for running	Extremely important	26	6.9	21	9.3	5	3.4
	Very important	92	24.3	51	22.6	40	27.2
	Some important	81	21.4	50	22.1	30	20.4
	Not so important	64	16.9	35	15.5	27	18.4
	Nothing important	115	30.4	69	30.5	45	30.6
Using heart rate monitor in popular races	Always	43	13.3	32	16.6	11	8.7
	Often	21	6.5	12	6.2	9	7.1
	Sometimes	16	4.9	11	5.7	5	4
	Rarely	40	12.3	24	12.4	15	11.9
	Never	204	63	114	59.1	86	68.3
Used of heart rate monitor on half marathon	Always	81	21.8	54	24.5	27	18.5
	Often	21	5.7	12	5.5	9	6.2
	Sometimes	13	3.5	9	4.1	4	2.7
	Rarely	33	8.9	22	10	10	6.8
	Never	223	60.1	123	55.9	96	65.8
Alternative system to use of heart rate monitor	Speedometer	9	2.4	6	2.7	3	2
	Mobile App	135	36.6	71	31.8	64	44.1
	Feeling	11	2.9	2	0.9	9	6.2
	Breething	210	57.1	141	63.2	69	47.6
	Cardiógrafo	3	0.8	3	1.35	0	-
Pulse control before training	Never	241	68.5	143	67.8	93	68.4
	While I run	34	9.7	24	11.4	10	7.4
	Before and after	37	10.5	21	10	16	11.8
	Only befor	22	6.3	10	4.7	12	8.8
	Only after	18	5.1	13	6.2	5	3.7
Degree of importance test effort	Extremely important	28	7.4	24	10.7	4	2.7
	Very important	132	35.1	76	33.8	54	37
	Some important	112	29.8	60	26.7	51	34.9
	No so important	45	12.2	27	12	18	12.3
	Nothing important	58	15.4	38	16.9	19	13
Have you performed a pre-effort testing before practice exercise	Yes	58	15.3	38	16.9	20	13
	No	318					

HR as substitute for the heart rate monitor, a 57.1% reflected controlled by breathing, followed by 36.6% mobile applications (APPS) or watches with GPS (36.6%).

Degree of importance of the performed a pre-effor testing of prior to be launched to PA a 64.9% considered it important or very important, compared with 29.8% somewhat important or anything important. As to the question that the runner explores whether it was subjected to any stress test prior to practice AF 15.3% responded in affirmative way compared to 84.7% who did not do it. Table 3.

Discussion

The studies have shown that there are differences in the training on runners routine according to sex (Sánchez & Milena,2015) and (Neilan et al, 2016) male participants were mostly recorded in sporting events. However, in the sample studied difference was found, although it has attracted the attention of the large proportion of women runners who reported having participated in this type of event in the past year; similar behavior has occurred in the last 10 years with the significant increase of the female figure in this type of sport activities (Ghaseminezhad 2011), only in the Spanish territory there were over seven thousand events linked to long and short races distance (Salgado-Barandela et al,2017), pointing out the tide rose - Madrid marathon that brought together more than 35,000 runners as exponent of this type of event (Reglamento Carrera de la Mujer de Madrid,2018).

According to the European society of Cardiology, it is recommended that the entire population, especially over 35 years, prior to starting a program of AP, know their cardiovascular status. We recommend carrying out a self-assessment, through a self-administered questionnaire, depending on their previous sports status and the intensity of his practice. In cases of moderate risk, when he is practiced exercise of high intensity, as well as in cases of high risk, is recommended to perform medical evaluations more thorough (Schwellnus,2017). The findings of this study confirm that some brokers are well aware of the importance of cardiovascular control, is collected in the questions related to the importance of monitoring during the race or the realization of a stress test prior. However, most of the sample does not give sufficient importance to these requirements.

New technologies have enabled the advance of mobile devices, apps where the user can take better control of their workout routines (Kheirkhahan, et al,2016; Revenäs et al, 2016; Hamagami et al, 2018), in this sample, the vast majority used external devices like mobile apps for measuring routines training and heart race, but the use of this tools not direct does not have a comprehensive or objective control of heart race, above all in those individuals who are at increased risk of cardiovascular death associated with a runner fatigue (Dallinga et al, 2018). Many participants considered that subjective physical activity monitoring involves a minimization of risk, through the sensation, increased respiratory rate (Schwellnus et al, 2018), or others. There is scientific evidence that justifies this kind of self-control, but it may be an indication of interest from runners regarding their health care.

The use of mobile devices, uses that value runner perception through emoticons, has become popular in recent years and in an indirect way, may be an important information tool for own runners to collect the evolution of your workouts such as distances, times (Muntaner-Mas et al, 2019 and Peake et al, 2018).

The use of the heart rate monitor has proven to be a reliable and effective tool in the prevention of cardiovascular risk in runners not professionals, (Jansen et al, 2015) where worked as a sieve for detecting important elements to consider before starting a routine of exercise of medium-high impact, such as running a marathon or a media-marathon. Through its use, aims to raise awareness, inform and provide the necessary tools to the runners that allows them to create tools for self -management as the basal and prior knowledge of their cardiac status and monitoring intra-race, that allows them to work in a range of speed and optimal intensity, not only in relation to the type of career, training or competition that takes place, but also in relation to the performance of each level (high, medium, low, or induction) and goals (Puri et al, 2017). In this way, it allows to empower this

figure of athletes in their own auto care.

Conclusion

This study has shown that there is a discrepancy between the cardiovascular control risk perception expressed by participants, and the lack of prior cardiovascular monitoring and during the race. Participants attach great importance to intra-race monitoring and the prior stress test and however it is noted the lack of realization of this procedure. The use of the heart rate monitor is considered unimportant among non-professional runners and is not used on a regular basis during the workout routines, or in races.

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