

DIFFERENCES IN CIRCADIAN HABITS OF BOXERS IN CONTEXT OF COMPETITIVE AND NON-COMPETITIVE PERFORMANCE

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Abstract: *In the paper is presented a study relating to the circadian preferences in boxers in Czech Republic. It was interviewed in total 50 boxers to exploration investigation. To the analysis of circadian regime were used only complete and well filled out questionnaires. There were analysed data of 20 hobby boxers and of 6 boxers-competitors. The statistics analysis showed that sleep habits in these two samples of boxers are not significantly different. A significant difference was demonstrated during sleep, when boxers-competitors had problems to fall asleep and needed longer time to fall asleep compared to the sample of the hobby boxers. Another interesting result is negative influence on the quality of sleep due using of computers or other displays in both samples of boxers. Research has clearly shown that the more time spent on computer equipment of the boxer, it is guiding to worse quality of sleep. In the study also eating habits were analysed. The significant difference between the investigated samples of boxers was found in milk consumption when in hobby boxers milk consumption is significantly higher than in boxers-competitors.*

Keywords: *Boxers, competitive and non-competitive sport orientation, circadian preferences, lifestyle.*

1 INTRODUCTION

Box ranks among individual combat sports. From the perspective of sport psychology it presents an anticipatory kind of sport. Concerning that, it can be characterised, that box is the fight of two rivals trying to beat each other through muscular strength, blows, technical, tactical activities and skills according to the rules. Rivals try to use a large amount of very hard and fast properly supervised simple and complex operations of offensive, defensive shots, combination of shots, evasion and dodging, etc. Box, like every other kind of sport is physically demanding activity, with the aliphatic character and takes great demands on neuromuscular coordination.

But in nowadays box presents not only a kind of fighting sport with competitive character, as everybody knows. In nowadays box has a very wide range of fitness applications, for example as a part of weight reduction programs and it is called "Hobby box" or "Fit box" when there is

realising regular training practice to reduce fat, increase fitness and comprehensive strengthening. Everybody can decide which kind of box he chooses. If he/she takes box as a fitness training like a hobby boxer, or if will regularly train and get into the fights as a boxer-competitor, it means as a boxer-fighter.

Box is full-contact kind of sport. Athlete, who wants to be successful in the box, should have the following characteristics: endurance, speed, stamina, strength, and should be mentally strong.

Special part of box is talent. It can be defined according Hošek in follow. Many assumptions to sport are genetically determined. Only on them followed a systematic practice and without this foundation a top performance in a sport is usually unattainable. Therefore, talent is analysed in research, therefore such high interest about talent generally. But, just have such talent, it may does not mean that the athlete filled the stellar career. There are many athletes, who do not have the top talent, but they replace it with

tremendous toil, talent when de facto beat it due hard work in training and in match (Hošek 2010).

2 OBJECTIVES AND HYPOTHESES

The main objective of the study is to realise the analysing of circadian habits in male boxers, particularly in the area of sleep quality. Next objective is analysing of differences in context of competitive and non-competitive performance in box.

Hypotheses:

H1: In the length of sleep will be analysed no significant difference between the sample of boxers-fighters and the sample of hobby boxers.

H2: The longer staying up over midnight of boxer by computers and displays, the worse quality of sleep, regardless it is a hobby boxer or a boxer-fighter.

3 METHODS

3.1 Material and procedure

The research was realised in 50 male boxers, in the age range of 20-35 years, with an average age of 27 years. 25 of the boxers were hobby boxers who train hard and regularly, but do not participate in competitions in boxing, as well as 25 boxers-fighters. Box base in the Czech Republic is not so big, as in other sports (for example football, ice-hockey, etc.). Therefore it was selected 50 male boxers. Unfortunately, quite high number of respondents returned questionnaires, which were not complete, lost their predictive value, and had to be discarded. To the data analyses were used only complete and well filled out questionnaires of 20 hobby boxers and only of 6 boxers-fighters, in the age range 25-35 years, with an average age of 29 years. Data acquisition and subsequent analysis was conducted in 2015.

3.2 Methods

- *Questionnaire of Circadian Typology "CIT" for adults (Harada, Krejčí - Czech version, 2010).*

The questionnaire consists of five parts. The questionnaire is very extensive and includes 100 questions. From the perspective of the present research study, it was crucial possibility to be analysed questions on M - E score, questions on mental health (anger and depression), and meals contents and the whole issue of sleep time spent on computers and similar devices and its effects on sleep quality.

- *Statistics*
Statistical analyses was provided in Japanese workplace, in the Laboratory of Environmental Physiology of Kochi University, on the base of SPSS program, with using Kruscal-Wallis test, Fisher's exact test and U-test.

4 RESULTS AND DISCUSSION

The results presented in the Figure 1 present difficulties with falling asleep. The Figure 1 clearly shows that the sample of boxers-fighters has troubles of falling asleep. The observed difference in troubles of falling asleep between the sample of hobby boxers and boxers-fighters is significant ($p = 0.006$). This result is inconsistent with the hypothesis H1. Significant difference between the investigated samples of boxers in the difficulty in getting to sleep can be explained by a higher training load of the boxers-fighters associated with muscle soreness. Then the boxers-fighters training occur in the later evening hours than the training of the hobby boxers, which may have an adverse impact on sleep. Finally, the poor quality of sleep is due the mental stress of the expected matches that are associated with fear of failure and fear of injury, which are in boxers-fighters, unfortunately, quite common. The hobby boxer is not facing to that, so

probably therefore the quality of sleep in hobby boxers is significantly better than in

boxers-fighters.

Figure 1 Difficulties with asleep in samples of hobby boxers and boxers - fighters
(N= 26, 20 hobby boxers; 6 boxers – fighters)



Figure 2 Milk consumption in samples of hobby boxers and boxers-fighters
(N= 26, 20 hobby boxers; 6 boxers – fighters)

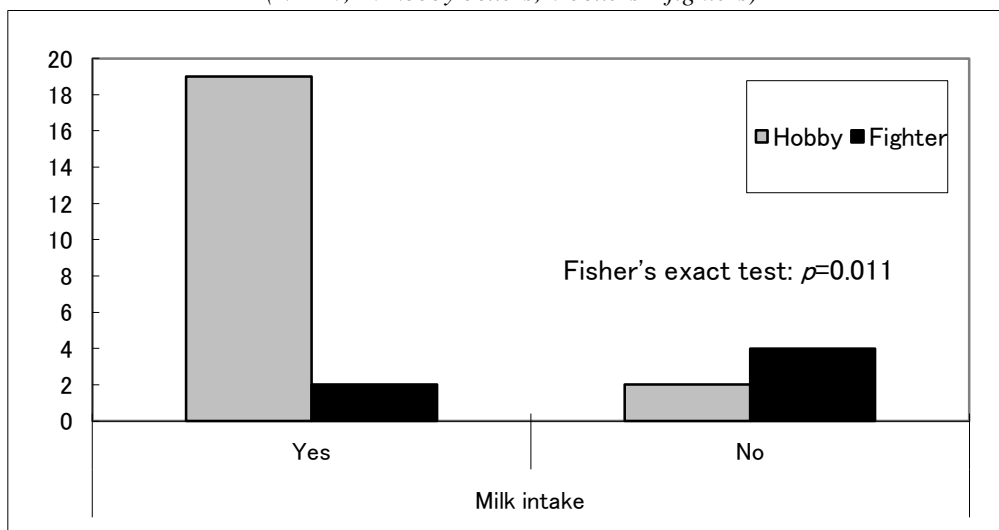


Figure 2 shows the use of milk in the diet of investigated boxers. The Figure 2 shows that from the 20 hobby boxers just 18 are drinking milk and only 2 do not. In contrast, from the 4 boxers-fighters drink milk 2 boxers only. This difference between the examined samples is

significant ($p = 0.001$). This phenomenon is difficult to explain because it was predictable that boxers-fighters will drink milk as much or perhaps more than hobby boxers. This phenomenon might deserve further exploration for athletes in the Czech Republic. Research

focused on milk consumption of sportsmen in relation to the optimization of circadian rhythms deals currently working in Japan Kochi University headed by Professor Harada (Harada et al. 2013-2015). Results of the scientific research team of Professor Harada show that tryptophan intake at breakfast has been known to be effective on promoting better mental health and morning-typed life

through serotonin and melatonin synthesis. For Japanese students, milk seems to be an important resource for taking tryptophan at breakfast because of limited meal time in the morning. Taking milk at breakfast might be effective to the promote serotonin synthesis in the morning which could improve mental health directly and become “inner zeitgeber” for circadian clocks.

Figure 3 *The influence of sleep quality from the view of computer using in boxers (N= 26, 20 hobby boxers; 6 boxers –fighters)*

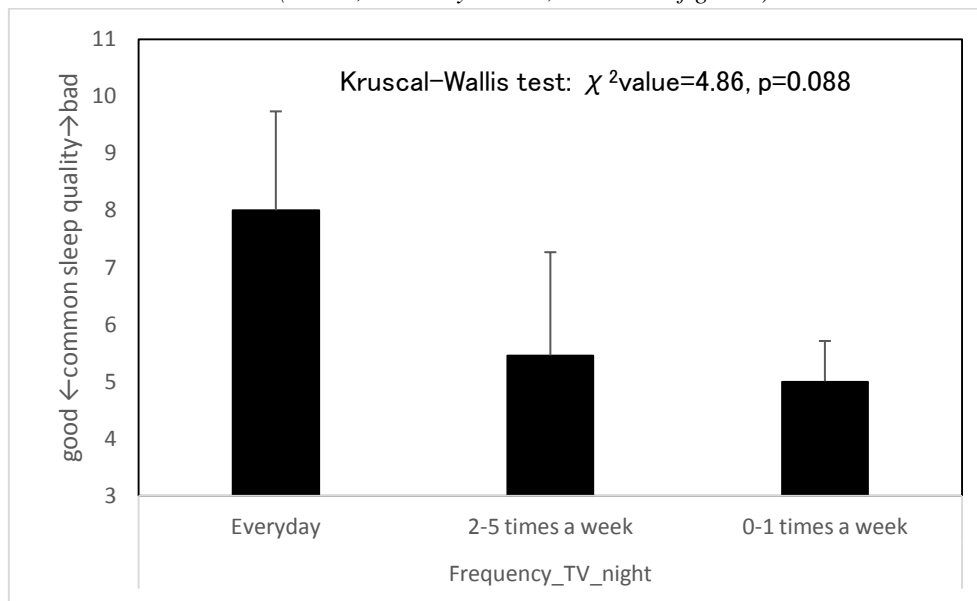


Figure 3 clearly shows: longer using of displays such as computers, the sleep quality is lower regardless it is a hobby boxer or a boxer-fighter. The results are significant at the significance level of $p = 0.08$. The results confirm the Hypothesis H2.

It is necessary to say that unfortunately in nowadays work with these IT is so geared, that for athletes are not able to be protected, to defend self. In this question, it was not specified whether it is about computer, tablet, television, etc., it was clarified IT with screen blue lights producing only. The results correspond with findings from previous studies in young athletes (Harada, Krejčí, Wada). As follows from the results of this study are similar correlations in adult athletes in the age range 25-35 years.

Figure 4 shows the length of time of asleep in minutes. From the Figure 4 is clear the fact that boxers-fighters need longer time to asleep. It presents significantly longer time to fall asleep in boxers-fighters comparing to the sample of hobby boxers.

Finally, Figure 5 confirms significantly worse sleep quality in a group of boxers-fighters comparing to the sample of hobby boxers.

As it was already discussed, this negative trend may affect the intensity of training, it can also be nervousness from the expecting match in the boxers-fighters. A large share of it may also be, for example, adjusting the weight, which may represent adjustments as well as weight 10-15 kg per month, which in our opinion has a big negative impact on the psyche and on the problem with falling asleep.

Again we stress, that this problematics would deserve a more detailed scientific research. However, scientific studies regarding sleep and diet boxers, are published in current Czech and foreign literature very rarely. This is important for psychological state and mental health. Just the fact that filling out lengthy questionnaires

managed in high quality hobby boxers in higher percentage compared to boxers-fighters may indicate poorer ability to concentrate, and increased confusion in the sample of boxers-fighters. Share it may be blows to the head and head injuries, which occur in competitive box.

Figure 4 Length of time to fall asleep in minutes in hobby boxers and boxers-fighters
(N= 26, 20 hobby boxers; 6 boxers – fighters)

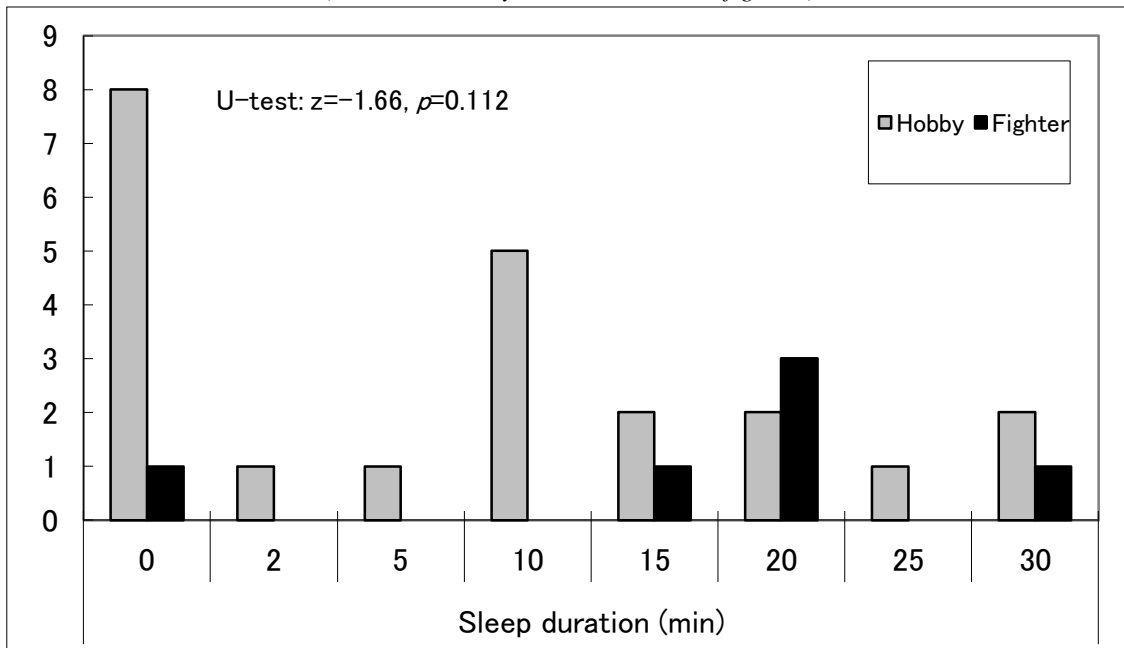


Figure 5 Displaying of sleep quality in hobby boxers and boxers-fighters
(N= 26, 20 hobby boxers; 6 boxers – fighters)

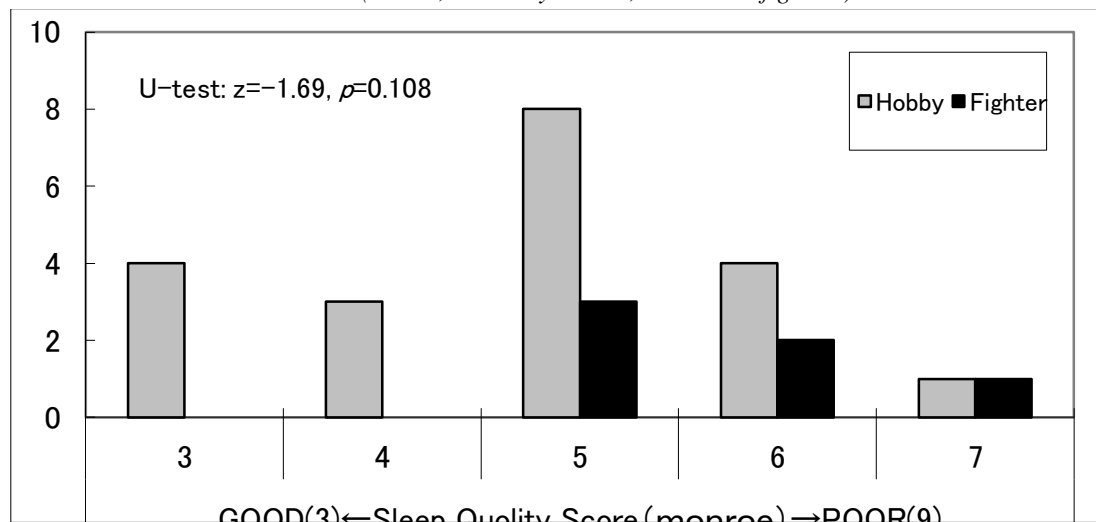


Figure 6 Analysis of M - E score in samples of hobby boxers and boxers-fighters
(N= 26, 20 hobby boxers; 6 boxers – fighters)

Note: M – Morning type; E – Evening type

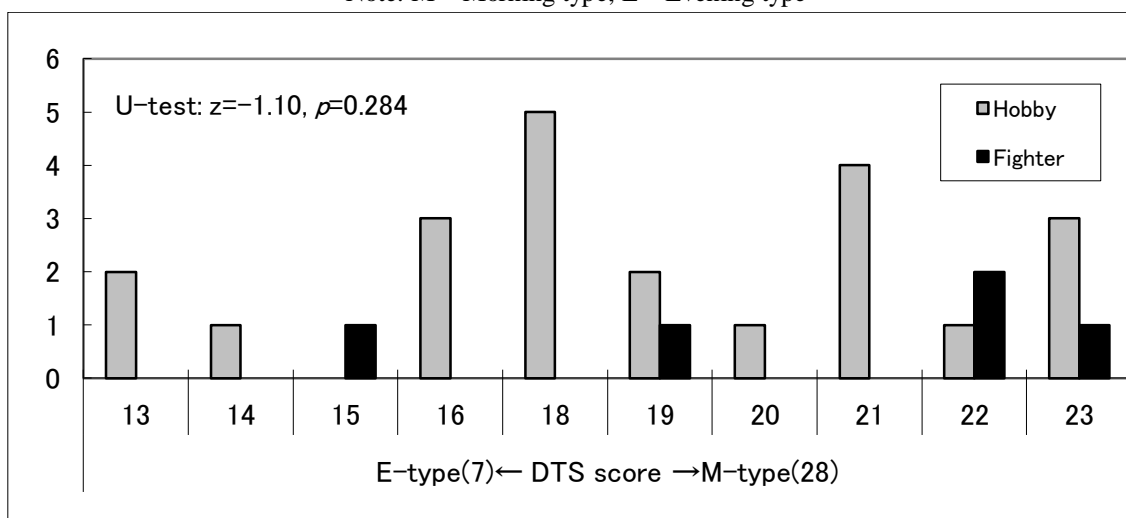


Figure 6 shows ME score in the investigated samples of hobby boxers and boxers-fighters. There was not detected the significant difference between boxers-fighters and hobby boxers. Figure 6 shows more predominant trend toward morning-type M, which is generally positive finding. It can be said that regular training practice of athletes leads to the desired circadian rhythms of sleep and wakefulness.

5 CONCLUSIONS

The goal of the present research study has been realised. The Hypothesis H1: “In the length of sleep will be analysed no significant difference between the sample of boxers-fighters and the sample of hobby boxers” was not confirmed.

Hypothesis H2: “H2: The longer staying up over midnight of boxer by computers and displays, the worse quality of sleep, regardless it is a hobby boxer or a boxer-fighter” has been confirmed.

The research had the appropriate level. As the lack of this study, it can be considered only a minor amount of boxers-fighters comparing to the sample of hobby boxers. The reasons that led to this situation have been explained. It expressed here an inability to fill and complete properly the long questionnaire, which has

mastered in high quality higher percentage of hobby boxers compared to the boxers-fighters.

Quite surprising it seems the less quality sleep in boxers-fighters. Boxer-fighter is exposed to higher stress than a hobby boxer. Also frequent use of computers or other IT devices with blue lights screen over the midnight leading to the worse quality and length of sleep in hobby boxers and in boxers-fighters as well. In contrast, hobby boxers are sleeping significantly better compared to boxers-fighters, and it is not just about the length of sleep but also about the speed of falling asleep. The whole problematic deserves further continuation of research. It is necessary to say, that to this topic of boxers still nobody regularly dealt with in the Czech Republic or abroad.

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