Characterization of sleep quality in Brazilian Jiu-Jitsu fighters

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ABSTRACT

Introduction: Sleep quality can positively or negatively influence the physical performance of Brazilian Jiu-Jitsu fighters; however, the literature does not indicate whether the sleep quality of these fighters is good or poor. Objective: Characterization of the sleep quality of Brazilian Jiu-Jitsu (BJJ) fighters, stratifying by weight category and color belts. Material and Methods: A descriptive study that featured 175 BJJ fighters, the Pittsburgh Sleep Quality Index (PSQI) was applied to assess sleep quality. Mean, standard deviation and 95% confidence interval of mean were used to characterize the data. Results: All groups, regardless of weight category or color rank, were classified as poor sleepers (PSQI=5), which indicates a low sleep quality. Conclusion: The sleep of BJJ fighters is characterized as poor, which may indicate negative outcomes in technical and physical performance.

Keywords: Sports; Sleep; Performance Tests.

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INTRODUCTION

Brazilian Jiu-Jitsu (BJJ) is a combat sport that is organized by weight categories and color belts. The aim in its practice is to defeat the opponent through submission, using specific techniques such as joint keys, strangles and immobilizations. For these techniques to be applied there is a need for high levels of strength and power, thus promoting benefits to performance in this sport.

It is known that sports performance can be influenced by both, positive or negative sleep quality of the athlete. The literature indicates that in athletes who modify some sleep-related factors, such as sleep duration, temperature and room brightness, they promote better sleep quality and, consequently, better sports performance.

However, poor sleep leads to less sleep quality, thus affecting aspects such as strength, power, attention and levels of strength and power. For these techniques to be applied there is a need for high levels of strength and power, thus promoting benefits to performance in this sport.

By stratifying BJJ fighters by weight category, we have the total number of participants in this study was 175 BJJ fighters of all color belts. The mean age was 30.6 ± 7.5 years, mean body mass 84.8 ± 14.7 kg, the mean trainings per week 4.5 ± 2.6 times, and training duration 88.8 ± 27.4 min. All participants were training continuously for at least 6 months.

All fighters were invited to their training center. After receiving an initial explanation, and giving their informed consent through the free and informed consent form, the fighters responded to the instrument privately, 30 minutes before the training and without interruption. All fighters were without exercise for 48 hours before answering the questionnaire.

This research was approved by the Human Research Ethics Committee of Vale do Acaraú State University with the number 3.095.508.

Pittsburgh Sleep Quality Index

To assess the subjective sleep quality, the Pittsburgh Sleep Quality Index (PSQI) developed by Buysse et al. and validated for Brazil later by Bertolazi et al. was used. PSQI consists of 19 items, which are divided into seven subscales: sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medication, and daytime dysfunction, each subscale can range from 0 to 3 scores. PSQI total scores can range from 0 to 21 scores. Values below 5 scores indicate good sleep quality, while values equal to or greater than 5 scores indicate poor sleep quality, so that it should be considered that the higher the PSQI score, the worse the sleep quality.

Statistical analysis

As this is a characterization research, a descriptive statistics technique was used. We obtained mean and standard deviation to data characterization. Confidence intervals were constructed from the 95% for mean. All data were analyzed in the statistical package for social sciences (SPSS 23.v).

RESULTS

By stratifying BJJ fighters by weight category, we have light feather (N = 6), feather (N = 30), light (N = 21), middle (N = 27), medium heavy (N = 27), heavy (N = 22), super heavy (N = 23) and ultra heavy (N = 19). Most fighters were from the feather category that is up to 70 kg.

The fighters were categorized by the following color belts: white (N = 26), blue (N = 56), purple (N = 34), brown (N = 20) and black (N = 39). Most fighters are in the blue belt.

All BJJ fighters scored above 5 scores, which characterizes them as poor sleepers (Table 1). It is noteworthy that only in the super heavy weight category the CI, was outside the range of 5 scores.

| Weight Category         | M(SD) 95% CI for M |
|-------------------------|-------------------|
| Light Feather           | 7.1 ± 1.9 5.1 - 9.2 |
| Feather                 | 7.2 ± 2.5 6.0 - 7.9 |
| Light                   | 7.2 ± 2.8 5.9 - 8.5 |
| Middle                  | 8.1 ± 2.5 7.1 - 9.1 |
| Medium Heavy            | 6.4 ± 2.3 5.4 - 7.3 |
| Heavy                   | 7.2 ± 3.5 5.6 - 8.7 |
| Super Heavy             | 5.9 ± 2.7 4.7 - 7.1 |
| Ultra Heavy             | 7.9 ± 3.4 6.2 - 9.5 |
| Total                   | 7.1 ± 2.8 6.7 - 7.5 |

Legend: M (Mean), SD (Standard Deviation), CI (Confidence Interval)

When the characterization of sleep was done through the color belts, all fighters are classified as poor sleepers (Table 2).

DISCUSSION

The study of Vargas et al. shows that a relationship of poor sleep quality, having a direct influence on body weight gain, which has a negative impact on this aspect of health, and what would explain the poor sleep quality of fighters with higher body weight. However, our results show that regardless of weight category, all fighters have poor sleep quality, including the lightest ones (light feather). Therefore, the literature brings multifactorial processes, such as mood state changes, bad thoughts and use of electronic devices as promoters of a poor
sleep quality\textsuperscript{11}. These processes justify the results found in all weight categories.

BJJ color belts are subjective indicators of technical level\textsuperscript{12}. So, the data in Table 2 shows that regardless of whether they have the first (white belt) or the last (black belt), all fighters are classified as poor sleepers. This outcome is corroborated by the literature, because athletes of different modalities and regardless of the technical level have been presenting a poor sleep quality\textsuperscript{13}.

The poor sleep quality in BJJ fighters analyzed in this research may cause loss to their performance, such as the reduction of strength, power, attention and concentration\textsuperscript{14}, which negatively impact on aspects related to technical learning and task execution.

Another factor that must be considered is that poor sleep quality is directly linked to the higher risk and incidence of injuries\textsuperscript{14}, thus aggravating the high incidence of injuries in BJJ fighters in both, training and competitions\textsuperscript{15}.

Considering the relevance of our findings, we cannot disregard the main limitation of this study, which is due to the use of only a subjective and indirect instrument (PSQI) to measure sleep quality, which makes necessary further analysis of other aspects such as phase duration, exact time to sleep and total time in bed. However, it should be noted that the sample used in this study is relevant, and may be one of the largest samples of BJJ fighters in the world. Besides that, there is no literature so far. Thus, data such as those obtained in this study can help multidisciplinary teams in monitoring the performance of these fighters.

### CONCLUSION

BJJ fighters are poor sleepers regardless of weight category or color belts. From this point, there is information that can support the professionals (technicians, psychologists, physiotherapists and medicine doctors) involved with these fighters, to promote better sleep quality and consequently a better performance.

### Conflicts of interest

All authors declare that there is no potential conflict of interest or funding regarding this article.

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**Table 2. Characterization of PSQI by Color Belt**

| Category       | PSQI | 95% CI for M |
|----------------|------|-------------|
| Light Feather  | 7.1 ±1.9 | 5.1 - 9.2  |
| Feather        | 7.2 ±2.5 | 6.7 - 7.9  |
| Light          | 7.2 ±2.8 | 5.9 - 8.5  |
| Middle         | 8.1 ±2.5 | 7.1 - 9.1  |
| Medium Heavy   | 6.4 ±2.3 | 5.4 - 7.3  |
| Heavy          | 7.2 ±3.5 | 5.6 - 8.7  |
| Super Heavy    | 5.9 ±2.7 | 4.7 - 7.1  |
| Ultra Heavy    | 7.9 ±3.4 | 6.2 - 9.5  |
| Total          | 7.1 ±2.8 | 6.7 - 7.5  |

Legend: M (Mean), SD (Standard Deviation), CI (Confidence Interval)