The effect of sleep disorders due to land travel on the mood profile in young football players

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Abstract: The purpose of this study was to determine the effect of sleep disorders due to land travel on the mood profile in young football players. Thus,15 football players with range age: 18.40 ± 1.24 years, height :167.66 ± 6.22 cm, weight :66.6 ± 7.28 kg, and Body Mass Index(BMI):23.60 ± 2.47 kg/m2, completed the 24-item Brunel Mood Scale after two trips from Gorgan to Tehran and Khorramabad. The subjects were selected using purposive and convenience sampling. Repeated measures analysis of variance was applied for data analysis.The results of Bonferroni correction revealed a no significant increase in total mood response (TMR) between the two cities of Gorgan and Tehran (p=0.100) , and significant increase in total mood response (TMR)between the two cities of Gorgan and Khorramabad(p=0.031).The results showed that there was a difference in the some differences the subscales of mood responses of the participants following sleep disorders due to land travel(such as confusion, fatigue,vigor ,anger depression, tension).The results of the present research showed that sleep disorders may play an important role in mood responses and the degree of severity of this effect stemmed from trip duration and the resulted disorders.and suggest that quality and depth of sleep can be a more significant determinant of profile of mood state.

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1. Introduction

Having a good and complete sleep is one of the individuals' satisfying experiences. Because this would keep that person in a great shape and also help them to have cognitive acuity. Also, it can be beneficial for the physiological balance and resilience of the individuals. Researches in this realm showed that humans have approximately spent one third of their life in bed(Nizar Souissi et al.,2003). Also, evidence suggests that humans concern about the effects of insufficient sleep on their performance (Nizar Souissi et al.,2003;Selma Arzu Vardar et al., 2007) (anaerobic power,muscle strength, endurance) as well as on the brain, and many organ systems.On the other hand, some of the chronic sleep disorders are created as fatigue due to long flights, sleep deprivation due to shift work, and some of the causes of chronic insomnia are initiated due to temporary changes in the regulatory body in relation to the environment and social networks(Bonnet 1980; Martin 1981; Angus et al.1985; VanHelder and Radomski 1989). Mental behavior can affect the physical performance indicators. Thus, they can be detected and halted before the onset of behavioral changes; or we can depict their influences in the reverse (ANDREW M. LANE et al.,2004). The relationship between mood responses and sport function has been studied widely by sport psychologists. In a study done on this association, Andrew and his colleagues (2004) showed that Reductions in vigour and increases in fatigue are normal responses to hard condition, but other aspects of mood disturbance, especially symptoms of depressed mood however small may be indicative of a maladaptive response (ANDREW M. LANE et al., 2004). However, Selma and his colleagues (2007) reported that 30 hours continuous wakefulness may increase anxiety level without impairing anaerobic performance, whereas one night of partial sleep deprivation was ineffective on both state anxiety and anaerobic performance .It is worth noting that a partial sleep disruption for 24 hours has no impact on the stated anxiety. Although several studies have focused on the effects of insomnia on mood indicators and body function, there is no consensus among the researchers regarding this impact (Nizar Souissi et al., 2003; Selma Arzu Vardar et al., 2007; ANDREW M. LANE et al., 2004). Because there are many reasons for this disagreement such as the differences in the methods of research implementation participants, disorders created in sleep, and different types of research projects. It is interesting to note that none of them has investigated the impact of sleep disorders, due to ground travel on a sport like soccer throughout the various

geographical widths. On the other hand, Soccer players always travel to other cities and countries for participating in national and international tournaments which can affect their humoral behavior and mood. Travelling to different geographical locations is one of the common characteristics of the lifestyle of international athletes in the contemporary age and this entailsa disruption of body's circadian timing mechanisms (R.V.T. Santos et al., 2007). Most studies measuring the effect of jet lag on athletic performance have methodological problems; yet, it is prudent to provide suggestions for minimization of jet lags (Mark Young et al., 1998). In land travels, sleep disorder is an inevitable outcome that needs special attention. Many studies have examined the effect of insomnia of hormonal and immune indices, yet not much research has been carried out on the effect of sleep disorders on the performance in a sport like soccer. Despite great effort, it was impossible to find a study done in this regard.In so doing, the readers have been guiding throughout this study for this hypothesis: sleep disorders due to ground travel have an impact on mood response changes of the participants.

2. Material and Methods

Participants

The participants of the present research are 15 football players with 18.40 ± 1.24 years of age, 167.66 ± 6.22 cm height, and 66.6 ± 7.28 kg weight. They had the record of playing in national league tournaments and were selected as sample after filling out the consent form using purposive and convenience sampling. It must be noted that all the participants were completely healthy and took no medications. Before selecting the participants, all the purposes and dimensions of the research, the testing procedures, and the risks were fully explicated to the subjects in an introduction session.

MEASURES:

Mood: The Brunel Mood Scale (BRUMS1) was used to assess mood. This measure, which was derived from the Profile of Mood States (McNair, Lorr, & Droppleman, 1971, 1992), assesses anger, confusion, depression, fatigue,tension,and vigor. Participants respond to 24 mood descriptors using a response timeframe "How do you feel *right now*?" Terry, Lane, Lane, and Keohane (1999) and Terry, Lane, and Fogarty (2003) have provided comprehensive support for the validity and reliability of the BRUMS, which was judged to be the most appropriate mood measure for use in the present study because (a) it was validated for use with British athletes, (b) it uses language suitable to adolescents, and (c) it has been comprehensively validated on the age-range of participants in the present study. BRUMS data were converted to T-scores using normative data from athletes (Terry et al., 1999, 2003) to facilitate comparisons with an appropriate reference group.

Experimental design:

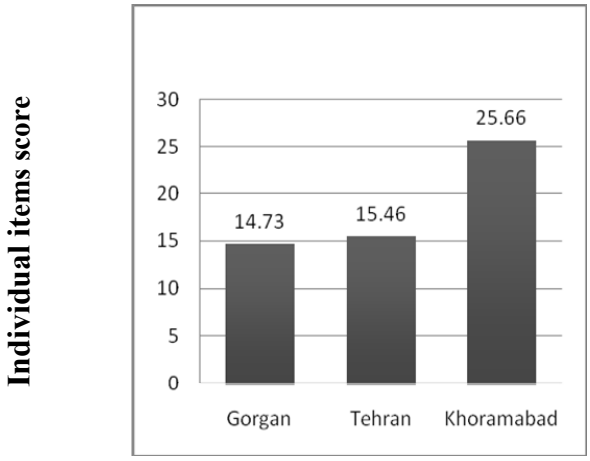
This experimental design consisted of three phases: 1 - The first test has been done during sleep in normal subjects at 10 A.M in Gorgan City at 54-56° latitude and 37-38° longitude (as the reference city) completed the 24-item self-report The Brunel Mood Scale (BRUMS). The day after filling out questionnaires measuring. 2- A week later and immediately after finishing a bus travel to Tehran, the second phase was taken at 10 A.M. in Tehran at 50-53° latitude and 35-36° longitude ,then they are asked to fill out a questionnaire to measure the Brunel Mood Scale (BRUMS). 3- The final phase was done in Khorramabad at 47-50° latitude and 33-34° longitude and at a similar time to that of the other cities. All the subjects have been forbidden for coffee or tea and other stimulants during the night before testing. Also, food the subjects eat has been controlled as the researchers want to show the consumption of food has nothing to do with the lack of sleep.

Statistical Analyses:

Descriptive and inferential statistics have been used for data analysis. All the data obtained in the present research has been reported based on mean and standard deviation.Regarding the inferential statistics, some indexes like Repeated measures analysis of variance (rANOVA) that is one of the most commonly used statistical approaches to repeated measures designs have been used.With such designs, the repeated-measure factor (the qualitative independent variable) is referred to as the within-subjects factor,while the dependent quantitative variable on which each participant is measured is referred to as the dependent variable. When Kolmogorov Smirnov test was significant in instead of using the parametric test ANOVA with repeated measures, nonparametric Friedman test was used throughout the study. Also, instead of using the Bonferroni correction test, Wilcoxon test was used for paired comparisons.for comparisons between the dependent variables measured at three stages of analysis of variance with repeated measures was used Kolmogorov Smirnov test was significant in cases where, instead of using the parametric test ANOVA with repeated measures nonparametric Friedman test was used instead of the correct test of Bonferroni. It is worth noting that the researchers set the level of significant at $P<0.05$ in this study and all the statistical operations were done using SPSS 16.

3. Results

The results showed that there is a no significant increases (p=1.000)in total mood response(TMR)participants following sleep disorders due to land travel from Gorgan to Tehran,though,there is a significant increase(p=0.031)in the total mood response(TMR)from Gorgan to Khorramabad which was farther from city of origin (Fig.1).



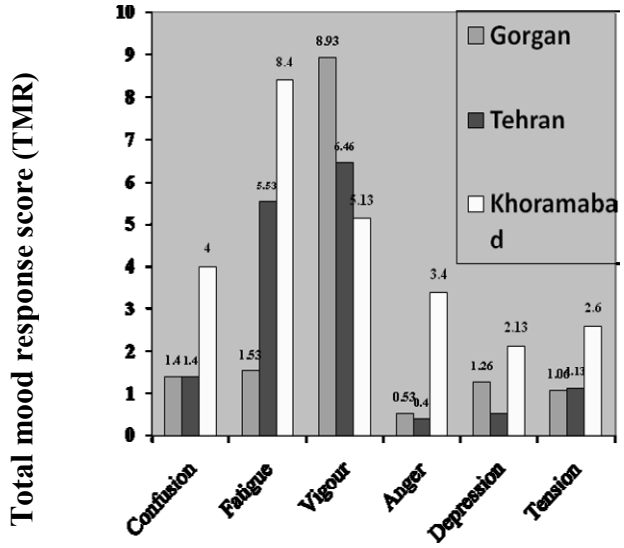
= 56-54Longitude And 37-38 = Latitude

Tehran = 53-50Longitude And 35-36 = Latitude

Khoramabad = 57-47Longitude And 33-34 = Latitude

Figure (1): total mood response (TMR) to sleep disturbances caused by young football players traveling due to different Latitudes and Longitudes.

According to the results obtained in this study, no significant difference(p=1.000)was observed in the subscales of confusion and chaos in the subjects' mood as they traveled from Gorgan to Tehran.On the other hand, there is a significant increase(p=0.008)in the subscales of confusion and chaos as they traveled from Gorgan to Khorramabad after sleep disorders due to land travel(Fig.2).



Gorgan: = 56-54 Longitude And 37-38 = Latitude

Tehran: = 53-50Longitude And 35-36 = Latitude

Khoramabad: = 57-47Longitude And 33-34 = Latitude

Figure (2): Individual items on mood response to sleep disturbances football players traveling due to different Latitudes and Longitudes.

There is a significant increase(p=0.000)in the subscale of fatigue as they traveled from Gorgan to Tehran.Also, there is a significant increase (p=0.000)in the subscale of fatigue as they traveled from Gorgan to Khorramabad after sleep disorders due to land travel(Fig.2). There is a significant decrease(p=0.030) in the subscale of Vigour as they traveled from Gorgan to Tehran. Moreover, there is a significant decrease(p=0.001) in the subscale of Vigour as they traveled from Gorgan to Khorramabad after sleep disorders due to land travel(Fig.2). There is no a significant decrease (p=0.480) in the subscale of anger as they traveled from Gorgan to Tehran.However, There is a significant increase (p=0.020) in the subscale of anger as they traveled from Gorgan to Khorramabad after sleep disorders due to land travel;however, given that this value exceeds the critical level of the modified Wilcoxon test(0.01667),thus,the results are no significant.There is a no significant decrease(P=0.091)in the subscale of depression as they traveled from Gorgan to Tehran.On the other hand, there is a no significant increase(P=0.091)in the subscale of depression as they traveled from Gorgan to Khorramabad after disorders due to land travel(Fig.2).There is a no significant increase in the subscale of tension as they traveled from Gorgan to Tehran,and there is no significant increase in the subscale of tension from Gorgan to Khorramabad after sleep sleep disorders due to land travel(p=0.195).

4. Discussions

The purpose of this study was to determine the effect of sleep disorders due to land travel on the mood profile in young soccer players.One of the challenging issues in research has been the mood responses resulting from sleep disorders. On the other hand, sleep deprivation can cause mood disorders which in turn can also affect the performance of individuals (Philip M. Becker et al.,2004,D. I. Orton and J. H. Gruzelier,1989; Selma Arzu Vardar et al.,2007) It has been suggested that the effects of environmental change tend to influence psychological functioning before they affect physiological factors (Kobrick, J.L. and Johnson,R.F.1991),And hence psychological monitoring may provide a useful early indicator of the adverse effects of environmental stress.(Andrew M. LANE et al.,2004) Many studies have shown that insomnia and sleep disorders effect on some individuals mood responses, while no effect on some others (Selma Arzu Vardar et al.,2007, Timo Giesbrecht et al.,2007; Yavuz selvi et al.,2007). Interestingly,the findings of the current study revealed that the there is a no significant increases in total mood response (TMR) participants following sleep disorders due to land travel from Gorgan to Tehran, though, there is a significant increase in the total mood response (TMR) from Gorgan to Khorramabad ,which was farther from city of origin.This increase appears to be a function of the duration of the trip and the subsequent sleep disorders due to land travel. Also, there has been reported some differences regarding the subscales of mood responses. Case in point, according to the results obtained in this study, no significant difference has been reported regarding the subscales of confusion and chaos in the subjects' mood as they traveled from Gorgan to Tehran. On the other hand, there is a significant increase in the subscales of confusion and chaos as they traveled from Gorgan to Khorramabad after sleep disorders due to land travel. It might be concluded that dizziness mood is associated with poor performance (Andrew M. LANE et al.,2004). Results from this study also revealed that the tension was increased during the trips, but was no significant. This slight increase is due to the travel length. Therefore, our results are not consistent with those of Yavuz selvi and his colleagues (2007) who investigated the mood responses after insomnia in healthy subjects' chronotypes.Another finding of the current study regarding the subscale of anger of the subjects mood, was reported that there is a no significant decresed in the subscale of anger as they traveled from Gorgan to Tehran .However, there has been reported a significant increase in the subscale of anger as they traveled from Gorgan to Khorramabad after sleep disorders due to land travel. Shamsul Bahri et.al(2007)showed that anger was prevalent among the Malaysian bus drivers .Also, Marc Wittmann et al(2006) showed that insomnia has some effect on anger especially on teens who went to bed late at night,and the current study also revealed that insomnia has an impact on anger, as a subscale of mood responses which is in line with Marc Wittmann et al(2006),study. Therefore, inspired by these studies, the researchers can conclude that sleep disorders have some effects on the subscale of anger. In addition, regarding the subscale of depression of the subjects' mood, the results of the current study revealed that there is a no significant decrease in the subscale of depression as they traveled from Gorgan to Tehran. On the other hand, there is a no significant increase in the subscale of depression as they traveled from Gorgan to Khorramabad after sleep disorders due to land travel.Therefore, although depressed mood is too low, it can be a negative response that needs more attention.As expected, regarding the subscale of fatigue in the subjects' mood, there is a significant increase in the subscale of fatigue as they traveled from Gorgan to Tehran which has a less distance from the city of origin .Also, there is a significant increase in the subscale of fatigue in Khorramabad which was farther from city of origin. On the other hand, by

traveling across several time zones, the circadian rhythm of the body retains its initial symptoms. New environmental forces affect these circadian rhythms, mainly at sunrise and sunset, and they act as a time period that adjusts body's clock(Thomas Reilly and Jim Waterhouse, 2009). Moreover,this study showed a significant decrease in the subscale of vigour as they traveled from Gorgan to Tehran. and, there is a significant decrease in the subscale of vigour as they traveled from Gorgan to Khorramabad after sleep disorders due to land travel.Therefore, the researches might interpret these increase and decrease in response to sleep disorders on the grounds that there was inappropriate environment and inappropriate vehicle for travelling. These findings are consistent with a study showing reductions in vigor and increases in fatigue are normal responses to inappropriate environment (Andrew M. LANE et al.,2004).On the other hand, the results of the current study both support some studies (D. I. Orton and J. H. Gruzelier,1989; Kazunori IKEGAMI et al.,2009; Mindy ENGLE-FRIEDMAN et al.,2003; Timo Giesbrecht et al.,2007) and contradict with some others (Jonathon P.R. Scott et al.,2006; Selma Arzu Vardar et al.,2007) This information is helpful for athletes and coaches in planning their itineraries. Thus, the results of the present research support the other findings that examined the effects of sleep deprivation on humans and animals. It appears that sleep and athletic performance are related. Many studies have focused on the relationship between sport and sleep and have studied the effects of exercise on the quality and quantity of sleeping (B.J. Martin,1981).Sleep deprivation may affect the peak power and performance of athletes (Nizar Souissi et al.,2003). These findings show the athletes to be concerned about the effects of inadequate sleep on their performance though the effect of sleep deprivation on physiological performance has not yet been fully understood. Also, these results cannot be generalized to situations of chronic insomnia,but this research is a harbinger to understand the effects of sleep disorders as acute stress when the subjects took a ground trip which in turn help sport community, that are experiencing this phenomenon, the researchers are required to identify each of the effective factor and conduct more researches in this realm.The researchers of the current study stated that the differences between the current study and previous studies may be applied to be generalized to situations of chronic insomnia. As a result, sleep disorders created through the travel ground is associated with the stress and it is up to the researchers to conduct their future studies on this mechanism.

5. Conclusion:

Finally,considering the findings of the present research we can come to the conclusion that sleep disorders due to land travel has a significant effect on the mood response. It seems that increased fatigue, decreases vigour and vice versa.Considering the results it can be concluded that sleep disorders plays an important role in various Psychological effects on the subscales mood and the quality and depth of sleep can be an important determinant of profile of mood state. It would be suggested that the results of the current study can be used as a potential candidate for the travel disruptions during the trips.

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