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Research in Physical Education, Sport and Health
2018, Vol. 7, No. 1, pp.31-36
ISSN(Print):1857-8152; ISSN(Online):1857-8160

LEVELS OF ANXIETY AND DEPRESSION IN ELITE KARATE ATHLETES

UDC: 796.853.26:616.89-008.441(497.7)
(Original scientific paper)

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Abstract

The aim of the study was to assess the levels of anxiety and depression, in elite karate athletes on the beginning of the summer preparatory period. The investigation was carried out as part of regular periodical systematic physical check-up of athletes. Twenty nine elite male karate athletes (most of them members of the Macedonian national karate team) aged 15 to 29 years, were asked to fulfil the Beck Anxiety Inventory (BAI) and the Beck Depression Inventory (BDI). The BAI questionnaire consists of 21 questions related to various aspects of anxiety. The intensity of perceived anxiety for every question in BAI is scored from 0 to 3, with 0 representing the least serious and 3 the most serious symptoms. The sum of all items is calculated at the end. BAI scores from 0-7 were ranked as a normal anxiety level; 8-25 as moderate; and 26-63 as high anxiety. The degree of depressive symptoms was measured by the 21-item-revised form of Beck Depression Inventory. The BDI statements for each question are ranked from 0 to 3, with 0 representing the least serious and 3 the most serious symptoms. Scores of BDI ≤ 10 indicate absence of depressive symptoms, BDI scores from 11-20 indicate mild depressive symptoms, while BDI scores from 21-30 indicate moderate depressive symptoms. BDI scores higher than 30 indicate clinically manifest depressive episode. Mean value of the acquired BAI scores in elite karate athletes was 4,1 ± 3,8. One seventh of all athletes showed moderate levels of anxiety. Mean value of acquired BDI scores was 6,1 ± 5,5. Four athletes showed mild depressive symptom, while one athlete showed moderate depressive symptoms. There was a positive correlation between the degree of depressive symptoms and the age of the athletes (r=0,575).

***Key Words**: anxiety, depression, karate athletes*

Introduction

Many studies have confirmed positive connection between physical activity (PA) and psychological well-being in young people, especially adolescents, as well as in other age groups (Pluncevic, & Mancevska, 2012). The importance of regularity, amount and the intensity of physical activity has also been addressed within this correlation. Additionally, physical activity is often determined as a non-pharmaceutical agent for treatment of anxiety and depression in adults, based on reports that aerobic exercise can reduce depression and state anxiety in clinical population (Lau, & Lau, 2010, Silva, et al., 2017).

Sports is a specific, complex, institutionalized and competitive physical activity with the frequency of training from two to six times per week. This type of PA improves person's physical features and is aimed for competition among athletes. However, competition and combat rivalry in sports require maximal effort from an athlete, often accompanied by mental stress and great physical tiredness. A higher level of stress and negative emotions are induced during tournament rivalry compared to training. Emotions are fundamental factor in both situations, because they determine arousal and influence the performance (cognitive as well as physical) of the athlete. Furthermore, negative emotions such as anxiety and depression are connected to severe musculoskeletal injuries, pain and fatigue in athletes (Weber, et al., 2018) Therefore, the phenomenon of anxiety is of particular interest for sports psychologists and coaches.

Anxiety is a multidimensional construct which is very closely connected to performance in athletes, as well as in non-athletes. High levels of anxiety which are always followed by excessive arousal (with accompanying cognitive, behavioural and vegetative symptoms) have harmful effects on performance. The

processing capabilities of the brain are always engaged by the excessive arousal and therefore limiting the informational intake and the efficiency during the task (Hardy, 1990). In every sports, anxiety is an essential component of each rivalry, for that reason its' level must be adequate to produce best results.

As a personality trait, anxiety is relatively stable feature which determines person's motivational and emotional response when coping with different situations. During stressful situations, individuals with high levels of trait anxiety become more anxious and show strong emotional response which does not correspond with the objective reality, with an anticipation of failure and or threats to self-esteem, which can have negative prolonged effects on the efficiency of their cognitive performance and can enhance further development of clinically manifest anxiety disorders (Hardy, 1990). As opposed to them people with low anxiety in stressful conditions show more efficient behaviour. Different factors such as age, gender, socioeconomic status, cultural precipitating factors and the way of manifestation influence the level of person's anxiety (Andrade, Caraveo, & Berglund, 2000). Our data on the prevalence of high anxiety and depression in university students with sedentary lifestyle show that over 20 % of medical, dentistry and law students suffer from high anxiety levels, while over 10% of them suffer from depression (Mancevska, et al., 2008).

Many reports show positive effects of regular physical exercise on cognition and mental wellbeing of university students (Walsh, 2011). Athletes are suggested to be less anxious and more self-confident than those who are not involved in sport. Furthermore, Bitonte et al, 2014 suggest that mandatory physical exercise should be prescribed for university students in order to enhance performance and prevent from mental illness (Bitonte & Santo, 2014). Our earlier study suggested that athletes engaged in different club sports such as soccer, basketball and handball showed significantly lower levels of manifest anxiety compared to their peers with sedentary lifestyle (Mancevska, et al., 2008). However, athletes are not immune to psychological distress and mental health issues and yet there are few studies that have investigated the prevalence of common mental disorders (CMD - anxiety, depression and adverse substance use) among elite athletes. Recent studies have shown a prevalence of symptoms of CMD in range of 17-45% among Australian and French elite Olympic athletes. (Gouttebarge, & Kerjhoffs, 2016).

In combat sports, such as karate, an effective attack on an opponent's body is the main assumption. It is very often is accompanied with the risk of pain and injury, which can cause psychological discomfort of competitors. This kind of sports competition requires extensive mental strength, rapid and tactically corrects reactions, as well as precision and imagination (Wong, Thung, & Pieter, 2006). Anxiety is particularly important in combat sports and the athlete's ability to maintain an optimal level of his anxiety during fight is essential for successful performance. Considerable deviations of this level (both increases and decreases) will lead to lower efficiency and reduced probability of success (Bali, 2015). General anxiety has rarely been measured in combat sports athletes. The existing reports suggested that karate athletes showed low to moderate anxiety levels (Tiric- Campara, et al, 2012).

To our best knowledge until now, in the Republic of Macedonia, there are no available data regarding the rates of high anxiety and depression among karate athletes and no available data regarding levels of depression among athletes in different sports, so far. This data is crucial for planning the strategies for prevention of mental health disturbances in children, adolescents and young adults as well as for planning mental preparation and successful performance of athletes. It is also necessary for the prevention of athletes' physical and mental health.

The aim of the study was to assess the levels of anxiety and depression in elite karate athletes on the beginning of the summer preparatory period and to determine the correlation between level of anxiety and depression with the age of athletes, sports experience duration and the intensity of the active training regime.

Material & methods

The study was performed at the Institute of Physiology and Anthropology, Medical Faculty, Ss. Cyril and Methodius University in Skopje on twenty nine male elite karate athletes. All athletes, aged 15-29 years, were members of Makpetrol karate club and most of them (18) had been or still were members of the Macedonian national karate team.

The total duration of their active physical training was between 8 to 20 years, with the mean value of 12.5±3.3 years. The duration of the training estimated in hours per week was between eight and fifteen hours, with mean value of 11.2±1.9 hours. The athletes were divided in two groups. The first group (U18 – under 18) consisted of 14 athletes, aged 15 to 18 years, mean age 17.2±1.1, while the second group (O18

– over 18) consisted of 15 athletes older than 18 years (19 to 29), mean age 22.5±3.5.

The investigation was carried out as part of regular periodical systematic physical check-up. At the time of the analysis neither respondent was at the stage of recovery from injury, or was previously treated by a psychiatrist or psychotherapist. For the purpose of clinical and psychological evaluation of the levels and perceived symptoms of anxiety and depressive symptoms, they were asked to fulfil the Beck Anxiety Inventory – BAI and the Beck Depression Inventory, respectively. The Macedonian versions of the questionnaires were administrated to the athletes in a form of self-rating questionnaire in ambulatory settings.

BAI consists of 21 questions related to various behavioural, emotional, cognitive and physiological symptoms of anxiety. The intensity of perceived anxiety for every question in BAI is scored from 0 to 3, with 0 representing the least serious and 3 the most serious symptoms. It is a short, simple and very popular tool which is used as a pre-screen for presence of an anxiety disorder in both clinical and non-clinical population. It has excellent internal consistency and high test-retest reliability. The sum of all items is calculated at the end. BAI scores from 0-7 were ranked as "normal anxiety level"; 8-25 as "moderate"; and 26-63 as " high anxiety".

The degree of depressive symptoms was measured by the 21-item-revised form of Beck Depression Inventory. The BDI statements for each question are ranked from 0 to 3, with 0 representing the least serious and 3 the most serious symptoms. The description of the symptoms includes mood change, social withdrawal, hopelessness, irritability, cognitions such as guilt or feelings of being punished, suicidal intentions, as well as physical symptoms such as fatigue, weight loss and lack of interest in sex. It is a simple, highly sensitive and one of the most widely used instruments for the evaluation of depressive symptoms in clinical as well as non-clinical population. It has excellent internal consistency (alpha =0.86). Similarly to BAI, the sum of all items was calculated at the end. Scores of BDI ≤10 indicate "absence of depressive symptoms", BDI scores from 11-20 indicate "mild depressive symptoms", while BDI scores from 21-30 indicate "moderate depressive symptoms". BDI scores higher than 30 indicate "clinically manifest depressive episode".

All participating subjects gave a written informed consent and completed the questionnaire anonymously, using code names.

For statistical evaluation of the data, SPSS 16 software (SPSS Inc., Chicago, IL) was used. The results are represented by mean values and their standard deviations as measures of central tendency; the analysis was performed with the Student t test, Pearson coefficient of correlation and chi-square test. The level of significance was $p< 0.05$.

Results

The description of our sample is shown in table 1. There was no difference in active training regime between the two groups of athletes (p=0.471). All athletes spent in average 11 hours per week in active training. Two thirds of the subjects were members of the Macedonian national karate team.

Table 1. Demographic variables of the elite karate athletes included in the study

Subjects	Group U18 N=14	Group O18 N=15	T-test
Mean age	17.2±1.1	22.5±3.5	p<0.001
Years of active training regime	10.5±1.4	14.2± 3.7	p=0.003
Weekly hours of active training regime	10.9±1.8	11.5±2.2	p=0.471
Members of the Macedonian national karate team	8	10	

Mean value of the acquired BAI scores in elite karate athletes was 4.1 ± 3.8 with minimal BAI score = 0 and maximal BAI scores =15. One seventh of all athletes showed moderate levels of anxiety. As can be seen from figure 1, the mean BAI score obtained from the U18 group was 3.9 ± 3.8 while in athletes older than 18 years it was 4.4±4.1. There was no statistically significant difference between groups (p=0.7).

Mean value of acquired BDI scores in all elite male karate athletes was 6,1 ± 5,5 with minimal BDI score = 0 and maximal BDI=24. Four athletes showed mild depressive symptom, while one athlete showed moderate depressive symptoms. The mean value of BDI scores obtained from the U18 group was 3.5±2.4, while in athletes from the O18 group, it was 8.5±6.6. Athletes older than 18 years (group O18) showed

significantly higher BDI scores than athletes younger than 18 years (p=0.01). Nevertheless the average BDI scores of both groups of athletes were within the range labelled as "absence of depression". (fig1)

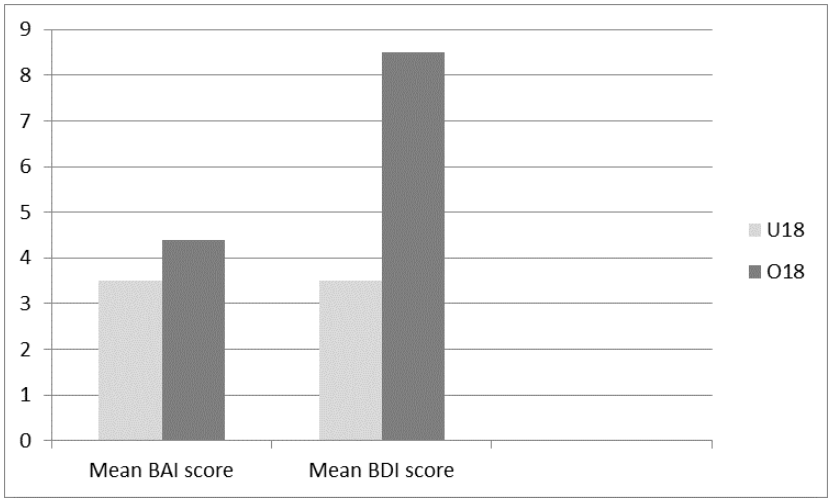

Figure 1. Mean BAI and mean BDI scores obtained in both groups of elite karate athletes

As can be seen from table 2, all elite male karate athletes from the two age groups showed normal to moderate anxiety levels (chi square = 0.007; df=1; p = 0.933). There was no linear correlation between the values of BAI scores and the age of the athletes (r=-0.11), while there was a weak negative correlation between the BAI scores and the total hours of active training regime during the week (r = - 0.21).

All athletes aged under 18 showed no symptoms of depression compared to two thirds (10 out of 14) of the athletes older than 18 who also showed no symptoms of depression (chi sqare = 3.5; df=1; p= 0.059). One third (four athletes) of the athletes from the second group (O18) showed symptoms of mild depressive mood and one showed moderate depression. No one showed clinically manifest depression. There was a positive correlation between the degree of depressive symptoms and the age of the athletes (r = 0.575) and a weak positive correlation between the BDI scores and total hours of training during the week (r = 0.229) (table 2).

Table 2. Distribution of athletes based on the obtained BAI and BDI scores

Subjects Variables	Group U18 N=14	Group O18 N=15
BAI scores		
0-7 Normal anxiety	12*	12
8-25 Moderate anxiety	2	3
>25 High anxiety	0	0
BDI scores		
0-10 No depression	14**	10
11-20 Mild depression	0	4
21-30 Moderate depression	0	1
>30 Clinically manifest depression	0	0

*chi square =0.007; df=1; p= 0.933
** chi sqare = 3.59; df=1; p= 0.059

Dicussion

The results obtained in our study, to our best knowledge, represent the first results regarding the levels of anxiety and depression in karate athletes in our country. All, elite male karate athletes from Makpetrol, one of the two internationally most awarded karate clubs in our country, showed low to mild anxiety levels, and there was no association with the age (r=0.11) and the duration of the sports experience. This is in accordance with the reports from other studies, which suggest that elite karate athletes show lower levels of anxiety compared to athletes from other sports and to general population (Piskorska, et al, 2016). Furthermore, reports suggest that levels of anxiety are lower in winner elite karate athletes compared to

defeated ones, as well as compared to non-elite karate athletes (Soltani, & Surender, 2013). It is argued that the observed relationship is probably a result of athlete's experience and derives from the impact of long-term adequate mental preparation (self-control and self-awareness training). Tiric - Campara et al. (2012) reported that the type of practiced combat sport influenced the obtained levels of anxiety in combat athletes. Thus, the highest average level of general anxiety was noticed in kick boxers (moderate anxiety) followed by karate fighters (mild anxiety), with the lowest levels in boxers (minimum anxiety) with no correlation between the levels of anxiety and the age and the duration of sports experience. Such data regarding different types of combat sports until now is insufficient in our country. Considering the importance of the level of anxiety for the performance of karate athletes during competition and also for the health of the athletes, it is suggested that preliminary determination of the anxiety level should be carried out and the results should be taken into account during the selection and continuation of practice of certain sport discipline (Tiric - Campara, et al, 2012). Individualization of sports training by coaches and sports psychologists can enable maintenance of optimal individual levels of anxiety in combat athletes. Results from different studies suggest that an ability to control particular types of anxiety seems to be one of the most important psychological skills, which highly affect the competition results of combat sports athletes.

Our results are also in line with the results from our earlier study on levels of trait anxiety in athletes from different team sports such as soccer, basketball and handball in our country. They showed low levels of trait anxiety compared to medical students (Mancevska, et al., 2008). Collective sports are considered to be a protective factor against the presence of psychological disorders, particularly in adolescents. Silva et al., (2017) reported that adolescents aged 11-19 years, who were involved in individual sports, such as swimming and judo, obtained more chances of presenting symptoms of anxiety, stress and depression compared to their peers involved in collective sports. They argued that the social nature of collective sports (collective goal) has the protective role against psychological distress compared to individual sports during the earlier stages of adolescence.

The levels of depressive mood in older athletes in our study were significantly higher compared to the ones obtained in younger athletes (under 18), although the average value of BDI scores in older athletes was still low. One third of athletes older than 18 years (five athletes) showed signs of mild depressive mood to moderate subclinical depressive symptoms. There was a positive correlation between the degrees of depressive symptoms and the age of athletes.

All athletes aged 15 to 18 years showed no signs of depression. Other researchers who used different self-evaluation instruments for the assessment of depressive symptoms showed that 20% of student athletes suffer from signs of depression (Weber, et al., 2018). Nevertheless, social relations (friendship and collective identity) during early and mid adolescence are considered protective factors against depression. In our study, the O18 group consisted of athletes aged 19 to 28 years. It is a period of late adolescence and young adulthood when many important life events happen. Late adolescence is a sensitive period of transition from high school to academic environment in which several processes of personal maturation occur. The definitions of personal – individual (opposed to collective) identity and professional identity, which sometimes could be traumatic experiences, are among those processes. During early adulthood, the life period after the age of 25, essential processes such as employment, career development and definition of emotional relationships and formation of family, occur. Many stressors are present during these life events and can negatively influence the athletes' mood and their satisfaction with the quality of their life. The highest BDI score was obtained in athletes aged 28 years. In this study we did not explicitly investigate the impact of different risk factors such as socio-economic status or emotional relationships on levels of depression in karate athletes. Depressed mood has negative impact on athletes' performance and is likely to activate anger and confusion and to increase physical pain and fatigue (Wong, Thung,& Pieter, 2006). Compared to high anxiety, which is always connected to high arousal and in some sports and in non-athletes can have a positive impact on performance (the role of anxiety as an inner drive), depression is a negative set of emotions which can be connected to low arousal as well as to high arousal, depending on the mechanisms of its origin and their clinical manifestation. Regardless of the origin, depression never shows positive impact on performance neither in athletes nor in non-athletes. There are few studies that have investigated the prevalence of common mental disorders (CMD - anxiety, depression and adverse substance use) among elite athletes. Recent studies have shown a prevalence of symptoms of CMD in range of 17-45% among Australian and French elite Olympic athletes. (Gouttebarge, & Kerjhoffs, 2016).

In addition to the growing body of evidence that prove the positive impact of physical activity on mental health in general population and in athletes, it is essential to gather data on mental health of athletes from

different sports (individual and collective). Regular mental health monitoring should be performed as conscientiously as it is done for their physical heath, especially in experienced senior athletes. Excessive exercise and training can be associated with masked symptoms of anxiety disorders and depression in non-athletes as well as in athletes and their continuation could be harmful (Weinstein, Maayan, & Weinstein, 2015).

Conclusions

The results from our study are the first of this kind in our country, from the best of our knowledge. They show that elite karate athletes maintain low levels of anxiety. However, the levels of depression were higher and showed positive correlation with the age. It is essential to gather additional data on the influence of different risk factors on mental health in athletes from different sports in order to make a substantial data base for further research of the impact of psychological parameters on performance in athletes and on the impact of physical activity and sports on the mental health of athletes, and of general population especially of young and senior population.

References

Pluncevic, J. & Mancevska, S. (2012). The effect of physical activity on cognition – Physiological mechanisms. *Mat Soc Med*, 24(3), 198-202.

Lau, PWC., & Lau EYY. (2010). The role of physical activity in the treatment and prevention of anxiety and depression in children. An overview. In: Chang, CH., Editor. Sport psychology: Coping, Performance and Anxiety. New York: Nova Science Publisher, Inc.; 215-25

Silva, H.A., Passos M. P., Oliveira, V. A., Silva Y. A., Pitangui, A.C., & Araujo, R.C. (2017). Prevalence of anxiety, depression and stress symptoms and its association with neck/shoulder pain in adolescents athletes. *Motricidade* 13(4), 13-22.

Weber, S., Puta, C., Lesinski, M., Gabriel, B., Steidten, T., Bar, K.Herbsleib, M., Granacher, U., & Gabriel H.H.W. (2018). Symptoms of anxiety and depression in young athletes using hospital anxiety and depression scale. *Front Physiol* doi:10.3389/fphys.2018.00182

Hardy, L. (1990). A catastrophe model of anxiety and performance. In J. T. Jones & L. Hardy,Eds., *Stress and performance in Sport*, Wiley, Chichester, 81-106.

Andrade, L., Caraveo-Anduaga, J. & Berglund, P. (2000). Cross-national comparisons of the prevalences and correlates of mental disorders. WHO International Consortium in Psychiatric Epidemiology. *Bull World Health Organ*, 78, 413–26.

Mancevska, S., Bozinovska, L., Tecce, J., Pluncevik- Gligoroska, J. & Sivevska Smilevska, E. (2008). Depression, anxiety and substance use in medical students in the Republic of Macedonia. *Bratisl Lek Listy*, 109 (12), 568-72.

Walsh, R. (2011). Lifestyle and mental health. *Am Psychol*, 66, 579-92.

Bitonte, R.A. & De Santo, D.J. (2014). Mandatory physical exercise for the prevention of mental illness in medical students. *Mental Illness*, 6, 5549-50.

Mancevska, S., Bozinovska, L., Pluncevic Gligoroska J., Sivevska Smilevska, E., handziski, Z., Nikolic, S., & Brezovska Kavrakova, J. (2008). Level of manifest anxiety in students of medicine. *Physioacta* 1(1), 49-54.

Gouttenbarge, V., & Kerjhoffs, G. (2016). Epidemiology of symptoms of common mental disorders among elite Gaelic athletes: a prospective cohort study. *Physician Sportsmed* http://dx.doi.org/10.1080/00913847.2016.1185385

Wong, R., Thung, J.S. & Pieter, W. (2006). Mood and performance in young Malasian karateka. J Sport Sci Med. 05 (CSSI1), 54-9.

Bali, A. (2015). Psychological factors affecting sports performance. *Int J Phys Educ Sport Health,* 1(6), 92-5.

Piskorska, E., Mieszkowski, J., Kochanovicz, A., Wedrowska, E., Niepodzinski, B., & Borkowska, A. (2016). Mental skills in combat sports – review of methods anxiety evaluation. *Arch Budo*. 12, 301-13.

Soltani, H., Surender Reddy, K. (2013). Comparative analysis of competitive state anxiety among elite and non-elite karate athletes in Iran. *Advances in Environmental Biology*, 7(7), 1244-8.

Weinstein, A., Maayan, G. & Weinstein, Y. (2015). A study on the relationship between compulsive exercise, depression and anxiety. *Journal of Behavioral Addictions*. 4(4), 315-18.