Research Paper Physical education

# The Evaluation of Sport and Psychological Stress Relationship in Handball Players in Ataturk University

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**ABSTRACT**

The aim of this study was to investigate the effects of sports participation on the psychological stress levels of handball players. Research subjects for the control group were 30 people chosen randomly. The subjects of stress were tested by a 40-item stress questionnaire and then tested in step independent variable "Sports participation" included handball education and skills training for three months and three weekly sessions of 75-90 minutes. We did not observe significant difference between the mean scores of stress-control group and experiment group scores at pre-test in $p<0.05$; significant differences were observed between the mean of control and experiment group stress on the post- test stage ($p<0.05$) and between the mean of stress in the control group pre-test and post-test in ($p<0.05$). Significant difference was observed statistically meaningful differences were observed between the mean scores of stress in the experiment group pre-test and post-test ($p<0.05$).

**KEYWORDS** Sports Participation, Psychological stress, handball players.

**Introduction:**

*The competitive sport presents a variability of stressors (internal and external pressures not controlled by athletes) that can destabilize physically and mentally the athlete (De Rose, 2002; Samulski, 2009). However, the different types of pressure experienced by athletes may or may not turn into stressors, depending on the individual's perception (Stefanello, 2007). Moreover, the way in which each athlete responds to the referred stressors is also specific and determines how the athlete will be affected by stress (De Rose, 1997). Any kind of stressor stimulus (physical and/or psychological) can trigger psychophysiological reactions that eventually result in hyperfunction of the central nervous system and the endocrine system. As to the latter, in particular, the adrenal glands result in an increase in the release of glucocorticoid hormones (Brandao and Lachat, 1995). Hydrocortisone (compound F), or cortisol, is the most potent glucocorticoid produced as the final product of the activation of the Hypothalamic-Pituitary-Adrenal axis (HPA). It is responsible for approximately 95% of the glucocorticoid activity of the organism (Wilmore and Costill, 2003). Its production and secretion increase during and after exposure to various stressors (Keller, 2006; Kim et al., 2009; Soares and Alves, 2006). Cortisol has been considered the stress hormone, which can be evaluated in blood plasma, hair, urine, and saliva. Among these ways of evaluation, salivary cortisol is not only an effective measurement, it is more accessible, fast and non-invasive, allowing data collection in a real competitive setting without causing problems of reactivity (Soares and Alves, 2006). This is important since it has been shown that young athletes are more successful when they are able to manage the pressures of competition in sport, overcoming distresses, and uncertainties (Pires et al., 2005).On the other hand, athletes can experience very high levels of stress from personal pressure to perform well, which can lead them to a premature abandonment of sports practicing (Stefanello, 2002). Most investigations include only professional athletes (Carre et al., 2006; Elloumi et al., 2008; Maso et al., 2002), and a few studies (Filaire et al., 2009; Vedhara and Miles, 2003) that have investigated the psyhophysiologic responses to personal and athletic stressors have shown controversial results.Although advances in science, technology and industrialization have brought valuable improvements to society, they have also presented numerous complications. Children, teenagers, and even adults gain the opportunity through sports to strengthen their physical, psychological, and social faculties. On this basis, the study seeks to evaluate whether participation in a relatively long-term physical activity changes the stress on student athletes. With exercise periods, they can revive their physical conditions and reestablish mental balance (Weinberg and Gould, 2001). The aim of this study is to evaluate the effects of exercise participation and sport on stress levels in handball players. Specific objectives include:*

- Evaluating pre-participation stress levels in subjects before handball training and practice.
- Measuring post-participation stress levels in subjects after handball training and practice.
- Determining whether participation in sports (handball) reduces stress in subjects.

To achieve the objectives, the following research hypothesis was proposed: Sports participation (handball) has a meaningful effect on the reduction of subjects stress.

**Material and Methods:**

This study evaluates the effect of sport participation relationship with the mental stress levels of hand ball players. Therefore, it was conducted as a quasi-experimental study and consisted of two groups - control and experiment - with pre-participation and post-participation measurements. Thirty subjects in the control group were selected randomly from 120 sport students of Physical education and sport science faculty of Ataturk university that were players in the hand ball team. They were ages 19-23 years with a mean age of 21.53. Thirty subjects were also selected at random from the same population to be in the experiment group. The experiment group (mean age 21.26) participated in handball team. Measurement instruments in this study included two questionnaires:

- Personal information questionnaire
- Personal stress questionnaire

Information was captured via the questionnaire from June-September 2014. Researchers collected the pre-test questionnaire after the first meeting with the control and experiment groups. However, before distributing the questionnaires, they did interviews to ensure none of the players had participated in regular exercises before. The experiment group participated in handball team. At the last session, post-test questionnaires were distributed to the two groups and were collected after completion by the examinees.

**Results:**

This study was done as a quasi-experimental research using control and experiment groups with pre-participation and post-participation questionnaires. Information from questionnaires regarding stress levels was analyzed and quantitatively converted using descriptive statistics (mean and standard deviation) and inferential statistics (student t-test).

**Table 1. Pre-participation in the control and experiment groups**

| Evidence Groups | Σ**X** | N | Mean | S | T |
|---|---|---|---|---|---|
| Control | 293 | 30 | 9.77 | 3.52 | 0.495 |
| Experiment | 278 | 30 | 9.27 | 4.27 | |

As shown in Table 1, since the t value (0.495) is less than table critical value (1.671) at 5% alpha level, it will not reject the zero assumption; the study hypothesis based on differences between the pre-participation mean scores of control and experiment groups is not confirmed. The differences observed between the control and experiment groups' mean scores of stress during the pre-participation phase are not statistically significant.

**Table 2. Post-participation measurements of control and experiment groups**

| Evidence Groups | ΣX | N | Mean | S | T |
|---|---|---|---|---|---|
| Control | 281 | 30 | 9.37 | 3.39 | 2.338 |
| Experiment | 217 | 30 | 7.23 | 3.67 | |

As shown in Table 2, since the t value (2.338) was more than the table critical value (1.671) at 5% alpha level, it rejects the zero assumption; the study hypothesis based on differences between the post-participation mean scores of control and experiment groups is confirmed. The differences observed between the control and experiment groups' mean scores of stress during post-participation testing are statistically meaningful. As shown in Table 3, since the t value (0.747) is less than the table critical value (1.671) at 5% alpha level, it will not reject the zero assumption; the study hypothesis based on differences between the pre-participation and post-participation mean scores of control and experiment groups is not confirmed. The differences observed between the control and experiment groups' pre-participation and post-participation mean scores are not statistically meaningful.

**Table 3. Results of the control and experiment groups at pre-participation and post-participation**

| **Evidence Groups** | ΣX | **N** | **Mean** | **S** | **T** |
|---|---|---|---|---|---|
| Control | 293 | 30 | 9.77 | 3.52 | 0.747 |
| Experiment | 281 | 30 | 7.373 | 3.39 | |

As shown in Table 4, since the t value (4.169) was more than the table critical value (1.671) at 5% alpha level, it will reject the zero assumption; the study hypothesis based on differences between the pre-participation and post-participation mean scores of experiment groups is confirmed. The differences observed between the pre-participation and post-participation mean scores of experiment groups are statistically meaningful.

**Table 4 - Experiment group pre-participation and post-participation test results**

| **Evidence Groups** | ΣX | **N** | **Mean** | **S** | **T** |
|---|---|---|---|---|---|
| Control | 278 | 30 | 9.27 | 4.27 | 4.169 |
| Experiment | 217 | 30 | 7.23 | 3.67 | |

Finally, the mean scores of stress in the control group's pre-participation and post-participation phases are 9.77 and 9.37 respectively, and for experiment group are 9.27 and 7.23 respectively.

**Discussions:**

Mc Mahan (1990) conducted many studies of the benefits of exercise and concluded that intense aerobic exercise can improve the development of self-esteem and reduce depression. Nora et al. (1995) found increases of 13-14 percent in aerobic power, decreased joint pain, and improved levels of anxiety and depression after 12 weeks of aerobic training. In another study (1997) they reported 10-20 percent cardio-respiratory improvements along with effective reductions of depression, anxiety, fatigue, and stress after subjects participated in an aerobic fitness program (Noreau *et al.,* 1997). This study examined the effects of sports participation on stress in handball players. Analysis of the results and mean scores of the stress levels of subjects by t-test shows that sports participation (specifically in handball) has a meaningful effect in reducing incidence of stress and can be 95% confirmed. Participation in sports is closely related to mental health, especially the prevention of disorders, and is a valuable tool to improve physical health. It seems the cause of stress reduction in the experiment group of players is regular physical activity that led to adjusted physical and psychological characteristics. Exercise causes excitement and joy and is a special vitality that can be a factor in reducing psychological disorders.

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