

## **Psychological stress in junior basketball players** **Stresul psihologic la jucătorii de baschet juniori**

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### **Abstract**

*Background.* Psychological training, which is an important component of the sports training process, should be a constant concern of coaching for obtaining the best performance.

*Aims.* The level of stress was studied in junior basketball players with specific training programs compared to pupils with general sports training, who practice sport according to the school curriculum.

*Methods.* The study included 6 groups (n=10 subjects/group): 3 control groups; M15 (15 years), M16 (16 years), M17 (17 years), and 3 groups of athletes; S15 (15 years), S16 (16 years), S17 (17 years). The research method consisted of applying the Perceived Stress Scale (PSS) questionnaire, developed by Cohen et al. (1983).

*Results.* The statistical analysis of PSS test scores showed highly statistically significant differences between groups IV-I ( $p<0.01$ ).

*Conclusions.* In the pre-competition period, our results evidence a moderate stress in junior basketball players, which requires a psychological training program in order to fight distress.

**Key words:** stress, PSS questionnaire, basketball players, physical exercise, training.

### **Rezumat**

*Premize.* Pregătirea psihologică trebuie să constituie o preocupare permanentă a antrenorului, ea este o componentă importantă a procesului de antrenament, pentru obținerea celor mai bune performanțe.

*Obiective.* S-a studiat comparativ nivelul de stres la jucătorii de baschet juniori cu pregătire specifică și la elevii cu pregătire sportivă generală, care practică sport conform programei școlare.

*Metode.* S-a lucrat cu 6 loturi (n=10 subiecți/lot), 3 loturi martor; M15 (15 ani), M16 (16 ani), M17 (17 ani) și 3 loturi sportivi; S15 (15 ani), S16 (16 ani), S17 (17 ani). Metoda de cercetare a constat în aplicarea chestionarului Perceived Stress Scale (PSS), concepută de Cohen et al. (1983).

*Rezultate.* La analiza statistică a scorurilor la testul PSS au fost observate diferențe statistice puternic semnificative între loturile IV – I ( $p<0,01$ ).

*Concluzii.* În perioada precompetițională, rezultatele noastre evidențiază un stres ușor moderat la jucătorii de baschet juniori, ceea ce impune un program de pregătire psihologică, cu efect de combatere a distresului.

**Cuvinte cheie:** stres, chestionar PSS, sportivi baschetbaliști, efort fizic, antrenament.

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### **Introduction**

Sport, due to the competitiveness factor, may generate negative emotions and distress. Athletes are in a tough competition with themselves or with strong opponents, being confronted with the situation of overcoming their condition. The manifestation of these emotions, particularly negative ones, is a problem of the highest interest for both athletes and trainers.

The research conducted by Patel et al. (2010) shows that anxiety problems in young people vary between 6-20%. The percentage is higher in the case of women. In the majority of athletes (13-24 years), sports activity is not more stressful than the majority of the daily activities carried out, where competition and performance are quantified (school, work, etc.). Starting with a certain

level, anxiety affects performance.

In a study on the psychological factors that influence performance, Resch (2010) shows that several forms of mental disorders have developed in sport, which are characterized either by non-specific syndromes predominantly occurring among female athletes, or by the presence of specific syndromes (depression, chronic stress, anxiety, sleep disorders, etc.).

A study carried out by Lu et al. (2010) on athletes (men and women) regarding the relationship between emotional intelligence and anxiety shows that subjects with the lowest emotional intelligence score have a higher anxiety level compared to the others.

The study performed by Filaire et al. (2009) in a group of tennis players (8 men and 8 women) on the

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day of competition evidenced that somatic anxiety was significantly higher +23% in women compared to men, while self-confidence was higher +34% in men. Winners had a lower cognitive and somatic anxiety level and a high self-confidence level.

Lukins & Leicht (2004), in a study on the competition state of mind and anxiety, reported that depression, vigor and tension were correlated with mood disturbances. Basketball players that had a higher fatigue and anger level, had less successful free throws and less points. The analysis of the team performance indicated a significant relationship between the venue of the game and tension. Participants reported a higher anxiety level when they competed at home compared to a different location.

### Hypotheses

Eustress has a main beneficial effect with a direct influence on athletes by increasing physical performance, favoring physical fitness through training and physiological fatigue. At the opposite pole is situated distress, which has a main negative effect with a direct influence on athletes, by decreasing physical performance, overtraining and pathological fatigue.

### Material and methods

#### Research protocol

##### a) Period of the research

Before the initiation of the study, the approval of the Ethics Board of the "Iuliu Hațieganu" University of Medicine and Pharmacy Cluj-Napoca and the informed consent of the subjects were obtained. The authors of the questionnaire agreed to its use for scientific purposes. The research was carried out in the period May 2012 - March 2013.

##### b) Subjects and groups

The studies were performed in 6 groups (n=10 subjects/group)

- 3 control groups; M15 (15 years), M16 (16 years), M17 (17 years)

- 3 groups of athletes; S15 (15 years), S16 (16 years), S17 (17 years)

The young professional athletes were members of the "U Mobitelco Cluj-Napoca" Club, and the controls were

pupils of the Informatics High School of Cluj-Napoca.

##### c) Tests applied

The PSS questionnaire developed by Cohen et al. (1991) is a scale for the self-perception of stress and its assessment based on 10 items, with 5 answer possibilities: 0 = never; 1 = almost never; 2 = sometimes; 3 = quite frequently; 4 = very frequently, which the subject must choose. PSS results are obtained by adding up the answers to the questions of the scale, for example: 0 = 4 points; 1 = 3 points; 2 = 2 points; 3 = 1 point; 4 = 0 points, items 4, 5, 7 and 8 being expressed positively, and their adding up for all the items of the scale.

##### d) Statistical processing

The statistical analysis of scores was performed using the non-parametric Mann-Whitney (U) test for two unpaired samples, the significance threshold being  $\alpha = 0.05$  (5%).

For the detection of the correlation between two variables, the Spearman ( $\rho$ ) rank correlation coefficient was used, the correlation coefficients being analyzed according to Colton's rule. The method used for obtaining the mathematical equation of dependence between two variables was the polynomial regression method.

Statistical processing was performed with the Excel application (Microsoft Office 2007) and StatsDirect v.2.7.2 software. The graphical representation of results used the Excel application (Microsoft Office 2007).

### Results

The statistical analysis of the PSS test items evidenced statistically significant differences between the groups for some items (Tables I-XI).

##### a) Item analysis

For item no. 1 – "How many times over the last month were you upset because something happened unexpectedly?", the frequency of answers by groups is shown in Table I.

For this item, no statistically significant differences were found between the 6 studied groups ( $p=0.1693$ ). There were no statistically significant differences between the control groups ( $p=0.2347$ ) or between the groups of athletes ( $p=0.5506$ ).

For item no. 2 – "How often over the last month did

**Table I**  
Item 1 in the studied groups.

Answer \ Group	Group						Statistical significance (p)	
	M15	M16	M17	S15	S16	S17		
never	0	2	1	3	1	2	M15-S15: 0.0833	M15-M17: 0.3156
almost never	5	1	5	5	4	4	M16-S16: 0.0729	M16-M17: 0.1422
sometimes	0	0	2	0	5	1	M17-S17: > 0.9999	S15-S16: 0.336
quite frequently	4	4	2	2	0	3	-	S15-S17: 0.5126
very frequently	1	3	0	0	0	0	M15-M16: 0.495	S16-S17: 0.9984

**Table II**  
Item 2 in the studied groups.

Answer \ Group	Group						Statistical significance (p)	
	M15	M16	M17	S15	S16	S17		
never	3	1	2	3	3	3	M15-S15: 0.4705	M15-M17: 0.7769
almost never	3	6	4	5	6	5	M16-S16: 0.164	M16-M17: 0.8087
sometimes	1	1	0	0	1	0	M17-S17: 0.4401	S15-S16: > 0.9999
quite frequently	2	2	3	2	0	2	-	S15-S17: 0.9732
very frequently	1	0	1	0	0	0	M15-M16: 0.9473	S16-S17: 0.7196

you feel incapable of controlling the important things in your life?”, the frequency of answers by groups is shown in Table II.

For this item, no statistically significant differences were found between the 6 studied groups ( $p=0.5717$ ). There were no statistically significant differences between the control groups ( $p=0.923$ ) or between the groups of athletes ( $p=0.9232$ ).

For item no. 3 – “How often over the last month did you feel nervous and stressed?”, the frequency of answers by groups is shown in Table III.

For this item, no statistically significant differences were found between the 6 studied groups ( $p=0.46$ ). There were no statistically significant differences between the control groups ( $p=0.3192$ ) or between the groups of athletes ( $p=0.4278$ ).

For item no. 4 – “How often over the last month did you feel confident enough about your ability to control your personal problems?”, the frequency of answers by groups is shown in Table IV.

For this item, statistically significant differences were found between at least 2 of the 6 studied groups ( $p=0.0277$ ). No statistically significant differences were found between the control groups ( $p=0.2314$ ) or between the groups of athletes ( $p=0.3575$ ). For this item, there were highly statistically significant differences between groups M15-S15 ( $p<0.01$ ).

For item no. 5 – “How often over the last month did you feel that things went the way you wanted?”, the frequency of answers by groups is shown in Table V.

For this item, there were no statistically significant differences between the 6 studied groups ( $p=0.1383$ ). No statistically significant differences were found between the control groups ( $p=0.947$ ) or between the groups of athletes ( $p=0.3965$ ). However, the statistical analysis of this item by groups, two by two, evidenced the presence of statistically significant differences between groups M15-S15 ( $p<0.05$ ).

For item no. 6 – “How often over the last month did you find you could not cope with all the problems you had to solve?”, the frequency of answers by groups is shown in Table VI.

For this item, no statistically significant differences were found between the 6 studied groups ( $p=0.3815$ ). There were no statistically significant differences between the control groups ( $p=0.451$ ) or between the groups of athletes ( $p=0.1282$ ).

For item no. 7 – “How often over the last month were you capable to control the irritating situations in your life?”, the frequency of answers by groups is shown in Table VII.

For this item, there were no statistically significant differences between the 6 studied groups ( $p=0.3208$ ). No statistically significant differences were found between the control groups ( $p=0.3002$ ) or between the groups of

**Table III**  
Item 3 in the studied groups.

Group	M15	M16	M17	S15	S16	S17	Statistical significance (p)	
Answer								
never	0	0	1	0	0	0	M15-S15: 0.3189	M15-M17: 0.3518
almost never	3	2	5	6	4	3	M16-S16: 0.18	M16-M17: 0.1911
sometimes	2	1	0	0	3	1	M17-S17: 0.3555	S15-S16: 0.6517
quite frequently	4	6	3	4	2	5	–	S15-S17: 0.2935
very frequently	1	1	1	0	1	1	M15-M16: 0.5444	S16-S17: 0.4324

**Table IV**  
Item 4 in the studied groups.

Group	M15	M16	M17	S15	S16	S17	Statistical significance (p)	
Answer								
never	0	1	4	3	2	4	M15-S15: <b>0.0013</b>	M15-M17: 0.2381
almost never	3	5	1	7	5	5	M16-S16: 0.5983	M16-M17: > 0.9999
sometimes	0	1	0	0	1	0	M17-S17: 0.4579	S15-S16: 0.2961
quite frequently	6	3	4	0	2	0	–	S15-S17: > 0.9999
very frequently	1	0	1	0	0	1	M15-M16: 0.1067	S16-S17: 0.3523

**Table V**  
Item 5 in the studied groups.

Group	M15	M16	M17	S15	S16	S17	Statistical significance (p)	
Answer								
never	1	2	1	4	3	2	M15-S15: <b>0.0443</b>	M15-M17: 0.8308
almost never	5	4	5	6	4	7	M16-S16: 0.4758	M16-M17: 0.903
sometimes	0	1	2	0	2	1	M17-S17: 0.1847	S15-S16: 0.3366
quite frequently	4	2	2	0	1	0	–	S15-S17: 0.4195
very frequently	0	1	0	0	0	0	M15-M16: 0.8671	S16-S17: 0.8113

**Table VI**  
Item 6 in the studied groups.

Group	M15	M16	M17	S15	S16	S17	Statistical significance (p)	
Answer								
never	1	4	3	3	2	2	M15-S15: 0.1457	M15-M17: 0.2826
almost never	5	3	5	6	2	7	M16-S16: 0.3819	M16-M17: > 0.9999
sometimes	1	0	0	0	3	1	M17-S17: > 0.9999	S15-S16: 0.1099
quite frequently	2	2	2	1	2	0	–	S15-S17: 0.8607
very frequently	1	1	0	0	1	0	M15-M16: 0.3735	S16-S17: 0.1097

athletes ( $p=0.4017$ ).

For item no. 8 – "How often over the last month did you feel that you were in control of all your problems?", the frequency of answers by groups is shown in Table VIII.

For this item, statistically significant differences were found between at least 2 of the 6 studied groups ( $p=0.0252$ ). There were no statistically significant differences between the control groups ( $p=0.175$ ) or between the groups of athletes ( $p=0.2022$ ). For this item, statistically significant differences were found between groups M15-S15 and M17-S17 ( $p<0.05$ ).

For item no. 9 – "How often over the last month were you angry because of something of which you had no control?", the frequency of answers by groups is shown in Table IX.

For this item, there were no statistically significant differences between the 6 studied groups ( $p=0.2669$ ). No statistically significant differences were found between

the control groups ( $p=0.0542$ ) or between the groups of athletes ( $p=0.7731$ ). However, for this item, statistically significant differences were found between groups M15-M17 ( $p<0.05$ ).

For item no. 10 – "How often over the last month did you feel that you could not overcome difficulties?", the frequency of answers by groups is shown in Table X.

For this item, no statistically significant differences were found between the 6 studied groups ( $p=0.2341$ ). There were no statistically significant differences between the control groups ( $p=0.2697$ ) or between the groups of athletes ( $p=0.1745$ ).

The statistical analysis of PSS test scores evidenced highly statistically significant differences between the groups M15-S15 ( $p<0.01$ ).

b) General score analysis

In table XI we performed the comparative analysis for PSS test scores and statistical significance.

**Table VII**  
Item 7 in the studied groups.

Group	M15	M16	M17	S15	S16	S17	Statistical significance (p)	
never	1	1	1	2	2	2	M15-S15: 0.2204	M15-M17: 0.2973
almost never	2	6	4	5	2	6	M16-S16: 0.5771	M16-M17: 0.6567
sometimes	0	0	0	0	1	1	M17-S17: 0.146	S15-S16: 0.6309
quite frequently	5	2	5	1	4	1	–	S15-S17: 0.5997
very frequently	2	1	0	2	1	0	M15-M16: 0.1841	S16-S17: 0.1595

**Table VIII**  
Item 8 in the studied groups.

Group	M15	M16	M17	S15	S16	S17	Statistical significance (p)	
never	1	1	1	1	2	5	M15-S15: <b>0.0348</b>	M15-M17: 0.9045
almost never	2	6	3	8	5	4	M16-S16: 0.716	M16-M17: 0.346
sometimes	1	0	1	0	1	0	M17-S17: <b>0.0203</b>	S15-S16: 0.8251
quite frequently	6	3	4	1	2	1	–	S15-S17: 0.1266
very frequently	0	0	1	0	0	0	M15-M16: 0.2353	S16-S17: 0.1977

**Table IX**  
Item 9 in the studied groups.

Group	M15	M16	M17	S15	S16	S17	Statistical significance (p)	
never	1	0	3	1	1	0	M15-S15: 0.3741	M15-M17: <b>0.0476</b>
almost never	1	2	2	4	3	2	M16-S16: 0.3532	M16-M17: 0.0537
sometimes	0	0	1	0	2	1	M17-S17: 0.1216	S15-S16: > 0.9999
quite frequently	5	7	4	3	2	7	–	S15-S17: 0.5739
very frequently	3	1	0	2	2	0	M15-M16: 0.6821	S16-S17: 0.4649

**Table X**  
Item 10 in the studied groups.

Group	M15	M16	M17	S15	S16	S17	Statistical significance (p)	
never	2	1	2	4	2	0	M15-S15: 0.0668	M15-M17: 0.164
almost never	2	6	6	5	4	9	M16-S16: 0.8087	M16-M17: 0.7095
sometimes	0	1	0	0	0	0	M17-S17: > 0.9999	S15-S16: 0.1875
quite frequently	4	2	2	1	3	1	–	S15-S17: 0.0759
very frequently	2	0	0	0	1	0	M15-M16: 0.2395	S16-S17: 0.4814

**Table XI**  
Comparative analysis for PSS test scores and statistical significance.

Group	Mean	SE	Median	SD	Min.	Max.	Statistical significance (p) between groups by ages	
M 15	21.5	2.6045	22.5	8.2361	7	35	M15-S15: 0.0095	M15-M16: 0.4242
M 16	18.2	2.3561	19	7.4506	4	30	M16-S16: 0.5406	M15-M17: 0.1169
M 17	16.1	1.8824	15	5.9526	8	26	M17-S17: 0.4453	M16-M17: 0.446
S 15	11.6	1.9276	11.5	6.0955	2	22	–	S15-S16: 0.1948
S 16	15.5	2.2718	17	7.1841	2	23	–	S15-S17: 0.479
S 17	13.2	1.3968	14	4.4171	6	20	–	S16-S17: 0.3049

## Discussion

Stress generates negative emotions that affect performance in sports activity; the study of stress and anxiety is a problem of the highest interest for both athletes and trainers.

Although sports psychologists have a wide range of methods for the improvement of performance, the expected results are frequently not obtained. Identifying the psychological factors of sports performance is a permanent concern of specialists (Resch, 2010).

Studies carried out on students of the Faculty of Physical Education and Sport and of the Faculty of Psychology using the PSS scale have shown that the practice of sport has favorable effects on the perception of physical stress by young people and the practice of high performance sport in young people determines a slight decrease of the PSS score compared to young people that do not practice high performance sport (Boroş-Balint, 2012).

Some researchers who used the PSS scale evidenced an influence on health status, correlated with high cortisol levels (Ebrecht et al, 2004); protective cardiovascular and stress-reducing effects of physical exercise (Taylor-Piliae et al, 2006); an association between the perception of stress and inflammatory response in trained athletes (Main et al, 2009); a reduction of physical exercise and psychosocial factors during early menopause (Conroy et al, 2007); the effect of active and passive, static and dynamic stretching on performance (Fletcher & Jones, 2004).

Studies conducted by some authors indicate that daily stress is associated with sports injuries in the case of athletes with a low social assistance level and reduced coping abilities. Individuals with a low self-esteem, who are pessimistic and have no ambition (Ford et al, 2000) undergo more sports injuries or need longer time periods to recover from injuries (Williams & Andersen, 1998).

Mental welfare is directly influenced by the regular practice of physical exercise. Physical exercise can be used to maximize the mental tone of the person concerned (Berger et al., 2001).

Our research, following the application of the PSS questionnaire in the pre-competition period, indicates a moderate stress level in all groups of athletes and a higher stress level in control groups 15 and 16. The results of the study following the application of PSS evidence a decrease in stress with age in control groups, and lower scores in the groups of athletes compared to control groups.

## Conclusions

1. Professional junior basketball players are characterized by moderate total stress scores in the pre-competition period.

2. The psychological training of athletes during the pre-competition period should be aimed at maintaining eustress favorable for obtaining high performance in competition by the reduction of anxiety.

## Conflicts of interests

Nothing to declare.

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