

### 43 - STUDY OF THE LEVELS OF PERCEPTION OF STRESS AND FORCE STATES OF LOWER LIMBS, AFTER AN INTERVENTION OF TRAINING IN PHYSICAL AND PSYCHOLOGICAL DANCERS.

ANDRESSA MELINA BECKER DA SILVA; IVETE BALEN;  
KÁTIA KUCZYNSKI; RUBENS TEMPSKI; BIRGIT KELLER  
Federal University of Parana, Curitiba - PR, BRAZIL  
andressa\_becker@hotmail.com

#### INTRODUCTION:

The physical and psychological training in dancers has been little discussed in our country, because only the technical aspects have been focused, ignoring the principles of physical and psychological training.

The dance has strong historical influences from Russia, place where the training is carried out extensively, analyzing the dancer as a whole, considering body and mind as a single being. We should not only be based on references and techniques from Russia, however we should give the same attention to training.

The importance of this study is based on verifying the actual seriousness of physical and psychological training in dancers, thus broadening the participation of the Physical Education in Dance. The physical educator works the foundations of sport psychology and physical training, while the choreographer is based on the technical movements. Thus, with no disputes in the labor market, both work with their own goals, not leaving room for troubled competition.

#### OBJECTIVES

The objective was to examine whether there is any significant difference between levels of stress and strength of lower limbs in pre and post-test, after an intervention by a physical and psychological training in dancers.

#### METHODOLOGY

The study presents a characteristic quasi-experimental. As participants we have counted with a group of 11 jazz dancers, of both sexes, aged 18 to 23, who belong to a dance company in the city of Curitiba-PR. They have good physical condition, with high-level training.

For the collection of data the Test impulse Vertical (Fernandes, 2002, p.192-193) and Inventory of Understood Stress Scale-10 (COHEN and WILLIAMSON, 1988) were used, translated into Portuguese, validation and reliability made by Kings (2004).

For the test of power for vertical jump (this test verifies the power of the knee extensor muscles) was necessary a plank for marked jump in each half centimeter and supported by a wall at a height of 30 cm. and chalk powder. The chalk powder was placed on the indicator fingers of the dominant hand, to mark the time to jump. The dancers bent down and jumped touching the board and marking the highest point they reached. It was not possible to walk or run horizontally to jump. The result was recorded by measuring the distance between the highest mark and their stature with the upper limb extended. It was recorded in centimeters and three attempts were allowed.

To identify the perception of stress the Inventory Scale Stress Understood was applied, presented in a Likert scale (never, just sometimes, regularly and always) in multiple choice, the score is derived from the adding up of points for each question.

After the application of those tests the dancers went through the intervention, consisting of 7 weeks. The psychological training was conducted with a time of 1hr, 3 times a week. But the physical training, 3 times a week, containing 1h15min - 20 minutes for the preparatory part, 45 minutes for the main part and 10 minutes for the ending.

After the 7 weeks, the vertical and Inventory perception of stress tests were applied again.

For the processing of the data analysis a descriptive statistics (mean and standard deviation) was applied, a MANOVA at a level of significance  $p < 0.05$  and a correlation of Pearson, with the aid of SPSS 13.0.

#### RESULTS AND CONCLUSION:

Regarding the perceived stress pre-test, the data were compared, in Table 1, to the score of Cohen (1984), which brings the average stress on the American population and is considered normal ( $X=14.2$ ;  $SD=6.2$ ). The scores were also compared to the Kings and Petroski (2004), which brings values of the population of southern Brazil ( $X=21.3$ ,  $SD=2.1$ ).

**Table 1:** Results of the perception of stress pre-test

DANCERS	SCORE	CLASSIFICATION
Subject 1	16	Above average of the U.S. population and less than the South of Brazil
Subject 2	31	Above average of the two
Subject 3	18	Above average of the U.S. population and less than the South of Brazil
Subject 4	20	Above average of the U.S. population and less than the South of Brazil
Subject 5	24	Above average of the two
Subject 6	32	Above average of the two
Subject 7	26	Above average of the two
Subject 8	17	Above average of the U.S. population and less than the South of Brazil
Subject 9	16	Above average of the U.S. population and less than the South of Brazil
Subject 10	29	Above average of the two
Subject 11	24	Above average of the two

Considering that 100% of the dancers showed levels of stress above the U.S. population, and 54.54% with levels of stress higher than the average for the population of southern Brazil. The group's average was 22.63 ( $SD=6.07$ ), there is a need to control the stress of training. After all, the psychological and physiological reactions to stress previously identified are likely to bring a considerable reduction in performance.

It is possible that the results have revealed high levels of stress because of the innumerable rehearsals and the important event that the dancers will shortly have. As Weinberg and Gould (2001, p.102, 103) explain, there are two sources of situational stress, which are: the importance of an event and the uncertainty of its outcome. The more important the event is, the more stress it will create. Similarly, the more uncertain a result is, the more stress it will generate. But it is important to remember that each person looks at a situation in different ways. What seems important or uncertain to a person may not be to another one.

Sousa, Mariani and Samulski (2004) stated that regarding a dance spectacle, one should take into consideration the fear of making mistakes, the forgetfulness of choreographic sequence, the presence of the audience and critics of the area. Thus, the professional dancers could be subject to psychological pressure, which leads to stress and anxiety. The authors conclude that a methodology of work for the dance must be formulated involving sport psychology, as the physical preparation will only have positive results if it is associated with an emotional and mental preparation. It is also clear that the longer the experience of the dancers with spectacles, the better their performance will be, considering that the psychological is more focused on its mission.

In the study by these authors an increase in the dancers' heart rate was shown and, as Atkinson et.al (2002) explain, the psychological and physiological reactions to stress, therefore are: Psychological reactions (anxiety, anger and aggression, apathy and depression and cognitive weakening); Physiological Reactions (increased metabolic rate, increased heart rate, dilation of pupils, high blood pressure, increased respiratory rate, muscle tension and the secretion of endorphins and ACTH). Table 2 presents the results of stress perceived post-test.

**Table 2:** Results of post-stress test.

DANCERS	SCORE	CLASSIFICATION
Subject 1	21	Above average of the U.S. population and less than the South of Brazil
Subject 2	Without Score	Excluded Individual
Subject 3	18	Above average of the U.S. population and less than the South of Brazil
Subject 4	20	Above average of the two
Subject 5	16	Above average of the U.S. population and less than the South of Brazil
Subject 6	26	Above average of the two
Subject 7	26	Above average of the two
Subject 8	Without Score	Excluded Individual
Subject 9	16	Above average of the U.S. population and less than the South of Brazil
Subject 10	21	Above average of the U.S. population and less than the South of Brazil
Subject 11	Without Score	Excluded Individual

With this data we find that 100% of individuals had values above the U.S. average and 37.50% had averages above the southern Brazilian population. The group's average was 20.50 (SD=3.92). There was no significant difference in the perception of stress between pre and post test  $F(2, 11)=1595, p=0.0225$ . During the phase of the intervention (training) the explosive power (power) was worked on. Dantas (1998, p.170) emphasized that this is one of the most important physical qualities. She also says that "this parameter is a function of execution speed of motion and strength developed by the muscle considered." You should be aware of the following note, "after a study of force is not recommended exercises for flexibility under the risk of damage. Rather, it is essential to the implementation of stretching exercises" (LEAL, 1998, p. 48).

Table 3 presents the values of protocol standards of performance of Benjamin (1988 apud FERNANDES, 2002, p.193).

**Table 3:** Standardized test performance in the vertical jump.

Performance (%)	Men (cm)	Women (cm)
90	64	36
80	61	33
70	58	30
60	48	25
50	41	20
40	33	15
30	23	10
20	20	5
10	5	2,5

The performance of individuals was assessed as follows: the values of the first and second marks were registered in meters, the best value was dropped out and the difference between the best performance and the stature of the individual with the upper limbs extended was calculated. The resulting figure was compared to table 3. The results of the calculations are presented in Table 4.

**Table 4:** Performance evaluated in the vertical jump test of the pre-and post-test.

Dancers	Better mark (m)		Height (m)		Difference (cm)		Performance	
	PRE	POST	PRE	POST	PRE	POST	PRE	POST
Subject 1	2,4	2,4	2,03	2,03	37	37	> de 90%	> de 90%
Subject 2	2,66	0	2,23	0	43	0	> de 90%	Excluded
Subject 3	2,5	2,7	2,13	2,13	37	57	> de 90%	> de 90%
Subject 4	2,36	2,5	1,96	1,96	40	54	> de 90%	> de 90%
Subject 5	2,44	2,5	2	2	44	50	> de 90%	> de 90%
Subject 6	2,45	2,5	2,02	2,02	43	48	> de 90%	> de 90%
Subject 7	2,38	2,41	2,02	2,02	36	39	> de 90%	> de 90%
Subject 8	0	0	0	0	0	0	0	Excluded
Subject 9	2,41	2,42	2,03	2,03	38	39	> de 90%	> de 90%
Subject 10	2,33	2,42	1,98	1,98	35	44	80 y 90%	> de 90%
Subject 11	2,62	0	2,26	0	36	0	40 y 50%	excluded

Most of the dancers in the pre-test, performed more than 80% (very good), except for a dancer, who had in the trainings more emphasis on strength. The group's average was 38.75 (SD=3.28) cm.

In the post-test it is possible to see that 100% of the subjects performed between 90 and 100%, which is very good considering that the dancers performed many jumps. The group's average was 46.00 (SD=7.44) cm. In the vertical impulse significant difference was found between pre-and post-test  $F(2, 11)=7332, p=0.016$ . The results of the correlation between the two variables were moderately negative and showed no significant difference ( $r=-0.144, p=0.57$ ).

It is possible to be concluded from this study that the stress and strength of the lower limbs are inversely proportional, that is, the lower the levels of stress, the higher and the performance in tests of strength. It was found that the intervention of reduction of stress was not as efficient as the training of strength. In this sense, it is necessary to use various techniques to reduce stress to increase the performance of the dancers. It is suggested further studies with different populations and age groups to monitor the performance and stress reduction.

**KEY WORDS:** Stress. Strength. Dancers.

**REFERENCES:**

- ATKINSON, Rita L.; ATKINSON, Richard C.; SMITH, Edward E.; BEM, Darly J.; INOLEN-HOEKSEMA, Susan. **Introdução à psicologia**: de Hilgard. 13. ed. Porto Alegre: Artmed, 2002.
- COHEN, S., KAMARCK, T., MERMELSTEIN, R. A global measure of perceived stress. **Journal of Health and Social Behavior**, 24, 1984.
- DANTAS, Estelio H.M. **A prática da preparação física**. 4. ed. Rio de Janeiro: Shape, 1998.
- FERNANDES, José Luís. **O treinamento desportivo**: procedimentos, organização, métodos. 1. ed. São Paulo: EPU, 1981.
- LEAL, MRM. **A preparação física na dança**. 1. ed. Rio de Janeiro: Sprint, 1998.
- SOUSA, Fátima Nogueira Gonçalves de; MARIANI, Myriam Evelyse; SAMULSKI, Dietmar Martin. Análise do nível de estresse e da ansiedade em bailarinos e bailarinas profissionais na pré-estréia de um espetáculo de dança. **Revista Online Unileste**. Disponível em: <http://www.unilestemg.br/revistaonline/volumes/01/index.html>. Acesso em 14 maio. 2008.
- REIS, R.S., PETROSKI, E.L. **Relibity and validity of the brazilian version of the perceived stress scale**. Preventive Medicine (In Press), 2004.
- WEINBERG, Robert S.; GOULD, Daniel. **Fundamentos da psicologia do esporte e do exercício**. 2. ed. Porto Alegre : Atmed, 2001.

**Author:** Andressa Melina Becker da Silva.

**Address:** Travessa Roger Bacon, 99.

Garden Aristocrat. São Jose dos Pinhais - PR, Brazil.

**Co-authors:** Ivete Balen (ivetche@gmail.com); Kátia Kuczynski (katiamk@softall.com.br); Rubens Tempski (rubens.tempski @ pucpr.br)

**Advisor:** Birgit Keller (birgit@indailyfitness.com.br)

### **STUDY THE LEVELS OF PERCEPTION OF STRESS AND FORCE STATES OF LOWER, AFTER AN INTERVENTION OF A TRAINING IN PHYSICAL AND PSYCHOLOGICAL DANCERS.**

#### **ABSTRACT**

**Introduction:** The physical and psychological training when work integrating body and mind, considering the individual as a whole. **Objective:** To examine whether there is any significant difference between levels of stress and strength of lower limbs in pre-and post-test, after an intervention by a physical and psychological training in dancers. **Methodology:** The sample consisted of 11 jazz dancers, of both sexes, aged between 18 and 23, members of a dance company from the city of Curitiba-PR. To collect the data testing of Vertical Thrust to assess the strength and Inventory Scale Stress Understood were applied before and after the training. The training had duration of 7 weeks. For the processing of the data analysis, a descriptive statistics (mean and standard deviation) was used, a MANOVA at a level of significance  $p < 0.05$  and a correlation of Pearson. **Results and conclusion:** For the stress, in the pre-test, 100% of individuals had levels of stress above the U.S. population, and 54.54% above the average for the southern Brazil population. The group's average of 22.63 (SD=6.07). In the post-test, 100% of individuals had values above the U.S. average and 37.50% above the southern Brazilian population. The average group in the post-test was 20.50 (SD=3.92). There was no significant difference in the perception of stress between pre and post-test  $F(2,11)=1595$ ,  $p=0.225$ . For strength, the dancers in the pre-test performed more than 80%. In the post-test, 100% performed between 90 and 100%. There was significant difference between pre-and post-test  $F(2,11)=7332$ ,  $p=0.016$ . The results of the correlation between the two variables were moderately negative and showed no significant difference ( $r=-0.144$ ,  $p=0.570$ ). It is possible to be concluded from this study, that the stress and strength of the lower limbs are inversely proportional, that is, the shorter the levels of stress, the higher the performance in tests of strength. It was found that the intervention of reduction of stress was not as efficient as the training of strength. In this sense, it is necessary to use various techniques to reduce stress to increase the performance of the dancers. It is suggested further studies with different populations and age groups to monitor the performance and stress reduction.

Keywords: Stress. Strength. Dancers.

### **ÉTUDE DES NIVEAUX DE PERCEPTION DU STRESS ET DE LA FORCE DES MEMBRES INFÉRIEURS APRES UNE INTERVENTION D'UN ENTRAÎNEMENT PHYSIQUE ET PSYCHOLOGIQUE AUPRES DES DANSEURS.**

#### **RESUMÉ**

**Introduction:** L'entraînement physique et psychologique travail en même temps le corps et l'esprit, tout en considérant de l'individu dans son ensemble. **Objectif:** L'objectif est d'analyse s'il existe quelque différence significative entre les niveaux de stress et de force des membres inférieurs dans le pré et post-test, après l'intervention d'un entraînement physique et psychologique auprès des danseurs de ballet. **Méthodologie:** L'échantillonnage des participants a été formé de 11 danseurs de jazz, des deux sexes, âgés de 18 et 23 ans, d'un groupe de la ville de Curitiba. Nous avons appliqué les tests de poussée verticale à fin d'évaluer la force et l'échelle de stress perçus. Ces tests ont été appliqués avant et après la formation, pendant 7 semaines. Pour le traitement des données, il a été appliqué une analyse statistique descriptive (en utilisant la moyenne écart type - et), une MANOVA à un niveau de signification  $p < 0,05$  et une corrélations de Pearson. **Résultats et conclusion:** Pour le stress, sur le pré-test, 100% des individus ont présenté des niveaux de stress au-dessus de la population américaine et 54,54% au-dessus de la moyenne de la population sud du Brésil. La moyenne pour le groupe a été 22,63, (et = 6,07). En post-test, 100% des individus ont présenté des valeurs au-dessus de la moyenne américaine et 37,50% au-dessus du sud de population brésilienne. La moyenne du groupe de post-test a été 20,50 (et = 3,92). Il est clair qu'il n'y a aucune amélioration significative par rapport au stress entre le pré et le post-test,  $f = (2, 11) = 1,599$ ,  $p = 0,225$ . Après il a eu l'analyse de force, où dans le pré-test les individus ont présenté des performances supérieures à 80%. En post-test, 100% des personnes ont présenté des performances entre 90 et 100%. Dans ce cas, il y a eu une différence significative entre pré et post-test  $F(2,11) = 7,332$ ,  $p = 0,016$ . Les résultats de la corrélation entre les deux variables ont été modérés négatifs et n'a pas présenté différence significative ( $r = -0,144$ ,  $p = 0,570$ ). Il s'ensuit que, pour cette étude, le stress et la force des membres inférieurs sont inversement proportionnelle. C'est à dire, plus petit est le niveau de stress, plus grand est la performance de force. En plus, il a été vérifié que la réduction du niveau de stress n'été pas si efficient comme l'entraînement de force. Par conséquent, la suggestion est l'utilisation des plusieurs techniques de réduction de stress en objectivant amélioré la performance des danseurs de ballet. Par fin, il est suggéré des nouvelles études avec des différentes populations des groupes d'âge diversifiés pour tracer l'évolution de la performance de réduction de stress.

Mots-clés: Stress. Puissance. Danseurs.

**ESTUDIO DE LOS NIVELES DE PERCEPCIÓN DE ESTRÉS Y LOS ESTADOS DE FUERZA DE LAS EXTREMIDADES INFERIORES, DESPUÉS DE UNA INTERVENCIÓN DE UNA FORMACIÓN EN FÍSICA Y PSICOLÓGICA EN LOS BAILARINES.****RESUMEN**

**Introducción:** El entrenamiento físico y psicológico cuando ambos trabajaban integrar el cuerpo y la mente, teniendo en cuenta al individuo como un todo. **Objetivo:** Examinar si existe alguna diferencia significativa entre los niveles de estrés y la fuerza de las extremidades inferiores en pre-y post-prueba, después de una intervención por una capacitación física y psicológica en los bailarines. **Metodología:** La muestra estuvo constituida por 11 bailarines de jazz, de ambos sexos, con edades comprendidas entre los 18 y 23 años, los miembros de un grupo de la ciudad de Curitiba-PR. La recopilación de datos se aplicaron antes y después de la formación, ensayos de empuje vertical para evaluar la fuerza y el Inventario de Estrés Escala Entendido. La capacitación tuvo una duración de 7 semanas. Para el tratamiento de los datos el análisis se utilizó una estadística descriptiva (media y desviación estándar), un MANOVA en un nivel de significación  $p < 0,05$  y una correlación de Pearson. **Resultados y conclusiones:** Para el estrés, en el pre-test, en el 100% de las personas había niveles de estrés por encima de la población de los EE.UU., y 54,54% por encima de la media de la población Del sur de Brasil. El grupo de la media de 22,63 (SD=6,07). En el post-test, el 100% de los individuos tuvieron valores por encima de los EE.UU. y la media de 37,50% por encima de la población del sur de Brasil. El promedio en el grupo después de la prueba fue 20,50 (SD=3,92). No hubo diferencias significativas en la percepción de estrés entre pre y post-test  $F(2,11)=1,595$ ,  $p=0,225$ . Por fuerza, los bailarines en el pre-test realizado más de 80%. En el post-test, el 100% realizado entre el 90 y el 100%. Hubo una diferencia significativa entre pre y post-test  $F(2,11)=7,332$ ,  $p=0,016$ . Los resultados de la correlación entre las dos variables fueron negativos moderados y no mostraron ninguna diferencia significativa ( $r=-0,144$ ,  $p=0,570$ ). Es por este estudio, que el estrés y la fuerza de las extremidades inferiores son inversamente proporcional, es decir, la más corta de los niveles de estrés, un mayor rendimiento en las pruebas de fuerza. Se constató que la intervención de reducción de estrés no es tan eficaz como la formación de la fuerza. En este sentido, es necesario utilizar diversas técnicas para reducir el estrés para aumentar el rendimiento de los bailarines. Se sugiere realizar nuevos estudios con diferentes poblaciones y grupos etarios para supervisar el rendimiento y reducir el estrés.

Palabras clave: Estrés. Fuerza. Bailarines.

**ESTUDO DOS NÍVEIS DE PERCEÇÃO DE ESTRESSE E FORÇA DOS MEMBROS INFERIORES APÓS UMA INTERVENÇÃO DE UM TREINAMENTO FÍSICO E PSICOLÓGICO EM BAILARINOS.****RESUMO**

**Introdução:** O treinamento físico e psicológico quando trabalhados simultaneamente integram corpo e mente, considerando o indivíduo como um todo. **Objetivo:** analisar se existe diferença significativa entre os níveis de estresse e força de membros inferiores em pré e pós-teste, após intervenção de um treinamento físico e psicológico em bailarinos. **Metodologia:** A amostra foi constituída de 11 bailarinos da modalidade Jazz, de ambos os sexos, com idades entre 18 e 23 anos, da cidade de Curitiba-PR. Para coleta dos dados foram aplicados, antes e após o treinamento, os testes de Impulsão Vertical para avaliar força e o Inventario da Escala de Estresse Percebido. O treinamento teve duração de 7 semanas. Para o tratamento dos dados foi empregada uma análise estatística descritiva (média e desvio padrão), uma MANOVA, a um nível de significância  $p < 0,05$  e uma correlação de Pearson. **Resultados e conclusão:** Para o estresse, no pré-teste, 100% dos indivíduos apresentaram níveis de estresse acima da população americana e 54,54% acima da média da população sul brasileira. A média do grupo foi de 22,63 (dp=6,07). No pós-teste, 100% dos indivíduos apresentaram valores acima da média americana e 37,50% acima da população sul brasileira. A média do grupo no pós-teste foi de 20,50 (dp=3,92). Não houve diferença significativa na percepção de estresse entre o pré e pós-teste  $F(2,11)=1,595$ ;  $p=0,225$ . Em relação à força, os bailarinos no pré-teste apresentaram desempenho superior a 80%. No pós-teste, 100% apresentaram desempenho entre 90 e 100%. Houve diferença significativa entre pré e pós-teste  $F(2,11)=7,332$ ,  $p=0,016$ . Os resultados da correlação entre as duas variáveis foram moderados negativo e não apresentou diferença significativa ( $r= -0,144$ ,  $p=0,570$ ). Conclui-se para este estudo, que o estresse e a força dos membros inferiores são inversamente proporcionais, ou seja, quanto menor os níveis de estresse, maior o desempenho no teste de força. Verificou-se que a intervenção de redução de estresse não foi tão eficiente quanto o treinamento de força. Neste sentido, é necessário utilizar várias técnicas de redução de estresse para aumentar a performance dos bailarinos. Sugerem-se novos estudos com diferentes populações e faixas etárias para acompanhar a evolução do desempenho e redução de estresse.

Palavras-chave: Estresse. Força. Bailarinos.