

CLINICAL SCIENCE

EVALUATION OF PHYSICAL ACTIVITY HABITS IN PATIENTS WITH POSTTRAUMATIC STRESS DISORDER

Marcio Antonio de Assis,^I Marcelo Feijó de Mello,^{II} Fulvio Alexandre Scorza,^{III} Mariana Pupo Cadrobbi,^{II} Aline Ferri Schoedel,^{II} Sergio Gomes da Silva,^{IV} Marly de Albuquerque,^I Antonio Carlos da Silva,^{IV} Ricardo Mario Arida^{IV}

doi: 10.1590/S1807-59322008000400010

Assis MA, Mello MF, Scorza FA, Cadrobbi MP, Schoedel AF, Silva SG, de Albuquerque M, da Silva AC, Arida RM. Evaluation of physical activity habits in patients with posttraumatic stress disorder. Clinics. 2008;63:473-8.

OBJECTIVE: In this study, we present data from a survey that aimed to assess the physical activity habits of adult Brazilian patients with Posttraumatic Stress Disorder.

METHOD: Fifty male and female patients with Posttraumatic Stress Disorder participated in this study. The mean age at onset was 37±12 years, and the mean time between diagnosis and follow-up was 3.6±4.2 years.

RESULTS: Substantial changes in physical activity habits were observed following the onset of PTSD. While more than half of the patients participated in physical activities prior to Posttraumatic Stress Disorder onset, there was a significant reduction in their participation afterwards. The justifications for stopping physical activities or sport participation were lack of time and lack of motivation.

DISCUSSION: Several studies have shown that physical exercise decreases reverts symptoms of psychiatric disorders such as depression, anxiety and social isolation. We could therefore hypothesize that patients with Posttraumatic Stress Disorder who exercise should experience the same benefits.

CONCLUSION: Our findings demonstrated that patients with Posttraumatic Stress Disorder have low levels of participation in sports or physical activities.

KEYWORDS: Posttraumatic Stress Disorder. Exercise. Physical activity habits. Patient quality of life.

INTRODUCTION

Posttraumatic stress disorder (PTSD) is a mental disorder that develops in people who are exposed to extremely stressful events such as natural disasters, environmental destruction or violence or who confront life-altering events,

such as the death of family members or friends. Although PTSD is a highly prevalent and often chronic condition, the relationship between PTSD, functioning and quality of life remains unclear. It has been associated with a lower quality of life in US war veterans,^{1,2} refugees of war,³ and sexual assault survivors.⁴ In addition, PTSD has been associated with poorer mental and physical health,⁵ increased violent behavior,⁶ marital and family adjustment problems⁷ and less favorable performance in work and education.⁸

Studies have consistently found that physical activity is associated with improved psychological well-being, physical health, life satisfaction, cognitive functioning and psychiatric conditions.⁹⁻¹⁶ Clinical and epidemiologic studies have also shown an association between physical activity and decreased symptoms of anxiety and depression.¹⁵⁻¹⁷ Few studies, however, have analyzed the impact of physical

^I Laboratório de Neurociências, Núcleo de Pesquisas Tecnológicas, Universidade de Mogi das Cruzes – São Paulo/SP, Brasil.

^{II} Departamento de Psiquiatria, Universidade Federal de São Paulo, Escola Paulista de Medicina – São Paulo/SP, Brasil.

^{III} Disciplina de Neurologia Experimental, Universidade Federal de São Paulo, Escola Paulista de Medicina – São Paulo/SP, Brasil.

^{IV} Departamento de Fisiologia, Universidade Federal de São Paulo, Escola Paulista de Medicina – São Paulo, Brasil.

Email: arida.nexp@epm.br

Received for publication on March 25, 2008

Accepted for publication on May 06, 2008

exercise in patients with PTSD.^{18,19} In a study carried out in veterans of the Vietnam War with PTSD, Otter and Currie¹⁸ observed lifestyle and psychological changes as a result of an exercise program. Another study assessed the impact of a 12-session aerobic exercise program on symptoms of PTSD, anxiety and depression. There was no reduction in symptoms observed during baseline phases. After exercise intervention, however, significant reductions in PTSD, anxiety and depression were observed.¹⁹ Information related to the effect of physical activity in PTSD patients is still lacking in the literature. Due to the physiological and psychological effects of the physical activity reported by several studies, the objective of this study was to assess the physical activity habits and uses of leisure time among Brazilian patients with PTSD.

MATERIALS AND METHODS

Patients with PTSD from the Program of Attendance to the Victim of Violence and Stress from the Department of Psychiatry of the Federal University of São Paulo were invited to participate as study subjects during a routine visit to the outpatient clinic. A structured clinical interview (SCID) was conducted after the patients had completed psychological testing. They were formally diagnosed with PTSD using the Clinician Administered Post Traumatic Stress Disorder Scale (CAPS) based on DSM-IV criteria. After referral, patients were given a first appointment and sent routine questionnaires. These included the Beck Depression Inventory (BDI) and the Beck Anxiety Inventory (BAI). A questionnaire was designed to assess physical and leisure time activities. Patients who could not read or comprehend the meaning of the questionnaire were excluded. Patients answered the 25-item questionnaire with simple close-end type response scales. Questions concerned (a) the facilities available for participation in various local community leisure time activities, (b) respondents' attitudes toward physical exercise in particular and their degree of participation in it, and (c) aspects of PTSD. Patients were classified as being active or inactive, and the guidelines of the American College of Sports Medicine²¹ were used as follows: active subjects were those who exercised at least three times a week for a minimum of 20 min at an adequate intensity; inadequately active patients exercised less than that; and sedentary patients did not exercise at all. The questionnaire was answered by 50 patients (16 male and 34 female patients ranging from 15-68 years, with a mean age=40.1 years). The mean age at onset of PTSD was 37±12 years, and the mean time between diagnosis and follow-up was 3.6±4.2 years. In order to compare our data, we used research that analyzed the physical activity level of the São Paulo State population as a control group.²⁰ None

of the patients presented with a physical disability that could have hindered their ability to participate in physical activities. The same investigator administered all questionnaires. Self-administrated questionnaires or any access of information concerning the subject during the questionnaire application was not allowed. The study received approval from the Human Research Ethics Committee, and all subjects signed an informed consent document. Subjects younger than 18 years old had informed consent documents signed by their parents.

RESULTS

The most frequent events related to PTSD in our patients' lives are listed in Table 1. Only 24% of them did not present comorbidities associated with PTSD. Depression (58%) and anxiety (22%) were the most common symptoms. The majority of the patients were treated with selective serotonin reuptake inhibitors (SSRIs) and anxiolytic (benzodiazepines) drugs, with at least one type of medication at the time of participation. Fifty-six percent were treated with two or more drugs, 26% with one drug and 18% with no medication.

Table 1 - The most frequent events related to PTSD among 50 patients interviewed

Clinical and Demographic data	
Mean age (years)	40,1 (15-68)
Sex	
Male	16(32%)
female	34(68%)
Mean age at PTSD onset (years)	37 ± 12
Mean time of PTSD (years)	3.6 ± 4.2
Follow-up time of PTSD (years)	3.6 ± 4.2
Stressor events	
n° %	
Death threat	4 (8%)
Physical attack	5 (10%)
Sequestration	3 (6%)
Assaut	13 (26%)
Homicide attempt	3 (6%)
Rebellion with physical attack	3 (6%)
Sexual abuse	5 (10%)
Loss of relative	13 (26%)
Others	4 (8%)
Comorbidities associated with PTSD	
Depression	29 (58%)
Anxiety	11 (22%)
Psychoactive substance abuse	2 (4%)
Another disorder	4 (8%)
Without comorbidity	12 (24%)

Clonazepam (28%) was the most commonly used drug, followed by fluoxetine (22%).

Leisure time opportunities, such as enjoying the cinema, social contact with friends, walking and being a part of a religious society were reduced after PTSD onset (Table 2). Considerable changes in physical activity participation were also observed after PTSD. More than half of the patients participated in physical activities, although not all of them participated regularly (52% before and 22% after PTSD

onset). Of the patients involved in physical activities, 24% were under the supervision of an instructor before PTSD, while only 4% were under supervision after PTSD onset. Before PTSD onset, 26% of the patients were deemed physically active, while only 14% were afterwards. Of the active subjects, 30% had been engaged in physical activities for at least two years before PTSD, and only 6% were involved afterwards.

Justifications for stopping sport activities among the patients included lack of time (14% before and 39% after PTSD onset) and lack of motivation (24% before and 71% after PTSD onset). Interestingly, many were advised to avoid most types of exercise by a physician. All patients answered questions regarding how much they liked doing physical exercise. No differences were found after PTSD (86% before and 78% after PTSD onset). Table 2 shows the specific aspects related to physical activity habits before and after PTSD onset.

Another interesting aspect found in this study is the type of sport or physical exercise chosen by patients with PTSD. Walking was the most popular physical exercise before and after PTSD onset. Interestingly, sport activities usually practiced before PTSD onset, such as swimming, jogging and soccer, were not performed afterwards (Figure 1).

Table 2 - Leisure time activities and physical activities habits before and after PTSD (n=50)

Custom	Before PTSD	After PTSD
Cultural activities (cinema, theatre, etc.)	42% (21)	18% (9)
Shopping	60% (30)	34% (17)
Walking	80% (40)	38% (19)
Driving	68% (34)	36% (18)
Social contact with friends	80% (40)	54% (27)
Participation in religious society	42% (21)	14% (7)
Like exercise	86% (43)	78% (39)
Do not have time to exercise	36% (18)	30% (15)
No one to exercise with	28% (14)	46% (23)
Tiredness after exercising	76% (38)	70% (35)
Discouraged from exercising by family and/or friends	2% (1)	2% (1)
Fear that exercise will cause health problems	16% (8)	26% (13)

DISCUSSION

This is one of the few studies specifically addressing the physical activity habits in a large population of Brazilian

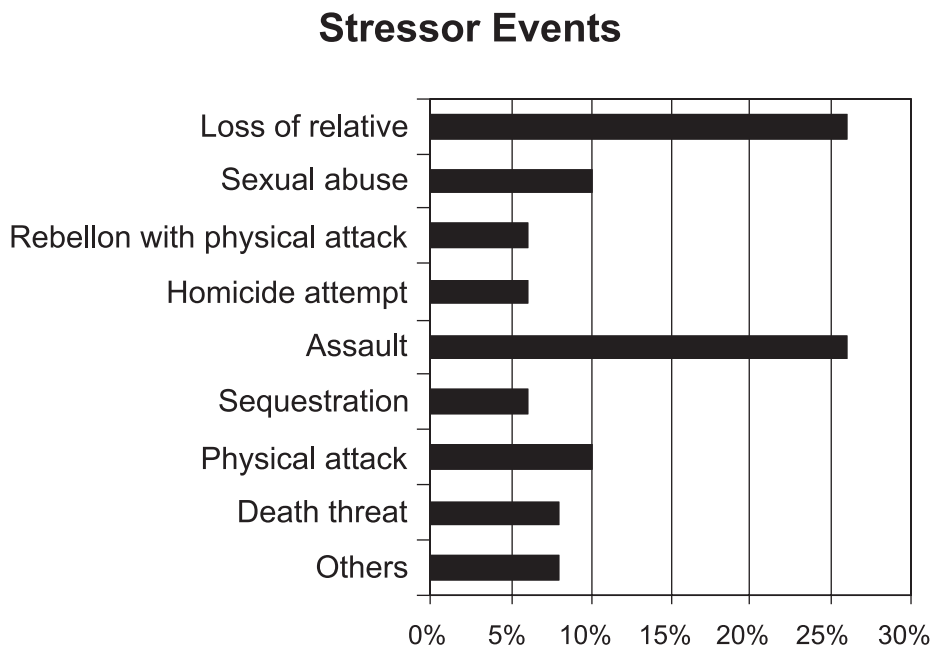


Figure 1 - Percentage of the main causes of PTSD pointed for the interviewed patients

patients with PTSD. Although this random sample was collected from a public hospital treating individuals from different social strata and from all over the country, we believe that, due to the limited geographic nature of the data, there is a limit to the generalizability of the findings to the wider PTSD population.

Our data show a reduction in the participation of physical activities as well as leisure time habits after the PTSD onset. Although more than half of the patients participated in physical activities before PTSD onset (52%), there was a significant reduction (22%) in their participation afterwards. Consequently, there was a reduction in the number of active subjects as well as subjects under supervision of an instructor after PTSD onset. For control subjects we considered the results of Matsudo et al.²⁰, who studied 2001 subjects in the São Paulo State population (14 to 77 years-old; 953 males and 1048 females) and showed that 53.6% were considered active. Although we found a smaller number of active subjects in our sample before PTSD onset (26%) than in a previous study of the Brazilian population²⁰, this number was reduced after PTSD onset (14%).

Regular physical exercise has received considerable attention as a mechanism for enhancing the resistance to the negative effects of psychosocial stress. It is generally accepted that physical exercise contributes to a person's general health and well-being,²² positive changes in life style,²³ improved mood and life quality,²⁴ a reduction in the symptoms of anxiety and depression,²⁵ and an increase in the perceived ability to cope with stress.²⁶ Anxiety and depression are two important conditions associated with PTSD.^{27,28} Subjects diagnosed with PTSD stop participating in society and no longer take part in activities they used to enjoy; this inaction may lead to depression and social isolation.²⁸ Australian Vietnam Veterans with PTSD have reported experiencing anxiety disorders (41% compared to 7% of control subjects) and depression (45% compared to 4% of control subjects).¹⁸ Although only few patients believe that physical activities will worsen their health problems, a reduction in the participation of physical activities was observed after PTSD onset. The reduction observed in our study could be in part attributed to these symptoms that are commonly observed in PTSD patients.

An interesting point observed in our study was related to the lack of motivation to participate in physical exercise programs or physical activities after PTSD onset. This seems intuitively correct, as PTSD patients present with negative feelings and do not typically feel that their lives are as positive as they were before the PTSD. As mentioned before, a person with PTSD is frequently diagnosed with other psychiatric disorders, such as depression and anxiety.^{29,30} These two comorbidities are present in our PTSD patients. These factors

could therefore be contributing to the negative attitude concerning the practice and habits of physical exercise.

Studies show that improved social support may be derived from the involvement in physical activity.³¹ It is interesting to note that PTSD patients in our study chose individual sport or physical activity. For instance, group activities such as soccer, handball and dancing were absent after PTSD. It has been recently reported that a physical exercise program can change the lifestyle of PTSD patients.¹⁸ Subjects with PTSD display an exceptionally high rate of severe quality of life impairment.³² It has also been shown that PTSD is associated with a variety of functional impairments, which include a diminished well-being, compromised physical health, physical limitations and unemployment.² An exercise program inclusion should therefore be recommended to PTSD patients in order to increase social interaction, acquire positive changes in life style and consequently achieve a better quality of life.

A large body of research has clearly demonstrated that physical activity programs not only help decrease mortality rates but also decrease morbidity (i.e., 'adding life to years' and not just 'years to life'). In a detailed review of cross-sectional and prospective studies, Spirduso and Cronin³³ have recently shown that physical activity is consistently associated with improved well-being and better quality of life in later life. While physical activity can indirectly improve well-being and life quality subjectively by preventing disease and premature death, there has recently been an increasing interest in its direct role in the prevention and treatment of mental health problems. As discussed above, quality of life for those diagnosed with PTSD is significantly lower than for those without. This could change with the informed and qualified supervision of the physician and the necessary safety precautions.

Nevertheless, these findings need to be interpreted with caution, as the current study has methodological limitations. The mean time between PTSD onset and follow-up varied among subjects. Although the BDI and BAI were applied in the clinical interview, the scales of anxiety, depression and quality of life were not analyzed in this study. The majority of patients were treated with psychotropic drugs, which could induce to sedation and therefore interfere in physical activity adherence. Beyond these methodological considerations, this study clearly demonstrates that like other major psychiatric syndromes, PTSD is associated with a broad profile of functional impairment and a diminished quality of life. Furthermore, the combined observations of significantly poorer outcomes in subjects with PTSD and a high prevalence of PTSD in subjects with comorbid disorders suggest that PTSD substantially contributes to the functional impairment observed in this sample of patients.

Our findings demonstrate that PTSD patients have low levels of participation in sports or physical activities. Studies analyzing the impact of physical exercise have demonstrated a positive effect in these PTSD patients. We believe that the campaigns for more physical activity that have been launched in Brazilian mass media have reached control subjects and patients with other mental and physical diseases. It seems to be necessary, however, to promote specific campaigns aimed at informing and stimulating PTSD patients to become more active. We believe that physicians and health professionals should encourage these patients to be engaged in leisure time and physical activities. It may be also be reasonable for them to have the support of health authorities, social workers and sports instructors to achieve these goals. We believe our study can serve as a

trigger for future research investigating the effect of physical exercise programs for PTSD subjects. The analysis of quality of life and psychological changes after regular physical activity may provide further information on the benefits of exercise in PTSD patients.

ACKNOWLEDGMENTS

This research was supported by Fundação de Amparo ao Ensino e Pesquisa (FAEP), Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq), Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP) and Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) (Brazil).

REFERENCES

1. Warshaw MG, Fierman E, Pratt L, Hunt M, Yonkers KA, Massion AO et al. Quality of life and dissociation in anxiety disorder patients with histories of trauma or PTSD. *Am J Psychiatry*. 1993;150:1512-16.
2. Zatzick DF, Marmar CR, Weiss DS, Browner WS, Metzler TJ, Golding JM et al. Posttraumatic stress disorder and functioning and quality of life outcomes in a nationally representative sample of male Vietnam veterans. *Am J Psychiatry*. 1997;154:1690-95.
3. Miller KE, Weine SM, Ramic A, Brkic N, Bjedic ZD, Smajkic A et al. The relative contribution of war experiences and exile-related stressors to levels of psychological distress among Bosnian refugees. *J Trauma Stress*. 2002;15:377-87.
4. Krakow B, Melendrez D, Johnston L, Warner TD, Clark JO, Pacheco M et al. Sleep-disordered breathing, psychiatric distress and quality of life impairment in sexual assault survivors. *J Nerv Ment Dis*. 2002;190:442-52.
5. Wolfe J, Schnurr PP, Brown PJ, Furey J. Posttraumatic stress disorder and war-zone exposure as correlates of perceived health in female Vietnam war veterans. *J Consult Clin Psychol*. 1994;62:1235-40.
6. Chemtob CM, Hamada RS, Roitblat HL, Muraoka MY. Anger, impulsivity and anger control in combat-related posttraumatic stress disorder. *J Consult Clin Psychol*. 1994;62:827-32.
7. Jordan BK, Marmar CR, Fairbank JA, Schlenger WE, Kulka RA, Hough RL et al. Problems in families of male Vietnam veterans with posttraumatic stress disorder. *J Consult Clin Psychol*. 1992;60:916-26.
8. Stein MB, Walker JR, Hazen AL, Forde DR. Full and partial posttraumatic stress disorder: Findings from a community survey. *Am J Psychiatry*. 1997;154:1114-19.
9. Meyer T, Broocks A. Therapeutic impact of exercise on psychiatric diseases: guidelines for exercise testing and prescription. *Sports Med*. 2000;30:269-79.
10. Farmer ME, Locke BZ, Moscicki EK, Dannenberg AL, Larson DB, Radloff LS. Physical activity and depressive symptoms: the NHANES I Epidemiologic follow-up study. *Am J Epidemiol*. 1988;128:1340-51.
11. Petruzzello SJ, Landers DM, Hatfield BD, Kubitz KA, Salazar W. A meta analysis on the anxiety-reducing effects of acute and chronic exercise. Outcomes and mechanisms. *Sports Med*. 1991;11:143-82.
12. Russo-Neustadt AA, Beard RC, Huang YM, Cotman CW. Physical activity and antidepressant treatment potentiate the expression of specific brain-derived neurotrophic factor transcripts in the rat hippocampus. *Neuroscience*. 2000;101:305-12.
13. Russo-Neustadt AA, Há T, Ramirez R, Kesslak JP. Physical activity-antidepressant treatment combination: impact on brain-derived neurotrophic factor and behavior in an animal model. *Behav Brain Res*. 2001;120:87-95.
14. Rehor PR, Dunnagan T, Stewart C, Cooley D. Alteration of mood state after a single bout of noncompetitive and competitive exercise programs. *Percept Mot Skills*. 2001;93:249-56.
15. Stewart AL, Hays RD, Wells KB, Rogers WH, Spritzer KL, Greenfield S. Long-term functioning and well-being outcomes associated with physical activity and exercise in patients with chronic conditions in the Medical Outcomes Study. *J Clin Epidemiol*. 1994;47:719-30.
16. Dimeo F, Bauer M, Varahram I, Proest G, Halter U. Benefits from aerobic exercise in patients with major depression: a pilot study. *Br J Sports Med*. 2001;35:114-7.
17. Dunn AL, Trivedi MH, O'Neal HA. Physical activity dose-response effects on outcomes of depression and anxiety. *Med Sci Sports Exerc*. 2001;33:S587-97.
18. Otter L, Currie J. A long time getting home: Vietnam Veterans' experiences in a community exercise rehabilitation programme. *Disabil Rehabil*. 2004;26:27-34.
19. Manger TA, Motta RW. The impact of an exercise program on posttraumatic stress disorder, anxiety, and depression. *Int J Emerg Ment Health*. 2005;7:49-57.
20. Matsudo SM, Matsudo VR, Araújo T, Andrade D, Andrade E, Oliveira L et al. Nível de atividade física da população do Estado de São Paulo: análise de acordo com o gênero, idade, nível sócio-econômico, distribuição geográfica e de conhecimento. *RBCM*. 2002;10:41-50.

21. American College of Sports Medicine position stand. The recommended quantity and quality of exercise for developing and maintaining cardiorespiratory and muscular fitness in healthy adults. *Med Sci Sports Exerc.* 1990;22:265-74.
22. Bouchard C. The consensus statement. In: C. Bouchard C, Shephard RJ, Stephens T, Sutton JR, McPherson BD, editor. *Exercise, fitness and health. A consensus of current Knowledge.* Champaign: Human Kinetics Books; 1990. p.497-510.
23. Shepard RJ. Costs and benefits of an exercising versus a nonexercising society. In: C. Bouchard, Shepard RJ, Stephens T, Sutton JR, McPherson BD, editor. *Exercise, fitness and health. A consensus of current knowledge* Champaign: Human Kinetics Books; 1990. p.49-60.
24. Folkens CH, Sime WE. Physical fitness training and mental health. *Am Psychol.* 1981; 36:373-89.
25. Martinsen EW, Medhus A, Sandvik L. Effects of aerobic exercise on depression: a controlled study. *BMJ.* 1985; 291(6488):109.
26. Steptoe A, Edwards S, Moses J, Mathews A. The effects of exercise training on mood and perceived coping ability in anxious adults from the general population. *J Psychosom Res.* 1989;33:537-47.
27. Kessler RC, Sonnega A, Bromet E, Hughes M, Nelson CB. Posttraumatic stress disorder in the national comorbidity survey. *Arch Gen Psychiatry* 1995;52:1048-60.
28. National Centre for War-Related Posttraumatic Stress Disorder stress. Melbourne: NCWRPTSD; 1999.
29. Schelling G, Stoll C, Haller M, Briegel J, Manert W, Hummel T et al. Health related quality of life and posttraumatic stress disorder in survivors of the acute respiratory distress syndrome. *Crit Care Med.* 1998;26:634-35.
30. Stoll C, Schelling G, Goetz AE, Kilger E, Bayer A, Kapfhammer HP et al. Health-related Quality of Life and post-traumatic stress disorder in patients after cardiac surgery and intensive care treatment. *J Thorac Cardiovasc Surg.* 2000;120:505-12.
31. Chogahara M, O'Brien Cousins S, Wankel LM. Social influence in physical activity in older adults: a review. *J Aging Phys Act.* 1998;6:1-17.
32. Rapaport MH, Clary C, Fayyad R, Endicott J. Quality-of-Life Impairment in Depressive and Anxiety Disorders. *Am J Psychiatry.* 2005;162:1171-78.
33. Spirduso WW, Cronin DL. Exercise dose-dependent effects on quality of life and independent living in older adults. *Med Sci Sports Exerc.* 2001; 33:S598-S609.