

Research Article

Acupuncture Effects on the Stress Level in Administrative Workers

Silveira AF¹, Rodrigues VRMC¹, Nascimento LCG¹, Bittar CML¹, Zaia JE² and Quemelo PRV^{3*}

¹Department of Health Promotion, University of Franca, Brazil

²Department of Biological Sciences, Minas Gerais State University (UEMG), Brazil

³Department of Physiotherapy, Sao Camilo University Center, Brazil

*Corresponding author: Paulo Roberto Veiga Quemelo, Department of Physiotherapy, Sao Camilo University Center, Sao Paulo, Sao Paulo – Brazil

Received: May 03, 2017; Accepted: June 02, 2017;

Published: June 14, 2017

Abstract

Introduction: Acupuncture has been growing in clinical practice with the aim of reducing the stress. However, there is a lack of studies proving their benefits.

Objective: To evaluate the effects of auricular acupuncture on stress levels in administrative workers.

Materials and Methods: Participated in the study, 58 administrative sector workers of a public hospital. The participants were randomly separated into two groups: control group (n=30) which received no intervention; and the experimental group (n=28), which was applied to auricular acupuncture for eight weeks. Perceived Stress Scale (PSS-10) measured the stress level.

Results: The stress level reduced in experimental group of high to moderate. The stress level reduced to 21.0 points to 18.5 points in the experimental group (p=0.001).

Conclusion: The implementation of eight weeks of auricular acupuncture showed an effective strategy for reducing stress. Acupuncture is a method that offers a low cost and easy application, being a practical and effective method for stress management in administrative workers.

Keywords: Stress; Occupational health; Burnout; Health promotion; Acupuncture therapy

Abbreviations

CNS: Central Nervous System; PSS – 10: Perceived Stress Scale 10; 5-HT: 5-Hydroxytryptamine receptors; PNPIC: National Policy on Integrative and Complementary Practices; SUS: Unified Health System

Introduction

Stress is the body's reaction that involves physical and psychological components that cause changes in the homeostasis [1]. Muscle tension, excessive sweating, dry mouth and perception of constant alertness are common symptoms caused by stress. These symptoms may occur through the coping of stressful situations on people, regardless of age, sex, social class or occupation [2]. Intellectual work, shift work and work pressure are conditions that can lead to stress conditions [3,4]. Occupational stress influences the health of workers, absenteeism and performance at work. Some disorders like insomnia, depression, anxiety, musculoskeletal disorders and burnout syndrome are common in stressed workers [3,5,6-8]. This situation brings economic impact with high cost for companies and government [7].

Given the impact that stress can have on workers it is important to think about interventions to reduce this condition. Acupuncture, meditation and yoga are alternative therapies frequently offered to mind and body practices [8]. Acupuncture has been widespread in the last decade in western countries as a treatment for many diseases

[9-11]. Acupuncture can be applied systemically in the body or in the ear. The auricular acupuncture therapy is based on an inverted fetus, in which the organs, viscera, central and peripheral nervous system are represented in the ear [12,13]. General mechanisms, including placebo effects, stress reduction, improved mood and sleep are mentioned by acupuncture therapy effects [10,11]. It was demonstrated a significant positive effect of acupuncture on cognitive impairment through modulation of signaling pathways involved in neuronal survival and functioning 'animal' studies, but the exact mechanism remains unclear [14]. Theoretically, acupuncture is believed to have the ability to regulate various biological functions through the autonomic nervous system and reduce the symptoms of musculoskeletal pain. However, there are few studies about acupuncture focused on the worker's health [15,16]. Specifically, about stress and workers, we did not find any studies about acupuncture effects. Since the use of acupuncture has grown in clinical practice and as a form of intervention in the workplace to reduce anxiety and stress it is important to further to investigate the benefits of acupuncture to improve the worker's health. Thus, the aim of this study was to evaluate the effects of auricular acupuncture on the stress levels of administrative workers.

Materials and Methods

The study was conducted in the administrative sector of a public hospital complex in São Paulo State, Brazil. The study was approved by the Research Ethics Committee (CAAE: 39306314.6.3001.5438). Data collection and intervention were made from April to July 2015.

Subjects

Fifty-eight female workers of the administrative sector of a public hospital complex were invited to participate in this study. The inclusion criteria were: female workers from the administrative sector (receptionist workers) that worked in the public hospital for more than one year and being at least 18 years old. The exclusion criterion was: workers on vacation or pregnancy period. The receptionist works directly with patients and people all the time. The activities include patient/person attendance; computer task; telephone service; note taking and medical scheduling (writing paper). Additionally, the receptionists are exposed to physical risks (static and repetitive activities) and mental overload (stress). The subjects (n=60) were separated into two groups at random procedure: 30 workers with 30.5 ± 10.5 years old were included in control group and 30 workers with 35.0 ± 11.2 years old were included in experimental group. Two (n=2) subjects of the experimental group dropped out of the study during the interventional period.

Auricular acupuncture intervention

The acupuncturist performed aseptis of the ear with cotton and alcohol 70%. After this procedure, the points in the ear were identified and semi-permanent needles (Dux Acupuncture – size: 0.30 x 0.50 mm) were applied and fixed with Micropore tape (3M Micropore). The points used for intervention were: Shenmen, Zero, Kidney and Brain Stem [12]. Participants were instructed to stimulate the needles once a day with moderate pressure. After seven days, the needles were removed; discarded and new needles were reapplied. The needles were changed every week during eight weeks. Each week the same application procedure was performed on the contralateral ear to avoid fatigue on acupuncture points [17]. Participants of the control group did not receive any intervention during these eight weeks.

Instrument and data collection

The Perceived Stress Scale (PSS-10) consists of a self-report instrument for general assessment of stress levels based on the responses to 10 items [18,19]. Each item has five possible answers based on frequency of symptoms. The final perceived stress score ranges from 0 to 40, with higher scores meaning higher stress levels. The perceived stress scores were classified as low: 0 to 10, moderate: 10 to 20, high: 20 to 30 and very high: 30 to 40. The Portuguese PSS-10 has high internal consistency (Cronbach’s alpha = 0.87) and high test-retest reliability (Intraclass Correlation Coefficient = 0.86) [19].

All participants of both groups (control and experimental) answered the PPS-10 questionnaire before the auricular acupuncture intervention (pre-intervention) and eight weeks after intervention (post intervention). We explained to the workers how to complete the questionnaire each employee responded to the questionnaire individually, but the researcher was available to clarify any doubts, if necessary. The questionnaire was placed in an envelope with pre-established numbers to avoid identification and any embarrassment in answering the questions.

Statistical analysis

Data were tabulated on an Excel spreadsheet, and the results were presented in a descriptive way, including mean, standard deviation and median. The analyses of the data were submitted to normality test (Kolmogorov-Smirnov). The Mann-Whitney and Wilcoxon tests

Table 1: Comparison between control and experimental group related to age, number of children, time in the current job and marital status.

Variables	Control Group (n=30)	Experimental Group (n=28)	P value
Age (years)	35.20 ± 11.36	29.86 ± 11.52	0.0783
Number of children	0.87 ± 1.07	1,14 ± 1.26	0.4089
Time in current job (years)	4.77 ± 6.13	4.54 ± 8.52	0.9072
Single (%)	43.3	53.6	
Married (%)	46.6	42.9	
Divorced (%)	10	3.8	

*p < 0.05.

were used to compare the control and experimental groups at pre and post intervention moments. Data were processed using the Statistica 7.0 software (StatSoft, Inc. 1984-2004) and the level of significance was set at p < 0.05 in all the analyses.

Results

There was no significant difference between the control and experimental groups for demographics data and time in the current study (Table 1).

The stress levels reduced from high level to moderate level in the experimental group after eight weeks. The stress level reduced from 21.0 points (median) to post interventional 18.5 points in experimental group (p = 0.001). The results of the variables are presented in (Table 2).

Discussion

There is currently a growing interest of society and on the part of researchers in relation to occupational stress of administrative workers in hospitals, because the negative consequences for the health of these professionals [20]. Workers in this sector, often act in extended workdays, with discrepancy between the high service demands, to run in short periods of time, which may favor for the increase in stress levels [20,21]. The results of this study indicate that the ear acupuncture reduced stress levels among workers in this sector. A possible explanation for this reduction is the release of neurotransmitters and other substances like endorphins, enkephalin, adrenocorticotrophic hormone and dopamine in the Central Nervous System (CNS) by acupuncture. These substances are responsible for the regulation of organic functions and immune disorders, which can promote a better homeostatic balance of the organism [17,22,23].

Similar diseases research, such as insomnia, depression, anxiety and even stress [24] associating the traditional treatments with acupuncture has shown positive results, due the influence of

Table 2: Comparison of the stress level between control and experimental group, and pre and post intervention periods.

Periods	Control Group (n=30)			Experimental Group (n=28)			
	Median	Mean	SD	Median	Mean	DP	p value*
Pre Intervention	21.0	20.63	5.21	21.0	20.79	5.73	0.682
Post Intervention	20.0	18.8	4.69	18.5	17.32	5.99	0.255
p value#	0.187			0.001			

SD: Standard Deviation

#p values according to Wilcoxon paired test

*p values according to Mann Whitney paired test

acupuncture on control of release of the hormone cortisol, which is directly related to the stress [25]. Recent study that aimed to analyze the effectiveness of electroacupuncture in rats, found that the application of this technique induced an increase in the synthesis, metabolism and uptake of 5-Hydroxytryptamine receptors (5-HT), which is a neurotransmitter or neuromodulatory responsible for antidepressant effects. This proves that the techniques of acupuncture promoting effects on the central nervous system, showing satisfactory results in reducing anxiety, one of the symptoms of stress [26]. Another study applied the technique of auricular acupuncture bilaterally on the evening of the day before an exam in medical students. It was observed that both participants in the experimental group and placebo group showed a reduction of anxiety before the college e, which points to a likely placebo effect acupressure technique [27]. In our study participants in the group that received the AA also showed a greater decrease in the perception of stress, in relation to the group without any intervention, however we did not have a placebo group to compare our findings with those of the present study.

Our study used only a technique in order to minimize the effects of stress, unlike Lorent (2016) [28] that discuss comparisons of effectiveness among different techniques, the auricular acupuncture and the progressive muscle relaxation. The research had 162 participants, with anxiety disorders and depression, diagnosed by the Psychiatry and Psychotherapy sector of the German Medical Center. Different of our study, in search of Lorent (2016) the participants had the option of choice the interventions, they could choose between auricular acupuncture or progressive muscle relaxation. The researchers found that the application of the technique of auricular acupuncture for 4 weeks significantly decreased the tension, anxiety, anger and aggression. It is worth noting that despite the positive outcome of the implementation of auricular acupuncture, the authors did not cite in which reference were based to the definition of the intervention time. They found similar effectiveness on the results of both interventions [28].

The pathophysiology of stress is complex and involves different mechanisms that can be measured in different ways. The application of scales used in the present study is considered a subjective method and need to be considered as a limitation of the study. Additionally, although the sampling of the present study is small and this should be considered as an important limitation of the study, the results point to a reduction in stress levels of this population by neuroendocrine mechanisms or placebo effect [29]. It should also be considered that the National Policy on Integrative and Complementary Practices (PNPIC) [30] recognizes acupuncture as a practice to be disseminated and used within the Unified Health System (SUS) in Brazil, contributing to the recognition of this ancient practice as an action for the health and well-being of people. In this sense, it is important more studies focused on the effects of acupuncture to better understand the mechanisms of therapeutic action.

Conclusion

Acupuncture is a method that offers a low cost and easy application, being a practical and effective method for stress management in administrative workers. However, the authors recommend further study with a larger number of workers in different sectors to better understanding of the benefits of acupuncture in managing and

reducing stress.

References

1. Kurebayashi LFS, Gnatta JR, Borges TP, Belisse G, Coca S, Minami A, et al. Aplicabilidade da auriculoterapia com agulhas ou sementes para diminuição de estresse em profissionais de enfermagem. *Rev Esc Enf USP*. 2012; 46: 89-95.
2. Utzet M, Moncada S, Molinero E, Navarro A. Psychosocial exposures and mental health: distribution by gender and occupational class in a population-based study. 2015.
3. Kalmbach DA, Pillai V, Cheng P, Arnedt JT, Drake CL. Shift work disorder, depression, and anxiety in the transition to rotating shifts: the role of sleep reactivity. *Sleep Med*. 2015; 16: 1532-1538.
4. Vieira ER, Serra MVGB, Almeida LB, Villela WV, Scalón JD, Quemelo PRV. Symptoms and risks for musculoskeletal disorders among male and female footwear industry workers. *International Journal of Industrial Ergonomics*. 2015; 48: 110-116.
5. Almeida LB, Vieira ER, Zaia JE, de Oliveira Santos BM, Lourenço AR, Quemelo PR. Musculoskeletal disorders and stress among footwear industry workers. *Work*. 2017; 56: 67-73.
6. Schmidt DRC, Dantas RAS, Marziale MHP, Laus AM. Estresse ocupacional entre profissionais de enfermagem do bloco cirúrgico. *Texto & Contexto Enferm*. 2009; 18: 330-337.
7. Ferreira RC, Griep RH, Fonseca MDJM, Rotenberg L. Abordagem multifatorial do absenteísmo por doença em trabalhadores de enfermagem. *Rev Saúde Pub*. 2012; 46: 259-268.
8. de Almeida LB, Vieira ER, Zaia JE, de Oliveira Santos BM, Lourenço AR, Quemelo PRV. Musculoskeletal disorders and stress among footwear industry workers. *Work*. 2017; 56: 67-73.
9. Zeng XH, Li QQ, Xu Q, Li F, Liu CZ. Acupuncture mechanism and redox equilibrium. *Evid Based Complement Altern Med*. 2014; 2014: 483294.
10. Ghaffari BD, Kluger B. Mechanisms for alternative treatments in Parkinson's disease: acupuncture, tai chi, and other treatments. *Curr Neurol Neurosci Rep*. 2014; 14: 451.
11. Lin JG, Chou PC, Chu HY. An exploration of the needling depth in acupuncture: the safe needling depth and the needling depth of clinical efficacy. *Evidence-Based Complement Altern Med*. 2013.
12. Young-Chang PA, Sakakima Y, Kawanishi J, Nishihara M, Ito A, Tawada Y, et al. Auricular acupuncture at the "shenmen" and "point zero" points induced parasympathetic activation. *Evidence-Based Complement Altern Med*. 2013.
13. Wang SM, Maranets I, Lin EC, DeZinno P. Is commercially available point finder accurate and reliable in detecting active auricular acupuncture points? *The Journ Altern Complem Med*. 2012; 18: 860-863.
14. Leung MC, Yip KK, Ho YS, Siu FK, Li WC, Garner B. Mechanisms underlying the effect of acupuncture on cognitive improvement: a systematic review of animal studies. *J Neuroimmune Pharmacol*. 2014; 9: 492-507.
15. Wu JH, Chen HY, Chang YJ, Wu HC, Chang WD, Chu YJ, et al. Study of autonomic nervous activity of night shift workers treated with laser acupuncture. *Photomed Laser Surg*. 2009; 27: 273-279.
16. Molsberger F, Molsberger A. Acupuncture in treatment of musculoskeletal disorders of orchestra musicians. *Work*. 2012; 41: 5-13.
17. Kurebayashi LFS, Gnatta JR, Borges TP, Silva MJPD. Eficácia da auriculoterapia para estresse segundo experiência do terapeuta: ensaio clínico. *Acta Paul Enferm*. 2012; 25: 694-700.
18. Cohen S, Kamarck T, Mermelstein RA. A Global measure of perceived stress. *J Health Soc Behav*. 1983; 24: 385-396.
19. Reis RS, Hino AAF, Añez CRR. Perceived Stress Scale reliability and validity study in Brazil. *Journ health psych*. 2010; 15: 107-114.
20. Alosaimi FD, Alghamdi AH, Aladwani BS, Kazim SN, Almufleh AS. Work-related stress and stress-coping strategies in residents and administrative

- employees working in a tertiary care hospital in KSA. *Journ Taibah University Medical Sciences*. 2016; 11: 32-40.
21. Inoue KC, Gomes SV, Gelena L, Misue Matsuda L. Stress level among intensive care nurses in the municipality of Paraná (Brazil). *Investig Educac Enferm*. 2014; 32: 69-77.
22. He W, Wang X, Shi H, Shang H, Li L, Jing X, et al. Auricular acupuncture and vagal regulation. *Evid-Bas Complem Altern Med*. 2012; 2012: 1-6.
23. Medeiros R, Saad M. Acupuntura: efeitos fisiológicos além do efeito placebo. *Mundo Saúde*. São Paulo. 2009; 33: 69-72.
24. Silva Filho CR, Prado GF. Os efeitos da acupuntura no tratamento da insônia: revisão sistemática. *Rev Neurocienc*. 2007; 15: 183-189.
25. Alves AKCRP, da Silva RAF, Licursi MDGB, Fagundes AA. Efeito da Acupuntura Sistêmica na Intensidade da Dor de Pacientes com Cervicalgia. *Rev Univap*. 2013; 19: 25-34.
26. Duan D, Tu Y, Yang X, Liu P. Electroacupuncture Restores 5-HT System Deficit in Chronic Mild Stress-Induced Depressed Rats. *Evidence-Based Complem Altern Medic*. 2016; 7950635: 1-9.
27. Klausenitz C, Hacker H, Hesse T, Kohlmann T, Endlich K, Hahnenkamp K, et al. Auricular Acupuncture for Exam Anxiety in Medical Students – A Randomized Crossover Investigation. *PLoS ONE*. 2016; 11: e0168338.
28. Lorent L, Agorastos A, Yassouridis A, Kellner M, Muhtz C. Auricular Acupuncture Versus Progressive Muscle Relaxation in Patients with Anxiety Disorders or Major Depressive Disorder: A Prospective Parallel Group Clinical Trial. *Journ Acupunct Merid Studies*. 2016; 9: 191-199.
29. Lee EH. Review of the psychometric evidence of the perceived stress scale. *Asian Nursing Research*. 2012; 6: 121-127.
30. Brasil. Ministério da Saúde. Secretaria de Atenção à Saúde. Departamento de Atenção Básica. Política Nacional de Práticas Integrativas e Complementares no SUS - PNPIC-SUS / Ministério da Saúde, Secretaria de Atenção à Saúde, Departamento de Atenção Básica. - Brasília: Ministério da Saúde. 2006.