



ORIGINALES

Effect of progressive muscle relaxation on stress and workplace well-being of hospital nurses

Efeito do relaxamento muscular progressivo no estresse e bem-estar no trabalho de enfermeiros Hospitalar

Efecto del relajamiento muscular progresivo en el estrés y bienestar en el trabajo de enfermeros hospitalarios

Eliseu de Avila Silveira¹

Karla de Melo Batista²

Eliane da Silva Grazziano³

Maria Edla de Oliveira Bringuete⁴

Eliane de Fátima Almeida Lima⁵

¹Nurse. MSc in Nursing from the Federal University of Espírito Santo. Vitória, ES, Brazil. eliseudavila321@gmail.com

² Nurse. PhD in Nursing from the University of São Paulo. Professor at the Nursing Department of the Federal University of Espírito Santo. Vitória, ES, Brazil.

³ Nurse. PhD in Nursing from the University of São Paulo. Professor at the Nursing Department of the Federal University of São Carlos. São Carlos, SP, Brazil.

⁴ Nurse. PhD in Nursing from the Federal University of Rio de Janeiro. Professor at the Nursing Postgraduate Program of the Federal University of Espírito Santo. Vitória, ES, Brazil.

⁵ Nurse. PhD in Nursing from the Federal University of Rio de Janeiro. Professor at the Nursing Department of the Federal University of Espírito Santo. Vitória, ES, Brazil.

<https://doi.org/10.6018/eglobal.396621>

Received: 20/09/2019

Accepted: 17/01/2020

ABSTRACT:

Objective: To evaluate the effect of progressive muscle relaxation on the levels of stress and workplace well-being of hospital nurses.

Method: This is an intervention, of the before-after type, longitudinal, which monitored 16 nurses from a hospital institution for eight consecutive weeks submitted to a progressive muscle relaxation protocol. Data were collected by questionnaire, Work Stress Scale and Well-being at Work Scale. Shapiro-Wilk, Wilcoxon, Sperman and Mann-Whitney tests were used.

Results: The mean stress level decreased (60/55 $p=0.166$) and the mean workplace well-being factors: positive affect, negative affect and fulfillment increased (3.22/3.42 $p=0.073$; 2.07/2.29 $p=0.094$ and 3.71/3.92 $p=0.060$), respectively.

Conclusion: The study revealed that the progressive muscle relaxation reduced the means of stress and promoted well-being at work among the nurses.

Key words: Nursing; Nursing Care; Relaxation Therapy; Occupational Stress; Workplace Well-being; Occupational Health.

RESUMO:

Objetivo: Avaliar o efeito do relaxamento muscular progressivo nos níveis estresse e bem-estar no trabalho de enfermeiros hospitalar.

Método: Estudo de intervenção, do tipo antes e depois, longitudinal, que acompanhou 16 enfermeiros de uma instituição hospitalar por oito semanas consecutivas submetidos há um protocolo de relaxamento muscular progressivo. Coletou-se os dados com questionário, Escala de Estresse no Trabalho; Escala de Bem-estar no Trabalho. Utilizou-se os testes *Shapiro-Wilk*, *T pareado*, *Wilcoxon*, *Sperman* e *Mann-Whitney*.

Resultados: Observou-se redução das médias de estresse (60/55 $p=0,166$) e aumento das médias dos fatores de bem-estar no trabalho- *afeto positivo*, *afeto negativo* e *realização* (3.22/3,42 $p=0,073$; 2,07/2,29 $p=0,094$ e 3,71/3,92 $p=0,060$), respectivamente.

Conclusões: Houve evidências que o relaxamento muscular progressivo reduziu as médias de estresse e promoveu bem-estar no trabalho entre os enfermeiros.

Palavras-chaves: Enfermagem; Cuidados de Enfermagem; Terapia de Relaxamento; Estresse Ocupacional; Bem-estar no Trabalho; Saúde do trabalhador.

RESUMEN:

Objetivo: Evaluar el efecto del relajamiento muscular progresivo em los niveles de estrés y bienestar en el trabajo de enfermeros hospitalarios.

Método: Estudio de intervención, de tipe antes y después, longitudinal, que ha acompañado 16 enfermeros de una institución hospitalaria por ocho semanas consecutivas sometidos a un protocolo de relajamiento muscular progresivo. Se han recogido los datos con cuestionario, Escala de Estrés em el Trabajo; Escala de Bienestar en el Trabajo. Se han utilizado las pruebas *Shapiro-Wilk*, *T pareado*, *Wilcoxon*, *Sperman* y *Mann-Whitney*.

Resultados: Se observó reducción de los promedios de estrés (60/55 $p=0,166$) y aumento de los promedios de los factores de bienestar en el trabajo- *afecto positivo*, *afecto negativo* y *realización* (3.22/3,42 $p=0,073$; 2,07/2,29 $p=0,094$ e 3,71/3,92 $p=0,060$), respectivamente.

Conclusiones: Hubo evidencias de que el relajamiento muscular progresivo ha reducido los promedios de estrés y ha promovido bienestar en el trabajo entre los enfermeros.

Palabras claves: Enfermería; Atención de Enfermería; Terapia por Relajación; Estrés Laboral; Bienestar en el Trabajo; Salud Laboral.

INTRODUCTION

Labor relations associated with technological, organizational innovation and increased demands for workers globally intensify and contribute to increasing occupational stressors and their intensity, affecting the health of workers and organizations⁽¹⁾.

Nurses are workers exposed to high physical and emotional demands, and having to deal with pain, suffering, death, high work days, deficit of personnel, low wages, high responsibility, constant need for technical and technological updates^(2,3), allied to factors, such as low ability of coping with stressors, may affect individual health with biopsychosocial problems, and, in organizations, with increased absenteeism, high staff turnover rates and sick leaves due to occupational diseases, in addition to reflecting negatively on the quality of the service provided, consequently, reflecting on the patient safety⁽¹⁻³⁾.

While stress chronicity brings negative effects, promoting workplace well-being (WWB) has an inverse effect, favoring improvements in individual and organizational levels⁽⁴⁾. Among nurses, the promotion of this construct relates to increased job satisfaction, quality of interpersonal relations, thus improving the quality of care provided to the patient⁽⁵⁾.

Researches on WWB among nurses are incipient, standing out as opportunities to promote this construct the use of stress management strategies, so that the adoption of these strategies can be developed in the workplace, aiming at a better quality of life for workers, interfering positively with their activities performed⁽⁵⁾.

Thus, the progressive muscle relaxation (PMR) emerges as a possible strategy.

PMR is a mind-body practice, which consists of directing the person's attention to certain muscle group, contracting it, keeping the contraction for a period, and then relaxing. This process is repeated with different muscle groups, in order to experience the feeling of relaxation throughout the body⁽⁶⁾.

PMR is a nursing intervention and its use in researches focuses primarily on evaluating its effect in patients, being rarely used in the evaluation of its action on workers' health.

Therefore, the following question emerged: what is the effect of a PMR protocol on stress and workplace well-being of hospital nurses? PMR is expected to reduce stress and provide workplace well-being.

Thus, the objective of this study was to evaluate the effect of using a protocol of relaxation on stress levels and workplace well-being of hospital nurses.

METHOD

This is an intervention, of the before-after type⁽⁷⁾, longitudinal, prospective study of quantitative nature, which monitored 16 nurses from an emergency room (ER) and hemodynamic ward (HM) of a federal hospital institution in southeast Brazil.

The nurses were selected according to the following inclusion criteria: self-reporting stress at work and working time at the institution of at least one year. The exclusion criteria were: leave or absence from work due to any nature, pregnancy, psychiatric monitoring or use of complementary integrative therapy.

Data were collected using a questionnaire with sociodemographic and occupational variables (SDOV), such as: sex, age, marital status, children, education, other employment, shift, daily work load, years of service in nursing, years of service in the institution, work unit, working area, income, leisure, physical activity, absence in the past 12 months by stress; Work Stress Scale (WSS); Well-Being at Work Scale (WBWS).

The WSS is a validated instrument, composed of 23 statements addressing various stressors and their emotional reactions, with Likert-type responses ranging from 1 -5- I strongly disagree to strongly agree. Its score varies from 23-115, with midpoint of 57.5 and, the higher the score, the higher the level of stress⁽⁸⁾.

The WBWS is a validated instrument, composed of 30 items with Likert-type response grouped into three factors: positive affect, negative affect and fulfillment. It is subdivided into two parts, the first corresponds to the affects, and, to be answered, the participant is guided through the question: "Over the past six months, my work made me feel...". The answers vary from 1- not at all to 5- extremely. The second part

corresponds to the Factor implementation and is guided through the instruction: " In my work, I..." and answers vary from 1- strongly disagree to 5- strongly agree. Its analysis is described by factors and each one varies on a 5-point scale, with the midpoint of 2.5⁽⁹⁾.

The independent variable was the technique of progressive muscle relaxation, compiled by Novaes, deriving from Jacobson⁽¹⁰⁾.

To apply the intervention, a study protocol was created, built based on the standard model of the institution where this research was conducted, consisting of eight sessions of PMR and follow-up of participants for eight consecutive weeks.

The evaluation of the effect of the protocol occurred from January to March 2018 through 10 meetings (a meeting for the invitation and presentation of the protocol, eight meetings for the implementation of the protocol and a meeting to return the effectiveness validation instrument for its implementation), in the following way:

- *First meeting* - a meeting with the nurses from the work units (ER and HM) for the presentation of the proposed protocol and invitation to participate. After acceptance, they were included in the study by signing the Informed Consent Form and delivery of a sealed envelope containing the instruments for the validation of the effectiveness: WSS, WBWS, collected up to one week after delivery.

- *Second to the ninth meeting*: eight PMR sessions, lasting 10-15 minutes each, being 1 session/week for eight consecutive weeks. The sessions occurred with the supervision of the researcher or a research assistant, trained and experienced to perform the technique, in the ward and during the working hours, in quiet environment (nursing rest), with the participant lying comfortably. The PMR sessions were scheduled in advance for a better organization of the participant and the service.

- *Tenth meeting*: a sealed envelope was delivered, containing the WSS and WBWS, collected in up to one week.

Data were analyzed using the program Statistical Package for Social Sciences (SPSS), version 19.0. The Shapiro-Wilk normality test verified that the data presented non-parametric distribution. The averages of stress and well-being at work of the group were compared before and after the protocol with the Wilcoxon test. The Spearman's correlation coefficient was used to establish correlations. The relationship between the SDOV with stress and well-being at work before and after the protocol was evaluated with the Mann-Whitney test. The significance level adopted was of 5%. The Research Ethics Committee approved this study under CAEE 79083317.0.0000.5060.

RESULTS

The participants were male (56.3%), with a mean age of 34.7 years, married (56.3%), with children (56.3%), post-graduates (87.5%), with an average of 10.2 years working in nursing and a single employment (68.8%), working in daytime shifts with 12 hours of work /36 hours of rest (68.8%), working in the emergency room (68.8%), healthcare activity (87.7%), was absent from work due to stress in the past 12 months (12.5%),

earning an average of 10 minimum wages (43.8%), practicing physical activity and leisure (68.8%).

The internal consistency of the instruments used in this study was evaluated and the values of the Cronbach's alpha were satisfactory (Table 1)

Table 1. Comparison of the means of stress and workplace well-being of nurses before and after intervention and values of Cronbach's alpha of the used scales. Vitória, ES, Brazil, 2018

| Variable | Intervention | Mean (SD)* | p-value [†] | Cronbach's alpha |
|-----------------|--------------|-------------|----------------------|------------------|
| Work stress | Before | 60 (14.11) | 0.166 | 0.906 |
| | After | 55 (14.01) | | |
| Positive Affect | Before | 3.22 (0.87) | 0.073 | 0.930 |
| | After | 3.42 (0.95) | | |
| Negative Affect | Before | 2.07 (0.77) | 0.094 | 0.903 |
| | After | 2.29 (0.59) | | |
| Fulfillment | Before | 3.71 (0.68) | 0.060 | 0.823 |
| | After | 3.92 (0.71) | | |

*Standard deviation; † Wilcoxon's test

Table 1 shows a reduction in the mean work stress after the intervention. Importantly, before the intervention, the overall average of participants was above the midpoint of the construct, which is 57.5 points; after the intervention, it was below.

In relation to the well-being at work, despite the increased average of the three factors after the intervention, the negative affect remained below the average of the construct, whereas the other two factors, positive feelings and perceptions of fulfillment, approached even more the upper limit of the average (Table 1).

The relationship between the SDOV of participants with the variables of stress and well-being at work.

For stress, before the intervention, those who worked daily, with hourly load of "6h and/or 8h" per day, had higher averages in this scale than those employed in duty of "12h/day" (p=0.031). Another variable with significant p-value was "physical activity", in which the nurses who practiced it showed higher averages than those who did not practice it (p=0.031). After the intervention, there were no significant differences.

The relationship between the SDOV and well-being at work was not statistically significant for positive and negative affect factors in any moment of the intervention. However, for the fulfillment factor, participants with income greater than ten minimum wages showed higher averages after the intervention (p=0.039). Nevertheless, before the intervention, there was no such significant difference.

Through the correlation between stress and well-being at work, before the intervention, there was a negative association between stress and the fulfillment factor ($p=0.042$), i.e., as work stress increases, the feelings of fulfillment decrease. On the other hand, after the intervention, there was a positive correlation between stress and negative affect ($p=0.006$), i.e., as stress increases, negative feelings also increases (Table 2).

Table 2. Correlation between stress and workplace well-being factors of nurses, before and after the intervention. Vitória, ES, Brazil, 2018

| Variables | Before intervention | | After intervention | |
|-----------------------|---------------------|----------|--------------------|----------|
| | Coefficient† | p-value† | Coefficient† | p-value† |
| WS* x Positive affect | 0.069 | 0.798 | - 0.229 | 0.393 |
| WS* x Negative affect | 0.426 | 0.100 | 0.659 | 0.006 |
| WS* x Fulfillment | - 0.514 | 0.042 | - 0.314 | 0.237 |

*Work stress; †Spearman's coefficient

DISCUSSION

This study adopted a nursing intervention for stress management and promotion workplace well-being of hospital nurses, feasible in the working environment, low-cost and easily applicable, which allowed for a better behavioral response of the participants, making their results relevant and promising for health promotion among these professionals.

The reduced mean work stress of the participants in this study is important, considering the effects of its chronicity, related to negative outcomes, such as burnout syndrome, which significantly affects workers' productivity and quality of care, besides increasing the absenteeism and encumbering institutions⁽¹¹⁾.

In this study, the well-being at work was measured in three factors: negative affect, positive affect and fulfillment. After the intervention, the average of all factors increased, with prevalence of positive affect and fulfillment factors. These data are encouraging, because they suggest a positive effect of the PMR. Strategies that promote the well-being at work allow for the work to add other meanings to the worker, as a happiness-source being, aiding in the prevention of diseases, reduction of absenteeism, and improvements in the quality of the service provided to the user⁽¹²⁾.

Regarding working hours, despite the association between duty and increased negative psychological aspects, absenteeism, burnout, fatigue⁽¹³⁾, the data of this study showed that the nurses with daily work had higher averages of stress than the intensivist, which can be explained by the larger resting intervals of nurses on duty, not daily exercising hospital activities, which can be softened by family or other activity that put them away from work stressors. This is not possible for those who exercise daily activity, who, in this study, also exerted administrative role in the unit, exacerbating work stress⁽¹⁴⁾.

Another relationship observed was that the nurses who practiced physical activity showed higher averages of work stress than those who did not practice, which differs from some studies relating the beneficial effect of physical activity on managing stress⁽¹⁵⁾. Nonetheless, physical activity can be understood as a daily task, either by social, personal imposition or by seeking a better physical condition. The physical

activity performed in the leisure context tends to promote satisfaction, but, when practiced as an obligation, or only to prevent or minimize diseases, can have negative repercussions on the individual⁽¹⁶⁾.

The fact that the nurses with higher income had higher averages of the fulfillment factor, in the well-being at work construct, allows for inferring the financial capital enables better life conditions for the individual, leading to a better quality of life, reflecting on the professional satisfaction, since the remuneration positively relates to work satisfaction⁽¹⁷⁾.

The correlation between stress and the three factors of well-being at work showed that, before the intervention, the reduced stress would lead to increased personal fulfillment, a fact evidenced after the intervention, where the average stress reduced and the fulfillment factor increased. After the intervention, the correlation showed that the increased stress would lead to an increased negative affect; however, despite the increased negative feeling, the mean stress decreased. Chronic exposure to stress among nurses is detrimental to the health of workers and to organizations, presenting a narrow relationship with increased absenteeism, lower job satisfaction, poor quality of care, negatively implying in the patient safety. These data reinforce the importance of developing strategies for coping with work stress more effectively⁽¹⁸⁾. In this study, the PMR provided a better way of dealing with the adversities and, even with increased negative feelings, there was a prevalence of positive affect and personal fulfillment, demonstrating the quality of the intervention. By inference, the practice of more PMR sessions would tend to decrease stress and increase personal fulfillment and positive feelings. The increased negative affect, in this study, may be related to the fact that the same was developed when some nurses were being sent to other units and a performance evaluation was being developed at the institution, which may have enabled the development of feelings of anger and fear.

The nurse's work is stressful and this study brings a timely response to this professional activity in wards of great demands. This intervention can be replicated in larger groups and contribute significantly to building more healthy work environments, allowing for reducing occupational stress and promoting well-being at work. Nevertheless, this study presents some limitations, such as the size of the sample, justified by the difficulty of adherence to the study, even with the attempt to expand data collection to other wards, which also resulted in the absence of a control group. The nurse has a certain difficulty to understand the need for self-care and realize that the self-care directly affects their work and the institution itself. In addition, one highlights the lack of funding for measuring physiological markers.

Future studies should be developed to investigate the effect of PMR on stress and workplace well-being promotion of nurses, preferably with larger samples, control group, with follow-up, measurement of physiological variables, such as capillary cortisol, comparison with other techniques for managing stress and acceptability of the intervention by these professionals.

CONCLUSION

The study evidenced that the progressive muscle relaxation reduced the average stress and promoted well-being at work. Furthermore, this technique is simple, low-

cost, self-administered and feasible in the work environment, requiring little time of workers to do it and significantly affecting the development of their activities.

This study can subsidize the introduction of this technology for health promotion among hospital nurses, or even other professionals.

REFERENCES

1. International labour organization. Workplace stress: a collective challenge. International Labour Office: Suíça, 2016. Disponível em: < http://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---safework/documents/publication/wcms_466547.pdf >.
2. Almazan JU, Abdulrhman SA, Alamri MS. Exploring nurses' work-related stress in anacutecare hospital in KSA. *Journal of Taibah University Medical Sciences*, 2019; 14(4): 376-382. Doi: <https://doi.org/10.1016/j.jtumed.2019.04.006>.
3. Botha E, Gwin T, Purpora C. The effectiveness of mindfulness based programs in reducing stress experienced by nurses in adult hospital settings: a systematic review of quantitative evidence protocol. *JBIS Database System RevImplement Rep.*, 2015 13(10):21-9. Doi: 10.11124/jbisrir-2015-2380. Doi:10.11124/jbisrir-2015-2380.
4. Maharaj S, Lees T, Lal L. Prevalence and Risk Factors of Depression, Anxiety, and Stress in a Cohort of Australian Nurses. *Int. J. Environ. Res. Public Health*. 2019;16: 61. doi:10.3390/ijerph16010061 [<https://www.mdpi.com/1660-4601/16/1/61/html>].
5. Häggman-Laitila A, Romppanen J. Interventions for nurses' well-being at work: a quantitative systematic review. *J Adv Nurs*. 2017;73(7): 1555-1569. doi: <https://doi.org/10.1111/jan.13210> [<https://onlinelibrary.wiley.com/doi/pdf/10.1111/jan.13210>].
6. Conrad A, Roth WT. Muscle relaxation therapy for anxiety disorders: It works but how? *J Anxiety Disord*. 2007; 21(3):243-64. doi: <https://doi.org/10.1016/j.janxdis.2006.08.001> [<https://www.sciencedirect.com/science/article/abs/pii/S0887618506001174>].
7. Polit DF, Beck CT. *Fundamentos da pesquisa em enfermagem*. 7 ed. Porto Alegre: Artmed, 2011.
8. Pascoal T, Tamayo A. Validação da Escala de estresse no trabalho. *Estud. psicol*. 2004;9(1):45-52. doi: <http://dx.doi.org/10.1590/S1413-294X2004000100006>. [<http://www.scielo.br/pdf/epsic/v9n1/22380.pdf>].
9. Paschoal T, Tamayo A. Construção e validação da escala de bem-estar no trabalho. *Aval. psicol [Internet]*. 2008 [citado ago 20, 2017]; 7(1):11-22. Disponível em: <http://pepsic.bvsalud.org/pdf/avp/v7n1/v7n1a04.pdf>.
10. Novais PGN, Batista KM, Grazziano ES, Amorim MHC. The effects of progressive muscular relaxation as a nursing procedure used for those who suffer from stress due to multiple sclerosis. *Rev. Latino-Am. Enfermagem*. 2016;24:e2789. doi: 10.1590/1518-8345.1257.2789 [<http://www.scielo.br/pdf/rlae/v24/0104-1169-rlae-24-02789.pdf>].
11. Thomas CM, Bantz DL, McIntosh CE. Nurse Faculty Burnout and Strategies to Avoid it. *Teaching and Learning in Nursing*. 2019; 14(2):111-116. doi: <https://doi.org/10.1016/j.teln.2018.12.005> [<https://www.sciencedirect.com/science/article/pii/S1557308718302245?via%3Dihub>].
12. Liddle M, Buffet A, Gervais RL, Eeckelaert L. Well-being at work: creating a positive work environment. *Eur Agency Saf Health Work*. Luxembourg: Publications Office of the European Union; 2013. doi: 10.2802/52064

[<https://publications.europa.eu/en/publication-detail/-/publication/9aec8ad1-a02c-4853-95eb-d8ef0b3ff94f/language-en>].

13. Dall'Ora C, Ball J, R O, Recio-Saucedo A, M A, M Paul, G Peter. Are long nursing shifts on hospital wards associated with sickness absence? A longitudinal retrospective observational study. *J NursManag.* 2019;27:19–26. doi: 10.1111/jonm.12643. [<https://onlinelibrary.wiley.com/doi/epdf/10.1111/jonm.12643>].

14. Silva JLL, Santos RSFB, Costa FS, Taveira RPC, Teixeira LR. Estrés em la actividad administrativa de enfermería: consecuencias para la salud. *Av.enferm.* [Internet]. 2013; 31(2): 144-152. [cited 2019 Feb 07] ; 31(2): 144-152. Available from: <http://www.scielo.org.co/pdf/aven/v31n2/v31n2a15.pdf>.

15. MithleenK, Stojanovska L, Polenakovic M, Bosevski M, Apostolopoulos V. Exercise and mental health. *Maturitas.* 2017; 106: 48-56. doi:<https://doi.org/10.1016/j.maturitas.2017.09.003>.

16. Silva C, Souza M, Rossi Filho S, Silva LF, Rigoni ACC. Atividade física de lazer e saúde: uma revisão sistemática. *Mudanças - Psicol Saúde.* 2017;25(1):57-65. doi: <http://dx.doi.org/10.15603/2176-1019/mud.v25n1p57-65> [<https://www.metodista.br/revistas/revistas-ims/index.php/MUD/article/viewFile/7185/5791>].

17. Morais MP, Martins JT, Galdino MJQ, Robazzi MLCC, Trevisan GS. Satisfação no trabalho de enfermeiros em um hospital universitário. *RevEnferm UFSM.* 2016; 6(1): 1-9. Disponível em [<https://periodicos.ufsm.br/reufsm/article/view/17766/pdf>]. Acesso em 07 fev. 2019.

18. Isa KQ, Ibrahim MA, Abdul-Manan HH, Mohd-Salleh AAH, Abdul-Mumin KH, Rahman HÁ. *British Journal of Nursing*, 2019; 28. Doi:10.12968 / bjon.2019.28.1.38. [<https://www.ncbi.nlm.nih.gov/pubmed/30620648>].

ISSN 1695-6141

© [COPYRIGHT](#) Servicio de Publicaciones - Universidad de Murcia