

Stretching exercises in perception of stress in nursing professionals: randomized clinical trial¹

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Abstract: Introduction: Nursing professionals (NP) have a very stressful work routine that makes them a category of risk for the development of occupational diseases. Physical exercises can ease stress, but there is doubt about the benefits of muscle stretching. Objective: To verify the effect of stretching exercises on stress in NP. Method: This is a randomized, parallel type study with the participation of 39 NPs (Experimental = 20, Control = 19). The occupational and occupational stress profiles were investigated by a questionnaire. The stretching classes lasted 8 weeks, 3 times weekly and 40 minute sessions. The data were treated with descriptive statistics and ANCOVA test ($p \leq 0.05$). Results: Regarding the occupational profile and occupational stress, the results showed that 64% considered the work 'heavy' with more than 10h/day (97%). On holiday, 62% reported taking more than 20 days, but 28% worked in that period. More than half were involved in other professional activities (51%) and used to work on weekends (97%). In the previous year, 49% were absent from the service one or more times for health reasons. Most of them (56%) were dissatisfied with their professional life, but considered the work environment to be 'very good' (92%) and 'good' and the relationship with colleagues as 'very good' (98%). After eight weeks of classes, there was a decrease in stress ($F = 43.522$, $p < 0.001$, effect size = 0.547). Conclusion: Despite the work profile and stress, stretching exercises provided attenuation of occupational stress in NPs. Brazilian Registry of Clinical Trials (RBR-6PVVDB).

Keywords: *Occupational Health, Professional Burnout, Health Promotion, Exercise.*

Exercícios de alongamento na percepção de estresse em profissionais de enfermagem: estudo clínico randomizado

Resumo: Introdução: Profissionais de Enfermagem (PE) possuem rotina de trabalho muito estressante que os tornam categoria de risco para o desenvolvimento de doenças ocupacionais. Exercícios físicos podem atenuar o estresse, mas, há dúvida sobre os benefícios do alongamento muscular. Objetivo: Verificar o efeito de exercícios de alongamento sobre o estresse em PE. Método: Estudo clínico randomizado, tipo paralelo, com a participação de 39 PE (Experimental = 20; Controle = 19). Os perfis laborais e de estresse ocupacional foi investigado via questionário. As aulas de alongamento duraram 8 semanas, 3 vezes semanais sessões de 40 minutos. Os dados foram tratados com estatística descritiva e teste ANCOVA ($p \leq 0,05$). Resultados: Quanto ao perfil laboral e estresse ocupacional, os resultados mostraram que 64% consideravam o trabalho 'pesado' com mais de 10h/dia (97%). Sobre férias, 62% afirmaram tirar mais de 20 dias, mas, 28% trabalhavam nesse período. Mais da metade envolvia-se com outras atividades profissionais (51%) e costumava trabalhar aos finais de semana (97%). No ano anterior, 49% ausentaram-se do serviço uma ou mais vezes por motivos de saúde. A maioria apresentou insatisfação (56%) quanto à sua vida profissional, mas, considerou 'satisfatório' a 'muito bom' o ambiente de trabalho (92%) e 'bom' a 'muito bom' o relacionamento com os colegas (98%). Após oito

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semanas de aulas, houve diminuição de estresse ($F = 43,522$; $p < 0,001$; tamanho do efeito = 0,547). Conclusão: Apesar do perfil laboral e de estresse, os exercícios de alongamento proporcionaram atenuação do estresse ocupacional nos PE. Registro Brasileiro de Ensaio Clínicos (RBR-6PVVDB).

Palavras-chave: *Saúde do Trabalhador; Esgotamento Profissional, Promoção da Saúde, Exercício.*

1 Introduction

Nursing professionals (NP) are a group of different categories of workers, who are differentiated by the technical qualification and the tasks assigned to them within a health unit (PEDUZZI; ANSEMI, 2004). That is, the nursing assistant has functions such as: preparing patients for consultations, examinations, and treatments; performing prescribed treatments; providing hygienic care, food, and comfort to the patient and ensuring their safety; as well as looking after cleaning in general, among others. The Nursing technician has duties such as assisting nurses in planning care activities, taking care of severely ill patients, performing comprehensive health care programs, and participating in health and safety programs at work. Finally, the nurse develops management activities (planning, organization, coordination, execution and evaluation of nursing care services, consulting on construction projects or remodeling in health units, etc.), childbirth care and prevention (hospital infection, prevention of damages to the patient, prevention of accidents at work) as well as other very important performances in a health team (CONSELHO..., 1987, 2013). The level of education also differs among NPs: the Nursing assistant must have completed Elementary School (former 1st Grade); the Nursing technician must have completed High School (former 2nd Grade); finally, the nurse must have a higher education course (CONSELHO..., 2016). In Brazil, there were 2,102,199 NP registered in its professional council in 2018, and Nursing technicians represent the largest quantitative of the group ($\approx 56\%$) (CONSELHO..., 2018). Together, NP provides therapeutic assistance while preserving patient safety and promoting satisfactory and qualified care.

NPs represent the largest quantity of the health workforce, providing health care services to people, but often they become patients because of their huge demand for work. For example, in Brazil, the NPs are part of one of the professional categories responsible for a large part of the social security benefits granted by the National Social Security Institute (INSS) (SANTOS; LIMA, 2012). More recent studies corroborate a large number of NPs who have health problems with medical leave, leave by occupational accidents, absences and work

accidents without leave (COSTA; FELLI, 2005; GUIMARÃES; FELLI, 2016).

The work profile of NPs may compromise their physical and emotional health (COSTA; FELLI, 2005; MACPHEE; DAHINTEN; HAVAEI, 2017; RAMOS et al., 2014), and the level of impairment of their health may differ by their attributions or position (GUIMARÃES; FELLI, 2016). One of the consequences of this impairment of NPs health is a sedentary lifestyle (OLIVEIRA; NOGUEIRA, 2010), which aggravates the scenario and can turn NPs into a risk group to develop stress and other work-related diseases.

Occupational stress promotes physiological changes in the human body that compromise daily work activities (FERRAREZE; FERREIRA; CARVALHO, 2006; FABRI et al., 2018). These changes lead to signs and symptoms such as tachycardia, pallor, fatigue, insomnia, nausea, chest pressure, muscle tension, social isolation, inability stop work activities, exhaustion, and depression (SELYE, 1956; SILVA; CAMELO, 2013). All this can lead to a greater commitment of health, that is, to professional exhaustion (Burnout Syndrome) (MACPHEE; DAHINTEN; HAVAEI, 2017).

According to the authors, the implementation prevention strategies are necessary, mitigating the health problems of the NPs (GUIMARÃES; FELLI, 2016). Thus, as a way to reduce occupational stress, the physical exercise of stretching has been considered an effective therapeutic strategy (MONTERO-MARÍN et al., 2013). With muscle stretching, the resting muscle length and blood flow increase, decreasing hyperalgesia, improving mental health, and restoring musculoskeletal balance (SOUZA, 2009; SILVA FILHO et al., 2017).

Although the benefits of physical exercise are evident in the scientific literature, there is no consensus on the best way to prescribe stretching exercises (SILVA FILHO; GURGEL; PORTO, 2014) and their real benefits in stress level (COREY et al., 2014). However, these exercises are frequently recommended in programs aimed at the health of the worker (CANDOTTI; STROSCHEIN; NOLL, 2011).

Based on this, the objective of this study was to verify the effects of a stretching exercise program

on the level of stress in NPs. As a hypothesis, it was expected that the effects would be beneficial to NPs health.

2 Method

2.1 Design

This controlled, randomized, parallel-type clinical study followed the Brazilian norms regulating research involving human beings (BRASIL, 2012). All volunteers signed the Informed Consent form (ICF) and were informed of the total preservation of their identity and the use of the data, only for the research and under the consent of the proposing Institution. The study was approved by a Committee of Ethics in Research, through the consubstantiated opinion of protocol number: 1,591,306. The research was also registered in the Brazilian Registry of Clinical Trials (TRIAL: RBR-6PVVDB).

2.2 Participants

The sample included 39 NPs. They are employees of the State Institute of the Brain Paulo Niemeyer (IEC). To participate in the research, NPs could not present any medical impediment to performing physical exercises and not participating in any kind of physical activity oriented during the research. Those individuals who were absent from classes for three consecutive sessions for any reason were excluded.

The volunteers were randomly assigned to the experimental group (EG: $n = 20$, 35.5 ± 9.5 years old, 69.9 ± 13.7 kg and 1.62 ± 0.5 m) and the control group (CG: $n = 19$, 37.8 ± 8.9 years old, 81.8 ± 15.4 kg and 1.68 ± 0.9 m). They were chosen from a list of random numbers generated in software (Microsoft Excel 2010, São Paulo, Brazil). The CG was submitted to the same evaluations as the EG. However, they did not participate in the classes of muscle stretching (MS). There was no blinding of participants and evaluators; however, it was considered that it did not influence the outcome of the study.

2.3 Procedures

2.3.1 Investigation of the working profile of the NPs

The questionnaire proposed by Alvarez (1996) was used for the investigation of the working characteristics of the NPs. Information such as hours of work, vacations and interpersonal relationships at work were collected.

2.3.2 Investigation of occupational stress

The information on the level of stress of the NPs was carried out through the Occupational Stress Scale (OSS). This instrument provides an evaluation of aspects that compromise the workers' health within their daily activities (PASCHOAL; TAMAYO, 2004).

2.3.3 MS exercise program

The members of the EG participated in MS classes for eight weeks, with 40-minute sessions containing active and static stretching exercises under the supervision and guidance of a Physical Education teacher. The classes were offered for three days a week and each member attended at least two days a week. The frequency of the students was recorded in all classes. The participant who missed three or more consecutive classes was excluded from the investigation; however, the only person excluded from the study was even allowed participating in the classes.

In each session, eight exercises with four sets of 30 seconds and 30 seconds interval were given, as recommended by the American College of Sports Medicine (2013). Active and static stretching exercises were directed to the body segments in general. The body segment was slowly moved up to a certain range of motion with slight tension (muscle discomfort), remaining in the position.

2.3.4 Statistic treatment

All data were treated in software (SPSS™ 21, Chicago, IL, USA). Descriptive statistics were used for the data from the questionnaires. To verify the effect of the stretching exercises in the occupational stress level, the ANCOVA test was applied to the CG and the EG in the pre and post-intervention conditions ($p \leq 0.05$).

3 Results

3.1 Working profile of the NPs

Data on the time, type of service and working hours of the NPs are shown in Figure 1.

Figure 2 shows the results regarding paid rest among NPs and the way they enjoy it.

Figure 3 shows the percentages of NP that work on weekends and/or other professional activities.

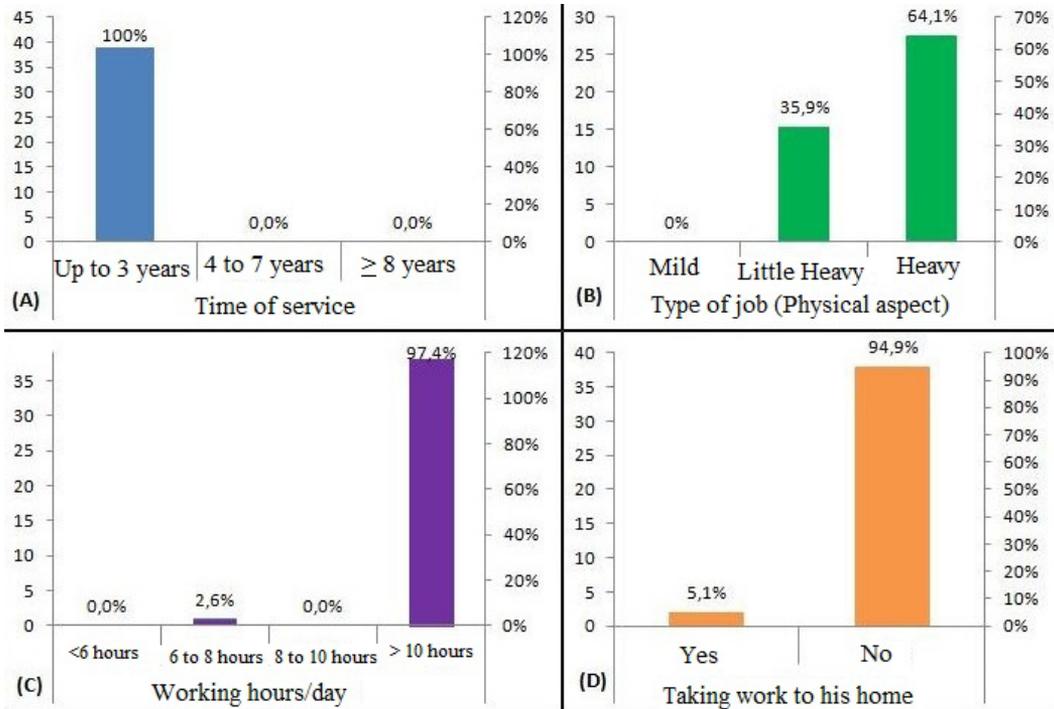


Figure 1. Data referring to the time, type of service and the NP workload. (A) Time of service; (B) Type of job (physical aspect); (C) Working hours/day; (D) Taking work to his home.

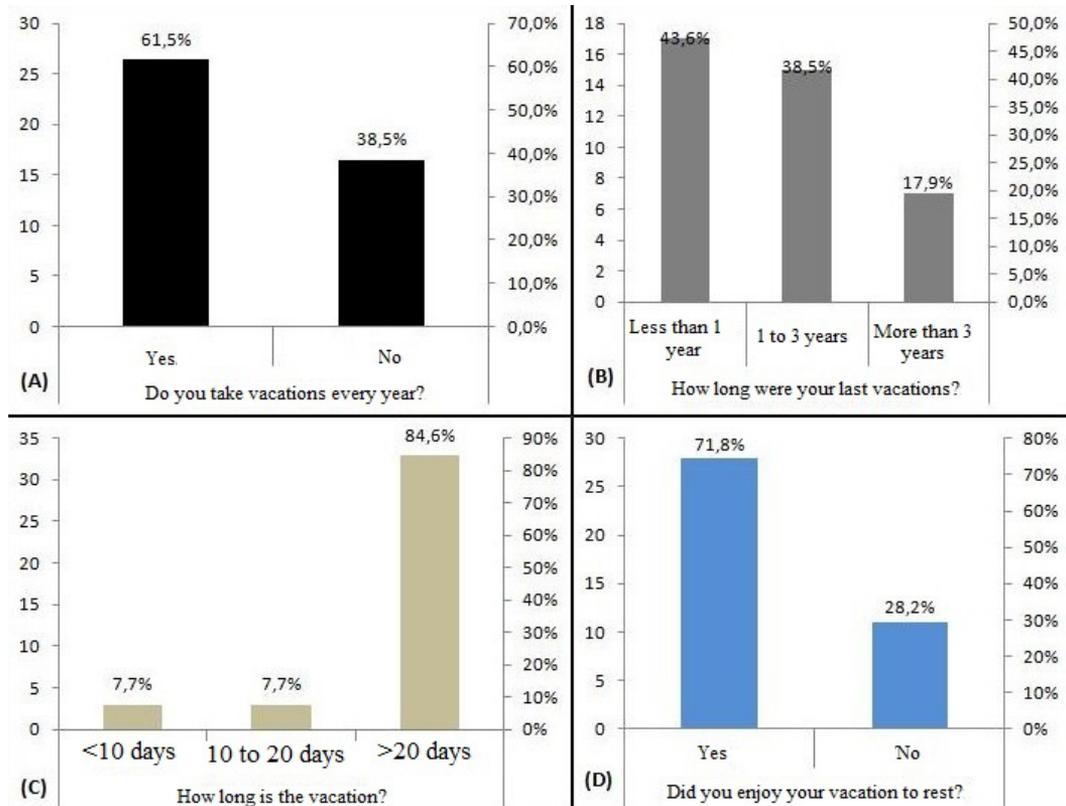


Figure 2. Data on rest and holiday of the NP. (A) Do you take vacations every year?; (B) How long were your last vacations?; (C) How long is the vacation?; (D) Did you enjoy your vacation to rest?

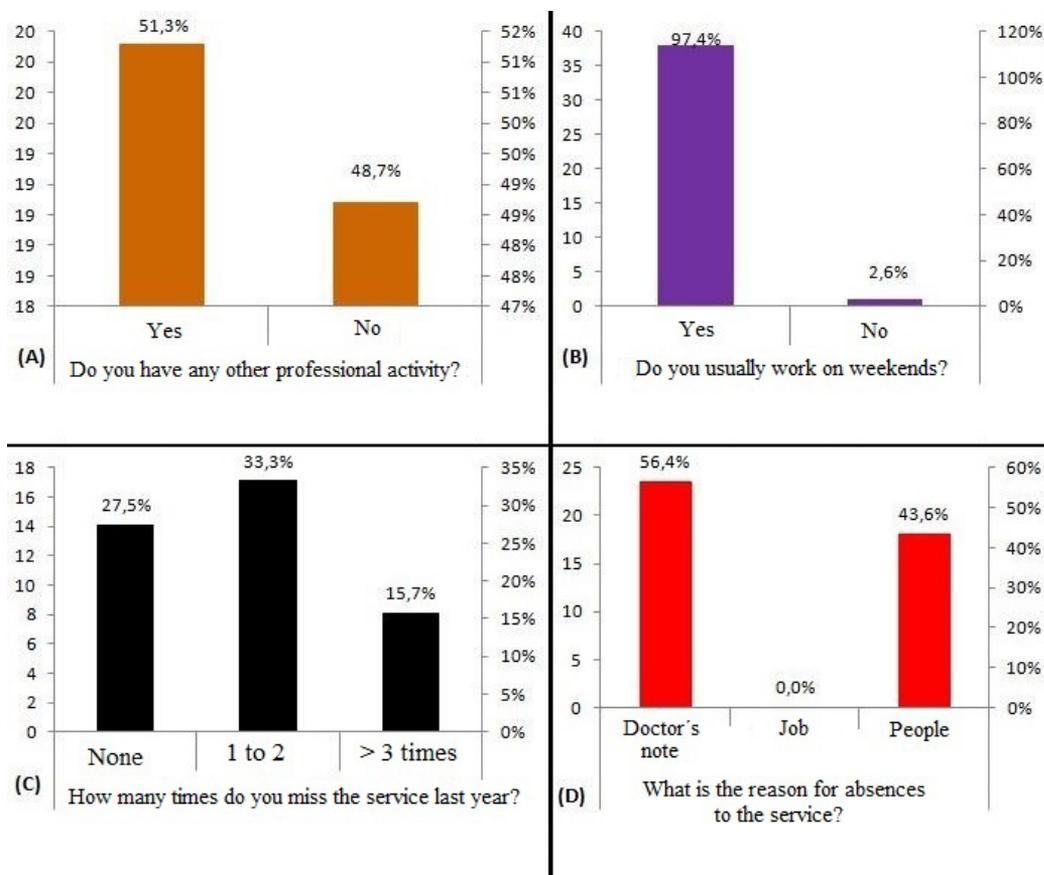


Figure 3. Work volume and absence to the service of the NP. (A) Do you have any other professional activity?; (B) Do you usually work on weekends?; (C) How many times do you miss the service last year?; (D) What is the reason for absences to the service?

There are also data on absences and the reasons for absence from work.

Finally, Figure 4 shows the answers of the NPs on their satisfaction with work life and work environment as well as their opinion about their interpersonal relationship with co-workers.

3.2 Level of stress after the intervention

The ANCOVA results showed that there was a decrease in the stress level of the NPs after the intervention with the stretching exercise, as shown in Figure 5.

4 Discussion

In agreement with our results regarding professional data, type of work, physical appearance and workload (Figure 1), Gouveia (2014) observed that the workload of the NPs was perceived by

most of the workers studied. Thus, individuals feel that they have too many tasks to do and that they do not have enough resources or time to perform the required activities with a reasonable level of satisfaction. Some components corroborate this scenario such as the reduced number of NP in health care, the emergency situations that the NP face during patient care, requiring physical effort, as well as the transport of patients (SECCO et al., 2011). Therefore, there is an imbalance between the demands of work and the individual's ability to meet these requirements, which can be one of the predisposing factors to Burnout (GOMES, 2014).

Menzani and Bianchi (2005) identified that the overload of work activities and the increase of the functions developed by the NP during the long working day, regardless of the work shift, cause anxiety and stress. The stress negatively influences the work activity, generating absenteeism, reducing productivity, physical and mental exhaustion, and creating feelings of incapacity and dissatisfaction (HANZELMANN; PASSOS, 2010).

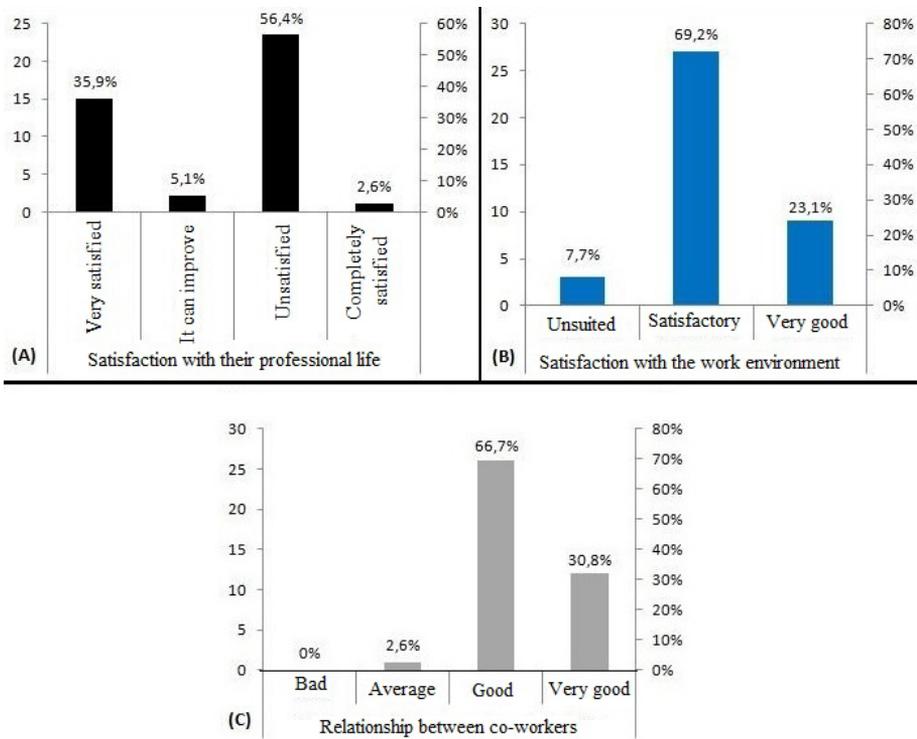


Figure 4. Results related to work life, work environment and relationship with co-workers. (A) Satisfaction with their professional life; (B) Satisfaction with the work environment; (C) Relationship between co-workers.

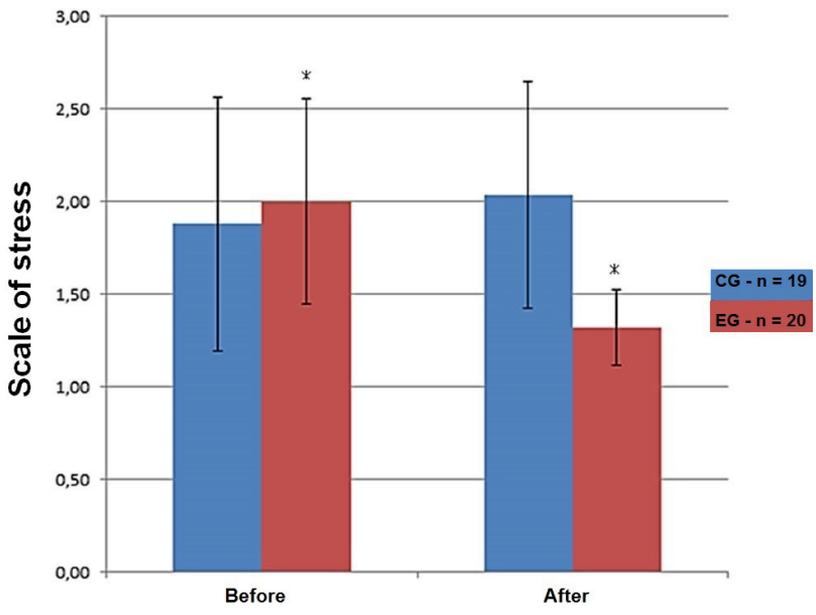


Figure 5. Effect of the intervention with SE on the stress between the EG and the CG. $F = 43.522$; $p < 0.001$; effect size = 0.547.

Regarding the working hours, according to Felli's (2012) study, NPs have a long journey because they need to cover peers for medical absences and leave. Regarding this theme, Martins et al. (2000) identified that most of the nurses highlighted the

work overload as a stressor agent. The excess hours worked can generate displeasure, tension and different health problems (PEIRÓ; SALVADOR, 1993). The excess hours worked and the consequent work overloads suggest a limitation of the time of

being with the family, of performing their social activities, interfering in their quality of life. Weekly shifts on weekends, without any day off also bring comorbidities such as anxiety and stress.

On workload, the absence from work and dissatisfaction with work (Figures 3 and 4), Murofuse, Abranches and Napoleão (2005) argue that the low pay condition makes the NP have a double job, generating long and exhausting monthly workload. Therefore, there should be a constant concern with the performance of these professionals who perform their activities in different shifts (SILVA FILHO, 2016; FERREIRA; DE MARTINO, 2012), since such activities are considered as a relevant factor for their health.

The absences in the service highlighted by the NP (Figure 3) were also perceived by Gonçalves et al. (2005), Sancinetti et al. (2009) and Ferreira et al. (2012). This is worrying as NPs represent the largest workforce in the hospital. That is, the lack of these professionals compromises the organization of the service, generating overload and dissatisfaction among colleagues.

Regarding the NPs who were dissatisfied with their professional life (Figure 4), according to the study by Spindola and Santos (2005), Nursing care in institutions has been penalized by the lack of human and material resources, which undermines the quality of care provided to the population, provoking dissatisfaction among professionals, who feel impotent and frustrated by this circumstance. Thus, the more pleasant the relationship of the professional with his work, the better his psychic health will be (MARTINEZ, 2002; SPINDOLA; SANTOS, 2005).

To alleviate the aggravating effects on worker health described in this scenario, this study proposed intervention with stretching exercise as a reducing agent of occupational stress experienced by the NP. However, due to its characteristics, it does not allow more than 15 minutes of intervention during the work process (MACIEL et al., 2005). However, a more robust intervention was opted in this study, out of the office, but within the work environment. The results were positive, that is, there was a reduction of the perceived stress sensation by NPs after the eight weeks of intervention (Figure 5). Corey et al. (2014) evaluated the effects of restorative yoga exercises (n = 88) and muscle stretching (n = 83) in individuals with metabolic syndrome, followed up for 12 months. The authors found that there was a significant improvement in the level of salivary

cortisol and stress in the group doing stretching exercises than in the group that practiced yoga. Also, there was a significant improvement in the measures of perceived stress and life stress in the group that practiced stretching exercises.

In another research, the objective was to study the influence of stretching exercises on the anxiety levels of workers. Individuals were divided in two groups: EG (n = 67) and CG (n = 67). The intervention lasted three months and, at the end of the study, the levels of anxiety of the EG were significantly lower after the intervention with the stretching exercises (MONTERO-MARÍN et al., 2013). Effects of stretching exercises on stress reduction were also observed by Lacaze et al. (2010) in call center workers of an airline. In the study, 64 operators participated in two groups, EG (n = 32) and CG (n = 32). The EG performed stretching exercises for two months with 10-minute sessions once a week. On the other hand, the CG had a daily rest break of 10 minutes during the same period. The authors concluded that the musculoskeletal discomfort decreased in both groups; however, the EG showed a significant difference in the state of mental fatigue, exclusively, in memory and fatigue.

The findings of this study may indicate an alternative to promote the health of NP without discarding other measures that may contribute to the improvement of working conditions and the life of these individuals. According to Schmidt et al. (2009), the results favor the progress of multidisciplinary knowledge of worker health and provide information for nurses and other managers to program preventive actions to occupational diseases, such as stress, and interventions for health promotion and improvement of the quality of life.

5 Conclusion

This study collected information about the work profile of a group of NPs and to investigate the effects of the practice of physical exercises, specifically stretching, on the level of stress in these professionals. The workload was high in the investigated participants. However, as hypothesized, the stretching exercises provided positive effects on the level of occupational stress after eight weeks of intervention. Despite the positive results of the practice of these physical exercises in the studied sample, it is suggested that new studies should be conducted to promote health in the NPs, decreasing the symptoms of stress.

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Author's Contributions

Flávia Porto conceived, designed and obtained funding for the research. Max Vanderson Cezar da Costa, José Nunes da Silva Filho, Jonas Lírio Gurgel and Flávia Porto participated in writing the manuscript, obtaining, analyzing and interpreting the data. All authors approved the final version of the text.

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Notes

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