

The Effects of Foot Reflexology Treatment on Work Stress and Anxiety Levels of Nursing Managers

✉ Burcu Genç Köse¹, ✉ Havva Öztürk²

¹Department of Nursing, Recep Tayyip Erdoğan University Faculty of Health Sciences, Rize, Türkiye

²Department of Nursing, Karadeniz Technical University Faculty of Health Sciences, Trabzon, Türkiye

Abstract

BACKGROUND/AIMS: Nursing managers' stress and anxiety can have a detrimental impact on their management procedures, ultimately affecting the quality of healthcare services provided. Hence, it is crucial to address these issues effectively. This study aimed to determine the effects of foot reflexology on nursing managers' work stress and anxiety levels.

MATERIALS AND METHODS: The study sample in three hospitals included 63 nursing managers, 32 in the control and 31 in the experimental groups. The data were collected via an information form, the job stress scale, and the state anxiety scale used as pre-test, post-test and retention tests. The nursing managers in the experimental group received eight-foot reflexology sessions.

RESULTS: There was no statistically significant difference between the pre-test work stress and state anxiety mean scores of the nurses in the experimental and the control groups ($p>0.05$), but the post-test work stress and state anxiety mean scores of the nursing managers in the experimental group after foot reflexology were statistically significantly lower than in the control group ($p<0.001$). The nursing managers' post-test mean job stress and state anxiety scores in the experimental group were lower than their pre-test and retention test mean scores ($p<0.001$).

CONCLUSION: The application of foot reflexology reduced the nursing managers' work stress levels and state anxiety, but the positive effects disappeared when the application was not continued. Regular applications of reflexology and teaching it to healthcare professionals for their own practice may ensure the continuity of stress management.

Keywords: Anxiety, nurse manage, reflexology, work stress

INTRODUCTION

The presence of nursing managers is important for maintaining quality health services, coping with existing complex problems¹ and delivering effective and efficient nursing services.² However, studies have shown that the majority of nursing managers experience stress due to working in understaffed or unfavourable conditions³ and their involvement in many different roles such as coordinating human relations, planning, and dealing with patients and their families.⁴ Labrague's⁵ integrative review study revealed that nursing managers experienced moderate stress and that this stress was caused by their workloads, shortfalls

in their workforces and/or insufficient budgets. In addition, the time pressure that the nursing managers experience according to Özkan and Kantek⁶ and being female in male-dominated societies according to Kelly et al.⁷ caused them to experience stress and distress. Another study found that 42% of executive nurses had a level of stress which threatened their health and negatively affected their work.⁶ In the study by Güney⁸, top and bottom-level managers were more exposed to the negative effects of stress, and middle-level managers experienced more stress than top managers. Furthermore, the job stress experienced by nursing managers is reported to cause burnout,⁹ poorer performance and decreased job satisfaction⁶ and prompt some to leave or consider

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ORCID IDs of the authors: B.G.K. 0000-0002-0358-6401; H.Ö. 0000-0001-8515-6263.



Address for Correspondence: Burcu Genç Köse

E-mail: burcu.kose@erdogan.edu.tr

ORCID ID: orcid.org/0000-0002-0358-6401

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leaving the profession.⁵ The stress in nursing managers brings problems such as insomnia, anger, frustration, impatience, restlessness, and exhaustion.⁴ The work stress experienced by nursing managers not only affects themselves, but also directly or indirectly affects the nurses in their team, as well as patient care and service quality.^{4,6} A stress-free working environment will boost nurses' efficiency and the success of health service delivery.¹⁰

Exposure to stress in the workplace is known to cause anxiety, and in one study, it was reported that 51.9% of nurses experienced moderate anxiety.¹¹ Stress and anxiety, which lead to emotional confusion, disharmony¹² and burnout¹³ in nursing managers, are related to each other. Especially difficulties in fulfilling duties and responsibilities and also protecting status and reputation affect the anxiety levels of managers.¹² According to some studies, anxiety experienced in the work environment reduces the performance of managers,¹⁴ decreases the willingness to take risks, and negatively affects their career advancement/promotion.¹⁵ Increased levels of stress and anxiety can render the managers unable to cope over time, with potential adverse outcomes for the institution.¹⁶ Anxiety causes a decrease in professional satisfaction and belief.¹⁷ Therefore, individual or organizational measures should be taken in order to reduce the intensity of work stress and anxiety and their negative effects. The ability of individuals to avoid the negative effects of stress depends on effective stress management.¹⁸

Among the studies on how nursing managers manage their stress process, an integrative review study found that nursing managers tried to cope with stress by having sufficient decision-making authority, receiving social support from other employees in the institution, taking breaks in intellectual processes and also by using individual coping methods.⁵ In another study, they coped with workplace stress by time management and establishing positive interpersonal relationships.³ In addition to these, complementary therapies, which are preferred because of their practicality, non-invasiveness, and low cost, are also used in coping with stress and anxiety.

Reflexology, as a complementary therapy, is preferred because of its safety and the interaction which inherently develops between the recipient and the practitioner. Reflexology involves applying pressure to each pressure point on the feet, which are connected to the body's muscles, organs and glands. This process spreads energy throughout the body along pathways called meridians.¹⁹ Thus, as determined in the study of Rahmani et al.²⁰, it creates positive feelings in individuals and reduces their levels of stress and anxiety. In some meta-analyses supporting these statements, reflexology was found to reduce the levels of anxiety in individuals over the age of 18 and affect the stress levels in workers who remained standing for long periods of time.^{21,22} Another meta-analysis observed reduced perceived stress, fatigue and depression in healthy individuals who self-applied reflexology.²³

The studies on work stress and anxiety carried out with nurses were mostly descriptive and did not focus on practical methods to cope with work stress and anxiety.^{5,7} Studies on the popular complementary therapy of reflexology²⁴ were mostly conducted with patients and nursing students,^{25,26} with no studies found on how nursing managers can reduce or manage their stress and anxiety with reflexology. Yet, the anxiety and stress levels of nursing managers should be kept under control in order to increase the quality of the service, to ensure that nurses are satisfied with their working life, to establish healthy communication and to better manage healthcare facilities.

The aim of this study was therefore to examine the effects of foot reflexology practice on coping with the stress and anxiety experienced by nursing managers.

MATERIALS AND METHODS

Study design; this was an experimental study with pre-, post- and permanence tests and a control group.

Sample; the population of this study comprised 72 nursing managers working in a university hospital (n=40), a provincial public hospital (n=22) and a district public hospital (n=10) in a city centre. The sample included 54 nursing managers, 27 each in the experimental and control groups, calculated with the G*Power 3.1 program (Germany) with a 95% confidence interval (CI), 5% significance level and 0.25 effect size. Considering the risk of not reaching the sample number due to the limited number of nursing managers in the population, it was aimed to reach approximately 15% more than the required sample size. Of the 72 nursing managers in the population, 9 nursing managers were excluded from the sample as 3 were on psychiatric drugs, 2 were pregnant and 4 did not agree to participate in this study. Thus, 63 nursing managers, corresponding to approximately 15% more than the required sample size and who volunteered to participate in this study were divided into groups by drawing lots, which is a simple randomization method. The 63 nurse managers were listed by numbering them from 1 to 63. Papers containing the numbers were drawn by an impartial person. The subjects were assigned to either the experimental or control groups by assigning the first number drawn to the former and the second to the latter. As a result, the study was carried out with a total of 63 (87.5%) nursing managers, 32 of whom were in the experimental group and 31 in the control group. With this sample size, the study was conducted with a CI of 96%.

Measurement; research data were collected with an information form, work stress scale, and the state anxiety scale [the State-Trait Anxiety Inventory (STAI-1)].

Information form: This information form was created by the researchers as a result of a literature review.^{1,3,6,22} It contains 7 questions, 5 about the nursing managers' demographics including age, gender, marital status, parental status and educational status, and 2 about their professional and managerial experience years.

Work Stress Scale: This scale was developed by Dr. Suzanne G. Haynes in 1994 and adapted to Turkish by Mavili Aktaş²⁷ in 1995. The five-point Likert-type scale is scored between 1-5 points. To evaluate, each "a" choice is given 5 points and each "e" option is given 1. In this scale which consists of 10 questions in total, the second question is scored reversely. The scale score range is between 10-50. As the score increases, the stress level increases, and vice versa. The Cronbach's alpha value of this scale in our study was 0.72.

STAI-1: This inventory was created by Spielberger and Gorsuch in 1964 and it was adapted into Turkish by Öner and LeCompte²⁸ in 1985. The scale consists of 20 items. The four-point Likert-type state anxiety inventory is scored as 1: not at all, 2: somewhat, 3: moderately so, and 4: very much so. In the inventory consisting of 20 questions in total, questions 1, 2, 5, 8, 10, 11, 15, 19 and 20 are scored reversely. A score ranging from 20 to 80 can be obtained from this scale. A high score from this scale indicates an increased level of anxiety, a low score indicates a low anxiety level. In our study, the Cronbach's alpha value of the state anxiety scale was 0.92.

Intervention; the data were collected between October, 2018 and November, 2019 with the work stress scale and STAI-1, which was used as a pre-, post- and permanence test, after the consent of the nurses to participate in this study was obtained. These tests were given to the participants and collected by the researcher immediately before reflexology, at the end of the reflexology sessions which lasted 4 weeks, and 4 weeks after the reflexology practices were completed. Completion of the scales took approximately 15 minutes in each session. After the pre-test, which was applied simultaneously to both groups, foot reflexology treatments were started in the experimental group, and it was performed in eight sessions, two days a week, for a total of four weeks. According to the literature, four or eight 30-minute sessions of reflexology are sufficient to open the clogged channels and affect the organs.²⁹ Care was taken to ensure that there was at least one day between sessions and that the same nursing manager was given one-on-one treatment on the same days of the week and in the same therapy room. In addition, taking into account the workload of the participants in the morning, the sessions were carried out by appointment in the afternoon when they were convenient. The reflexology application of a managerial nurse took four weeks, and the entire practice for all individuals was completed in 26 weeks in total. No more than six people per day were treated as the pressure the researcher could deliver decreased as they became tired in practice. Foot reflexology treatment was applied by the first researcher who has a reflexology certificate, in sessions of 30 minutes in total, 10 minutes on the right foot and 20 minutes on the left foot. This treatment time is planned according to the sympathetic parasympathetic reflexology theory stated in the literature. The sympathetic-parasympathetic theory is a recent theory, according to which it is necessary to practice on the left foot in order to affect the parasympathetic nervous system so as to relax and calm the individual, and the reflexology areas on the right foot so as to affect the sympathetic nervous system in order to revitalize and accelerate the organism. To reduce stress and anxiety, the parasympathetic nervous system is stimulated by working on the left foot for longer, allowing the person to relax.³⁰ In our study, a five-minute warm-up and relaxation were performed on the right foot first. It was then aimed to send a message to the whole body by pressing the "solar plexus" point with the thumb five or six times. The application was continued with pressing, pulling and caterpillar movements. A five-minute treatment was applied to the standing brain, thyroid, sinus, lower lymph nodes, intestinal and spinal cord regions. Finally, the application was completed by pressing the solar plexus. Then, after a five-minute warm-up and relaxation application on the left foot, the same area used on the right foot which affects stress and anxiety was treated with the same method for 15 minutes. These applications took a total of 30 minutes for both feet.

Researcher's foot reflexology competence: As per the regulation on traditional and complementary medicine practices in Türkiye, only certified healthcare professionals can practice reflexology. For this reason, the researcher participated in a program covering 120 hours of theoretical and practical training from the "Istanbul Reflexology and Psychology Center" and received a certificate on the 19.03.2018.

Ethical considerations; approval was obtained from the Karadeniz Technical University Faculty of Medicine Clinical Research Ethics Committee (approval number: 2018/133, date: 31.07.2018). Those nurses who participated in this study were informed about the study, and written informed consent was obtained from those who

volunteered to participate. The nursing managers were also reassured that their personal information would not be shared with anyone, and the nursing managers in the control group were informed that they would be offered reflexology if they wanted after this study was completed.

Statistical Analysis

Before the data were analysed, their fit to normal distribution was evaluated with the Kolmogorov-Smirnov test and the data were found to be normally distributed. The socio-demographics, professional characteristics, the comparison of the pre-, post- and permanence tests of the nursing managers in the experimental and control groups, and their work stress levels were analysed by frequency, percentage and chi-square test. Paired-samples t-test and ANOVA were used for intra-group work stress and anxiety level comparisons before and after reflexology and independent t-test, ANOVA and Bonferroni tests were used for the inter-group comparisons of the nurses in the experimental and control groups. The findings were evaluated at a 95% CI and at a 5% significance level.

RESULTS

When the demographic and occupational characteristics of the nursing managers who received foot reflexology were examined, there was no statistically significant difference between the demographics of the nursing managers and their professional and managerial experience years in both groups ($p>0.05$) (Table 1).

Based on the pre-test results of the work stress scale, no statistically significant difference was found between the work stress scale pre-test mean scores of the nursing managers in the experimental (29.64 ± 5.68) and control (29.96 ± 6.15) groups ($p=0.829$; $p>0.05$). For the post-test, the mean score of the nursing managers in the experimental group who received foot reflexology was statistically significantly lower than the control group ($p=0.000$; $p<0.001$) (Table 2).

In the intra-group comparisons, there was no statistically significant difference between the work stress scale pre-test and post-test mean scores of the nursing managers in the control group ($p=0.286$; $p>0.05$), but the mean work stress scale post-test score of the experimental group was statistically significantly lower compared to the pre-test and permanence test scores ($p=0.000$; $p<0.001$) (Table 2).

There was no statistically significant difference between the state anxiety scale pre-test mean scores of the nursing managers in the experimental (39.29 ± 4.56) and control (39.71 ± 5.06) groups ($p=0.726$; $p>0.05$). For the post-test, the state anxiety scale mean score of the nursing managers in the experimental group was statistically significantly lower than the mean score of the control group ($p=0.000$; $p<0.001$) (Table 2). Additionally, the state anxiety scale post-test mean score of the nursing managers in the experimental group was statistically significantly lower than the pre-test and permanence mean scores ($p=0.000$; $p<0.001$). However, the state anxiety scale post-test mean score of the nurses was statistically significantly lower than the pre-test mean score in an intra-group comparison in the control group ($p=0.029$; $p<0.05$) (Table 2).

DISCUSSION

It has been reported in the literature that foot reflexology reduces stress and anxiety²³ but no study has been found in which foot reflexology

Table 1. Comparison of demographics and professional characteristics of nursing managers in the experimental (n=32) and control (n=31) groups

Demographics and professional characteristics		Experimental		Control		p
		n	%	n	%	
Age	20-35 years	7	22.6	14	43.8	0.064*
	36 years and older	24	77.4	18	56.2	
Gender	Male	1	3.2	3	9.4	0.319*
	Female	30	96.8	29	90.6	
Marital status	Married	27	87.1	28	87.5	0.628*
	Single	4	12.9	4	12.5	
Parental status	Parent	27	87.1	27	84.4	0.521*
	Non-parent	4	12.9	5	15.6	
Educational level	Health vocational high school + associate degree	9	29.0	12	37.5	0.328*
	Bachelor's degree	22	71.0	20	62.5	
Professional experience	10 years and less	8	25.8	10	31.2	0.421*
	11 years and more	23	74.2	22	68.8	
Managerial experience	10 years and less	25	80.6	27	84.4	0.477*
	11 years and more	6	19.4	5	15.6	

*p>0.05.

Table 2. Comparison of work stress and state anxiety scale pre-test, post-test and permanence test mean scores of nursing managers in the experimental (n=32) and control (n=31) groups

Work stress and anxiety level	Experimental (n=31)		Control (n=32)		p
	Mean	SD	Mean	SD	
Work stress pre-test ¹	29.64	5.68	29.96	6.15	0.829*
Work stress post-test ²	19.19	5.21	29.09	5.68	0.000**
Work stress permanence test ³	30.12	6.41			
F	1,145.906		1.180		
p	0.001**		0.286*		
Bonferroni	2<1 and 3				
State anxiety pre-test ⁴	39.29	4.56	39.71	5.06	0.726*
State anxiety post-test ⁵	24.67	3.09	35.56	7.70	0.000**
State anxiety permanence test ⁶	40.54	4.82			
F	145.21		5.276		
p	0.001**		0.029***		
Bonferroni	5<4 and 6		5<4		

*p>0.05; **p<0.001; ***p<0.05. SD: Standard deviation.

practice was used to reduce the work stress and anxiety levels of nurses, who play an important role in the management of health services. This study, which attempted to reduce work stress and anxiety levels by performing foot reflexology on nursing managers, enrolled nursing managers into experimental and control groups which were comparable in terms of their demographics and professional characteristics. The pre-test revealed moderate levels of work stress for the nursing managers in both groups with no significant difference noted between them. Moderate levels of perceived stress were reported also by another study (15.94±3.45).¹⁰ The post-test results showed significantly decreased levels of work stress for the nursing managers in the experimental group with intra-group comparisons confirming significantly reduced work stress levels for nursing managers in the experimental group, while the work stress levels of the nursing managers in the control group remained unchanged. However, after the post-test, reflexology was discontinued and the permanence test performed one month later

revealed that the work stress levels of the nursing managers in the experimental group had increased again. This indicated that reflexology was only temporarily effective on the nursing managers and it reduced their work stress levels only for a certain time, losing its effects when discontinued with the work stress levels returning to their original values. In support of these findings, some other studies conducted with different groups reported that foot reflexology reduced stress levels and was effective in stress management.^{23,31,32} Additionally, some studies with non-management nurses reported that complementary therapy³³ and reflexology³⁴ were effective on stress and anxiety. In one study conducted with a different sample group, foot reflexology influenced physiological parameters, although not in the long term, in alignment with the results of our study.³⁵ There is an overall consensus that the effects of reflexology treatment start to be seen after the fourth session, with the blocks dissolving only after then. Also, one or two more sessions of treatment should be performed after the individual starts

to feel better, and treatment repeated once every 15 days or once a month after these sessions are completed in order to maintain general relaxation.^{29,36}

When the anxiety levels of the nursing managers were examined, the nursing managers in both groups had state anxiety levels which were low or slightly below moderate compared to their pre-test results, but this difference was not statistically significant. Another study evaluating the anxiety levels of nurses reported significantly higher anxiety for nursing managers compared to nurses.³⁷ In the post-test results, the state anxiety levels of the nursing managers in the experimental group decreased significantly more than for those in the control group. Intra-group comparisons, on the other hand, showed a significant decrease in the state anxiety level of not only the experimental group, but also the control group. However, the permanence test performed one month after the reflexology treatment was discontinued showed that the state anxiety levels of the nursing managers had increased again. These results indicated that foot reflexology reduced the nursing managers' state anxiety levels temporarily and its effects diminished after it was discontinued. Some studies with different sample groups obtained similar results and confirmed that reflexology reduced levels of anxiety^{26,38,39} whereas others emphasized that the effects of reflexology decreases after its discontinuation, supporting the results of our study, and so indicating that it should be repeated once or twice a month in order to maintain its effects.^{29,36} In addition to this indisputable positive effect of reflexology, the reason for the decrease in the state anxiety levels of the nursing managers in the control group can be attributed to the disappearance of other variables affecting their anxiety levels.

Study Limitations

This study was limited especially with respect to determining the persistent effects test results due to the fact that it was carried out with a small number of nursing managers in a small number of public hospitals in the city where the study was conducted, and that foot reflexology was administered to the nursing managers only for eight sessions in a month.

CONCLUSION

Conducted with nurses who had moderate levels of work stress and near-moderate levels of state anxiety, this study demonstrated that the nursing managers in the experimental group, to whom foot reflexology was applied, had decreased work stress and state anxiety levels compared to the control group, meaning that foot reflexology had a positive effect on their work stress and state anxiety. One month after the foot reflexology treatment was completed and discontinued, the measured work stress and state anxiety levels of the nurses in the experimental group had increased again, showing that the positive effects on work stress and state anxiety could not be sustained and that reflexology sessions need to be applied continuously or with booster sessions.

This study provides important information about the work stress and anxiety levels of nursing managers and how to intervene accordingly. It also revealed the positive effects of foot reflexology on the stress and anxiety levels experienced by these managers. Therefore, foot reflexology sessions can be organized in hospitals to help nursing managers effectively cope with the work stress and anxiety they experience. Owing to the positive effects of these sessions, foot

reflexology can be arranged not only for nursing managers, but also for all employees and other managers in the hospital. Treatments can be performed continuously and at regular intervals in order to maintain the effects of foot reflexology on work stress and anxiety levels. In order for employees and even patients to benefit from this treatment, a polyclinic or unit can be established in the hospital where reflexology treatments and other complementary medical applications can be conducted. Additionally, foot reflexology treatments can be performed for nurses, and awareness can be increased by providing information on this subject. Other healthcare professionals and managers can be informed with regards to reflexology. The effects of foot reflexology applied to nurses on their quality of patient care can be measured. In addition, training can be organized in order to teach individual stress management techniques and reflexology to both nursing managers and other healthcare workers so that they can apply them at their convenience. Finally, institutional policies can be developed in order to reduce those factors which create high or moderate levels of work stress and state anxiety in nursing managers.

MAIN POINTS

- Intense and continuous work stress and anxiety have negative effects on individuals and the institution. According to this study, nursing managers, who are responsible for nurses and their patients, experience moderate or high levels of work stress and anxiety.
- This study found that foot reflexology applied to nursing managers had a positive effect and reduced their work stress and anxiety levels.
- Foot reflexology sessions should be performed continuously or periodically in order to maintain this positive effect and ensure its permanence.

ETHICS

Ethics Committee Approval: The approval was obtained from the Karadeniz Technical University Faculty of Medicine Clinical Research Ethics Committee (approval number: 2018/133, date: 31.07.2018).

Informed Consent: Written informed consent was obtained from those who volunteered to participate.

Authorship Contributions

Surgical and Medical Practices: B.G.K.; Concept: B.G.K, H.Ö.; Design: B.G.K, H.Ö.; Data Collection and/or Processing: B.G.K.; Analysis and/or Interpretation: H.Ö.; Literature Search: B.G.K.; Writing: B.G.K, H.Ö.

DISCLOSURES

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