

Massage application for occupational low back pain in nursing staff

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This is a clinical trial which aims to evaluate the efficiency of massage in the reduction of occupational low back pain, and its influence on the performance of work and life activities for the nursing team. The sample consisted of 18 employees who received seven to eight sessions after their work period. From the Numerical Pain Rating Scale, significant improvements were found between the 3rd and 1st evaluations ($p=0.000$) and between the 3rd and 2nd ($p=0.004$), using the Wilcoxon test. Regarding the Oswestry Disability Index, the paired t test showed a statistical difference ($p=0.02$) between the baseline, with a mean of 21.33% and the second evaluation (18.78%), which was also seen between the second and third evaluation (16.67%). The score for the Handling and Transfer Risk Evaluation Scale was 18 points (medium risk). It is concluded that massage was effective in reducing occupational low back pain, and provided improvement in activities of work and life. Clinical Trials Identifier: NCT01315197.

Descriptors: Low Back Pain; Massage; Complementary Therapies; Nursing.

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Aplicação da massagem para lombalgia ocupacional em funcionários de Enfermagem

Trata-se de ensaio clínico com o objetivo de verificar a eficiência da massagem para diminuir a lombalgia ocupacional e sua influência no desempenho das atividades laborais e de vida, na equipe de Enfermagem. A amostra foi composta por 18 funcionários, que receberam de 7 a 8 sessões após o plantão. Pela escala numérica de dor, houve melhora significativa estatisticamente entre a 3ª e 1ª avaliação ($p=0,000$) e entre 3ª e 2ª ($p=0,004$), pelo teste de Wilcoxon. Sobre a avaliação funcional de Owesstry, no teste T pareado, observou-se diferença estatística ($p=0,02$) entre o primeiro momento, com média de 21,33% e o segundo (18,78%), e se manteve entre a segunda e terceira avaliação (16,67%). Foram encontrados 18 pontos (médio risco) para escala de avaliação do risco na movimentação e transferência. Conclui-se que a massagem foi eficiente na diminuição da lombalgia ocupacional, assim como trouxe melhoria nas atividades de trabalho e vida. Clinical Trials Identifier: NCT01315197.

Descritores: Dor Lombar; Massagem; Terapias Complementares; Enfermagem.

Aplicación del masaje para lumbalgia ocupacional en empleados de Enfermería

Se trata de ensayo clínico con el objetivo de verificar la eficiencia del masaje para apocar la lumbalgia ocupacional y su influencia en el desempeño de las actividades laborales y de vida, en el equipo de Enfermería. La muestra fue compuesta por 18 empleados, que recibieron de 7 a 8 sesiones después del plantón. Por la escala numérica de dolor, hubo mejora significativa estadísticamente entre la 3ª y 1ª evaluación ($p=0,000$) y entre la 3ª y 2ª ($p=0,004$), por la prueba de Wilcoxon. Sobre la evaluación funcional de Owesstry, en la prueba T pareado, se observó diferencia estadística ($p=0,02$) entre el primer momento, con media del 21,33% y el según (18,78%), y se mantuvo entre la segunda y tercera evaluación (16,67%). Fueron encontrados 18 puntos (medio riesgo) para escala de evaluación del riesgo en el movimiento y transferencia. Se concluye que el masaje fue eficiente en la disminución de la lumbalgia ocupacional, así como trajo mejoría en las actividades de trabajo y vida. Clinical Trials Identifier: NCT01315197.

Descritores: Dolor de la Región Lumbar; Masaje; Terapias Complementarias; Enfermería.

Introduction

The issues of work and health can not be dissociated. The nursing professional that wants to care for and treat others also needs care, with it being necessary that their physical, mental and spiritual health conditions are in balance. Given this, the purpose of this study was to verify the efficacy of the use of a complementary practice, massage, in the treatment of problems affecting the lumbar spine of those who work in hospitals.

Issues related to worker health affect the quality

of the care and its actual implementation. The level of absenteeism is often high and there are significant numbers of days off due to musculoskeletal problems, which affect the entire nursing team⁽¹⁻²⁾.

Concern about the health of employees is increasingly gaining important space and work in the area. A study which associated musculoskeletal disorders with the working conditions of nursing staff⁽³⁾ found an occurrence of between 80% and 93%

in the hospital environment, predominantly in the cervical, shoulder, lumbar and knee regions, especially low back pain. The authors highlight a combination of factors that favor the appearance of the disorders, such as "(dis)organization of the work", issues related to the environment and ergonomics. The handling and transportation of patients, inappropriate body posture, lack of adequate equipment, the low amount of human resources, repetitive movements and long working hours are highlighted⁽²⁾. Attention to these spinal problems is therefore emphasized, since they are limiting and debilitating.

According to the health descriptors, low back pain is a symptom related to acute or chronic pain in the lumbar or sacral regions, and may be associated with sprains and strains of muscles and ligaments, displacement of the intervertebral disc and other conditions.

The treatment possibilities for low back pain are of global interest. There are pharmacological and non-pharmacological treatments proposed for this condition and, within these, massage is seen as a possible treatment⁽⁴⁻⁷⁾, bringing benefits such as decreased pain and increased well-being⁽⁸⁾. It is also indicated in the joint clinical practice guideline from the American College of Physicians and American Pain Society⁽⁹⁾.

In a systematic review conducted in 2008 to update the 2000 review, which relates to massage and back pain, it was concluded in this new stage⁽⁸⁾ that massage is beneficial for nonspecific low back pain, i.e. pain that is not due to disease, is subacute or chronic, and that also presents long term effects, for at least one year after the completion of the treatment. Other effects of massage are indicated as pain and muscle tension relief, relaxation, promotion of a sense of well-being, and the promotion of attention and affection⁽¹⁰⁾.

Massage, according to the Health Science descriptors, is the "group of systematic and scientific manipulations of body tissues, best performed with the hands, for the purpose of affecting the nervous and muscular systems and the general circulation"⁽¹¹⁾.

In Brazil there is a substantial number of nursing studies in this area, but these present methodological flaws⁽¹²⁾, such as the absence of the description of the sequence of massage techniques⁽¹³⁻¹⁴⁾, not describing what type of massage was performed or the duration of the technique⁽¹⁵⁻¹⁶⁾; key data which prevents the replication of the studies, as well as the analysis of

the results being extrapolated to other populations/samples. In other countries a recurring criticism is the use of massage as a control and not an intervention⁽¹⁷⁾. Further research, which provides a clear description of the technique and presents massage as the main intervention investigated, is therefore justified in this field and area of expertise, so that the complementary and integrative practices are configured as part of the care for the benefit of a greater number of people. This was the motivating factor that justifies the present study.

There is legal support for the use of massage in the care of the population of the municipality of São Paulo through Law 13,717 of 2004, which provides for the implementation of Natural Therapies in the Municipal Health Secretariat⁽¹⁸⁾, with emphasis on massage therapy and acupuncture, among others. The COFEN - Federal Council of Nursing - established Resolution No. 197, in 1997, which recognizes nurse specialists in complementary health practices, provided the specialization courses fulfill the requirements of the Ministry of Education⁽¹⁹⁾.

Aims

The aims of this study were to verify the efficiency of massage in the reduction of occupational low back pain and to verify the influence of the technique on the performance of activities of work and life.

Study group and Methods

Type of study: This was a semi-experimental, before and after, clinical trial, field study. *Study site:* The study was developed at the Institute of Orthopedics, of the Clinical Hospital of the Faculty of Medicine, University of São Paulo, with Nursing Team professionals of the Spinal Cord Injury Unit. *Ethical and legal aspects:* The research project was approved by the Research Ethics Committee of the Clinical Hospital of the Faculty of Medicine, University of São Paulo (Protocol No. 0237/10) and adhered to Resolution 196/1996 of the National Health Council, regarding research with humans, using the Terms of Free Prior Informed Consent (TFPIC) in order to obtain the prior authorization of the subjects participating. Anonymity and confidentiality of the data were guaranteed. *Sample:* To define the sample, all the employees of the Spinal Injuries sector who reported pain in the back related to work activities, were invited

to take part in the study. For those interested, the physiotherapists participating in the research applied the Numerical Pain Rating Scale⁽²⁰⁾ and the Translated Oswestry Disability Index⁽²¹⁾. However, only individuals who scored higher than 0 (zero) in the Numerical Pain Rating Scale⁽²⁰⁾ and higher than 15 in the Translated Oswestry Disability Index⁽²¹⁾ were invited to participate. *Inclusion criteria:* (1) Voluntary participation in the study with employees of both sexes who had time available to commit to the sessions; (2) Not to be pregnant; (3) To perform a shift of at least six hours daily; (4) Not to go on vacation or sick leave during the study period; (5) to present low back pain, either self-reported or verified by medical diagnosis; (6) Not to have spondylolisthesis, herniated disc or sciatic pain, either self-reported or confirmed by medical diagnosis, (7) Not to be using anti-inflammatory drugs; (8) to present a score higher than 0 (zero) in the Numerical Pain Rating Scale⁽²⁰⁾ and a score greater than 15 in the Translated Oswestry Disability Index⁽²¹⁾. *Discontinuation/exclusion criteria:* (1) To miss more than one session; (2) To leave the study.

Data collection procedure: After definition of the sample, the TFPIC and the Sociodemographic Data questionnaire were completed. The application of the TFPIC and clarification of the study were performed by the researcher. This was followed by the application of the Numerical Pain Rating Scale⁽²⁰⁾, Translated Oswestry Disability Index⁽²¹⁾ and the Handling and Transfer Risk Evaluation Scale⁽²²⁾ by the physiotherapist co-authors, with the reapplication of the these in the 2nd week (4th treatment session) and at the end of the study (7th or 8th session), at the end of the session.

The Sociodemographic Data questionnaire investigated the following factors: age, gender, position, length of time working in the unit, presence of underlying condition and duration of low back pain. The Numerical Pain Rating Scale⁽²⁰⁾ evaluates the intensity of pain at the time and classifies this into three categories, numbered 01 to 03 for mild pain, 04 to 06 for moderate pain and 07 to 10 for severe pain. In the Translated Oswestry Disability Index⁽²¹⁾ there are 10 domains of questions with six alternatives that score 0 to 05 points. The determination of the score is made through the expression: total points x 100 ÷ 50. The result is classified according to the percentage: 0% to 20% minimal disability; 21% to 40% moderate disability; 41% to 60% severe disability; 61% to 80% crippled; and 81% to 100% individual is bedridden or exaggerating the symptoms. The Handling and Transfer Risk Evaluation Scale is an instrument, validated in Brazil, that evaluates

the risk of professionals developing occupational low back pain related to diverse factors connected with work⁽²²⁾. It comprises eight topics, each with three alternatives, with values from 1 to 3, which must be filled in by a worker of the health area. The topics are: weight, height, level of consciousness and psychomotor function, mobility in bed, transference from bed/stretcher or bed/chair and vice-versa, ambulatory, catheters and equipment used by the client and environment. The results are classified as low risk (8-12), medium risk (13-18) and high risk (19-24).

Participants received between 7 and 8 massage sessions (2 per week), lasting 30 minutes per session, after the work period, performed by the researcher, nurse (first author of the study).

The techniques used were:

1. Smoothing: superficial, light, continuous movement, performed with the whole palm surface and with both hands. Performed three times quickly, starting in the thoracic region, moving vertically until the beginning of the lumbar region, then a centripetal motion, ending with a horizontal motion in the lower back.
2. Acupressure: performed with the tip of the thumb, with strong enough pressure for the individual to feel some pain. The duration of pressure is 3 seconds, in a vertical direction.
3. Kneading: manipulation in which the subcutaneous muscles and tissues are alternately compressed and released. Performed with the tip of the thumb, the movements are circular, being three loops returning to the same point, duration of 3 seconds each.

Massage protocol The massage protocol, the theoretical and methodological basis of the present study, was designed by combining the knowledge of massage with the texts/books based on acupuncture. The location of the points and their meridians, as well as the function of each, were extracted from acupuncture⁽⁹⁾. The movements of smoothing, kneading and pressure are from massage⁽⁸⁾. Pressure plays a fundamental role in the protocol, it is mainly through this that the analgesic effect is obtained⁽²³⁻²⁴⁾. First smoothing was carried out. The pressure and kneading were performed conforming to the techniques described, once at each point. For the correct location the acupuncture points and their meridians the descriptions in Figures 1 - A and B, were used:

The main meridian pathway used in this protocol was the bladder (Pang Guang) due to its location and points that operate in the treatment of low back pain, already described in the literature for its effectiveness⁽²⁶⁾.

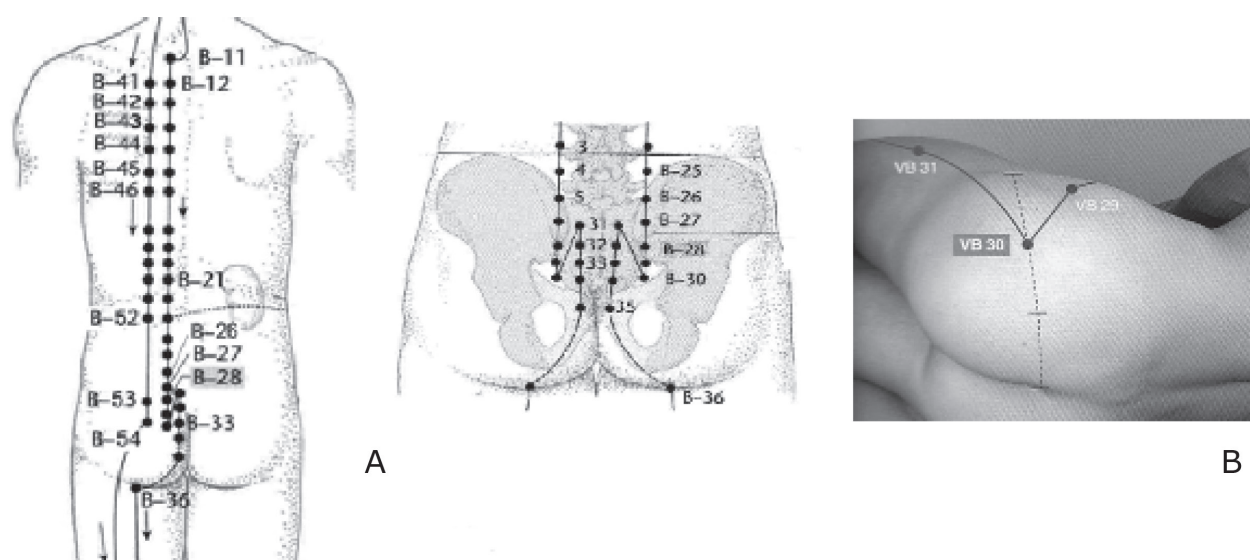


Figure 1 - A - Modified image of the points of the protocol⁽²⁵⁾. São Paulo, 2010. B - Point VB 30⁽²⁵⁾. São Paulo, 2011

The points used were those that descend along the paraspinal muscles, from the thoracic region, down the back, sacroiliac region, the buttocks, to point B36, in the gluteal fold. The point Gallbladder 30 is located behind the trochanteric region. The points of the first line of the bladder, points B11 to B35, and the points of the second line of the bladder, B41 to B54, and finally B36, the gluteal fold. As well as the points B23 to B26, of the first line, B52 to B54, of the second line, the points of the sacral foramen (B31, 32, 33, 34) and VB30 were used, all located in the lumbar and sacral regions⁽²⁶⁾.

Point B23 is the Shu point of the Kidneys and among its main indications are chronic back pain and muscle contractions in the lumbar region⁽²⁶⁾. Points B24 and B26 are located under point B23 and associated with the lumbar vertebrae. To strengthen the lower parts of the back, lumbar region and knees is one of the main functions of these points, which have specific indications for back pain and sciatica⁽²⁶⁾. The points B31, 32, 33, 34 are located in sacral foramen and one of their main functions is to strengthen the lumbosacral region and knees. Point B36, at the bottom of the gluteus maximus and in the midpoint of the skin fold of the buttocks, is used to relax the hamstrings and for low back pain and sciatica. The points of the second line of the bladder meridian, B52 to B54 were also used because, among other functions, they are indicated to strengthen the lower back⁽²⁶⁾. Point VB30 (Huan Tiao) is a point that lies at one third the distance from the greater trochanter to the sacral hiatus. The choice of this point also relates to its functions, such as strengthening the lumbar spine region and the lower limbs. It also relaxes the tendons, muscles and joints of the leg and buttock⁽²⁶⁾.

Results

The entire nursing team of the unit was invited to participate in the study. Of the 22 employees with the condition, four were excluded from the project because: (1) had no back pain, (2) had no available time due to working two jobs and (1) did not accept the therapy. In total, therefore, the study sample was composed of 18 employees, 15 Auxiliary Nurses and three Registered Nurses. None of them performed regular physical activity. The mean age of the subjects was 38 years, ranging from 21 to 58 years. Eleven were female and seven male. Employees from all three shifts participated (Morning, Afternoon and Night). The mean length of time working in the sector was 13 years, ranging from 1 year and 8 months to 36 years. The underlying diseases that appeared were glaucoma, hypertension, herniated cervical disc and gastric ulcer. The perceived duration of the low back pain had an interval of 6 months to 25 years with a mean of 6.5 years. The number of sessions was respected by the subjects, with regard to the exclusion criteria, with 88.9% (16 subjects) of the sample that underwent eight sessions and 11.1% that performed seven sessions.

In the initial evaluation of the Numerical Pain Rating Scale⁽²⁰⁾ moderate pain predominated, with 55.5% (N=10) of the sample. The evaluations were distributed as follows: 3 (16.6%) people with mild pain, 10 (55.5%) with moderate pain and 5 (27.7%) with severe pain. In the second evaluation 8 (44.4%) were pain-free, 9 (50%) had mild pain and 1 moderate pain. At the final evaluation, only 1 (5.5%) person scored 02 in intensity (mild pain) and the remaining 17 (94.5%) subjects were pain free. In the Wilcoxon test there was a statistically significant difference observed between the third and first sessions, as well as between the third and second, as shown in Table 1.

Table 1 - Distribution of comparative pain scores at the moments of massage evaluation. São Paulo, Brazil, 2010

	N	Evaluation	p
3 rd evaluation	18	Initial evaluation (session 0)	0.00*
3 rd evaluation	18	2 nd evaluation (4 th Session)	0.00†

* P<0.05 in the comparison between the 3rd and the initial evaluations

† P<0.05 in the comparison between the 3rd and the 2nd evaluations

Through the non-parametric Spearman correlation it was observed that the duration of the low back pain had no relationship with either age or length of employment in the Spinal Injury Unit ($p > 0.05$), as shown in Table 2. However, there was a statistically significant difference between duration of low back pain and the second evaluation of the pain intensity.

Table 2 - Quantitative correlation between variables time working in the unit and pain. São Paulo, Brazil, 2010

	N	Age	Time working in the Unit (years)	Initial evaluation (Session 0)	2 nd assessment (4 th session)	3 rd evaluation
Duration of low back pain (years) p	18	0.12	0.87	0.86	0.01*	0.47

* P<0.05 in the correlation between duration of low back pain and 2nd evaluation

Figure 2 shows the potential of the technique used, or improvement curve, which continued even after the second evaluation, as evidenced by the improvement in this time period, although with less impact, as can be seen.

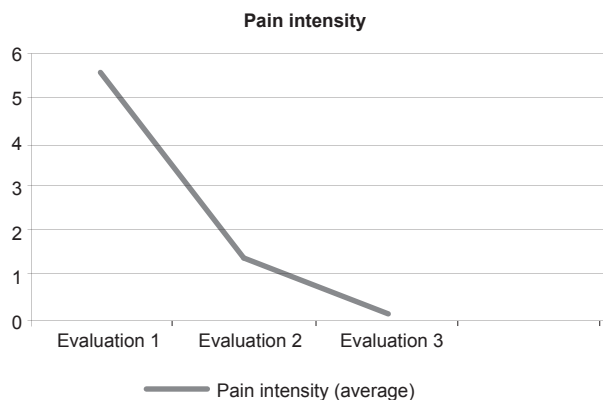


Figure 2 - Pain evaluation. São Paulo, Brazil, 2010

With the application of the Translated Oswestry Disability Index⁽²¹⁾ the team studied presented mostly minimal disability. In the paired t test a statistically significant difference ($p=0.02$) was observed between the baseline, with a mean of 21.33%, and the second evaluation, with 18.78%. The minimal disability remained between the second and third evaluation, 16.67%, as seen in Figure 3.

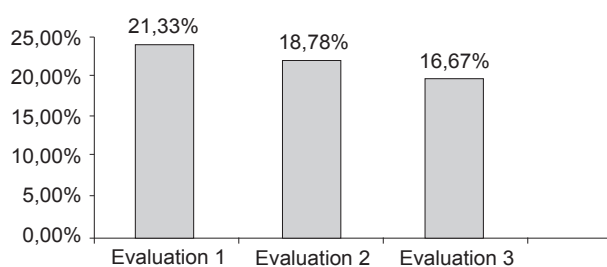


Figure 3. Oswestry Disability Index of the subjects studied. São Paulo, Brazil, 2010

The Handling and Transfer Risk Evaluation Scale⁽²²⁾ presented a mean of 18 points in the three assessments, with a significant difference between the first and third assessment, obtained using Spearman's test. The majority of the sample, 62.6% presented "medium risk" and others "high risk".

Discussion

The Spinal Injury Unit can be compared to the Intensive Care Unit, present in all other hospitals that receive patients requiring intensive care nursing, as the characteristics of the work activities are similar. Statistical tests were applied to all the data collected. It is noteworthy that data such as age and length of time working in the unit, performing the same procedures every day, in a sector with a high workload, did not present a positive correlation. The only statistically significant difference was between duration of back pain and the second evaluation of pain intensity, suggesting that these variables are linked, however, it was not possible to determine the nature of the influence that may have occurred between them. Given the above, the Handling and Transfer Risk Evaluation Scale⁽²²⁾ was used in order to attempt to evaluate the ergonomic risks present in the handling and transfer of patients routinely admitted to the unit, regardless of the correct or incorrect ergonomics of the employees. The results demonstrate the "need for planning (...) and for small equipment (plastic slides⁽²²⁾, boards, (...), transfer board, non-slip hand blocks)" in the provision of care.

Since the present study was performed in the inpatient unit with specificity of the type of patient hospitalized, there was no change in score of the questionnaire throughout the study, this result being consistent with a study performed in the ICU of a University Hospital within the state of São Paulo⁽²²⁾. The Translated Oswestry⁽²¹⁾ Disability Index is an instrument

available for use in Brazil, to specifically investigate the presence of low back pain and its interference in the daily activities of the respondent. The sample studied presented moderate disability at the baseline, followed by minimal disability in the following evaluations, indicating that this massage protocol positively influenced the performance of work and living activities. Comparing this result with that obtained in the Handling and Transfer Risk Evaluation Scale⁽²²⁾ draws attention to the planning of the care in order to prevent complications of the condition, which increase the rate of absenteeism and cause an overload of the team due to possible absences and employee dissatisfaction. Pain responded satisfactorily to the therapy throughout the proposed treatment period. At the baseline, the first evaluation, there was a high impact on the pain, with this decreasingly maintained in the other evaluations, though with less intensity. This decrease can be attributed to the overall improvement in the pain presented by the subjects, since only one worker ended the proposed sessions with pain of a mild intensity. The number of sessions was shown to be effective, even for the individuals who underwent seven sessions.

The Brazilian National Health System (SUS) points out that in January 2011 there was, in the state of São Paulo alone, the registration of 3833 hospital admissions related to diseases of the musculoskeletal system and connective tissue (Group M of the ICD-10)⁽²⁷⁾. Low back pain was the fourth most common injury due to work accidents among 50 codes of the International Classification of Diseases (ICD) in 2007⁽²⁸⁾. A study conducted in the period 1990 to 1997⁽²⁹⁾ in a university hospital identified that of 531 accidents reported through the CAT - *Comunicação de Acidentes de Trabalho* (Work Accident Communication), 7% (37 accidents) were related to injuries of the spine. The type of professional most affected was the auxiliary nurse (39.1%); 44% of the accidents occurred in the morning period, 34.8% occurred in the room of the patient and the most common cause was the handling and transportation of patients.

A study conducted at a university hospital in São Paulo city noted that, in relation to the absenteeism of this type of worker, the most common complaint of excused absence referred to problems in the musculoskeletal system and the connective tissue (Group M of the ICD-10). This group of disease together with the mental disorders accounted for 4957 days of absence from work, with soft tissue disorders (M70-M79) and dorsopathy (M50-M54) accounting for more than 50% of the absenteeism verified in the study⁽³⁰⁾. This result confirms data found in a study conducted

in a hospital of the city of Campinas with auxiliary nurses and nursing technicians, in which low back pain accounted for 13.3% of the absenteeism found over a period of 12 months and 25.7% of the demand for medical care among the 105 participants⁽²⁾.

In the Eastern cultures there is support for the use of massage for low back pain due to its potent analgesic effects, especially if applied to acupuncture points, i.e. acupressure⁽⁸⁾. A study performed in China focusing on low back pain compared acupressure with conventional physical therapy, at the end of this study acupressure demonstrated positive results⁽³¹⁾. In another study, the effectiveness of this technique on low back pain was identified using the visual analog scale, Roland and Morris's Questionnaire and the Translated Oswestry Disability Index⁽²¹⁾.

There are still few studies that consider massage as the main intervention in the treatment of low back pain. Only two studies were found that addressed this issue. Published in 2011, one study⁽³²⁾ compared two types of massage and usual treatment for chronic nonspecific low back pain in 401 patients. Relaxing massage was compared with structural massage focused on low back pain. The usual treatment referred to the treatment that the individual was undergoing, which constituted the control group. After 10 weeks of treatment and with follow-ups immediately after, at 26 and at 52 weeks. It was concluded that ten sessions of massage therapy led to a more rapid improvement in low back pain than the usual medical care. There was no apparent difference between the relaxing massage and the more specialized structural massage technique. The other study was conducted in 2008⁽³³⁾, evaluating the decrease in pain scores and improvement in anxiety levels in 101 individuals with non-malignant chronic low back pain, with pain intensity from moderate to severe, after the application of a massage session by nurses. Two groups were randomly allocated: intervention (massage) and control group (talk about the pain). Questionnaires were administered before the session, at the end of the session, and 1, 2, 3 and 4 hours after the session. It was concluded that the group that received massage had a decrease in the pain and anxiety scores after the first hour, indicating this technique as a possible short-term treatment.

During the performance of the research one of the subjects, after the 5th session, suffered a fall at home presenting intense pain in the lumbar region and the realization of the massage significantly decreased the level of pain in the subsequent sessions. This event was not considered a cause for exclusion from the study because it was an unexpected event that could also be treated

with massage. Another individual, after the 5th session, also presented an episode of severe pain in the cervical region due to the presence of a herniated disc in this area, and used anti-inflammatories; a fact that could interfere in the improvement results in relation to the efficacy of the massage, since the subject used at least one dose of the drug and, after this incident, there were still three sessions.

Conclusion

From this study it was concluded that the massage protocol used was effective in reducing occupational low back pain, indicating the technique described as a therapy that can be used within hospital institutions for the benefit of the employees. The study provided improvements in the work and life activities for the nursing team and allowed the protocol to be described in detail, which will permit the replication of this study in future research in this area. Also the sample studied presented scores corresponding to minimal disability and medium risk of developing low back pain, indicating the need for rigorous planning of the activities relevant to the Nursing profession.

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