

Low back pain among hospital nursing assistants

Lombalgias em auxiliares de enfermagem hospitalares

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ABSTRACT | Background: Occupational low back pain (LBP) is a relevant condition among hospital nursing assistants (NA). **Objective:** To characterize the context of LBP among NA who sought medical care for this reason. **Methods:** We conducted structured interviews to characterize the participants' sociodemographic profile, state of health and most relevant LBP episode. Next we subjected the participants to brief objective physical examination and reviewed their occupational health records. **Results:** We interviewed 30 NA, most of whom were middle-aged women with excess weight and sedentary lifestyle. The most relevant LBP episodes were characterized by severe pain (93.3%) and resulted in functional restrictions for 63.3% of the sample. Job tasks most frequently associated with LBP were patient transfer (23.3%) and lifting/carrying loads >12 kg (20%). Although all the participants had sought medical care, 80% still complained of pain at the time of the interviews. On physical examination, the Lasègue and Bragard signs were found in 11 participants. We found significant association ($p<0.05$) between clinical signs, ongoing pain and incapacity for work. **Conclusions:** According to most participants, LBP episodes occurred while performing tasks involving high physical demands, such as patient transfer and lifting/carrying loads >12 kg. The influence of individual factors notwithstanding, prevention and treatment of LBP among NA requires integrated occupational health interventions to minimize its impact on health and absenteeism.

Keywords | low back pain; occupational diseases; nursing assistants.

RESUMO | Introdução: Os auxiliares de enfermagem (AE) hospitalares constituem um grupo profissional para o qual a lombalgia ocupacional é relevante. **Objetivo:** Caracterizar os contextos da lombalgia num grupo de AE que, por esse motivo, solicitaram exame médico ocasional. **Métodos:** Utilizou-se uma entrevista estruturada para a caracterização sociodemográfica, do estado de saúde e do episódio mais relevante de lombalgia e seu enquadramento, seguida de exame objetivo sumário e de consulta do processo individual do Serviço de Saúde Ocupacional (SSO). **Resultados:** Foram entrevistados 30 AE: predomínio de mulheres de meia-idade, com excesso de peso e sedentárias. Os episódios mais relevantes de lombalgia caracterizaram-se por dor intensa (93,3%), tendo condicionado limitação funcional em 63,3% dos AE. As atividades mais relacionadas com o episódio de lombalgia foram a transferência de doentes (23,3%) e a movimentação/o transporte de cargas >12 kg (20%). Todos eles recorreram a serviços médicos, mas, à data da entrevista, 80% mantinham lombalgia ativa. Ao exame objetivo, oito apresentavam dismetria dos membros inferiores, e 11, escoliose. Os sinais de Lasègue e de Bragard estiveram presentes simultaneamente em 11 casos. Identificaram-se associações significativas ($p<0,05$) entre a presença de sinais clínicos, a presença de lombalgia atual e a incapacidade para o trabalho. **Conclusões:** A maioria dos AE afirmou que o episódio agudo de lombalgia ocorreu durante a realização de tarefas exigentes, como transferência de doentes e movimentação/transporte de cargas >12 kg. Assim, apesar da influência dos fatores individuais, a prevenção e o tratamento da lombalgia em AE passam por uma intervenção integrada do SSO, minimizando o seu impacto na saúde e no absentismo.

Palavras-chave | lombalgia; doenças profissionais; auxiliares de enfermagem.

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INTRODUCTION

Health care workers are at particularly high risk for low back pain (LBP)^{1,2}. Among nursing assistants (NA), who are mainly female, the prevalence of LBP is higher compared to nurses and women in the general population. Indeed, NA represent one of the occupational groups most affected by LBP^{3,4}. The prevalence of LBP is higher among the less qualified hospital employees⁵.

Eriksen reported a prevalence of 54.9% (95% confidence interval–95%CI 53.7–56.1) of LBP in the past 14 days among NA in Norway (n=7,478). Prevalence was higher among the NA in jobs posing more physical demands, i.e. in nursing homes⁶. In a later study, Eriksen et al. found association between severe low back pain and:

- positioning patients in the bed frequently;
- perceived lack of support from immediate superiors;
- perceived lack of relaxing and pleasant culture in the work unit.

These authors further found association between sick leave attributed to LBP and:

- frequently handling heavy objects;
- average physical demands;
- perceived lack of support and encouragement at work;
- shift and night shift work⁷.

Gurgueira et al. interviewed 105 NA and nursing technicians (all female; 66% NA) in a university hospital in Brazil; 59 and 31.4% of the sample reported LBP in the past 12 months and 7 days, respectively⁸. About 13.3% of the interviewees had missed working days due to LBP, and 25.7% had sought medical care in the past 12 months for this reason. Patient moving (87.6%) and transport (49.5%) were the activities most frequently associated with LBP⁸.

Almeida et al. administered a self-report musculoskeletal symptoms questionnaire to NA (n=22) at the central sterile services department of a university hospital in Portugal. Occurrence of symptoms in the past 12 months was reported by 95.2% of the participants, mainly LBP⁹. In another study also performed in Portugal, most of the participating nurses (60.6%) reported LBP in association with tasks such as patient bedside bathing (odds ratio–OR 1.4 [1.08–1.84])¹⁰.

Taken together these data indicate that prevention or control of LBP among hospital NA should be a focus of concern for workplace health and safety or occupational health departments. For this purpose, or to improve the efficacy and efficiency of work processes, a characterization of the affected workers, identification of work situations associated with LBP, and reflection on implemented preventive and therapeutic measures are necessary.

The aim of the present study was to characterize work situations associated with LBP among NA allocated to any hospital department (clinical and non-clinical) who sought medical care for LBP. The study objectives were:

- to characterize hospital NA with history of LBP;
- to describe the working environment where the most relevant episodes of LBP occurred;
- to characterize the most relevant episodes of LBP, their repercussion and follow up;
- to perform brief objective physical examination.

METHODS

STUDY DESIGN

The present cross-sectional, observational, descriptive and analytical study was based on data collected from a university hospital occupational health department (OHD) records relative to worker-requested medical examinations from 1 January 2016 through 31 March 2018, structured interviews with NA who sought medical care for LBP, and the results of brief objective physical examination.

The present study complied with the Declaration of Helsinki. Since the OHD granted authorization to access clinical data, ethical clearance was waived.

SAMPLE

OHD made available a Microsoft Excel database of worker-requested medical examinations that contained information on occupational group, hospital department, date and reason for requests, and the relationship of complaints with work.

We located all NA-requested medical examinations due to acute LBP (n=42) and identified the involved workers (n=42) to include them for interview. We called this group by

phone to invite them to participate in the present study and briefly explain the aims of interviews. The NA who agreed to participate were interviewed at OHD in the period from 27 April to 24 May 2018.

DATA COLLECTION INSTRUMENT

With support on individual medical records, we conducted the interviews following an ad hoc protocol with the following sections:

- sociodemographic characterization;
- health state characterization;
- characterization of the most relevant LBP episode.

At the end of the interviews a specialist in physical medicine and rehabilitation performed a brief objective physical examination according to good practice in medical evaluation of LBP.

STATISTICAL ANALYSIS

Data analysis was performed with IBM Statistical Package for the Social Science (SPSS) Statistics 24. The participants' anonymity was protected.

We performed descriptive analysis in terms of mean, standard deviation, median, minimum and maximum for numerical variables, and absolute and relative frequency for categorical variables. We tested statistically significant associations among the selected variables (χ^2 and Fisher's exact tests) for a significance level of 5%.

RESULTS

CHARACTERIZATION OF HOSPITAL NURSING ASSISTANTS WITH HISTORY OF LOW BACK PAIN

We interviewed 30 NA, 22 (73.3%) of whom were female, with average age 49.17 ± 7.67 years old. More than half of the participants (53.3%) were ≥ 50 years old, including three older than 60.

The participants' average length in the profession was 16.7 ± 8.6 years, 20 and 30 years or more for 30 and 12.3%, respectively. Most participants (63.3%) worked 40 hours/week, and only two-fifths still had a rotating shift schedule. Two participants (6.7%) had a second job, and only four (13.3%) did not do any routine household chore.

About 40% of the sample exhibited overweight (body mass index–BMI 25–30 kg/m²) and 26.7% obesity (BMI >30 kg/m²), 90% had at least one diagnosed disease — herniated lumbar disc (40%), depression (36.7%), 73.3% took some medication, and 6.7% were enrolled in a rehabilitation program. About 76.7% of the participants did not regularly perform physical activity, 40% were smokers (26.7% ex-smokers), 83.3% regularly drank coffee, and 50% slept 6 to 8 hours/day. Only one participant (3.3%) reported to drink alcohol on a regular basis.

Upon inquired about their most relevant LBP episode, 27 (90%) participants stated it had been related to hospital work (to non-hospital and home work for the other three). Table 1 describes the hospital departments where the participants worked at the time of episodes. In 16 cases (59.3%) pain started suddenly. Ten episodes (62.5%) were duly reported as on the job accidents.

DESCRIPTION OF THE WORK ENVIRONMENT AT THE TIME OF THE MOST RELEVANT LOW BACK PAIN EPISODE

Tables 2 and 3, respectively, describe the posture profile (percentage of the daily working time) and tasks performed (times per day) at the hospital department of allocation at the time of the most relevant LBP episode.

According to the participants, the hardest tasks were patient transfer (26.7%) and moving and carrying loads >12 kg (23.3%) together corresponding to half of the sample. These were also the tasks more frequently reported as associated with LBP, 23.3 and 20%, respectively. We should observe that 10 of the 14 participants (71.4%) who reported lifting patients from bed did not use mechanical aids.

Besides meal breaks, two participants (6.7%) reported not to have any other break during the working hours, three (10%) one 5-minute break, and the largest proportion (46.7%) one 10-minute break.

CHARACTERIZATION OF MOST RELEVANT LOW BACK PAIN EPISODE, REPERCUSSION AND FOLLOW UP

Concerning LBP clinical presentation, all NA scored pain intensity as >5 on a 0-10 numerical rating scale; 93.3% reported severe pain (scores ≥ 7) and 36.7% reported the

maximum possible score - 10. Twenty-six participants (86.7%) reported that pain radiated to the lower limb(s). Pain lasted from 2 to more than 90 days (more than 3 months for 6.7% of the participants) and caused functional limitations to 19 participants (63.3%) all of whom were effectively working at the time of the interviews.

Functional limitations led to sick leave (mean: 65.5, median: 23, minimum: 3, maximum: 480 days) and/or job restrictions (mean: 184.2, median: 110, minimum: 4, maximum: 780 days).

All the participants reported recurrent LBP episodes, more than half (53.3%) more than 6 episodes and more than a half (53.3%) reported usually suffering more than 6 episodes/year. LBP episodes accounted for 6 to 949 days off work (mean: 163.95, median: 87 days) for 11 participants.

On the occasion of the most relevant LBP episode, all the participants sought care from one or more specialists. About 16.7% of the sample was not evaluated at OHD and only 33.3% was evaluated in a Physical Medicine and Rehabilitation consultation. Twelve participants were seen at the neurosurgery department, 5 of whom underwent surgery and one was referred to the pain management department. Twenty-four participants (80%) were indicated at least one diagnostic test, radiographs in 43.3% of the cases. Of the 18 participants who were not assessed at the neurosurgery department, 8 were subjected to computed tomography and 5 to magnetic resonance imaging.

Almost all the participants (96.7%) received treatment for LBP, consisting in oral (86.7%), injectable (70%) and topical (56.7%) medications, physical therapy (36.7%), mesotherapy (10%) and acupuncture (3.3%). About 16.7% of the sample required surgery, and 82.8% of the participants who received some form of treatment reported partial (66.7%) or total (33.3%) relief of symptoms.

Table 1. Nursing assistants' allocation at the time of the most relevant work-related low back pain episode, Lisbon, 2018 (n=27).

Hospital department	Absolute frequency	Relative frequency
Support services	11	40.7
Inpatient	11	40.7
Surgery	3	11.1
Emergency	2	7.4

At the time of the interviews, 13 participants (43.3%) had restrictions for tasks involving heavy loads, and 15 had been reallocated to jobs with less physical demands. Nevertheless, 24 participants (80%) reported current pain.

Table 2. Time spent in definite body postures along the working day, Lisbon, 2018 (n=27).

Posture	Absolute frequency	Relative frequency
Standing		
Not applicable	1	3.3
26-50%	3	10.0
51-75%	1	3.3
76-100%	25	83.3
Sitting		
Not applicable	19	63.3
0-25%	6	20.0
26-50%	3	10.0
51-75%	1	3.3
76-100%	1	3.3
Walking		
Not applicable	1	3.3
0-25%	1	3.3
26-50%	1	3.3
76-100%	27	90.0
Trunk flexion		
Not applicable	2	6.7
0-25%	2	6.7
26-50%	1	3.3
51-75%	2	6.7
76-100%	23	76.7
Trunk rotation		
Not applicable	1	3.3
0-25%	3	10.0
26-50%	1	3.3
51-75%	2	6.7
76-100%	23	76.7

Table 3. Task repetition along the working day, Lisbon, 2018 (n=27).

Task	Absolute frequency	Relative frequency	Task	Absolute frequency	Relative frequency
Bedside hygiene and comfort			6-10 times/day	3	10.0
Not applicable	12	40.0	>10 times/day	4	13.3
1-2 times/day	3	10.0	Patient lifting without mechanical aid		
3-5 times/day	4	13.3	Not applicable	16	53.3
6-10 times/day	5	16.7	1-2 times/day	1	3.3
>10 times/day	6	20.0	3-5 times/day	2	6.7
Bathroom hygiene and comfort			6-10 times/day	3	10.0
Not applicable	16	53.3	>10 times/day	8	26.7
1-2 times/day	4	13.3	Patient lifting with mechanical aid		
3-5 times/day	5	16.7	Not applicable	26	86.7
6-10 times/day	3	10.0	1-2 times/day	2	6.7
>10 times/day	2	6.7	6-10 times/day	2	6.7
Patient positioning/moving in bed			Patient feeding		
Not applicable	12	40.0	Not applicable	16	53.3
1-2 times/day	1	3.3	1-2 times/day	1	3.3
3-5 times/day	4	13.3	3-5 times/day	1	3.3
6-10 times/day	2	6.7	6-10 times/day	1	3.3
>10 times/day	11	36.7	>10 times/day	11	36.7
Patient positioning/moving in chair			Lifting and carrying loads ≤12 kg		
Not applicable	17	56.7	Not applicable	6	20.0
1-2 times/day	2	6.7	1-2 times/day	9	30.0
3-5 times/day	2	6.7	3-5 times/day	5	16.7
6-10 times/day	4	13.3	6-10 times/day	2	6.7
>10 times/day	5	16.7	>10 times/day	8	26.7
Patient transfer			Lifting and carrying loads >12 kg		
Not applicable	10	33.3	Not applicable	7	23.3
1-2 times/day	1	3.3	1-2 times/day	8	26.7
3-5 times/day	2	6.7	3-5 times/day	4	13.3
6-10 times/day	4	13.3	6-10 times/day	3	10.0
>10 times/day	13	43.3	>10 times/day	8	26.7
Patient transport			Cleaning		
Not applicable	11	36.7	Not applicable	26	86.7
1-2 times/day	2	6.7	3-5 times/day	2	6.7
3-5 times/day	10	33.3	>10 times/day	2	6.7

For the asymptomatic participants, the average duration without pain was 216.17 days (median: 150, minimum: 7, maximum: 720 days).

OBJECTIVE EXAMINATION

On objective examination, asymmetry between the lower limbs was found among eight participants (26.7%) and scoliosis among 11 (36.7%; postural in nine cases and structural in two). Eighteen participants (60%) reported pain on palpation of the lumbar spinous processes (mean: 5.72 ± 2.08 , median: 5, minimum: 3, maximum: 10) and 14 (46.7%) on palpation of the lumbar paravertebral muscles (mean: 5.14 ± 2.28 , median: 5, minimum: 2, maximum: 10). Contracture of the lumbar paravertebral muscles was detected for 16 participants (53.3%). On Schober's test distance was <13 cm in one single case. No participant exhibited abnormalities on heel or toe walking. The Lasègue and Bragard signs were jointly present in 11 cases (36.7%); the mean range of motion on passive hip flexion with knee extension was $31.36 \pm 13.43^\circ$ (median: 30° , minimum: 10° , maximum: 60°) and $32.27 \pm 14.6^\circ$ (median: 30° , minimum: 10° , maximum: 30°) respectively. The participants who tested positive reported symptoms suggestive of lumbosacral pain.

SIGNIFICANT ASSOCIATION BETWEEN ONGOING LOW BACK PAIN AND OTHER VARIABLES

We found statistically significant association ($p < 0.05$) of ongoing LBP with the Lasègue and Bragard tests ($\chi^2 = 4.342$; $p = 0.037$), work incapacity ($\chi^2 = 5.735$ $p = 0.017$) and more than 6 episodes of LBP per year ($\chi^2 = 10.446$; $p = 0.015$).

DISCUSSION

The analyzed sample of hospital NA with LBP mainly comprised women, as also in other studies^{11,12}, older than 49. The current raising of the retiring age in Portugal and hiring restrictions are likely to increase the frequency of workers with LBP in the near future¹³.

The job profile of the participants is different to that of most NA, because about half of them had already been reallocated to jobs with less physical demands as a function of restrictions derived from their personal history of LBP.

In addition, 13 participants had restrictions for definite tasks, which situation reduced the odds of work-related aggravation of pain. Indeed, a large part of the participants worked in (non-clinical) support services or inpatient services with restrictions determined by the OHD to minimize the physical demands. Nevertheless, the participants still reported pain, which leads one to infer that not even the best preventive or medical-administrative interventions are always able to eliminate and/or control the occurrence of symptoms.

Professional or home activities performed in addition to the hospital job are sources of additional physical exhaustion, which fact should not be passed over when evaluating workers with LBP¹². Most of the female participants reported to perform household chores daily, which might represent an aggravating factor¹².

Some individual health and lifestyle aspects stand out as aggravating factors^{12,14,15}. In the present study we identified overweight/obesity and depression in 80% of the participants with ongoing LBP, which might behave as aggravating factors or contribute to make this condition chronic. This rate is similar to that reported by Aquino et al. for a sample of 400 NA in a hospital in Brazil (overweight: 58%, anxiety/depression: 36.7%)¹¹.

Almost all the participants associated LBP episodes with work, mostly in a context of sudden installation. Job tasks might have been determinant for acute LBP episodes for about half of the sample. The jobs at the hospital departments to which these workers were allocated are characterized by high physical demands as a function of the high degree of physical dependence of patients or for involving handling heavy loads⁸.

When long sustained, the body postures most frequently reported by the participants and repetitive tasks are considered occupational risk factors for LBP, especially when associated with physical effort^{15,16}. According to Serranheira et al., some tasks, such as those related to patient bed hygiene and comfort (OR 2.484), patient moving in bed (OR=2.022) and patient feeding (OR=2.186) are associated ($p < 0.05$) with higher risk of low back musculoskeletal complaints when performed more than 10 times per day¹⁷.

The tasks rated as the hardest, and also associated with occurrence of acute LBP episodes, involved handling loads, to wit, patient positioning in bed, bathroom hygiene and patient

transfer. These tasks are frequently associated with risk of LBP among health care workers⁵. Also not using mechanical aids — due to unavailability or to save time — was found to be a risk factor for LBP ($p=0.004$)¹⁶.

In regard to organizational factors, scheduled breaks lacked for most participants. There is scientific evidence for the need of breaks (in addition to meal breaks) during the working day as a function of the physical demands of the job. Such additional breaks help prevent or reduce symptoms and musculoskeletal disorders, thus they contribute to safeguard the health of workers in the long term and decrease the frequency of work accidents (proportionally to the total duration of breaks)^{18,19}.

The main results of the brief objective physical examination were: lower limb asymmetry in eight participants, two of whom also exhibited structural scoliosis — both conditions are associated with LBP, and the former can be corrected; pain on lower back palpation among two-thirds of the participants, being moderate to severe in 75% of the cases; and the Lasègue sign in 36.7% of the participants — which has high sensitivity (0.8 to 0.97) but low specificity (0.4) to identify disc herniation^{15,20}. The Lasègue and Bragard signs were associated with LBP at the time of examination, probably due to an underlying structural lesion that caused incapacity and recurring pain, which were also significantly associated with LBP at the time of physical examination.

The measurable consequence of LBP for the analyzed sample was having to miss working days, which is indicative of the harms of LBP for organizations.

CONCLUSIONS

Occupational LBP, i.e. perceived by workers as related to the job demands, was described as the most relevant LBP episode by most participants (90%).

The tasks reported as the hardest were related to patient transfer (26.7%) and lifting/carrying loads > 12 kg, which were also associated by most participants to their most relevant LBP episode. These findings reinforce the relevance of efforts to prevent LBP through the use of adequate mechanical aids, with the necessary physical adjustment of the work environment. Designing protocols for tasks related to patient lifting, moving and transport, including reorganization of staffs (eventually through algorithms based on patient dependence levels) may contribute to reduce the risk of LBP, its impact on health and absenteeism. Also relevant are initiatives to raise the awareness of workers on the prevention of work-related diseases and work accidents and healthy lifestyles, and increase their knowledge about health promotion particularly in regard to the workplace.

To summarize, while NAs' tasks are not irrelevant as concerns LBP and its possible chronic progression, occupational medicine interventions and the most adequate treatments should be always considered for acute episodes of LBP.

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