Looking into the Factors Affecting Low Back Pain Incidents in General Hospital Nurses: a Questionnaire Research.

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Abstract

Background: Literature review has focused on occupational health issues associated with musculoskeletal system. Nursing personnel, a group with serious incidents of low back pain (LBP) and injuries, have attracted researchers' attention.

The objectives of this research are to explore factors affecting the onset of LBP incidents in nursing personnel (NP), aiming at suggesting prevention and coping techniques.

Design/Methods: Dutch Musculoskeletal Questionnaire (DMQ) was distributed to NP of a general hospital (85F, 15M) and it was filled anonymously. NP on long term sick leave and pregnancy/maternity leave were excluded.

Results: Our NP have mean age 38.39(±5.9) years and Body Mass Index 25.11(20.44-37.97) kg/m^2. Forty six and forty nine percent of NP carry more than once a day >5Kg and >20Kg, respectively. Ninety percent of NP experienced low back pain last year, grading its intensity with 4.89. NP experiences LBP after carrying weight (53.8%) and classifies it as sharp, sudden localised pain (43%). Half of the NP prefers taking painkillers.

Conclusion: Implementation of patient handling regulations, team lifting when required and training nurses, in both schools and workplaces, on handling weights and on using mechanical aids in everyday work, is essential. However, when the problem is established visiting specialised doctors and physiotherapists is prerequisite, combining a special exercise program.

Key words: hospital, nurse, lift load, low back pain, move load

Introduction

During the past decades, there has been increasing interest in occupational health issues relating to musculoskeletal system. One of these is low back pain (LBP), a phenomenon with particular high prevalence (Cooper et al, 1996, Yip, 2001). To identify critical basic risk factors or to distinguish between causative and prognostic ones, multicenter cohort studies are required (Feyer et al, 2000)!

LBP is a social problem due to the negative impact in daily/professional life, cost and mental/physical health (Jansen et al, 2001, Hoogendoorn et al, 2002, Smedley et al, 2003, Eriksen et al, 2004, Underwood, 2004). Researchers report that 65-80% of general population will have at least one LBP incident during adulthood (Maul et al, 2003).

Nurses, as professionals, have serious incidents of occupational LBP and traumas in the lumbar area, as their profession is unique with heavy emotional and physical work, and are exposed to a combination of mechanical and psychosocial stress at work (Ando et al, 2000, Smith et al, 2003b, Smith & Leggat 2004a, Smith et al, 2004b, Eriksen et al, 2004, Engkvist, 2006).

Working positions often are uncomfortable due either to lack of space or movement restriction caused by special circumstances, such as in dialysis unit, operating theatre, intensive care unit. It has been found that nurses have to walk and stand up during their shift more than warehouse workers (Lagestrom et al, 1998) a lot of times more than 6 hours a day (Vasiliadou et al, 1995, de Bono et al, 2001).

Aim

The present paper aims to study the prevalence of LBP in a General Hospital Nursing Personnel (NP) and enquire into a range of potential causative factors. Furthermore it aims at offering solutions to minimise and prevent the risks, and to cope with the problem.

Methods

Sample
Nursing personnel of a general hospital (n=135) was investigated. Nurses on long leave of absence due to pregnancy, maternity, accident or disease were excluded.

Research Tool
Dutch Musculoskeletal Questionnaire was used (Hildebrandt et al, 2001) designed to self-report, anonymously, possible physical, personal and psychological factors affecting the onset of LBP that are job related. It consists of questions on demographics (age, sex, body weight and height, marital status, number of children, smoking, consumption of alcohol), general employment questions (department, shifts, tasks, years in position, lifts of patient/equipment, standing/seating positions, repetitive movements), general questions on daily life (daily habits, driving to work, walking, exercise, sports) and questions regarding possible LBP problems (location/duration/intensity of pain, means of relieving it, leave of absence). The questionnaire, distributed in different envelope for each ward/clinic, was answered in the working environment, having received a verbal consent, and was collected three days later.

Statistical analysis
Statistical analysis was performed using descriptive statistics (mean, median) to describe the general characteristics of the nursing personnel and their LBP. Further on logistic regression models were used to estimate the association between LBP and various variables that were considered as scientifically relevant (work related factors, age, gender, familial characteristics, leisure time activities, smoking, daily consumption of cigarettes, health complains).

Results

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Discussion

When studying the above results, one can see that nurses in the particular hospital are in their late thirties (mean=38.39 years old) and with more than ten years of working experience (78%). Having in mind, that nursing profession causes great physical/mental stress, as it is necessary a close contact with people in need, and that 90% of the sample had low back pain incidents during the previous year, it is obvious that nursing personnel should be enriched with new nurses. Worldwide a lot of research studies have focused on the relationship between LBP and working department. It has been found that working in intensive care unit, operating room, orthopaedics, geriatrics and medical ward increases the risk of LBP incidents (Yip, 2001, Smith et al, 2003a). However, in our research there was no statistically significant difference between working department and LBP incidents, maybe because the sample from those wards was limited. Ando et al (2000) and Karahan & Bayraktar (2004) came to the same conclusion.

Sixty four percent of nurses are working in shifts (morning, afternoon and night). In other studies it was found that having to work the night shift, is in correlation with LBP (Josephson et al, 1997, Eriksen et al, 2004). Night shift relates to less sleeping hours and bad quality of sleep. A hypothesis explaining this correlation is that sleep abnormalities increase muscle tension and this way increase pain perception in the lumbar area. Despite these, there was no statistically significance in our study.

Two out of five nurses remain seated <1 hour during their shift. Karahan & Bayraktar (2004) in Turkey reported that 58.9% of nursing personnel are standing more than six hours a day. Standing workstations increase back strain, and if this body part is already affected, it is get worse. The absence of significance, is probably due to the fact that nurses intermittently have a short break "for a smoke" (smokers have 7 cigarettes a day). By all means, those breaks rest lumbar area from constant strain but they aggravate other tracts of the human anatomy!

Other researchers implicate offspring as a personal factor affecting the onset of LBP (Feyer et al, 2000, Yip, 2001, Hoogendoorn et al, 2002). Probably because during pregnancy body weight increases and body posture changes aggravating the lumbar area. Furthermore, children, particular very young ones, need manual handling and cuddling, increasing the load in lumbar area.

It is a wonder that there was no significance between LBP and nurses' body characteristics (age, height, weight and BMI), despite the different findings of foreign researchers (Ozguler et al, 2000, Engkvist, 2006) and despite the fact that BMI is quite high and in the minimum of overweight range (25.11Kgr/m2). The relationship between BMI and load in the lumbar area is obvious: heavier subjects-higher L5-SI torques due to increased upper body weight (de Looze et al, 1998). Ozguler et al (2000) in France found that LBP prevalence increases as BMI increases. Smedley et al (2003) in two English hospitals found that LBP incidents were higher in nurses with BMI ?30Kg/m2. This is due to the fact that researchers focused on nursing personnel from specific wards, such as intensive care unit, operating room and orhtopaedics. In a previous study of Smedley & Cooper (1997), in Southampton, there was no significance found between body weight or BMI and LBP. Ando et al (2000) concluded in the same negative conclusion, during a study of nursing personnel in a University hospital in Japan.

In our study there was a positive correlation between LBP and lifting/carrying load up to 5Kg (for example a tray of surgical instruments, a dialysate container, two PD exchange bags or five bags for intravenous infusion). As one can imagine, during their shift nurses in a ward with 30 beds (mean beds in each ward in our hospital) will perform the above nursing activities more than once. According to the literature, carrying loads is the main factor affecting the onset of LBP (Ozguler et al, 2000, Yip, 2001, Eriksen et al, 2004). In a large university hospital in Athens, Greece, 25% of nurses reported that they lift loads ?15kg at least six times during their eight hour shift (Vasiliadou et al, 1995).

A lot of researchers believe that bad working postures (turning movements of the upper body, as well as repetitive and sudden movements) are responsible for back problems in nursing personnel (Ando et al, 2000, Yip, 2004). Our results are in order with that. On many occasions, nurses do not use their body mechanics. Bed care (turning, lifting and bed making), venepuncture for haemodialysis or nursing interventions in the operating room, usually are not performed with ergonomic criteria. When these daily duties are not performed correctly, it is most possible that LBP incidents will increase. In a study conducted by Lee & Chiou (1995) it was found that stress in the spine is greater when the bed is lower than iliacus ruga (approximately 90cm). The American National Institute for Occupational Safety and Health (NIOSH) has found that body postures during 17% of daily nursing interventions cause forces greater than allowed (Lee & Chiou, 1995). Direct nursing care is accompanied by static and awkward positions, with forward bending, kneeling and asymmetric load (patient) lifting.

Prevention and Coping with Low Back Pain

It has been a while, that global nursing community has recognised manual patient handling as a true occupational hazard. Several nursing associations across the world have taken initiative, often in cooperation with governments, to present guidelines concerning manual patient handling. United Kingdom and Australia are pioneers in this campaign and have published strict guidelines (Royal College of Nursing, 2002, Australian Nursing Federation, 2004). The main tendency of these guidelines is to eliminate manual handling in all situations, except in the life-threatening ones.

Each hospitals' policy on manual handling, guidelines on the body's biomechanical limits as well as proper patient

handling should be distributed and posted on the wall on every hospital ward (Yip, 2001, Brown, 2003, de Castro, 2004, Fergusson et al, 2005).

Team Lifting should be applied when the requirements of the tasks are beyond the lifting capacity of a single health professional or when mechanical assistance is not available or practical (Barrett & Dennis, 2005). The Team's ability to lift and move is greater than an individuals', and total load and effort is divided equally between its' members.

Exercise, on a regular basis, increases muscle and tissue strength, blood circulation, flexibility, muscle endurance and reduces stress (Blue, 1996). De Looze et al (1998) propose endurance programs for back, trunk and lumbar area muscles. According to Yip (2004) thirty minutes of exercise or modest physical activity more than 3 days a week can prevent LBP. Proper diet and rest/sleep, as well as exercise, can help a nurse fulfill his/hers duties (Lee & Chiou, 1995, McHugh & Schaller, 1997).

Nowadays, it is common to piece together different approaches in order to face LBP, as a lot of risk factors attribute to its onset. Proper body posture and body mechanics should be included in undergraduate nursing education, as well as in orientation education (McHugh & Schaller, 1997, Hui et al, 2001, Radovanovic & Alexander, 2004). Alexandre et al (2001) described an educational program consisting of general advice, specific ergonomic orientation, patient handling, self-exercise program (strength and flexibility exercises) and relaxation methods.

Ward and work organizing is the key element to minimize and prevent risk factors (Hellsing et al, 1993). Desk, chair, computer screen and keyboard should be designed in order to promote professionals health. Electric beds and dialysis chairs prevent LBP, as they reduce heavy body labor, patients lifting and moving and awkward body postures during nursing care. Cost can be a strain for the purchase of such equipment (Walls, 2001). Nevertheless, a cost-benefit analysis is necessary (McHugh & Schaller, 1997, Smedley & Cooper, 1997, Hildebrandt et al, 2001).

Mechanical aids (lifts, sliding boards, lifting belts) should be the main way of prevention, as it has been shown that the use of such devices reduce LBP incidents (Smedley & Cooper, 1997, de Looze et al, 1998, Hui et al, 2001, Brown, 2003, Hignett, 2003, de Castro 2004).

A very popular way of coping with LBP is visiting a specialized doctor (orthopaedic surgeon or neurologist). Forty one percent of Turkish nurses visited a doctor for managing LBP (Karahan & Bayraktar, 2004). More than one third of nurses in Yip's study (2001) were under medical advice.

Physiotherapy is personalized according to patients' special needs (Cooper et al, 1996). During the acute phase rest with periods of controlled movements, manipulation and traction are recommended. For strengthening the abdominal muscles, as stem stabilizers, as well as for increasing muscle endurance abdominal exercises are suggested, initially one minute duration going up to three minutes. For strengthening the lumbar muscles, as stem stabilizers, and for increasing muscle endurance rachidial exercises are recommended (Kisner & Colby, 1999).

Limitations

The current study found some of the factors affecting the onset of LBP incidents in nurses. Further studies, with more subjects are needed in order to generalise. In addition, a comparison between different hospitals would be of benefit.

Nonetheless, the present study will help to fill a void in this area. It is hoped that it will arouse interest on the theme in Greece.

Conclusion

The research team would like to emphasise that ergonomic planning of workplace environment cannot solve all problems, but it can improve daily nursing practice. A nurse, having undergone ergonomic training, can identify and solve possible problems in the workplace (patient or equipment transfer).

Finally, ergonomic designed working stations (beds, desks, chairs, dialysis chairs) can decrease repetitive movements and bad body postures as well as increase productivity while decreasing pain (an obstacle in delivering nursing care).

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Tables

Table I. Questionnaire return per ward.

Hospital Wards	Empty	Filled	n
Surgical	5	7	12
Operating Theatre	4	8	12
Nurse Managers	0	2	2
Haemodialysis Unit	1	17	18
Peritoneal Dialysis	1	6	7
Medical	3	11	14
Urology	1	11	12
Orthopaedics	6	7	13
Neurology	8	4	12
Renal	2	4	6
Coronary Unit	6	6	12
Intensive Care Unit	4	4	8
Cardiology	7	5	12
Infectious Disease Department	0	1	1
Emergency Unit	5	3	8
Anaesthetics	1	5	6

Table 2. Sample's characteristics

Body Weight	69.20 Kg	46-140 Kg
Body Height	1.66 m	150-192 m
Body Mass Index (BMI)	25.11 Kg/m2	20.44-37.97 Kg/m^2

Table 3. Load lift and move.

Movements	Positive answers
Lifting weight of 5kg >1 a day	39
Pushing weight of 5kg >1 a day	35
Moving weight of 5kg >1 a day	36
Lifting weight of 20kg >1 a day	25
Pushing weight of 20kg >1 a day	29
Moving weight of 20kg >1 a day	30

Table 4. Onset of low back pain (LBP) during last year.

LBP per hospital ward personnel	Yes	No
1. Urology ward	10	1
2. Nursing managers	2	0
3. Surgical Ward	6	1
4. Renal Ward	3	1
5. Peritoneal Dialysis Unit	6	1
6. Orthopaedics Ward	7	0
7. Operating Theatre	6	2
8. Neurology Ward	3	1
9. Infectious Diseases Department	0	1
10. Medical Ward	10	1
11. Intensive Care Unit	2	0
12. Haemodialysis Unit	16	1
13. Emergency Department	3	0
14. Coronary Unit	6	0
15. Cardiology Ward	6	0
16. Anaesthetics Department	4	0

Table 5. Low Back Pain (LBP) frequency.

Frequency	Positive answers
Once a day	6
Once a week	9
Once a year	5
Several times a week	13
Several times a month	19
Several times a year	19
After lifting or moving weights	44

Table 6. Type of pain.

Type of pain	Positive answers
Sharp, localized pain	43
Sharp, spread pain	20
Numbness of lumbar area	28
Numbness & burning of foot	29
Chronic pain	13

Table 7. Ways of coping with low back pain (LBP).

Coping mechanisms	Positive answers
I don't do anything	23
Painkillers	47
Rest	31
Back belt	11
Reduce movements at work	7
Reduce movements at home	26
Heat (locally)	20
Musculerelaxants	27
Exercise	7