

Article

Low back pain among healthcare workers in a surgical environment: a research protocol

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Abstract. *Background:* Nurses and surgeons are among the healthcare categories with the highest risk of developing low back pain (LBP). The aim of this study is to present the research protocol of a survey for assessing the presence of low back pain among healthcare workers of a surgical ward and its associated factors. *METHODS:* The survey will be conducted in the Orthopaedics ward of the teaching hospital "Policlinico Umberto I" in Rome, during the year 2018. The low-back pain will be measured using the Italian version of the Nordic Questionnaire musculoskeletal disorders. Socio-demographic and clinical data will be collected, such as: age, gender, height, weight, body mass index (BMI), type of work, years of work, working timetable. LBP intensity will be assessed with the Numerical Rating Scale. This is a one-dimension numerical scale with possible score from 0 (no pain) to 10 (the worst possible pain). The general health status will be assessed with the SF-12 questionnaire, for calculating the Mental and Physical component scales, MCS and PCS respectively. The physical activity will be assessed with the Italian version of the International Physical Activity Questionnaire. Moreover, work-related stress will be assessed using the Karasek-15 questionnaire.

Conclusion: This research protocol will be useful for assessing the prevalence of LBP and its associated factors. These informations will be used for planning primary and tertiary prevention.

Keywords: Low back pain; healthcare workers; surgical environment.

Background

In an ideal world, the carrying out of work, especially that which takes care of people, should not have consequences on the personal health of those who perform it.

In reality, as with other sedentary or dynamic work activities, this is not the case.

Scientific literature has showed that ergonomic risk to healthcare workers is potentially higher than in any other occupational group due to high physical work demands of healthcare work (1).

Among the health care categories with the highest risk of developing this kind of pathology there are nurse and surgeons related to particular or incorrect postures, exposure to heavy physical loads, muscular efforts, patient handling activities (2-7).

Many international surveys found that a high prevalence (between 80 and 90%) of surgeons has experienced at least an occupational symptom, and around 28% reported an occupational injury or chronic condition (8-11).

Most surgeons in the operating room are routinely subject to mental and physical stresses and suffer discomfort caused by musculoskeletal symptoms (physical fatigue, stiffness and pain) or disorders (MSDs) in different parts of the body during or after performing of surgery (Minimally invasive surgery (MIS) or open surgery) (12, 13, 14).

As it has been described by several studies there is a strong association between risk factors and discomfort and or injuries; most frequently these are static positions and extreme postures with high force exertion for long durations without breaks, inadequate recovery time between surgeries (1).

There are different surgical specialties involved in the surveys (i.e., general, pediatric, orthopedic, neurosurgery, urology, otorhinolaryngology, gynecology, plastics, thoracic, vascular surgery) and each one has its own ergonomic characteristics (incorrect position of the operating table height and the location of monitors, design of the handles of laparoscopic instruments). Evidence suggests that particular groups of surgeons may be at higher risk of occupational symptoms.

Previous works show that the most affected zones of the surgeons' body are, in descending order, the lower back, neck (with headaches), upper back, lower extremities (leg and foot), right shoulder, arms, right wrist and hand (1, 12).

Furthermore, surgeons may be affected by work-related disorders as swollen legs and feet and varicose veins, peripheral neuropathy at the arm and hand, a disorder called laparoscopists' thumb, rotator cuff overuse injuries, damage cervical joints and vertebral disk (10, 15-17).

The predominantly affected body area may change among surgical specialties because of different surgery types with each specialty (9, 18, 19).

Furthermore many surgeons report that pain, particularly low back pain (LBP), interfered their quality of life, mental and physical health, impacted sleep and relations with other people (4, 13, 20, 21).

These disturbances may eventually culminate in surgeon burnout. Most surgeons minimize these problems, consuming over-the-counter pain medications and using compression stockings, but some look for solutions for their conditions in areas such as training, fitness, massage, acupuncture or consulting specialists such as occupational physiotherapists, chiropractic and other.

The persistent discomfort causes temporary working disability with sickness leave and therefore threaten patient healthcare access (13, 14, 22, 23).

As ISTAT data shows, even in Italy, low back pain is one of the major causes of chronic disorder (24).

In the long term, the severe chronic injuries related to MSDs (predominantly low back, neck, shoulder) would influence the older surgeons' ability and efficiency when performing their work (21) or they could push them to choose to perform open surgeries rather than minimally invasive surgery (MIS) (6) or they could force the surgeons to reduce the number of procedures or early stopped surgical practicing (18, 25, 26).

Furthermore, there are also surgeons who receive surgery themselves due to the chronic injuries related to MSDs; for example in scientific literature it has been reported an increased risk of a herniated vertebral disk in gynecologists and plastic surgeons and carpal tunnel syndrome in orthopedists and neurosurgeons (27-29).

So, since there is a potential risk that symptoms will be increased in the future and currently the socioeconomic cost in terms of sickness absence and poor work ability caused by MSDs are substantial it is necessary to consider additional interventions and to design preventive strategies in order to reduce the injuries risk and improve provider health and patient safety (7, 13, 30-32).

Moscato et al. (13) suggest that it is important to promote by ergonomics experts new programs of prevention based on professional training and physical activity to provide benefit and to reduce the occurrence of LBP in these professional categories.

Due to the limited knowledge and poor ergonomic adaptation of operating rooms and surgical equipment there are few methods which may be used to mitigate these ergonomic risks.

The most commonly employed methods to try to alleviate pain during surgery are the changing positions and the elevating a foot on a step stool while operating to alleviate back pain (1).

However it would be more correct to know and adopt healthier ergonomic postures during surgical activities to prevent forced positions (2, 14).

Minimally invasive surgery has developed guidelines for monitor placement, table height, and arm positioning to improve intraoperative ergonomics (10, 11).

An alternative strategy to prevent or reduce the work-related musculoskeletal disorders may be achieved by increasing the workers physical capacity through physical training interventions.

The Hallback's et al. study show that muscle strength is revealed as a protective factor against physical fatigue and MSDs (21).

The Jakobsen's study has compared the effect of workplace-based versus home physical exercise on musculoskeletal pain among healthcare workers (33).

Although previous researchs indicate that is the individual responsibility for surgeons to maintain or enhance their muscle strength over the years and that the implementation of physical workplace interventions often showed low adherence (34), they hypothesize that supervised physical training with colleagues at the workplace is superior respect to home exercise in reducing pain symptoms and increasing adherence.

R. Voss et al study, after having analyzed factors significantly associated with occupational injury, evaluated the feasibility of intraoperative gel-based foot mat use to mitigate occupational symptoms in oncologic surgeons, by measured objectively surgeons' leg volumes with perometry, but it concluded that this use is associated with increased discomfort (10).

Previous studies have reported a subjective benefit with the use of antifatigue mats during endoscopic or laparoscopic surgery and an improvement in postoperative fatigue symptoms by surgical teams (10, 35-37).

Several studies have shown that the incorporation of intraoperative microbreaks into OR routine, as in other industries, with standardized exercises focused on the neck, back, shoulders, hands and lower extremities that could be performed in the sterile field, significantly reduce discomfort in surgeons with no change or improvement in their mental focus and physical performance, without distraction and without significantly increasing the duration of their surgeries or workflow interruption (21, 38-40).

Objective

The aim of this paper is to present a research protocol of a survey for assessing the presence of low back pain among healthcare workers of a surgical ward and its associated factors.

Methods

Setting and population

The survey will be conducted in the Orthopaedics ward of the teaching hospital "Policlinico Umberto I" in Rome, during the period March-May 2018.

The low-back pain will be measured using the Italian version of the Nordic Questionnaire musculoskeletal disorders (41).

Moreover, we will collect socio-demographic data and data concerning possible factors associated with LBP.

Inclusion criteria:

Healthcare workers of the Orthopedic clinics involved in surgical activities;

Individuals of both sexes.

Exclusion criteria:

Individuals participating in other studies;

Individuals with local or systemic infections.

Protocol for the assessment of LBP:

The presence of LBP will be assessed using the Italian version of the Nordic Questionnaire musculoskeletal disorders (41), and in particular the part concerning LBP.

Socio-demographic and clinical data will be collected, such as: age, gender, height, weight, body mass index (BMI), type of work, years of work, working timetable.

LBP intensity will be assessed with the Numerical Rating Scale. This is a one-dimension numerical scale with possible score from 0 (no pain) to 10 (the worst possible pain).

The general health status will be assessed with the SF-12 questionnaire, for calculating the Mental and Physical component scales, MCS and PCS respectively.

The physical activity will be assessed with the Italian version of the International Physical Activity Questionnaire. Moreover, work-related stress will be assessed using the Karasek-15 questionnaire. This research protocol will be useful for assessing the prevalence of LBP and its associated factors. These informations will be used for planning primary and tertiary prevention.

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