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Back Injuries among Nursing Personnel Related to Exposure

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This investigation was undertaken to examine the consistency of epidemiologic studies relating back pain among nursing personnel and exposure to frequent stressful patient handling. A comprehensive literature review resulted in the identification of six studies that included data on both patient handling frequency and back pain prevalence. Data from each study were extracted to provide comparable information for an exposure variable and a health outcome variable. Exposure was characterized as a two-category variable: less frequent and more frequent patient handling. The health outcome variable was prevalence of a back problem according to the definition used in the particular study. Despite differences in specific criteria for characterizing exposure and defining health outcome, all of the studies were consistent in finding larger prevalence rates among those nursing personnel who more frequently performed physically stressful patient handling. Overall, the prevalence rate of those who more frequently handled patients was about 3.7 times that of the nursing personnel who infrequently handled patients. The practical implication of these results is that industrial hygienists serving health-care employees may find it useful to characterize exposure in terms of patient handling frequency and use this information to determine which groups of nursing staff should receive priority for back injury prevention efforts. Several ideas are offered for expanding the back injury prevention programs of hospitals and nursing homes. Jensen, R.C.: *Back Injuries among Nursing Personnel Related to Exposure*. *Appl. Occup. Environ. Hyg.* 5:38-45; 1990.

Introduction

Occupational back injuries are a major problem in the United States and throughout the world.⁽¹⁻⁴⁾ The Bureau of Labor Statistics estimated that in the U.S. in 1979 there were 630,000 lost-workday back injuries.⁽⁵⁾ Another indicator of the magnitude of the back injury problem is the percentage of workers' compensation cases for injured backs. Back injury cases coded as sprains make up approximately 17 percent of all workers' compensation claims.⁽⁶⁾ Such figures explain why the National Institute for Occupational Safety and Health (NIOSH) includes work-related back disorders and other musculoskeletal injuries and illnesses among the ten leading occupational injury and illness problem areas.^(7,8)

Among the workers most adversely affected by back

problems are nursing aides (NAs) and to a lesser extent licensed practical nurses (LPNs) and registered nurses (RNs). Studies have documented that these nursing personnel, when compared to other occupational groups, have relatively high prevalence rates of back pain⁽⁹⁻¹⁵⁾ and high incidence rates of workers' compensation claims for back injuries.^(6,16) For example, NAs and LPNs ranked fifth and ninth, respectively, on a list of occupations with the largest annual incidence ratio (cases of workers' compensation claims for back sprains and strains per 1000 employees).⁽⁶⁾

Data such as these prompted the initiation of a NIOSH project to provide the research needed to reduce the incidence of work-related back injury among nursing personnel. As part of the NIOSH project, a review of literature was performed on risk factors for back problems among nurses.⁽¹⁷⁾ Some findings from this review should interest industrial hygienists with responsibilities for the health and safety of nursing personnel. In particular, those studies concerning job factors, as opposed to personal factors, should be of interest due to the opportunities for making changes in the work that could reduce the incidence of back injuries among the nursing staff.

The literature review found several studies concerned with the back problems of nursing personnel. It was surprising to find, however, that few studies approached the topic with the familiar industrial hygiene orientation of attempting to determine the relationship between a health outcome and an exposure level. While the concept is analogous to that used for airborne contaminants, the measurement aspects of the research have been a problem. Neither researchers nor practitioners have agreed on standard methodologies for measuring either health outcome or level of exposure to back-stressing tasks.

Health outcome measures used in epidemiologic studies of back pain lack uniformity.⁽¹⁸⁾ Some studies of nursing personnel are based on prevalence of back pain during a one-year period, while other studies use prevalence for different time periods. Other investigations are based on incidence of back injuries reported to the employer, incidence of clinic visits for back-related problems, or in-

cidence of workers' compensation claims for back injury.⁽¹⁸⁾

Exposure characterization has also been a problem. There is no well-accepted exposure scale, e.g., parts per million, for quantifying the exposure of nurses to back-stressing tasks. This particular difficulty is especially troublesome when attempting to characterize exposure to the most pervasive back-stressing task: patient handling. There are several different methods for quantifying single lifts;⁽¹⁹⁻²³⁾ however, these methods have limitations when applied to patient handling. First, they have been limited to lifts in the sagittal plane (and selected asymmetric positions that are inapplicable to patient handling). The applicability of these exposure characterization methods are further complicated by the fact that many patient-handling tasks consist of multiple elements. For example, moving a patient from a bed to a wheelchair includes pulling and pushing, followed by a motion similar to lifting, and another motion that involves both pulling and lowering. Second, patient-handling tasks tend to be very different from one patient to another and even with the same patient on different days. Finally, these methods do not provide a clear way to assess exposure to the multiple patient-handling tasks that occur throughout a workshift. Industrial hygienists appreciate the importance of measuring exposure to a hazardous chemical or physical agent for a full shift. Exposure criteria are commonly based on a time-weighted average exposure over 8 hours for a 40-hour workweek. With respect to the exposure of nursing personnel to stressful patient-handling tasks, there is no accepted methodology for calculating an exposure index similar to a time-weighted average. These difficulties with methods for characterizing exposure help to explain why so few epidemiologic studies have attempted to relate back injury rates to patient-handling exposure.

A few, recent epidemiologic studies used a novel and simple measure of exposure to biomechanically stressful patient-handling tasks—average frequency of these events per shift. The use of patient-handling frequency may be thought of as a global index of exposure to the biomechanically stressful, manual load-handling requirements of

different nursing jobs. The concept underlying the use of this exposure measure is that each stressful patient-handling event involves some risk of a back injury. If the patient behaves predictably and everything goes smoothly, the risk is minimal; however, if anything unusual happens, the risk increases sharply. Thus, the theory is that the more times stressful patient-handling tasks are performed, the more likely the patient handler will experience an extra-stressful incident that could strain a muscle, sprain a ligament, or damage a cartilage end plate in the lumbar spine.

This investigation was undertaken to determine if epidemiologic data are consistent with this theory. The specific purpose was to use previously completed studies to examine the relationship between back injuries among nursing personnel and the frequency of their exposure to biomechanically stressful, patient-handling tasks.

Methods

A comprehensive literature search was conducted and published as an annotated bibliography.⁽¹⁷⁾ The search identified and abstracted all studies published between 1967 and 1987 that contained original research on nursing personnel and back problems. From the studies in the bibliography, all those that examined the relationship between patient handling and back pain or injury were identified. Two other studies were located by personal contacts with researchers interested in these topics. All of the studies were further screened to identify those providing data 1) suitable for distinguishing between two groups of nursing personnel, one exposed to more frequent patient handling than the other and 2) sufficient to determine prevalence of back problems for each group. The six studies so identified were conducted by different research groups, each using somewhat different methods and different populations.

Results of the studies were analyzed together by expressing their data in terms of a period prevalence rate (PR), defined as the percentage of group members who experienced a back pain problem during a specified time period according to the particular source of data. Comparisons between the more frequent and less frequent patient-handling groups were made with two measures: 1) the difference in their respective PR values and 2) the ratio of the PR values of the more frequent to the less frequent group, i.e., the risk ratio.

The Studies

One investigation conducted in a West Virginia hospital was based on a study population of 253 NAs, 142 LPNs, and 20 attendants.⁽²⁴⁾ The facility's safety department records were used to determine which members of the study population had reported a back pain episode during the study period. These nursing personnel were classified into one of two exposure categories: infrequent or frequent patient lifting, based on estimates by the nursing supervisor most familiar with the specific job performed by the individual. Figure 1 is a bar chart showing the PR of both

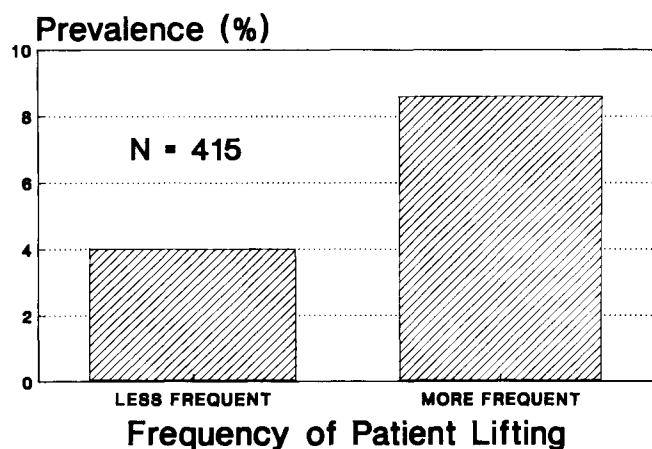


FIGURE 1. Prevalence of low-back injury experience related to patient lifting frequency at a health care center in West Virginia.⁽²⁴⁾

the less frequent and more frequent exposure groups. (Exposure is displayed on the horizontal axis and health outcome is shown on the vertical axis.) The PRs of the less

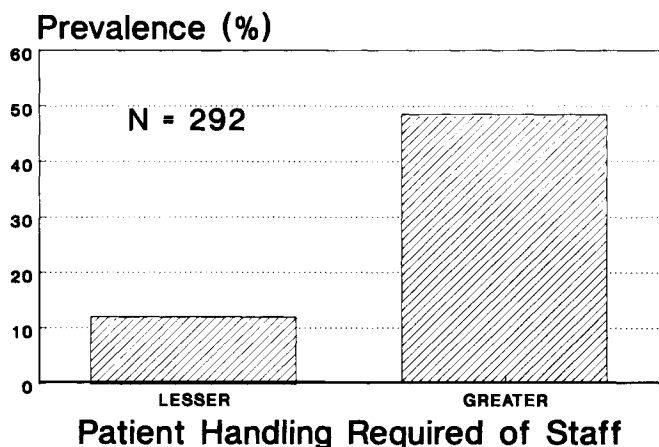


FIGURE 2. Prevalence of lost-workday back injury experience related to physical load imposed by patient handling at a mental hospital in Scotland.⁽²⁵⁾

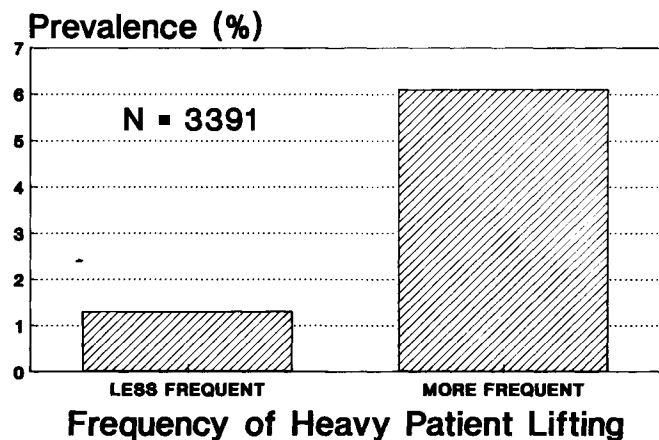


FIGURE 3. Prevalence of back injury, based on having filed a compensation claim, related to frequency of lifting heavy patients according to data from hospitals in Ontario.⁽²⁶⁾

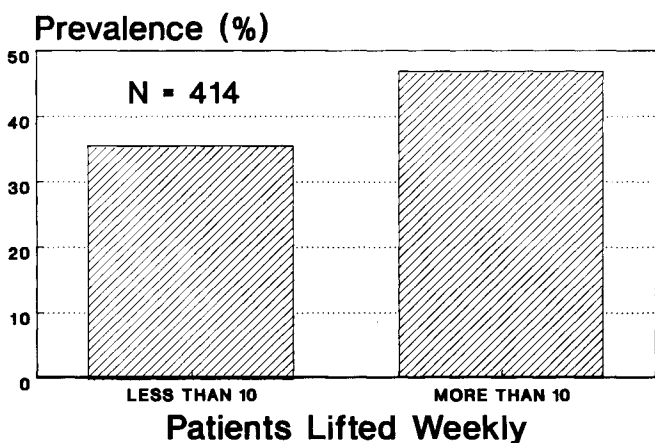


FIGURE 4. Prevalence of low-back pain experience related to patient lifting frequency at a large hospital in Minnesota.⁽²⁷⁾

frequent and more frequent patient-handling groups were 4.0 and 8.6 percent, respectively.

Another study was conducted in a mental hospital in Scotland.⁽²⁵⁾ This study included both nurses and nursing aides and was based on data for an 18-month period. Only work-related back pain episodes that resulted in absence from work were used to construct incidence and prevalence rates. The investigator utilized a classification scheme based on the patient-handling requirements on each of the 34 wards to dichotomize the nursing staff on the basis of physical load imposed on them from patient handling. The term "physical load" was not defined precisely in the report, but it was said to consider both frequency and intensity of patient handling. For purposes of the present assessment, these categories have been treated as equivalent to the less frequent and more frequent categories for patient handling. There were 16 and 18 wards identified as imposing high and low physical loading, respectively. Figure 2 shows the results. The 18-month PRs of the less and more frequent patient-handling groups were 12.5 and 48.6 percent, respectively.

Canadian data were obtained from a survey of nursing personnel employed in nine hospitals and one extended-care facility in Ontario.⁽²⁶⁾ Workers' compensation claims for back injury filed during a 12-month period were used to compute incidence and prevalence rates. One group of nursing personnel were classified as "heavy, frequent lifters" based on responses to a questionnaire concerning patient handling. These individuals reported that during each workday they lifted at least one patient weighing more than 10 kg or assisted with positioning or transferring of patients with weights over 25 kg. All other nursing personnel reported less patient handling. For purposes of comparison with the other studies, these two groupings were considered similar to the more frequent and less frequent patient-handling groups defined in the other studies. Through personal communication with the principal author, it was determined that the less frequent lifters had a PR of 1.31 percent (9 claims among 698 individuals). The PR of the more frequent lifters was 6.11 percent (155 of the 2693). Results are displayed in Figure 3.

A survey of the RNs who worked at a large hospital in Minnesota provided data similar to that of the other studies.⁽²⁷⁾ The questionnaire included information about whether the individual experienced low-back pain that lasted more than 48 hours at least once during the past 12 months. Respondents also indicated whether they lifted 0 to 10 patients per week or more than 10 patients per week. Results of a step-wise multivariate logistic regression analysis indicated that patient-lifting frequency was a significant factor in explaining which members of the survey sample experienced low-back pain. These two categories of patient-lifting frequency were also used for the analysis reported in this article. The PRs of the two groups are shown in Figure 4. The less frequent and more frequent patient-lifting groups had PRs of 36.4 and 47.2 percent, respectively.

An investigation in a New York hospital relied on data

from responses to a questionnaire that the hospital's safety department had enclosed in the employee's paycheck envelope.⁽²⁸⁾ Responses were received from 168 RNs and 32 NAs. Responses to the survey were used to assign individuals to either a more frequent or less frequent patient lifting group and classify each individual as either having experienced or not experienced an episode of low-back pain during a 12-month period. Figure 5 shows the results. The PRs of the less frequent and more frequent patient-lifting groups were 18.2 and 45.5 percent, respectively.

An Australian survey of nurses employed by one large hospital in New South Wales was reported by Arad and Ryan.⁽²⁹⁾ They classified respondents into five lifting categories (0, 1-5, 6-10, 11-20, and over 20 lifts per shift) and reported the one-month prevalence of low-back pain for each category. The respective prevalence values were 29, 33, 49, 55, and 54 percent. Figure 6 displays these values as a bar chart. Because this study reported the results using five lifting frequency categories instead of the two categories used by the other investigators, it was necessary to re-group these data for comparability to the other studies. This was accomplished by grouping the two lowest lifting frequency groups from the Australian study into a category called less frequent. The report for this study did not indicate how many nurses were in each of these exposure categories, so exact prevalence values could not be calculated. The average prevalence of the original two groups was used to estimate the prevalence of the new less frequent patient-handling group at 31 percent. Similarly, the two most frequent categories were combined to form a group called more frequent. The one-month prevalence value, 54.5 percent, was determined as the average prevalence of the original two groups. The middle frequency group was omitted in order to assure a clear difference in the exposure of the less and more frequent groups.

Results

The data are summarized in Table I. The first and second columns indicate the first author of the report and the state or country where the study was conducted. The sample size is shown in the third column; in the surveys, this figure is the number of respondents rather than the number originally surveyed. The PR values of the groups are listed in the fourth and fifth columns. The sixth column indicates that within each of the six study populations, the PR of the frequent lifting group was larger than that of the infrequent lifting group. If there were no actual difference in PR, the expected distribution of the differences would be binomial, with about half being positive and half being negative. A look at the data in Table I shows that all six differences were positive. Application of the paired-data sign test led to rejection of the null hypothesis of no difference in favor of the one-sided alternative that the more frequent lifters had a greater PR than the less frequent patient lifters ($p = 0.0156$). This threshold finding led to the subsequent analyses to estimate the magnitude of the effect of being exposed to frequent stressful patient-handling tasks. This effect may be referred to as "effect size."

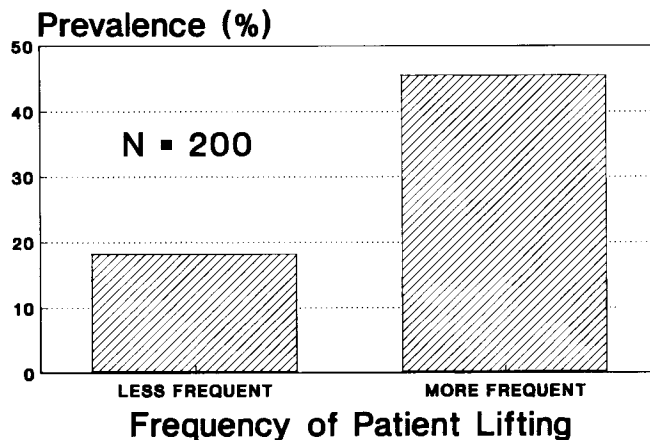


FIGURE 5. Prevalence of a low-back pain episode related to patient lifting frequency at a hospital in New York.⁽²⁸⁾

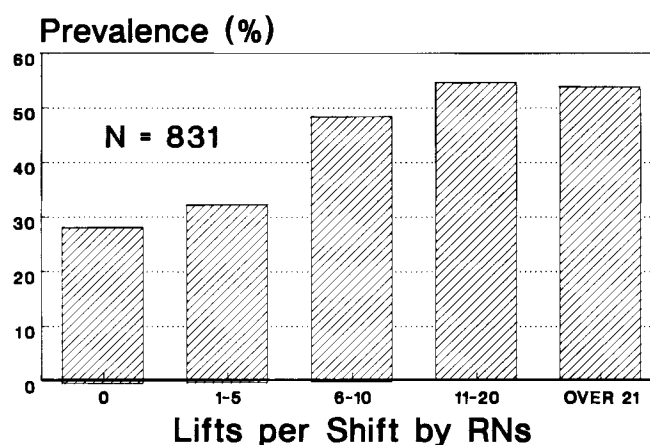


FIGURE 6. Prevalence of low-back pain related to lifting frequency at a hospital in Australia.⁽²⁹⁾

TABLE I. Prevalence Rate (PR) for Nursing Personnel in Six Different Studies

Author	Location	Study Population N	PR of Group		PR Difference	PR Ratio
			Exposure Frequency			
			Less	More		
Stobbe	W. Virginia ^A	415	4.0	8.6	4.6	2.15
Sharp	Scotland ^B	292	12.5	48.6	36.1	3.89
Venning	Ontario ^C	3391	1.3	6.1	4.8	4.70
Mandel	Minnesota ^D	414	36.4	47.2	10.8	1.30
Gross	New York ^E	200	18.2	45.5	27.3	2.50
Arad	Australia ^F	831	31.0	54.5	23.5	1.76

^ABased on low-back injury reported to employer during 1-year study period.

^BBased on back injury resulting in work absence during 18-month study period.

^CBased on back injury workers' compensation claim in 1-year study period.

^DBased on recollection of low-back pain lasting more than 48 hours during past year.

^EBased on recollection of having experienced low-back pain during past year.

^FBased on recollection of having experienced low-back pain during past month.

When the outcome measure is a proportion (or percentage), there are two appropriate measures of effect size.^(30,31) One is the difference in PR value shown in column six of Table I. Another is the ratio of the PR values

for the two study groups. The ratio values are listed in column seven of Table I. These ratios range from 1.30 to 4.70.

The average PR difference was multiplied by a weighting factor (the number in the study population divided by the total number in all six study populations). These products were summed to get the overall average. The resulting estimate of the difference in PR value was 10.5 percent. This same weighting procedure was applied to the PR ratio values. The resulting overall estimate was that the PR of the more frequent patient-handling employees averaged 3.69 times that of their corresponding group of less frequent patient handlers.

Discussion

The approach used here to synthesize findings of six studies drew heavily from a body of literature on a topic often referred to as "meta-analysis." Meta-analysis is a group of systematic procedures for synthesizing the results of numerous independent studies that made similar comparisons.⁽³⁰⁻³³⁾ These procedures are applicable even if each study used somewhat different measures or measurement techniques. In fact, it is considered stronger evidence of a true difference between groups if results of studies by multiple investigators using somewhat different criterion variables and different measurement techniques lead to similar conclusions.⁽³¹⁻³⁴⁾

Numerous statistical procedures are available to help with the synthesis of multiple studies. Much of the literature on these procedures has been devoted to finding more powerful significance tests to apply to data from multiple studies in which conclusions were inconsistent.⁽³¹⁻³⁵⁾ These often discussed meta-analysis statistical procedures were not applied in this investigation for two reasons. First, critical information about population size in the exposure categories was unavailable from the report on the Australian study.⁽²⁹⁾ Second, the paired data sign test used for analyzing this data set had sufficient power for detecting a difference in PR between the more frequent and the less frequent exposure groups.

Authorities on meta-analysis frequently express concern about the exclusion of studies because the reviewer/synthesizer does not believe the study measured up to his/her particular standards of quality.⁽³¹⁻³⁵⁾ This recommendation stems from studies demonstrating that when different reviewers evaluate the same set of studies, their opinions about the merits of the studies are not very consistent.⁽³³⁾ Thus, if the same set of studies were used for a meta-analysis by different reviewers, they might disregard different studies on the basis of their personal opinions about merit. If this was the practice, then meta-analysis procedures would not meet the scientific standard of repeatability.

Consequently, for the analysis reported here, all studies that provided data suitable for comparing frequency of performing stressful patient-handling tasks and period prevalence of back pain were included in the initial analysis. However, there is room for debating whether the New

York hospital study⁽²⁸⁾ should have been included in the analysis because of a very real possibility of bias. The primary concern is the possibility of differences between those employees who responded to the survey and those who did not. Other questionnaire surveys of nursing personnel have reported response rates in the 55-60 percent range^(10,12,36) and occasionally more.^(14,15) Response rates in the New York survey were 33 percent for RNs and 20 percent for NAs. The investigators made no attempt to obtain additional data to compare nonrespondents with respondents, so there is no evidence of either bias or lack of bias. Still, even without evidence of bias, an examination of available findings without the New York data may be useful. If the New York study would have been omitted, there would still be five studies available for meta-analysis. Each of these found the more frequent patient-handling group having the larger PR. The one-sided probability of this is 0.0313, a value generally considered sufficient for rejecting a null hypothesis. The weighted-average PR ratio of these five populations is 3.74 as contrasted to 3.69 for the six studies. Thus, the New York data could have been excluded from the statistical analysis without affecting the conclusions.

A major advantage of the collective analysis of multiple independent studies can be the light it sheds on the issue of external validity. Each of the studies included in this analysis was based on a nursing population within a single hospital or several hospitals in a geographic region. When analyzing each study separately, there is considerable uncertainty about the validity of the conclusions with respect to a broader population. When analyzed collectively, with the findings from different populations being consistent, the uncertainty about external validity is reduced considerably.

Additional confidence in the major conclusion can be found by looking at other sources of information. Numerous articles in the nursing journals and magazines indicate a belief that a major reason for the high prevalence and incidence rates of low-back pain among nursing personnel is their exposure to biomechanical stress developed during lifting and transferring patients. Prior to the six studies analyzed here, the limited information supporting this belief came from three sources: 1) biomechanical studies of selected patient-handling tasks;^(20,37) 2) epidemiologic studies in other industries such as manufacturing,^(21,38,39) mining,⁽⁴⁰⁾ and construction;^(41,42) and 3) reports by nursing personnel with a back problem on compensation forms or in response to surveys.⁽⁴³⁾ The data reported here provide a fourth source of information pointing to frequent performance of physically stressful patient-handling tasks as a factor apparently associated with increased probability of nursing personnel experiencing an episode of back pain. Just how much of the variation in back pain prevalence among nursing personnel is due to patient handling and how much is due to personal, psychosocial, and other task factors cannot be determined from these data or existing literature. Prospective epidemiologic studies will be needed to assess the relative contributions of patient han-

dling and other factors that may affect risk of developing back pain. However, before undertaking an expensive prospective study, a better method is needed for characterizing exposure.

For this investigation, a relative measure of exposure to patient handling was useful; however, this ordinal scale would not be sufficient to study specific aspects of patient handling. Recent attempts to develop and apply more specific task analysis techniques reflect the difficulty of fully quantifying the stressfulness of exposure to patient handling.^(12,37,44-49) Further efforts to develop practical techniques for making on-the-job assessments of the biomechanical stresses associated with nursing work should be encouraged. Such methods would complement the low-back evaluation methodologies NIOSH has been developing^(50,51) by making it possible to conduct epidemiologic studies with better measures of both exposure and corresponding low-back signs and symptoms.

Recommendations

From the findings of the six studies summarized here, the most direct implication is that efforts should be made to reduce the frequency of stressful patient handling. The specific suggestions that follow are offered as additions to the existing employee health and safety programs of health care facilities. Thus, it is assumed that the health care facility already has programs 1) to assure that all NAs, LPNs, and RNs have been trained in patient-handling procedures, 2) to provide prompt medical care for employees who sustain a back injury and encourage their participation in an appropriate rehabilitation program, and 3) to provide an opportunity for back-injured employees to return to a job that involves minimal stress on their backs until they have recovered sufficiently to return to their normal job.⁽⁵²⁾

A logical first step is identification of the nursing jobs involving the greatest frequency of stressful patient handling. These are the jobs that should receive the highest priority for attention. There are several ways to identify these jobs. Of the methods used in the six studies described here, no particular technique was clearly best. The questionnaire approach may appear most expedient, but it can result in such a poor response rate that results will be useless. As a generality based on the literature, surveys of nurses that arise out of the interest of nursing staff tend to result in better response rates. In contrast, surveys initiated by hospital management tend to receive poorer response rates. Thus, questionnaires might be appropriate for health care facilities in which the nursing staff has been active in expressing a desire to reduce their risk of back injury. For facilities lacking that level of enthusiasm, observational studies could be used. A less expensive alternative would be to interview nursing supervisors in a manner similar to that reported in the West Virginia survey.⁽²⁴⁾

After identifying the jobs with the greatest frequency of stressful patient handling, the specific patient-handling requirements of these jobs should be studied. The nursing personnel who perform these jobs can identify the specific patient-handling tasks that are most back-stressing.⁽⁵³⁾ These

tasks can then be examined to identify possibilities for elimination, substitution, or control.

To illustrate the elimination principle, suppose the staff indicates that getting a patient from a wheelchair onto a toilet seat is an especially stressful task. A possible improvement would be to consider the use of commercially available chairs designed to serve the dual purpose of both transporting a patient and positioning the patient over a toilet. Use of such equipment would make it unnecessary to transfer the patient from the wheelchair onto the toilet. It would also eliminate the transfer back to the wheelchair.

The substitution approach is often a viable possibility. For example, moving a heavy patient from a wheelchair onto a bed can be accomplished with a portable or ceiling-mounted patient hoist. Similarly, hoists can be affixed beside a bathtub to move a patient into and out of the tub. These are examples of substituting a mechanical device for the arm and back muscles of nursing personnel.

Ironic as it may seem at first impression, many nurses have a negative attitude about portable patient hoists. Some of the reasons were revealed in a survey of British nurses.⁽⁵⁴⁾ The surveys found that one reason why portable patient hoists were not used very often was that training in the proper procedures for using patient hoists was not often provided to nursing assistants, and many fully qualified nurses had only a brief introduction to the use of patient hoists.⁽⁵⁴⁾ In a comparative study of multiple wards in Finland, it was found that mechanical hoists were regularly used only on the ward that had well-organized, on-the-job training.⁽⁵⁵⁾ Another reason for nonuse was that portable hoists were often stored in closets located too far from the patient's room.⁽⁵⁴⁾ This practice meant that it took nurses much longer to perform a patient transfer with the hoist than to perform it manually. A third reason for nonuse of hoists was that the nurses believed that some patients would feel insecure in the hoist or that the patients' skin was too sensitive.⁽⁵⁴⁾ Most of the health care facilities did not have any guidelines to help nurses determine for which patients the use of a hoist would be useful or which type of sling would be appropriate for particular patients. A fourth reason was that maneuvering portable hoists was difficult or impossible in some areas due to different heights of adjacent floors and to the limited space available through doors, around toilets, between adjacent beds, and under some beds and bathtubs.⁽⁵⁴⁾ Additionally, the survey indicated that many nurses felt that certain types of slings put the patient in an unacceptably embarrassing position.⁽⁵⁴⁾

A problem occasionally encountered in hospitals is the admission of an extremely heavy patient. It is not uncommon to hear nurses talk about such situations. One nurse told of a man weighing over 273 kg (600 pounds) being admitted to a university teaching hospital; after admission, it was discovered that none of the portable hoists in the hospital had a sling with sufficient capacity for this patient. When several nurses joined forces to move him, three nurses suffered back injuries.

If neither elimination nor substitution provide practical alternatives, the third approach to consider is control of

the exposure level. There are numerous types of devices that can reduce the intensity of biomechanical stresses associated with patient transfers.⁽¹⁷⁾ Among these are sliding boards, patient roller boards, gait belts, and ambulation belts. The boards can help reduce the pushing and pulling forces required to transfer a patient from one surface to another. The belts can help the nurse establish a position with better leverage as well as provide a place to grip in case the patient suddenly starts to fall.

Some suggestions are offered to increase the use of patient-handling equipment. These suggestions are 1) to provide training on the use of the equipment to all employees who might have an occasion to use it; 2) to have equipment situated close to the areas where its use is appropriate so that nursing personnel do not have to spend much time getting it; 3) to encourage the nursing department to develop policies and practices that delineate as part of their patient-care plan a systematic evaluation of patient-handling requirements and a determination of the preferred patient-handling procedure, including the identification of appropriate equipment; and 4) to make sure that the facility has at least one portable patient hoist with maximum capacity for moving the occasional extremely heavy patient. It is also a good idea to occasionally visit the unit where new equipment has been supplied to identify any problems with its use.

In summary, six independent studies found greater prevalence of back injury among nursing personnel who more frequently perform stressful patient-handling tasks compared to those who less frequently perform such tasks. This finding suggests that back injury prevention efforts for nursing personnel ought to focus on those nursing jobs involving the greatest frequency of stressful patient handling. For these jobs, the most back-stressing tasks should be identified. These tasks can then be examined to identify possibilities for elimination, substitution, or control. The ideas offered here are directed toward the patient-handling aspects of a back injury program for nursing personnel only. Ideas for putting together a comprehensive back injury prevention and control program are described elsewhere.⁽⁵⁶⁾

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