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A Survey of Musculoskeletal Injuries Associated with Manual Patient Lifting in Occupational Therapy Practitioners in the State of Ohio

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Abstract: The purpose of this study was to investigate the incidence rate of musculoskeletal injury among occupational therapy practitioners within the state of Ohio due to patient handling. A questionnaire focusing on safe patient handling issues that entailed three sections: a job-factor section, an education section, and a symptom section was emailed to 1,113 occupational therapy practitioners in the state of Ohio. The overall response rate was 26%. A proportion of respondents indicated they had sustained a musculoskeletal injury while manually transferring a patient, missed days away from work in connection with sustaining an injury, and were required to perform manual transfers on a regular basis. The study demonstrated that this sample of occupational therapy practitioners is exposed to occupationally-based high risk situations regarding patient handling with moderate to high incidence rates for musculoskeletal injuries.
A Survey of Musculoskeletal Injuries Associated with Manual Patient Lifting in Occupational Therapy Practitioners in the State of Ohio

Healthcare professionals, by virtue of job demands requiring frequent patient handling procedures, are exposed to a relatively high level of work-related injury of the health care professions. Nursing has been identified as being consistently listed as one of the top 10 occupations for work related musculoskeletal disorders, with incident rates of 8.8 per 100 in hospital settings and 13.5 per 100 in nursing home settings (Bureau of Labor Statistics, U.S. Department of Labor, 2006). These findings for 2006 nonfatal occupational injuries and illnesses requiring days away from work included that nursing aides, orderlies, and attendants had 49,480 days away from work cases and a rate of 526 per 10,000 workers, which was more than four times the total for all occupations. Musculoskeletal disorders accounted for 30 percent of the injuries and illnesses with days away from work, the same percentage as in 2005 (Bureau of Labor Statistics, U.S. Department of Labor, 2006).

In an attempt to address injury from lifting static loads, the National Institute of Safety and Health (NIOSH) developed an equation to calculate the level of risk in given situations. It takes into account stressors such as horizontal and vertical reach locations, task asymmetry, frequency and duration of lifting, and hand-to-object pairing (Waters et al., 1993). Janet Haartz (1994) has reported that the equation was designed to help assist healthcare workers in evaluating lifting tasks and reducing the incidence of low back injuries in healthcare workers. It should be noted that the NIOSH lifting equation is just one method to prevent work-related musculoskeletal disorders directly due to the manual lifting of static objects. It is not directly suitable for calculating risk for lifting patients. Other risk factors for musculoskeletal disorders in the healthcare workplace can be described as applying excessive forces during pushing and/or
pulling of objects, required use of awkward postures during patient care, and working long
hours. These associate risks can deeply affect the increased volume needed to lift, turn, pull, and
position patients. This can result in fatigue, muscle strain, and injury. In a comparison with
lifting a box that has handles, lifting a patient is much more complex and difficult. A patient’s
mass is not evenly distributed and the mass is asymmetric, the patient can be bulky, and the
patient cannot be held close to the body (Blue, 1996; Viderman et al., 1984). Furthermore,
patient handling tasks are unpredictable; patients can be combative, experience muscle spasms,
or suddenly lose their balance. The amount of assistance a patient can offer at any point in time
will vary making the task somewhat different each time it is performed (Waters, Collins,
Galinsky, & Caruso, 2006).

Alongside with the nursing profession, there have been studies in the physical therapy
profession associated with musculoskeletal injuries. One particular survey (Cromie, Robertson,
& Best, 2000) queried 824 Australian physical therapists about whether they experienced any
musculoskeletal injury related to patient handling during the previous 12 months. The 488
respondents reported experiencing work-related musculoskeletal pain and discomfort at some
point in their working life. For 48% of these respondents, the most serious work-related problem
concerned their lower back. Additionally, the risk factors for the physical therapists’ daily tasks
involving manual orthopedic techniques were associated with increased risk of neck, shoulder,
elbow, wrist, and hand symptoms. Furthermore, in connection with performing a task frequently,
treating a large number of patients in one day, repeated bending and twisting of the back, and
continuing to work when injured were all reported as being large risk factors. Finally, the authors
concluded that one in six physical therapists changed their specialty area or left the physical
therapy profession because of work-related musculoskeletal problems.
In addition, Bork et al. (1996) examined the frequencies of musculoskeletal injuries among physical therapists during a 12-month period. The study included 928 respondents from 46 states, the District of Columbia, and 3 foreign countries. The study’s results indicated that the lower back, wrist and hands, upper back, and neck were the highest reported musculoskeletal injuries. In addition, low back pain accounted for the largest percentage of missed work days during the 12-month period.

This increasing problem of musculoskeletal injuries threatening healthcare professionals is widespread in nature and can be found overseas as well. In an attempt to curb this ever growing occupationally hazardous problem, the Royal College of Nursing (RCN) Safer Patient Handling Campaign (1996) in Britain was launched to highlight the need to avoid the manual lifting of patients in all but exceptional or life threatening situations. The RCN believed that nurses should be trained on how to use specialized equipment while practicing safe systems of work to help evaluate and remove manual handling situations by risk assessments. The Chief Executive of the Health and Safety Executive (HSE) Geoffrey Podger, stated that back pain will affect as many as four out of five people in Britain, and results in 4.5 million days off work a year (Barnes, 2007). It is estimated that 20,000 nurses suffer a back injury every year in the United Kingdom (RCN, 2004). The RCN and Royal College of Midwives have brought into awareness musculoskeletal injuries suffered by Britain’s healthcare members by bringing civil cases in opposition to employers for infringement on health and safety regulations relating to manual handling. Employers in the United Kingdom have a legal responsibility under the Manual Handling Operations Regulations (MHOR) (Health and Safety Executive, 1992) to manage and prevent the risk of back injury (RCN, 2001). The European Directors MHOR (Health and Safety Executives, 1992) defines manual handling operations as “Any transporting
or supporting of a load (including the lifting, putting down, pushing, pulling, carrying, or moving, thereof) by hand or of bodily force.” (p. 1144).

In an effort to establish laws in safe patient handling for the protection amongst its citizen healthcare workers, Texas became the first state in the US to require hospitals and nursing homes to implement safe patient handling and transferring programs. The legislation requires health care facilities to identify, assess, and develop methods of controlling the risk of injury to patients and nurses associated with lifting, transferring, repositioning, and movement of patients (Hudson, 2005). As this is one step closer in addressing musculoskeletal injuries among US healthcare workers, more is needed to be done in requiring safe patient handling laws in all US states. The US healthcare industry has fallen behind other countries, such as Australia and England, which are more advanced in their use of modern technology for patient lifting and with “no-lifting” policies prohibiting manual lifting (Hudson, 2005).

Audrey Nelson has spear-headed research and public awareness on this topic. Nelson has developed algorithms to standardize tasks for safe patient handling, while also helping to develop a “no lift” policy and ergonomic guidelines in association with the Occupational Safety and Health Administration (OSHA) (Nelson et al., 2004). Nelson and Baptiste reported that work-related musculoskeletal injuries associated with patient handling are often based on traditional teachings and personal experience rather than scientific evidence (Nelson & Baptiste, 2006). These traditional techniques involve instruction in proper body mechanics, training in safe lifting techniques, and the use of back belts. Beyond these traditional approaches, there is evidence that the use of assistive equipment as part of a safe patient handling program can significantly reduce the risk of musculoskeletal injuries for caregivers who have to handle and move patients (Stubbs et al., 1983; Garg & Owen, 1992). Assistive technology for patient handling and movement
includes ambulatory assist devices, sit-to-stand lifts, floor-based devices, and ceiling or track-mounted overhead full body lifts (Collins et al., 2006). There has been momentous agreement that patient-handling assistive devices are necessary for caregiver safety (Daynard et al., 2001; Garg et al., 1991; Smedley et al., 1995).

However, several barriers to the use of equipment have been identified. This includes the following: patient aversion of the equipment, unstable equipment, operational difficulty, inconvenient storage location, poor maintenance and cleaning of equipment, and time constraints. In addition, inadequate number of available lifts, inadequate training particularly with high employee turnover levels, space restrictions to control equipment, incompatible equipment purchased, and weight limitations for the devices are all seen as barriers to using moving and handling equipment (Bell, 1987; Owen & Garg, 1991; Darnyard et al., 2001; Newman & Callaghan, 1993).

In response to the risk factors associated with musculoskeletal injuries in the healthcare profession, as stated previously, the Occupational Safety and Health Administration (OSHA) has developed ergonomic guidelines for nursing home facilities. These guidelines recommend that manual lifting of residents should be minimized in all cases and eliminated where feasible. Additionally, employers should implement an effective ergonomics process that provides management support, involves employees, identifies problems, implements solutions, addresses reports of injuries, provides training, and evaluates ergonomics efforts (US Department of Labor, OSHA, 2003).

The nursing profession has experienced attrition with nurses leaving at a rate of 12-18% a year because of chronic back pain (Owen, 1989). In addition, 12% of nursing personnel consider a job transfer each year to decrease their risk of musculoskeletal injuries (Owen, 1989). This puts
the health care field at great risk of incurring large economic expenses every year. These economic expenses include indirect costs in relation to temporarily hires for replacement personnel, overtime expenses of an injured worker, and legal fees associated with worker compensation claims (Charney, Zimmerman, & Walara, 1991; US Department of Labor, OSHA, 2002).

In reviewing the occupational therapy literature, no reported peer-reviewed studies completed in relation to musculoskeletal injuries due to the manual lifting of patients were found. In the occupational therapy profession, occupational therapy practitioners’ perform many of the same manual patient lifting tasks as nurses and physical therapists. These manual patient lifting tasks are associated with transfer in/out of bed, reposition in bed or chair, transfer on/off toilet, transfer in/out of tub, dressing/undressing, and pushing a wheelchair. It can also be generalized that occupational therapy students as well as nursing students are usually taught traditional safe patient handling techniques, such as the applying of “proper” body mechanics as the primary strategy for patient transfers (Nelson, Fragala, & Menzel, 2003). In light of this, there is a need to conduct research within occupational therapy to determine the influence (if any) this problem has had upon the profession.

The American Occupational Therapy Association (AOTA) has reported on the attrition of occupational therapists. AOTA reported that of those who left the profession 49.3% desire to work in a different field, 32.2% plan to temporarily stop working, 33.9% plan to permanently stop working, and 6.8% cite “other.” The reasons cited by the occupational therapy respondents for working in a field other than occupational therapy were varied. About one-third cite occupational therapy specific issues, such as “burn out,” dissatisfaction with reimbursement practices, low pay scale, and inability to find work. The remaining two-thirds cited a variety of
reasons such as the need for more time flexibility due to parenting responsibilities, the general
desire to move in a new direction, health issues, and retirement from their occupational therapy
work to pursue other goals (Workforce Study, Final Report, 2006). However, the health related
issues did not go into detail about what these health issues were, and could quite possibly be
associated with musculoskeletal injuries.

Occupational therapy has been reported as one of fastest growing health care professions
with an expected increase of 23 percent between 2006 and 2016; which is much faster than the
As occupational therapy is vitally important to the healthcare team, it is only natural to assume,
since occupational therapist work in similar environments as nurses and physical therapists that
occupational therapists would be at risk for musculoskeletal injuries as well. Therefore this
study’s purpose is to investigate the incidence rate of musculoskeletal injury due to patient
handling, and any subsequent impact upon their jobs/careers associated with missed work,
change of jobs, and retiring early. It is therefore hypothesized respondents will indicate having
received musculoskeletal injuries secondary to patient handling activities. It also is hypothesized
that responses from occupational therapists will indicate that they are exposed to occupationally-
based high risk situations regarding patient handling. Lastly, it is hypothesized that respondents
will indicate that they have missed work days due to musculoskeletal injuries secondary to
patient handling situations.

Method

Participants

An invitation to participate in a questionnaire was emailed to 1,113 licensed practicing
occupational therapists and occupational therapy assistants in the state of Ohio who were
members of the Ohio Occupational Therapy Association (OOTA). An email list of practicing occupational therapists and occupational therapy assistants who were members of OOTA was obtained from OOTA’s membership directory; sixty-eight percent of the members had email addresses. All occupational therapists and occupational therapy assistants OOTA members who had valid email addresses were granted the opportunity to participate in the study. An exclusion criterion included occupational therapists and occupational therapy assistants who were currently not licensed in the state of Ohio and who were not members of OOTA.

Study Design

This study used a survey research design. Survey research was used to systematically gather information from participants by using a three part questionnaire.

Instruments

The questionnaire was internet-based and entailed three sections: a job-factor section, an education section, and a symptom section (see Appendix A). The job-factor section focused on the underlining problem areas concerning things at work that could contribute to job-related pain and injury. The education section asked the respondents’ opinion about the adequacy of their training and what they were taught/experience with manual transfers, gait belts, sliding boards, and mechanical lifts. The symptom section was comprised of the standardized Nordic-style questionnaire for work-related musculoskeletal disorders (WMD) which concentrated on musculoskeletal symptoms most often encountered in an occupational setting over a 12 month period (Kuorinka et al., 1987). Descatha et al. (2007) tested the validity of the Nordic-style questionnaire comparing the results using two French surveys on upper limb WMD’s with somewhat different designs; namely, the “Repetitive Task” and “Pays de la Loire” surveys with clinical examinations. The results indicated that Nordic-style questionnaires can be useful tools
for monitoring upper limb WMD’s. The questionnaire contained eighteen questions with the questions comprised of these three sections. The beginning of the questionnaire sought out general background information related to the respondent’s age, gender, highest occupational therapy degree obtained, how many years practicing, and what type of facility currently working at. Questions one through four were based on a 5-point Likert scale having the respondents mark a check to how much they “agree” or “disagree” with the statement. Questions 5, 14, and 18 asked the respondent to check “all that apply” from given choices. Questions six through thirteen asked the respondent to choose “yes” or “no” in response to that statement. Questions 15 and 16 were open-ended questions and involved a comment box. Question 17 involved checking columns of different body regions associated with ache, pain, and discomfort with the use of a schematic of a human to help identify location of discomfort.

**Procedures**

An electronic email that introduced this questionnaire was sent to 1,113 occupational therapists and occupational therapy assistants who were OOTA members obtained from the OOTA membership directory at the time of the emailing. The electronic email contained a cover letter that explained the purpose of the study with a brief overview of the questionnaire. The electronic email included in its text an active link to a computer server (owned and operated by Vovici corporation (2008); an online survey with whom The University of Toledo had a contract for providing online surveys that housed the questionnaire. The computer server recorded the participants’ responses. Once the respondent clicked the active URL link in the recruitment email, they did so with the assumption that they were acknowledging that they were informed and were providing their consent to participate. Even though there was a record of the respondents’ ISP address, no other identifying information was collected beyond what is asked in
the survey. A reminder electronic email was sent to all OOTA member occupational therapists and occupational therapy assistants approximately two weeks after the initial mailing in attempt to increase the response rate.

Results

The results of this questionnaire were divided into three sections based upon the respondents’ answers to the educational survey, job-factor survey, and symptoms survey.

Demographics

Out of the 1,113 emails that were sent, 285 surveys were returned with an overall response rate of 26%. Sixteen surveys were undelivered due to invalid email addresses with the total number of valid emails being 1,097. Of the 285 surveys that were returned, 88 (31.1%) respondents indicated they were Occupational Therapy Assistants with the remaining 195 (68.4%) indicating they were Occupational Therapists. Two respondents (0.7%) did not indicate their occupational therapy credential. The average age of the respondents was 44.15 years (SD=10.646, range=23-70). Two hundred fifty-nine (91.5%) respondents indicated that they were female and 24 (0.08%) respondents indicated they were male, with 2 respondents not reporting their gender. With 270 (94.7%) responses, the mean number of years respondents have been practicing in the field of occupational therapy was 15.31 years with a standard deviation of 9.8 years. The majority of respondents, 87 (30.5%) indicated that their primary setting of work was a long-term care/skilled nursing facility (see Table 1 and Figure 1).

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Insert Table 1 and Figure 1

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Educational Section

The first four statements in the Educational section were Likert-styled and they had a high level of reliability with a Cronbach’s Alpha score of .821. The first question in this section was “The “management” has kept up with the knowledge of trends in providing safe handling equipment.” Over half of the responses either “agreed” or “strongly agreed,” whereas only 15.2% responses either “disagreed” or “strongly disagreed.” The other 14.4% were undecided (see Table 2 and Figure 2). The second question in this section was “The health care staff that are involved with direct patient/client contact have kept up with the knowledge of trends in providing safe handling equipment.” Again, over half of the responses either “agreed” or “strongly agreed,” whereas only 17.0% responses either “disagreed” or “strongly disagreed.” The other 10.5% were undecided (see Table 2 and Figure 3). The responses to the question of “I feel I am adequately trained on how to use safe patient handling equipment” were also similar. Specifically, over half of the responses either “agreed” or “strongly agreed,” whereas only 7.5% responses either “disagreed” or “strongly disagreed.” The other 8.8% were undecided (see Table 2 Figure 4). The final Likert-styled statement was “I feel the topic of safe patient handling is an important issue within occupational therapy.” Over half of the responses either “agreed” or “strongly agreed,” whereas only 3.2% responses either “disagreed” or “strongly disagreed.” The other 2.5% were undecided (see Table 2 and Figure 5).

For the question “Where did you receive training on how to use safe patient handling equipment?” The majority of respondents (i.e., 83.8%) indicated they have received on the job training. The rest of the respondents indicated that they received training from either occupational therapy school or occupational therapy assistant school (i.e., 45.9%), received training from conferences/workshops (i.e., 27.4%), received training from a durable medical
equipment vendor (i.e., 22.4%), and finally, 4.2% responded “other.” The “other” responses that were offered included: publications, reading, US Army, research, vertical evacuation practices, and not receiving any training on safe handling equipment (see Table 3 and Figure 6).

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Insert Table 2-3 and Figures 2-6

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Job-Factor Section

One of the questions (i.e., “Are patients randomly transferred from one surface to another in your facility”) in this section was worded incorrectly and was deleted from the analysis. The first hypothesis which was, “There will be respondents who indicate having received musculoskeletal injuries secondary to patient handling activities” was supported in that, there were respondents who answered "Yes" to the following questions, "Have you sustained an injury while manually transferring a patient within the past five years,” and "Have you sustained an injury while manually transferring a patient within the past year?" Please refer to Table 4. Specifically the "Yes" responses accounting for 18.9% from the first question and 5.3% from the second question (see Table 4).

Similarly, the second hypothesis was supported in that there were respondents who indicated that they are exposed to occupationally-based high risk situations regarding patient handling. Specifically, 63.5% of the respondents indicated "Yes" to the question, "Are you required to perform manual transfers on a regular basis (see Table 4). The third hypothesis was also supported in that there were respondents who indicated they have missed work days due to musculoskeletal injuries secondary to patient handling situations. Specifically, to the question,
"Would you say you have missed days away from work in connection with sustaining an injury while manually transferring a patient?" 8.4% indicated “Yes” (see Table 4). Interestingly, 11.2% of the respondents considered leaving the profession or retiring early in relation to acquiring a musculoskeletal injury from manually lifting a patient (see Table 4). Overall, 228 (80%) of the respondents reported that occupational therapist are required to perform manual transfers at their facility (see Table 4).

Sixty-four percent of the respondents (n= 184) indicated that occupational therapists are involved in providing in-service training to facility employees regarding safe patient handling techniques (see Table 4). In regard to what “safe patient strategies” were in place at the facility, the majority of respondents indicated that their facility had gait belts (77.9%), and only about half (50.2%) indicated that they had floor-based sling lifts at their facility. The lowest percentages that were reported were no lift policy (5.6%), limited lift policy (16.5%), lift teams (30.5%), sliding belt (8.8%), and ceiling lifts (14.4%) (see Table 5 and Figure 7). In addition, a large proportion of respondents (77.2%) provided examples of the “safe patient handling strategies” at their facility. Common responses included transfer sliding boards, Hoyer lifts, stand lifts, and co-treating.

Symptom Section

Respondents reported the greatest ache, pain, and discomfort as a result of patient handling in the low back (31.9%). The other higher reported regions were the shoulder (n= 36),
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neck (10.2%), wrists/hands (7.0%), and upper back (6.7%). The lower reported regions were the head (1.4%), elbows (2.1%), buttocks (2.1%), hips/thighs (2.5%), and knees (3.9%) (see Table 6 and Figure 8). With 42.8% of responses, the largest reported time period of experiencing discomfort as a result of patient handling was 0-3 months (31.2%). In comparison, 5 or more years was the second largest reported time range of discomfort by the respondents at 3.5% (see Table 7 and Figure 9).

Discussion

While nurses have one of the highest incidences of musculoskeletal work related back injuries of most professions, this study focused on assessing musculoskeletal injuries within the occupational therapy profession. The underlying purpose of this study was to investigate the incidence rate of musculoskeletal injuries in occupational therapists and occupational therapy assistants due to patient handling with missed work, change of jobs, and retiring early. Our findings suggest that occupational therapy is a moderate to high-risk profession for work-related musculoskeletal injuries. The study’s results are relatively similar the injury rate for the nursing profession that has been reported by the BLS. Therefore, safe patient handling issues are a significant issue for the profession of occupational therapy as well, if one can generalize from this Ohio-based survey to the profession of occupational therapy throughout the whole country.

It was hypothesized that respondents would indicate having received musculoskeletal injuries secondary to patient handling activities. The study’s results indicated that 18.9% of
respondents sustained a musculoskeletal injury within the past five years, and 5.3% of respondents reporting that they have sustained an injury while manually transferring a patient within the past year. According to the BLS statistics, 8.8% per 100 of nurses in hospital settings and 13.5% per 100 of nurses in nursing homes acquired a work-related musculoskeletal injury per year (Bureau of Labor Statistics, U.S. Department of Labor, 2006). Our figure of 5.3% per year is lower than what has been reported by the BLS for the nursing profession, but our figure of 18.9% within the past five years is fairly high. While the BLS reports an annual injury rate of 8.8%, 5.3% of this study’s respondents indicated receiving an injury within the past year illustrates that occupational therapist and occupational therapy assistants are likely to be exposed to high risk situations for musculoskeletal injury at some point in their career due to the manual handling of patients. Furthermore, 5.3% may not portray the full picture of acquiring a musculoskeletal injury reported by the respondents and could have been quite higher of a percentage due to several reasons. The first being that the type of facility did not require frequent manual transfers of patients, indicating that there would be a less of a chance of acquiring an injury while manually transferring a patient. The second being if the work setting did not require the manual transfer of patients at all. Whereas the nurses and nurses aids referred to in the BLS report worked in hospitals and nursing residential care facilities which are settings that involve manual handling of patients regularly on a daily basis, the occupational therapists and occupational therapy assistants in this study worked in settings in addition to hospitals and residential care facilities. Indeed, an \textit{a posteriori} analysis of only those participants in facilities where patients/clients are manually transferred on a regular basis was performed. Respondents in these facilities indicated higher frequencies of injury. Specifically, 20.9% indicated being injured within the past 5 years and 9.9% indicated being injured within the past one year due to manual
handling. This latter figure is actually higher than the BLS annual injury rate for nurses (Bureau of Labor Statistics, U.S. Department of Labor, 2006).

Furthermore, the state of Ohio currently is one of only eight states which has legislation pertaining to safe patient handling. It is unknown if the respondents were aware of the recently passed safe-patient handling legislation. Therefore, it is difficult to generalize these particular responses to occupational therapists and occupational therapy assistants who are not members of OOTA and those in the profession outside of the state of Ohio. Further research needs to be conducted in settings where manual transfers are frequently preformed and with comparing states that have passed safe patient handling legislation compared to states that have not yet passed any legislation regarding safe patient handling.

It was hypothesized that respondents would report that they have missed work days due to musculoskeletal injuries secondary to patient handling situations. The study’s results showed that only 8.4% of respondents indicated that they have missed work days in connection with sustaining a musculoskeletal injury while manually transferring a patient. This could be due to the fact that there was such a low percentage of respondents’ reporting that they have acquired a musculoskeletal injury in the first place. This could also be in relation to the fact that health care workers often under report having sustained an injury (Collins et al., 2004). McGuire and Dewar (1995) conducted a national survey that randomly selected 4,918 nurses, and one area examined the reporting of injuries. Thirty-three percent of respondents had reported an injury related to patient handling but only 52% of the respondents with an injury had actually reported it. A few reasons for under reporting have been addressed in the literature. Some of the reasons that were reported were as follows: unaware of injury until after the event, confusion over whether going home with a dull ache is considered an injury, fear of dismissal, socialization of health care
workers to focus on patient care and deny their own needs/safety, peer pressure not to take time off for an injury, and perceived lack of support from occupational health providers who may be dismissive of reports of back pain since the medical evaluation is subjective and there are not clear diagnostic tests (Collins, 1990; Retsas & Pinikahana, 2000).

It was hypothesized that respondents would indicate that they are exposed to occupationally-based high risk situations regarding patient handling. Our results showed that over half of the respondents (63.5%) reported that they are required to perform manual transfers on a regular basis and with even higher percentage (i.e., 80%) that they are required to perform manual transfers at their facility. Bettencourt (1990) identified two causes of musculoskeletal injuries among occupational therapist. The causes related to patient handling of manual transfers and performing faulty body mechanics with maintaining prolonged and static postures or positions. More surprisingly, 11.2% of the respondents considered leaving the profession or retiring early in relation to developing a musculoskeletal injury from manually transferring a patient. Cromie, Robertson, and Best (2000) surveyed 824 physical therapists with results posting that 17.7% left the physical therapy profession or changed their specialty area because of musculoskeletal injuries. While, our study’s result of 11.2% is not as large as what Cromie, Robertson, and Best (2000) reported, it still represents a sizable portion of the sample who thought of leaving the occupational therapy profession or retiring early. This would indicate that a substantial amount of occupational therapist and occupational therapy assistants thought about leaving the occupational therapy profession due to acquiring musculoskeletal injuries from manually transferring patients. Is unknown from our study the percentage of occupational therapists and occupational therapy assistants who actually left the profession or retired early in relation to acquiring a musculoskeletal injury. Further research is needed to better understand
how many occupational therapists and occupational therapy assistants left the profession, retired early, or change their specialty area because of musculoskeletal injuries associated from manual transfers of patients.

The highest reported ache, pain, and discomfort respondents indicated was in the lower back region at 39%, which is similar to the findings of Bork et al. (1996) at 45% and Cromie, Robertson, and Best (2000) at 62.5%. This current study’s results also matched Bork et al. (1996) and Cromie, Robertson, and Best (2000) results with the other higher reported regions of musculoskeletal injuries located in the neck (24.7%), wrist/hands (29.6%), and upper back (28.7%).

The results of this study showed that the majority of respondents felt that the health care staff at their facilities has kept up with the knowledge and trends in providing safe patient handling equipment. The respondents also feel that they are adequately trained on how to use the safe patient handling equipment at their facilities. This may be due to the fact that occupational therapy profession is poised to take a leadership role when it comes to safe patient handling. Part of an occupational therapists training requires instruction in body mechanics and ergonomics. The study’s results indicated that 64% are involved in providing the in-service training to facility employees regarding safe patient handling techniques. However, this could be somewhat biased in that Bork et al. (1996) and West and Gardner (2001) found that well-trained healthcare workers with specialist knowledge of injury prevention continue to be injured during the course of their work, particularly in the first few years of practice. This suggests a gap between knowledge of ‘safe’ practice and its application in the workplace.

Respondents reported the highest percentage at 77.9% of the use of gait belts as to what “safe patient strategies” are in place at their facilities. There is no scientific evidence reported on
the effectiveness of the use of gait belts, unlike the use of patient handling equipment and
devices as part of a safe patient handling program (Nelson, Frangala, & Menzel, 2003).
Furthermore, respondents reported the lowest percentages at 5.6% of having a no lift policy and
16.5% of having a limited lift policy as part of their “safe patient strategies.” The study showed
that Ohio’s healthcare facilities have still not all adopted important evidence-based safe patient
handling strategies in regards to the low percentages that were reported by the respondents who
have a no lift policy, limited lift policy, and safe patient handling equipment as part of their safe
patient handling strategies. Stetler et al. (2003) summarized literature from the 1990s to develop
a safe patient handling program for a hospital. The program incorporated research findings on
safe patient handling and systemic data collected on site to refine and improve the program. The
study’s results suggested that multifaceted interventions need to be adopted into a safe patient
handling program that should include at least two of the following: elimination of risk factors,
engineering controls, a no lift policy, and training and education. Nelson et al. (2005) conducted
a research study on the design and the implementation of a multifaceted program that integrated
evidence-based practice, technology, and safety improvement for nursing staff that provide direct
patient care. The nurses in the study ranked program elements they deemed to be highly
effective: equipment was rated most effective (96%), followed by a no lift policy (68%). The
multifaceted program resulted in an overall lower injury rate, fewer modified duty days taken per
injury, and significant cost savings.

Limitations and Future Research

Several limitations in the current study deserve consideration. The first limitation is the
use of survey research as the method of inquiry. When using survey research there is potential
for response bias and non-response bias that can influence the results of the study. Response bias
could have occurred in our study in two different ways. Participants might not have been able to recall information accurately, or they might have interpreted the meaning of a question differently than the meaning intended. There is also the chance of having a non-response bias with this study where respondents selected for the sample elected not to respond because of how they felt toward the topic.

Another limitation is that it is unknown from our study the percentage of occupational therapist and occupational therapy assistants who actually left the profession or retired early in relation to acquiring a musculoskeletal injury. Future research is needed to better understand how many occupational therapists and occupational therapy assistants left the profession, retired early, or change their specialty area because of musculoskeletal injuries associated from manual transfers of patients.

Lastly, this was a relatively small sample size of occupational therapist and occupational therapy assistants from the state of Ohio, which may not truly depict the representation of occupational therapist and occupational therapy assistants throughout the United States regarding the incidence rate of musculoskeletal injuries due to patient handling. Future research needs to be addressed in all states regarding musculoskeletal injuries associated with the manual transfer of a patient. Future research also needs to investigate the use of different safe patient handling strategies as part of a safe patient handling program in regards to the prevention of musculoskeletal injuries to deem what are the most effective in preventing musculoskeletal injuries in the workplace.

Conclusion

The results of this study are congruent with other physical therapy and nursing studies that compared results amongst musculoskeletal injuries associated with manual transfers in that
the lower back was the highest reported musculoskeletal injury followed by the shoulder, neck, wrist/hands, and upper back. From our findings this suggests that occupational therapy practitioners experience occupational musculoskeletal injuries at a somewhat similar rate experienced by physical therapist and nursing practitioners. In addition, 11.2% of occupational therapist and occupational therapy assistants considered to leave the occupational therapy profession or retire early as a result of acquiring a musculoskeletal injury. This represents a sizable portion of the sample. Further research is warranted to determine the amount of occupational therapist and occupational therapy assistants who actually have left the profession or retired early to better understand the issues of acquiring a musculoskeletal injury with costs involved in changing specialty area and leaving the profession. Overall, this study showed that over half of the respondents are required to perform manual transfers on a regular basis, which determines that occupational therapy practitioners are exposed to occupation-based high risk situations regarding patient handling. It is concluded from this study that the musculoskeletal injury rate per year for occupational therapy practitioners is relatively similar to the musculoskeletal injury rate per year for the nursing profession reported by the BLS. The topic of safe patient handling is a significant issue for the profession of occupational therapy as it can be determined from this study that occupational therapy is a moderate to high-risk profession for work-related musculoskeletal injuries.
References


Appendix A

Background questions

What is your age in years?

What is your gender?

What is your highest occupational therapy degree obtained?

How many years have you been practicing?

What type of facility have you been working at currently: Rank order all that apply, with your primary facility = 1 (if only employed/working at one facility, mark it as 1)

__ Long-Term Care          __ Academia          __ Other

__ School System           __ Private Practice

__ Hospital Inpatient Rehab __ Community

__ Outpatient Rehab        __ Psychiatric-Based Facility

When answering questions dealing with work settings, answer the questions with regard to your primary place of employment.

5-point Likert scale questions
1. The “management” has kept up with the knowledge of trends in providing safe handling equipment.

   Strongly Disagree__
   Disagree__
   Undecided__
   Agree__
   Strongly Agree__

2. The health care staff (these involved with direct patient/client contact at your primary facility) has kept up with the knowledge of trends in providing safe handling equipment.

   Strongly Disagree__
   Disagree__
   Undecided__
   Agree__
   Strongly Agree__

3. I feel I am adequately trained on how to use safe patient handling equipment.

   Strongly Disagree__
   Disagree__
   Undecided__
   Agree__
   Strongly Agree__
4. I feel that the topic of “Safe Patient Handling” is an important issue within occupational therapy.

   Strongly Disagree__
   Disagree__
   Undecided__
   Agree__
   Strongly Agree__

5. Where did you receive training on how to use safe patient handling equipment? (Check all that apply)

   _ OT School          _ Conference/Workshops
   _ OTA School         _ Durable Medical Equipment Vendors
   _ On the Job         _ Other

Yes/No questions

6. Have you sustained an injury while manually transferring a patient within the past year?
7. Have you sustained pain on a regular basis directly due to patient handling within the past five years?

8. Would you say you have missed days away from work in connection with sustaining an injury while manually transferring a patient? If yes, how many days [ ]

9. Have you considered leaving the profession or retiring early in relation to acquiring a musculoskeletal injury from manually lifting a patient?

10. Are you required to perform manual transfers on a regular basis?

11. Are patients randomly transferred from one surface to another in your facility?

12. Are occupational therapists required to perform manual transfers in your facility?

13. Are occupational therapists involved in providing in-service training to facility employees regarding safe patient handling techniques?

14. What “safe patient strategies” are “in place” at your facility? (Check all that apply)
   - no lift policy
   - ceiling lifts
   - limited lift policy
   - floor based sling lifts
   - lift teams
   - sit to stand lifts
   - gait belts
   - not applicable
   - sliding belt

Open-ended questions:
15. Do you have a suggestion(s) regarding any strategy for reducing the risk of work related musculoskeletal disorders for occupational therapists at your workplace?

16. Do you have a suggestion(s) regarding any strategy for reducing the risk of work-related musculoskeletal disorders for occupational therapists in general?

17. Have you had any ache, pain, or discomfort affecting your muscles, joints, neck, or back as a result of patient handling that has affected your ability to carry out your duties as an occupational therapist? If yes, please check the region(s) in the column below. Use the schematic to help identify location of discomfort.

<table>
<thead>
<tr>
<th>Region(s)</th>
<th>Ache, pain, discomfort during the past year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head</td>
<td></td>
</tr>
<tr>
<td>Neck</td>
<td></td>
</tr>
<tr>
<td>Shoulder(s)</td>
<td></td>
</tr>
<tr>
<td>Upper back</td>
<td></td>
</tr>
<tr>
<td>Elbows</td>
<td></td>
</tr>
<tr>
<td>Low back</td>
<td></td>
</tr>
<tr>
<td>Buttocks</td>
<td></td>
</tr>
<tr>
<td>Wrist(s)/Hand(s)</td>
<td></td>
</tr>
<tr>
<td>Hip(s)/thigh(s)</td>
<td></td>
</tr>
<tr>
<td>Knee(s)</td>
<td></td>
</tr>
<tr>
<td>Ankle(s)/foot/feet</td>
<td></td>
</tr>
</tbody>
</table>

18. How long have you had or did you have this discomfort? (Check all that apply)

__ Currently  __ 4 years ago

__ 1 year ago  __ 5 years ago
__ 2 years ago    __ More than 5 years ago

__ 3 years ago  

Musculoskeletal Injury 34
Table 1.

*The respondents reporting on their type of facility.*

<table>
<thead>
<tr>
<th>Facility</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>LTC/SNF</td>
<td>87</td>
<td>30.5</td>
</tr>
<tr>
<td>School System</td>
<td>48</td>
<td>16.8</td>
</tr>
<tr>
<td>Hospital Inpatient Rehab</td>
<td>34</td>
<td>11.9</td>
</tr>
<tr>
<td>Outpatient Rehab</td>
<td>30</td>
<td>10.5</td>
</tr>
<tr>
<td>Acute Care</td>
<td>19</td>
<td>6.7</td>
</tr>
<tr>
<td>Home Health</td>
<td>16</td>
<td>5.6</td>
</tr>
<tr>
<td>Academia</td>
<td>11</td>
<td>3.9</td>
</tr>
<tr>
<td>Private Practice</td>
<td>8</td>
<td>2.8</td>
</tr>
<tr>
<td>Community</td>
<td>8</td>
<td>2.8</td>
</tr>
<tr>
<td>Work Hardening/Industrial Rehab</td>
<td>7</td>
<td>2.5</td>
</tr>
<tr>
<td>Psych-Based</td>
<td>5</td>
<td>1.8</td>
</tr>
<tr>
<td>MR/DD</td>
<td>5</td>
<td>1.8</td>
</tr>
<tr>
<td>Early Intervention</td>
<td>2</td>
<td>0.7</td>
</tr>
<tr>
<td>Retired</td>
<td>2</td>
<td>0.7</td>
</tr>
<tr>
<td>Pediatric Clinic</td>
<td>2</td>
<td>0.7</td>
</tr>
<tr>
<td>Geriatric Behavioral</td>
<td>1</td>
<td>0.4</td>
</tr>
</tbody>
</table>
Table 2.

Survey of knowledge and preparedness with safe patient handling.

<table>
<thead>
<tr>
<th>Questions # 1 through 4</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The management has kept up with the knowledge of the trends in providing safe patient handling equipment.</td>
<td>2.74</td>
<td>1.05</td>
</tr>
<tr>
<td>2. The health care staff that are involved with direct patient/client contact have kept up with the knowledge of trends in providing safe handling equipment.</td>
<td>2.70</td>
<td>1.03</td>
</tr>
<tr>
<td>3. I feel I am adequately trained on how to use safe patient handling equipment.</td>
<td>3.06</td>
<td>.97</td>
</tr>
<tr>
<td>4. I feel the topic of safe patient handling is an important issue within occupational therapy.</td>
<td>3.59</td>
<td>.80</td>
</tr>
</tbody>
</table>

*Note:* Score code: 0 = Strongly Disagree, 1 = Disagree, 2 = Undecided, 3 = Agree, 4 = Strongly Agree.
Table 3.

*The respondents reporting on where they received training on how to use safe patient handling equipment.*

<table>
<thead>
<tr>
<th>Source</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>OT School</td>
<td>75</td>
<td>26.3</td>
</tr>
<tr>
<td>OTA School</td>
<td>56</td>
<td>19.6</td>
</tr>
<tr>
<td>On the Job</td>
<td>239</td>
<td>83.8</td>
</tr>
<tr>
<td>Conferences/Workshops</td>
<td>78</td>
<td>27.4</td>
</tr>
<tr>
<td>Durable Medical Equipment Vendor</td>
<td>64</td>
<td>22.5</td>
</tr>
<tr>
<td>Publications</td>
<td>1</td>
<td>0.4</td>
</tr>
<tr>
<td>US Army</td>
<td>1</td>
<td>0.4</td>
</tr>
<tr>
<td>Reading</td>
<td>1</td>
<td>0.4</td>
</tr>
<tr>
<td>Research</td>
<td>1</td>
<td>0.4</td>
</tr>
</tbody>
</table>
Table 4.

*Survey of occupational therapy job factors relating to safe patient handling.*

<table>
<thead>
<tr>
<th>Questions</th>
<th>Category</th>
<th>n</th>
<th>Observed Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. Have you sustained pain on a regular basis directly due to patient handling within the past five years?</td>
<td>No</td>
<td>230</td>
<td>.81</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>54</td>
<td>.19</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>284</td>
<td>1.00</td>
</tr>
<tr>
<td>7. Have you sustained pain on a regular basis directly due to patient handling within the past year?</td>
<td>No</td>
<td>269</td>
<td>.95</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>15</td>
<td>.05</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>284</td>
<td>1.00</td>
</tr>
<tr>
<td>8. Would you say you have missed days from work in connection with sustaining an injury while manually transferring a patient?</td>
<td>No</td>
<td>259</td>
<td>.92</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>24</td>
<td>.08</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>283</td>
<td>1.00</td>
</tr>
<tr>
<td>9. Have you considered leaving the profession or retiring early in relation to acquiring a musculoskeletal injury from manually lifting a patient?</td>
<td>No</td>
<td>252</td>
<td>.89</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>32</td>
<td>.32</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>284</td>
<td>1.00</td>
</tr>
<tr>
<td>10. Are you required to perform manual transfers on a regular basis?</td>
<td>No</td>
<td>103</td>
<td>.36</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>181</td>
<td>.64</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>284</td>
<td>1.00</td>
</tr>
<tr>
<td>12. Are occupational therapists required to perform manual transfers in your facility?</td>
<td>No</td>
<td>52</td>
<td>.19</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>228</td>
<td>.81</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>280</td>
<td>1.00</td>
</tr>
<tr>
<td>13. Are occupational therapists involved in providing in-</td>
<td>No</td>
<td>97</td>
<td>.35</td>
</tr>
<tr>
<td>Question</td>
<td>Yes</td>
<td>No</td>
<td>Total</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>-----</td>
<td>----</td>
<td>-------</td>
</tr>
<tr>
<td>Service training to facility employees regarding safe patient handling techniques?</td>
<td>184</td>
<td></td>
<td>281</td>
</tr>
</tbody>
</table>

*Note: Question #11 was omitted from the analysis.*
Table 5.

The respondents reporting on what “safe patient strategies” are “in place” at their facility.

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Lift Policy</td>
<td>16</td>
<td>5.6</td>
</tr>
<tr>
<td>Limited Lift Policy</td>
<td>47</td>
<td>16.5</td>
</tr>
<tr>
<td>Lift Teams</td>
<td>87</td>
<td>30.5</td>
</tr>
<tr>
<td>Gait Belts</td>
<td>222</td>
<td>77.9</td>
</tr>
<tr>
<td>Sliding Belt</td>
<td>25</td>
<td>8.8</td>
</tr>
<tr>
<td>Ceiling Lifts</td>
<td>41</td>
<td>14.4</td>
</tr>
<tr>
<td>Floor-based Sling Lifts</td>
<td>143</td>
<td>50.2</td>
</tr>
<tr>
<td>Not Applicable</td>
<td>30</td>
<td>10.5</td>
</tr>
<tr>
<td>Other</td>
<td>51</td>
<td>17.9</td>
</tr>
</tbody>
</table>
The respondents reporting on what anatomical areas that they have received any ache, pain, or discomfort as a result of patient handling.

Table 6.

<table>
<thead>
<tr>
<th>Anatomical Area</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head</td>
<td>4</td>
<td>1.4</td>
</tr>
<tr>
<td>Neck</td>
<td>29</td>
<td>10.2</td>
</tr>
<tr>
<td>Shoulders</td>
<td>36</td>
<td>12.6</td>
</tr>
<tr>
<td>Upper Back</td>
<td>19</td>
<td>6.7</td>
</tr>
<tr>
<td>Elbows</td>
<td>6</td>
<td>2.1</td>
</tr>
<tr>
<td>Low Back</td>
<td>91</td>
<td>31.9</td>
</tr>
<tr>
<td>Buttocks</td>
<td>6</td>
<td>2.1</td>
</tr>
<tr>
<td>Wrist/Hands</td>
<td>20</td>
<td>7.0</td>
</tr>
<tr>
<td>Hips/Thighs</td>
<td>7</td>
<td>2.5</td>
</tr>
<tr>
<td>Knees</td>
<td>11</td>
<td>3.9</td>
</tr>
<tr>
<td>Ankle/Foot</td>
<td>8</td>
<td>2.5</td>
</tr>
</tbody>
</table>
Table 7.

The respondents reporting how long they were in discomfort as a result of patient handling.

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-3 Months</td>
<td>89</td>
<td>31.2</td>
</tr>
<tr>
<td>4-6 Months</td>
<td>9</td>
<td>3.2</td>
</tr>
<tr>
<td>7-12 Months</td>
<td>3</td>
<td>1.1</td>
</tr>
<tr>
<td>1-2 Months</td>
<td>8</td>
<td>2.8</td>
</tr>
<tr>
<td>3-4 Months</td>
<td>3</td>
<td>1.1</td>
</tr>
<tr>
<td>5 or More Years</td>
<td>10</td>
<td>3.5</td>
</tr>
<tr>
<td>Total</td>
<td>122</td>
<td>42.8</td>
</tr>
<tr>
<td>Missing System</td>
<td>163</td>
<td>57.2</td>
</tr>
</tbody>
</table>
Figure 1. The respondents reporting on what type of facility they work.
Figure 2. The respondents reporting on if their management has kept up with the knowledge of the trends in providing safe handling equipment.
Figure 3. The respondents reporting on the health care staff involved with direct patient/client contact have kept up with the knowledge of trends in providing safe handling equipment.
Figure 4. The respondents reporting if they feel they are adequately trained on how to use safe patient handling equipment.
Figure 5. The respondents reporting on if they feel the topic of safe patient handling is an important issue within occupational therapy.
Figure 6. The respondents reporting on where they received training on how to use safe patient handling equipment.
Figure 7. The respondents reporting on what “safe patient strategies” are in place at the facility.
Figure 8. The respondents reporting on what anatomical areas that they have received any ache, pain, or discomfort as a result of patient handling.
Figure 9. The respondents reporting how long they were in discomfort as a result of patient handling.