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Evaluation of a Safe Patient Handling Program

Abstract

Purpose : The purpose of this project was to evaluate the effectiveness of implementing a comprehensive Safe Patient Handling (SPH) Program system wide in a large healthcare organization relative to injury severity and organizational cost. **Background :** Extensive review of the literature reveals clear evidence that healthcare workers who participate in patient handling activities continue to be at a very high risk for occupational musculoskeletal injuries. Workers employed up to one year, and those employed greater than ten years within the institution studied were noted to have higher rates of injuries that were more severe and more costly to the organization. **Methods :** Implementation of a comprehensive SPH program was implemented in 2010 and all direct patient caregivers were trained. The sample consisted of new hires (n=89) and long term hires (n=144) identified via aggregate data from data bases owned by the institution. Data were analyzed on the Statistical Package for the Social Sciences (SPSS) program. Mean differences in the severity of injury and cost of injury between pre and post-training periods were analyzed via independent samples t-tests. Chi-square was used to identify whether there was a significant difference in the frequency of injuries between the pre and post-training periods. **Results :** Results indicated that the average injury severity during the pre-test period was significantly higher compared to post-test. No significant differences were found related to cost or frequency of injury between pre and post-test. **Discussion :** Issues related to the practical significance of the results and challenges due to the small sample size are discussed.

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Abstract

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Methods: Implementation of a comprehensive SPH program was implemented in 2010 and all direct patient caregivers were trained. The sample consisted of new hires (n=89) and long term hires (n=144) identified via aggregate data from data bases owned by the institution. Data were analyzed on the Statistical Package for the Social Sciences (SPSS) program. Mean differences in the severity of injury and cost of injury between pre and post-training periods were analyzed via independent samples t-tests. Chi-square was used to identify whether there was a significant difference in the frequency of injuries between the pre and post-training periods.

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Discussion: Issues related to the practical significance of the results and challenges due to the small sample size are discussed.

Chapter I

Introduction

It has been stated that:

The adult human form is an awkward burden to lift or carry. Weighing up to 200 pounds or more, it has no handles, it is not rigid, and is susceptible to severe damage if mishandled or dropped. When lying in a bed, a patient is placed inconveniently for lifting, and the weight and placement of such a load would be tolerated by few industrial workers (Anonymous, 1965).

This editorial was published forty years ago and nurses continue to suffer a high prevalence of work related back pain and workers' compensation claims (Collins, Wolf & Evanott, 2004).

Research Problem Identified

Occupational musculoskeletal injuries in healthcare workers represent a significant problem in most hospitals and nursing homes today. Nursing personnel continue to have one of the highest job related injury rates of any occupation. Nurses experience more back injuries than the general population as a result of their physically demanding work according to Bureau of Labor Statistics data (de Castro, Hagan & Nelson, 2006). In 2006, 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 (U.S. Department of Labor, 2006). In a review of Bureau of Labor Statistics data published in 2009, 252 per 10,000 health care workers suffered musculoskeletal disorders. This is the highest rate of musculoskeletal disorders and more than seven times the national average for all occupations (Bureau of Labor Statistics, 2009). An estimated 12 percent to 18 percent of nursing personnel leave the profession annually

due to chronic back pain, and another 12 percent consider a job transfer to reduce their risk of back injury (Nelson & Baptiste, 2004).

A variety of patient handling tasks that exist within the context of nursing care, such as transferring and repositioning patients have traditionally been performed manually. In spite of initiatives in other nations such as the United Kingdom and Australia a no lift policy has been slow to be accepted in the United States (ANA, 2011). In response to the significant number and severity of work-related back injuries and other musculoskeletal disorders among nurses, the American Nurses Association (ANA) launched the Handle With Care campaign in 2003. This campaign in conjunction with the efforts of other organizations such as The Institute of Medicine (IOM) and The National Institute for Occupational Safety and Health (NIOSH) has raised awareness among healthcare organizations of the importance of addressing safe patient movement and handling (ANA, 2011).

Significance

The cost of work related injuries adds additional financial burden to institutions already facing huge increases each year in virtually every area of operation. The cost of a single work related back injury can easily exceed several thousand dollars. In some cases the costs are far greater when multiple diagnostic tests and perhaps surgery is needed. Treatment that could last for months, years, or a lifetime, coupled with indemnity payments dramatically increases costs. The loss of staff due to injury is especially difficult as our acute care and long term care settings continue to struggle with issues related to the nursing shortage as well as the scarcity of other experienced caregivers. Patient handling becomes even more difficult given the aging health care work force. By 2013, the average age of registered nurses in the United States will be older than 45 years, with approximately 40 percent of registered nurses being older than 50 years (Fragala

& Bailey, 2003). Injury to the musculoskeletal system is cumulative and “incremental” during the course of one’s career. The first musculoskeletal damage (MSD) at a young age in nursing may not be recalled, but it can be the beginning of a long series of damaging events leading to inability to or restriction of physical activity for the rest of life, a career ending possibility (Watters, 2008).

It is clear that when a healthcare worker sustains a work related musculoskeletal injury many others are affected. When it is necessary for the injured worker to be out of work or on restricted duty, supervisors may need to scramble to find replacements or to make accommodations. Staff morale may be affected by the absence of the employee as other team members are forced to absorb more responsibility. The injured worker may experience a “disconnect” from the workplace during even a brief absence, threatening a successful return. Lack of staff stability coupled with chronic shortages, greatly increases the chance for work related injury. When staff are rushed and over worked they are tempted to take shortcuts. They may attempt to transfer or re-position patients alone because they are too rushed or impatient to ask for or wait for assistance. A lack of teamwork in some areas only adds to the problem. Some staff will ask for assistance only as a last resort and often it is not generally viewed as an acceptable thing to do.

For years, hospitals have been buying equipment such as total body lifts to use with little or no effect on workers’ compensation costs or patients’ comfort and safety. Nurses did not use safety equipment for several reasons, much of which involves the “time” it takes to get the equipment, set up the equipment and move the patient (Watters, 2008). Often equipment is not purchased with adequate research regarding needs, and staff input (Watters, 2008). In addition the lack of policies and procedures that clearly define how and when to use assistive equipment

and devices is sorely lacking in many facilities. The ANA Handle With Care campaign clearly states the importance of building a health care industry-wide effort to include appropriate and adequate education and training for current caregivers and reshaping nursing education to incorporate safe patient handling. This observation has been clear to the researcher conducting this study for a number of years. While healthcare workers are the backbone of healthcare, nursing remains one of its highest risk occupations. An American healthcare worker suffers a back injury every 30 minutes. With nearly 55 percent of the U.S. population, or approximately 97 million adults, designated as overweight or obese, patient weight has become a contributing factor in these injuries, along with the accompanying cost (Bersch, 2003).

Institutions that do not place a high priority on safe patient handling put themselves at risk on several levels. Not only do the skyrocketing costs associated with workers' compensation threaten the viability of an organization, but so do the pressures of regulatory bodies such as the Joint Commission and the Occupational Safety and Health Administration (OSHA) as they exert pressure to provide increasingly safe environments for patients and employees. It is imperative that hospitals be realistic and creative in developing plans to reduce these types of injuries while demonstrating a high level of management and employee support in fostering a meaningful culture of safety.

Theoretical Framework

Leaders involved with introducing projects requiring significant change within an organization such as implementing a comprehensive Safe Patient Handling Program may benefit from analyzing theories of change. Lewin is recognized as the founder of modern social psychology. Unlike his counterparts, Lewin was very interested in conducting field research to study human behavior (Schein, 1995). As a result he would build "models" of processes.

According to Schein (1995), the most powerful of these was his model of the change process in human systems. The three steps in Lewin's change theory include: unfreezing, moving and refreezing, The first step in the change process involves making others aware of the need for change and this is referred to as unfreezing (Schein, 1995). This is a critical step in convincing key players at all levels within an institution about the value of implementing a Safe Patient Handling Program. It is the change agent's responsibility to adequately analyze and describe the problem in such a way that individuals or groups realize the value of pursuing the change (Schein, 1995).

Purpose/Summary

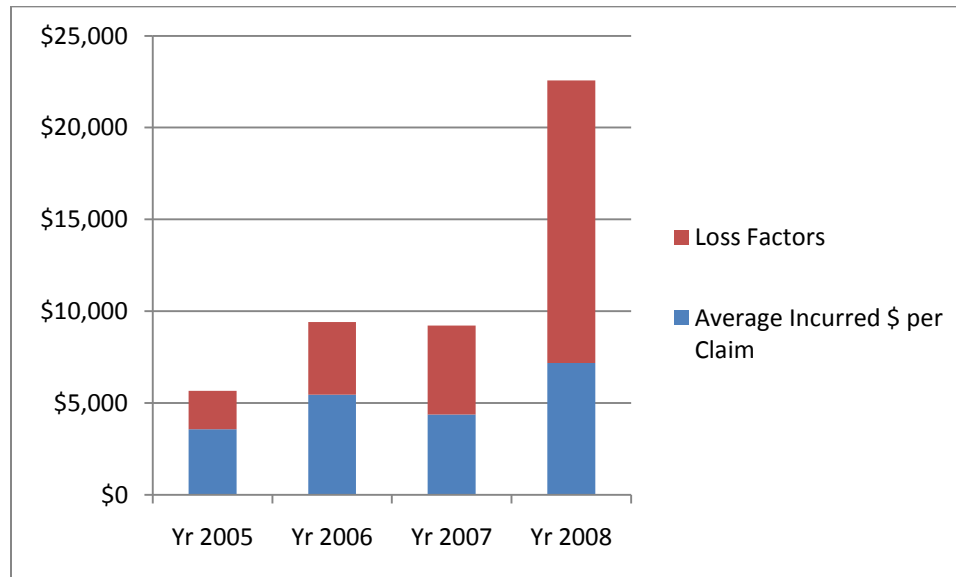
The purpose of this project was to purpose, implement, and subsequently prove to top management within the organization the value of a comprehensive Safe Patient Handling Program.

The researcher is the manager for the Employee Health Services of a healthcare organization comprised of two hospitals, three nursing homes and numerous specialty services at approximately seventy locations. There are close to 5300 employees. This department provides a number of services including pre-employment exams and management of the disability and workers' compensation programs. In the area of workers' compensation provision of quality injury and claims management is a high priority.

Workers' Compensation costs to healthcare organizations of this size can easily exceed several million dollars per year. While some costs, such as those related to the New York State Workers' Compensation laws, cannot be controlled by the organization, other efforts can impact cost containment. Probably the most effective way to control costs is to identify the most frequent, severe, and expensive types of injuries and implement effective prevention programs.

Injuries to employees providing direct patient care are the most frequent, severe and costly to the institution. A review of the average incurred costs per claim for the years 2005-2008 valued as of 12/31/ claim year (Figure 1) confirmed this trend.

Figure 1. Average incurred costs per claim, 2005 - 2008 valued as of 12/31/claim year.



Average incurred dollars per claim include medical treatment and indemnity (salary replacement for the out of work injured worker). Loss factors include costs related to New York State assessment fees, reserves the organization is required to set aside for estimated future costs, and payment for claims management by the Third Party Administrator (TPA), and consultant group.

Prior to starting this project, an extensive review of the literature was done to evaluate the type of program that would best fit the needs of the organization. The value of embracing the lift team concept versus a program that more comprehensively involved all caregivers at a higher level was carefully scrutinized. The literature review yielded multiple examples of programs that demonstrated not only extraordinary financial results for organizations in a relatively short

period of time, but more importantly positively impacted the health and well being of their caregivers. Findings demonstrate frequency, severity, and costs related to work related injuries resulting from patient handling activities among a select population of caregivers employed in an acute care hospital pre and post implementation of a comprehensive Safe Patient Handling Program.

Chapter II

Review of Literature

An extensive literature search was performed utilizing the Medical Library at the study institution and the Lavery Library at St. John Fisher College using CINAHL, Cochrane, Ovid and Medline using the following key words: safe patient handling, injuries in healthcare workers, musculoskeletal disorders among nurses, patient handling techniques, patient handling equipment and ergonomics in healthcare. Information was also accessed from on-line resources from the following agencies: The Association of Occupational Health Professionals (AOHP), the Occupational Safety and Health Administration (OSHA), and the United States Bureau of Labor Statistics. Approximately forty studies and other documents were reviewed. Twenty seven studies and documents are cited in this study.

A review of the literature revealed several general themes related to safe patient handling. First there was historical and current information describing laws, or position statements from several regulatory agencies and professional organizations. Several articles discussed recent policy and legislative initiatives. There were studies documenting the effectiveness of implementing safe patient handling programs and redesigning patient handling tasks. One article described the value of investigating several comprehensive systematic reviews of the literature on the emerging science of evidence based facility design. Several authors detailed the successes organizations had in implementing lift teams.

Studies were chosen for this review based on soundness of design and the ability to demonstrate results that were clearly measurable. Also taken into consideration was the mix and qualifications of those conducting the research. Another important factor was their ability to adequately identify and analyze the study objectives.

In addition to studies that provided evidence based research justifying the value of SPH programs, there were a number of important policy and legislation issues at the state and federal levels. On November 14, 2000, the federal Occupational Safety and Health Administration (OSHA) issued a final rule for an ergonomics standard that covered general industry, including healthcare workplaces (de Castro, Hagan & Nelson, 2006). Despite the fact that the final ergonomic standard was repealed by Congress in 2001, OSHA continues to address ergonomic concerns, including safe patient handling, through the general duty clause that requires every employer to provide a safe and hazard – free work environment (Association of Occupational Health Professionals (AOHP) OSHA Alliance, 2006). Currently at the federal level, the Nurse and Health Care Worker Protection Act of 2009 is moving through Congress (Hospital Employee Health, 2010). Passage of this federal law would trigger a new regulatory standard. The law would require the U.S. Occupational Safety and Health Administration to issue a rule within two years of enactment, and health care employers would then have two years to purchase “an adequate number of safe lift mechanical devices.” Safe lift mechanical devices include those that are appropriate for the patient population. For example, if a patient care unit may encounter the possibility of caring for a bariatric patient weighing five hundred pounds or more, the unit should be equipped with a total lift, and a sit to stand device that accommodates patients weighing up to six or preferably eight hundred pounds. The bill also requires health care employers to implement a safe patient handling and injury prevention plan (Hospital Employee Health, 2010).

Washington state law required hospitals to have adequate safe patient handling equipment in place to reduce injuries by January 31, 2011. This is the nation’s most comprehensive safe patient handling law (American Nurses Association, 2011). States that have

passed comprehensive programs include Illinois, Minnesota, Maryland, New Jersey, Rhode Island, Texas and Washington. New York State has offered demonstration projects where facilities apply for funding to sponsor pilot programs in their facilities. New York has also passed a law requiring installation of ceiling lifts for newly constructed or major renovated nursing homes and hospitals (American Nurses Association, 2011).

Evidence exists to demonstrate that safe patient program intervention plans yield positive results for organizations. Nelson (2006) reported that participation in a musculoskeletal (MDS) prevention program in an acute care hospital resulted in a 50 percent reduction in total injuries, 28 percent reduction in lost time injuries, and a 25 percent reduction in low back injuries in the first year of implementation.

The international nursing community has long recognized the dangers and risks of manual patient handling. Other Western, industrialized nations, such as the United Kingdom, have had formal policies through their nursing associations for years, that in concert with government regulation, ban the act of manual patient handling (de Castro, 2006).

In 2006, a national education program that specifically targets student nurses with messages and procedures about safe patient handling was developed by The National Institute of Occupational Safety and Health (NIOSH) in conjunction with the American Nurses Association (ANA) and the Veterans Health Administration's Patient Safety Center (Hughes, 2006). The program titled *Safe Patient Handling and Movement Principles* includes audio and video presentations. The content focuses on safe patient handling and is intended for use in nursing schools to demonstrate the risks of manual lifting, dispel myths, and encourage the use of assistive equipment for lifting (Hughes, 2006). It is critical that nursing students receive adequate

education in the area of safe patient handling and remain cognizant of the potential risks not only to their health but to their careers.

The Association of Occupational Health Professionals (AOHP) is a national organization for occupational health professionals from many disciplines who are involved in the occupational health of healthcare workers. In 2006 the AOHP formed an alliance with the Occupational Safety and Health Administration (OSHA) to develop educational materials related to the targeted areas identified in the Alliance (AOHP OSHA Alliance, 2006). Safe patient handling was identified as a key area of focus for the Alliance. As a result, the Alliance developed a comprehensive resource guide for healthcare facilities titled, “Implementing a Safe Patient Handling Program in the Acute Care Setting.” The guide provides information about conducting a needs assessment, worksite data analysis, developing and implementing a plan and evaluating outcomes (AOHP OSHA Alliance, 2006).

In response to the significant number and severity of work-related back injuries and other musculoskeletal disorders among nurses, the American Nurses Association (ANA) launched its Handle With Care campaign in 2003 (de Castro, Hagan & Nelson, 2006). The campaign seeks to build a health care industry – wide effort to prevent back and other musculoskeletal injuries. The goal is to develop education and training programs, increase the use of assistive equipment and patient handling devices, incorporate safe patient handling into nursing education and pursue federal and state policies addressing the issue (de Castro, Hagan & Nelson, 2006).

It is apparent that despite the recommendations and efforts by numerous organizations in recent years that regulations or laws that are clear and enforceable will be necessary to effect significant change in the area of patient handling in our healthcare institutions. Perhaps the most difficult barrier will be instilling new safe practices into the routines of nurses and other

caregivers who have become so accustomed to the traditional methods and the myths of using “proper” body mechanics. In 1994, the National Institute for Occupational Safety and Health (NIOSH) revised the NIOSH Lifting Equation – an ergonomics assessment tool that can be used to calculate the recommended weight limit for two-handed manual-lifting task (Waters, 2007). NIOSH excluded assessment of patient-handling tasks from the uses of the equation. They argued that such tasks involved too many variables as patients can be unpredictable (they might have muscle spasms, be combative, or resist) (Waters, 2007). Recently Thomas R. Waters, a research safety engineer in the Division of Applied Research and Technology at NIOSH revised the equation for use in patient handling tasks. The revised equation yields a recommended 35 lb. maximum weight limit for use in patient handling activities. When weight to be lifted exceeds this limit, assistive devices should be used (Waters, 2007). The recommendation makes sense, but applying it in healthcare institutions will necessitate dramatic changes.

There are numerous studies in the literature on SPH. Engineering and administrative controls can dramatically reduce the risk of musculoskeletal injuries to nursing care staff (Nelson & Baptiste, 2006). Nelson and her researchers identified nine patient handling tasks that place nursing staff at high risk for musculoskeletal injuries. An expert panel redesigned these tasks by introducing new patient handling techniques and environmental controls. The study included use of a biomechanics laboratory that was configured to represent a typical patient room. This technology allowed the researchers to more accurately evaluate stress levels on muscles, the lumbar spine and joints of study participants (Nelson & Baptiste, 2006).

Nelson & Baptiste used objective and subjective data. Sixty-three participants who performed the redesigned tasks were compared with seventy-one participants who used standard procedures. Standard procedures included lack of equipment use, not adjusting bed levels and

not asking for assistance from other staff members. Objective data revealed significant improvement in five of the redesigned tasks, while staff subjectively rated four of the redesigned tasks as significantly improved. Some of the interventions that proved significant improvement involved simple changes such as adjusting the bed height. Other interventions included the use of new equipment such as ceiling lifts. The researchers concluded that simple changes to the environment and in postural techniques used by staff can significantly reduce the risk of injury. In addition they felt that more research is needed to examine other high risk nursing tasks (Nelson & Baptiste, 2006).

A significant barrier to the effectiveness of safe patient handling programs includes the lack of appropriate and easily accessible equipment for caregivers (Wardell, 2007). The goal of a study conducted by Wardell was to determine the effectiveness of implementing a comprehensive patient handling program. The purpose of the study was to compare patient handling techniques and perceptions about barriers to using patient handling equipment prior to and subsequent to the implementation of a comprehensive patient handling program. The implementation of this program included identification of high risk, high injury departments, the purchase of sufficient patient handling equipment and the use of patient assessment algorithms. Employees were educated and assessed on the proper use of equipment. The initial survey of caregivers was conducted before the training began. The post implementation survey was conducted one month after the equipment was delivered to the patient units. A convenience sample (n=55) of caregivers was chosen. The survey used closed-ended questions with multiple choice responses. Responses to the post implementation survey showed an increase in the use of patient handling equipment by caregivers. Although some equipment was available prior to the policy it was being used for only 5 percent of all patient handling tasks. The use of equipment

increased six fold following the introduction of the program. In the first three months following implementation of the program the hospital experienced a 61 percent reduction in strain and sprain injuries associated with patient handling. Data from the survey indicated that many of the barriers affecting the success of patient handling programs were addressed. This study illustrates how implementation of a safe handling policy can result in significant change in a short period of time.

Musculoskeletal disorders exact an unacceptable toll on the health and military readiness of U. S. Department of Defense personnel (McCoskey, 2007). McCoskey conducted a cross – sectional study to describe patient handling activities during a typical day in inpatient units of a military health care facility. Two surveys were developed for the study. A demographic survey included general information such as age, gender, job title and physical symptoms or conditions within the last 12 months and perception of etiology. One purpose of the symptom survey was to establish a baseline of discomfort levels in order to identify jobs that may warrant ergonomic analysis. Participants (n=283) were also provided with patient handling coupons and were asked to rate the severity of exertion for each patient handling event. Of the 175 responding nursing staff, 97 percent reported physical discomfort in the past 12 months, and 57 percent of the participants associated the discomfort with patient handling. The study identified high risk tasks and patient populations on specific units in the acute care setting. A significant finding was that lateral transfer, especially repositioning, more frequently require greater physical exertion and take longer to perform than other types of transfers. This study is helpful in identifying high risk tasks so that appropriate interventions can be developed to prevent musculoskeletal injuries in caregivers. As mentioned, lateral transfers, and repositioning in bed are high risk tasks for

caregivers. In addition to these tasks, transfer from bed to chair, toileting and ambulation of patients have the potential for significant risk.

Stichler (2007) presented evidence of design features that have either demonstrated improved safety outcomes or are currently being studied to determine their cost/benefit in improving safety. Careful consideration of patient care areas should be a priority early on in the planning of new construction or renovation. Well thought out plans that solicit input from a number of disciplines can prevent costly redesign in the future. Careful attention regarding the layout of patient rooms and bathrooms are critical for patient care efficiency and injury prevention (Stichler, 2007). Ceiling tracking in patient rooms that extends into the bathrooms should be considered for all rooms, not just areas designed for bariatric patients. Hallway tracking is also highly recommended (Stichler, 2007). The United States is expected to invest nearly 200 billion dollars in healthcare construction by 2015 (Stichler, 2007). It's critical that nurse leaders be knowledgeable about design capabilities to assure that hospitals facilitate optimal patient outcomes and enhance the work environment of healthcare providers. The author mentioned how several organizations have provided leadership recently to support and develop the emerging science of evidence based design. The Center for Health Design, with funding from the Robert Wood Johnson Foundation, has sponsored several comprehensive systematic reviews of the literature relating to the physical environment and patient outcomes (Stichler, 2007). These resources would also be helpful in investigating healthcare environments designed to decrease the risk of employee injury.

Several articles were reviewed detailing how lift team programs were implemented and how follow-up research was conducted to measure success. The results were very positive. Every article referenced the work of William Charney who is a pioneer of the lift team approach. In

1989, Charney, who was an industrial hygienist and director of environmental health and safety at San Francisco General Hospital, launched a pilot study of the lifting team method. This was in response to discovering that back injuries from lifting patients were a leading cause of workers' compensation expenditures, costing the hospital almost a quarter of a million dollars per year, an average of \$9,000 per recorded injury (Rissman, 1994).

Charney's lift team members were carefully chosen and trained. The day shift was selected for the program because it had twice as many lost-time accidents as the evening shift and more than six times as many accidents as the night shift. Nurses were instructed that during the day shift, they could perform no patient lifts or transfers. During the first pilot program year, the expected 16 lost-time accidents on the day shift were reduced to one. This injury occurred early in the study when a nurse did not wait for the team to arrive. Charney calculated the compensation dollars saved to be \$65,000 after subtracting the salaries of the team. A formula was used to calculate hidden savings accounting for the time saved per nursing unit where personnel no longer had to engage in lifting and moving activities. This savings amounted to an additional \$70,000 over a 12 month period (Rissman, 1994).

In 1997, Charney outlined the results of a 10 hospital study using the program evaluation method. Program evaluation involves the following steps: understanding and engaging, assessing needs, setting goals and objectives, developing an intervention, implementing the intervention, and evaluating the results (McKenzie, Neiger & Smeltzer, 2005). Nine acute care hospitals and one long-term care facility were included in the study. Back injury data from nurses whose injuries resulted from lifting patients was analyzed by comparing the number of injuries before and after the availability of a lift team. OSHA 200 logs were used to calculate injury rates and lost time for one year prior to implementation of the lift team and at least one year post lift team.

Care was taken to be sure that all necessary training was done in all facilities and that the proper policies were in place.

The results showed that all ten facilities experienced a decrease in the number of nursing personnel back injuries. There was a 69 percent decrease in the incidence rates, and a 90 percent decrease in the number of lost days. Facilities able to retrieve workers' compensation cost data reported reductions. There were also decreases in health care costs associated with the injuries. There were no lift team injuries. All ten facilities reported that nurses indicated high satisfaction rates with the teams on questionnaires. In his conclusion Charney stresses that lifting is a skill, not a random task, and should be performed by skilled teams using mechanical lifting devices (Charney, 1997).

A study designed to describe the availability of preventive devices and training in relation to musculoskeletal injuries in registered nurses, outlined by (Trinkoff, Brady & Nielsen, 2003), yielded interesting results. Data were collected from 1163 randomly selected nurses through anonymous mailed surveys. The response rate was 74 percent. Results showed that nurses working where mechanical lifting devices were available were significantly less likely to have neck or back musculoskeletal disorders. Also back injuries were less likely when lifting teams were available. The data indicated that training focused exclusively on lifting without accompanying devices or teams has not been successful. Education only programs did not prevent low back pain and related lost time (Trinkoff, Brady & Nielsen, 2003).

Additional results from this study showed that half of the nurses surveyed had mechanical lifting devices available to them. Only 6 percent of this group reported "always" using the devices, and 57 percent indicated using the devices "sometimes." When questioned about their preferred transfer method 46 percent indicated a two person lift, 17 percent a lifting

team, and only 16 percent chose a mechanical lifting device (Trinkoff, Brady & Nielsen, 2003). Certainly if the nurse were to participate in a transfer, use of the mechanical device would be the healthier option. Another surprising result was that the nurses using transfer boards and adjustable beds were 67 percent more likely to have back musculoskeletal disorders (Trinkoff, Brady & Nielsen, 2003). The results of this study represent an opportunity for implementation of safer patient handling policies to prevent initial injury and re-injury of nurses.

A comprehensive summary of nine lifting team program reports between 1991 and 2001 was detailed by (Haiduven, 2003) following a literature review. All nine programs resulted in a significant decrease of injuries related to lifting and transfer. There was also a great reduction in lost time from work. The author reviewed all the important factors that must be considered while developing the lift team concept within an organization. Topics discussed included: team composition, training, policy development and methods of measuring outcomes. The problem is carefully analyzed and clearly described to key individuals and groups at all levels. The author emphasized that given the continuing problems related to musculoskeletal disorders in nursing personnel, and the critical shortage of nurses, healthcare facilities should be highly motivated to consider the feasibility of initiating lift team or safe patient handling programs within their institutions (Haiduven, 2003).

The Sioux Valley Hospital University of South Dakota Medical Center successfully implemented a lift team program that has resulted in several significant benefits (Hefti et al., 2003). The hospital chose a multidisciplinary team to develop the program. Improvement objectives included decreasing the number of back injuries, lost days, and restricted days. An additional goal was to reduce costs related to back injuries by 20 percent. Improvement priorities included establishing a lift team, conducting and equipment inventory, developing policies,

training and obtaining adequate support from management. Indicators were chosen and defined in order to monitor the effectiveness of the project. Injury data, lift team data and financial information was carefully collected and tracked. The positive financial benefit was impressive. For example the average cost per recordable back injury related to patient handling pre-lift team was \$6,294 and \$1,099 two year later. Direct costs went from \$182,520 pre-lift team to \$9,894 two years later (Hefti et al., 2003).

The Veterans Health Administration (VHA) has now rolled out safe patient handling to 153 Veteran Administration facilities across the country (Hospital Employee Health, 2011). The roll-out provides for a designated coordinator in each facility. This was a lesson learned from more than 10 years of research into safe patient handling at the VHA center in Tampa, Florida. In 2000 the Tampa facility implemented a program at VA hospitals throughout Florida and Puerto Rico, with equipment, algorithms to assess patients' needs, peer leaders to help co-workers use the devices, and "safety huddles" to share progress and setbacks. Injuries declined by 30%, modified duty day dropped by 70 percent, and lost-time days declined by 18 percent (Hospital Employee Health, 2011). When the study ended, some hospitals found a way to keep their safe patient handling coordinators, and others let the position go. With no support, the peer leaders were unable to keep up a consistent program. They found that without the coordinators to support the technology and the culture change the equipment was often not used. As a result the VA wide roll-out of safe patient handling, which began in 2008, provides for ongoing support. A directive issued in 2010 details the responsibilities for safe patient handling and states: "It is the VHA policy that a [safe patient handling] program to protect caregivers and patients from injuries due to patient handling and movement must be established and maintained in all VHA facilities and that new construction and renovation projects must incorporate appropriate and

necessary patient handling and moving equipment at all VHA facilities.” The directive mandates a facility coordinator or champion and peer leaders in each unit or area where patient handling occurs (Hospital Employee Health, 2011).

Summary

Review of the literature clearly identifies the need for healthcare institutions to comprehensively analyze the needs and challenges of issues related to safe patient handling. This is critical in order to effectuate change that is carefully planned, evidence based, and customized to assure maximum benefit to employees, patients and the organization. In light of the fact that patient handling incidents result in significant numbers of injuries, lost days, restricted days, and incurred workers’ compensation costs, the aim of the current project is to investigate whether the implementation of a comprehensive Safe Patient Handling Program in a large healthcare organization will result in a safer workplace environment for caregivers by reducing the incidence and severity of injuries and financially benefit the institution.

Chapter III

Design

The purpose of this project and resulting study was to evaluate whether a Safe Patient Handling (SPH) Program will benefit employee health and lower institutional costs. The Employee Health Services department has made great strides in the past ten years in providing what has been described by a risk management consultant group, and third party administrator (TPA) in the area of workers' compensation as "State of the Art" in the area of post injury management; however, significant opportunity remains in the area of prevention.

In early 2009 the researcher, who is the Manager of the Employee Health Services met with the Vice President of Patient Care Services and provided detailed information from a literature search regarding of the value of implementing a Safe Patient Handling Program. She was impressed with the presentation and recommended the proposal be brought before all health system vice presidents. These meetings were arranged and the researcher provided the leaders with statistics regarding the number and severity of injuries and the financial impact on the organization related to workers' compensation costs. Data were provided indicating how average incurred costs per claims have been trending up significantly over the past few years. The highest cost claims are related to patient handling activities. The researcher recommended the formation of a SPH committee representing all areas with direct caregivers in order to develop a policy, and identify training and equipment needs. A certified professional ergonomist specializing in health care was brought in at the recommendation of our risk consulting group. He conducted tours of all areas in both hospitals, interviewed staff and assessed current patient handling techniques. He provided a detailed report with recommendations regarding policy, handling techniques and the purchase of equipment.

Within a short time approval was given to implement a system wide comprehensive SPH program. Approval was also given to hire a full time physical therapist with extensive experience in occupational medicine and patient handling training. A system wide clinical practice policy for SPH was written. A vendor fair was held and \$200,000 was used to purchase a variety of equipment including total lifts, sit to stand lifts, transfer gait belts, slip sheets for every patient room and pivot discs. All caregivers were required to attend a three hour training session that included class room instruction and hands on training with the new equipment. New hires attend the training as part of their orientation, and an annual competency process is being developed. Training for all patient caregivers was scheduled from June 1, 2010 – December 31, 2010.

Data Collection Methods

This study was a secondary data analysis of pre-existing data comparing pre and post intervention data specifically related to back injuries. Pre-existing data was collected from the following data bases owned by the institution: Ultipio, Cinch, and CompWatch, and the Employee Safety Portal. These data bases provide demographic information on employees, details of work related back injuries and total medical and indemnity costs. Data also were gathered from employee medical records housed in the Employee Health Services department. As manager of the Employee Health Services for the institution the researcher had access to these records and data bases. Approval was obtained from the Vice President of Brand and Talent Management of the institution to access the records and data bases (Appendix A).

It has been observed that the health care system's newer and longer tenured employees are injured most often. Workers' compensation claims by tenure stratification 2005-2008 claim years indicate that the employees injured most frequently are those employed up to one year, and those employed greater than ten years (see Table 1). The highest percentage of back injuries in

these groups is directly related to patient handling activities. These injuries also account for the highest total incurred costs.

Sample

The sample for this study was selected from the target population for the SPH program and included direct care givers from select areas of the acute care hospital. Staffs that were required to participate in patient handling activities on a regular basis were included. The acute care areas included eight 24 bed units comprised of medical, surgical, oncology, orthopedic, telemetry and acute care dialysis patients. Staff from diagnostic imaging, special procedures, surgery pre-testing, surgery (including pre-anesthesia and recovery), ambulatory surgery, labor and delivery and cardiology testing were included. Job titles for this population included nurses, patient care assistants, technicians, and radiology technicians. Exclusion criteria included employees currently out on leave or disability and those with a current injury that restricts regular duty.

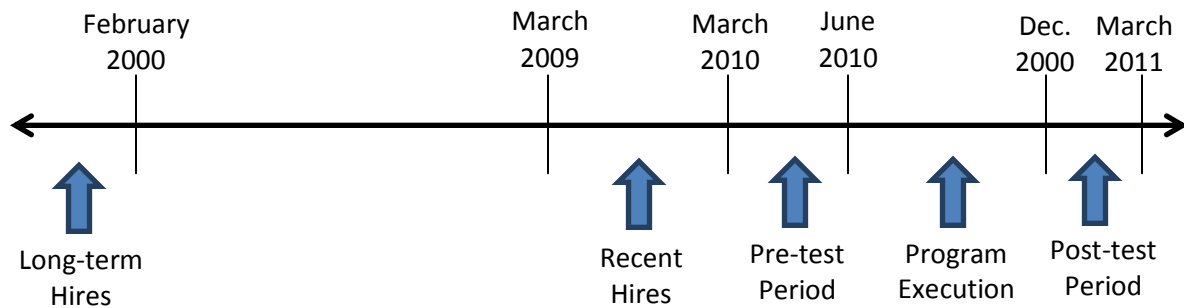
Table 1. Claims by tenure stratification 2005 – 2008 valued as of 12/31/2008.

Tenure Stratification	Number of Claims	Average Incurred	Total Incurred
A – Up to 1 Year	108	\$9,707	\$1,048,355
B – 1 to 2 Years	69	\$3,861	\$266,408
C – 2 to 3 Years	55	\$5,216	\$286,860
D – 3 to 4 Years	44	\$4,365	\$192,080
E – 4 to 5 Years	20	\$5,036	\$100,721
F – 5 to 10 Years	79	\$6,422	\$507,364
G – Greater than 10 Years	107	\$5,802	\$620,832
Grand Total	482	\$6,271	\$3,022,620

Sampling

As previously mentioned, the SPH training occurred from June 1, 2010 through December 31, 2010. The purpose of this study was to compare back injury rates, injury severity, and financial cost among the high risk groups pre and post training. The three month pre-training period was defined as March 2010 through May 2010 (see Figure 2). The three month post-training period was defined as January 2011 through March 2011. The two groups sampled for this study included new employees (n = 89), those employed March 2009 through May 2010, and longer tenured employees (n = 144), those employed at least ten years prior to the pre-training period, hired in February 2000 or before.

Figure 2. Project timeline.



Hypothesis

Implementation of a comprehensive Safe Patient Handling (SPH) program in an acute care hospital will result in lower rates of back injury, severity, and workers' compensation costs to the health system among high risk populations of direct caregivers employed up to one year and greater than ten years within the institution.

Human Subjects Protection

As previously stated pre-existing aggregate data was collected from the following data bases owned by the institution: Ultipro, Cinch, Compwatch, and employee medical records located in the Employee Health Services department. At the time of retrospective record review, each study subject was assigned an ID number selected from a table of random numbers.

Collected data were stored on a flash drive which was kept in a locked cabinet in a locked office that only the researcher had access to. The office is located in the Employee Health Services Office at the institution. No data were stored on computers. The researcher has been trained in issues of confidentiality, and has successfully completed the National Institutes of Health Web-based training course “Protecting Human Research Participants.”

IRB approval was obtained from the Institutional Review Board at St. John Fisher College (Appendix B) and the Unity Health System Institutional Review Board (Appendix C).

Research Variables

It was important to identify musculoskeletal disorder (MSD) back injuries related to patient handling and identify staff and staff characteristics involved with the injuries. Variables such as job title, department, date of injury, and length of service were identified for analysis. In addition, key outcome variables included frequency, severity of injury and cost of injury claim.

Severity was categorized as 1 = mild (incurring no cost, and no lost time), 2 = moderate (incurring costs less than \$2000, and or lost time less than one week), and 3 = severe (incurring costs greater than \$2000, and or lost time greater than one week). These parameters are routinely used by the institution in categorizing severity of workers’ compensation injuries.

Data from total incurred workers' compensation costs were collected from MSD back injuries pre-program to be compared with post-program data. Data on demographic variables such as gender, ethnicity, and age was also collected.

Data from total incurred workers' compensation costs were collected from MSD back injuries pre-program to be compared with post-program data. Data on demographic variables such as gender, ethnicity, and age also were collected.

Data Analysis

Data were analyzed on the Statistical Package for the Social Sciences (SPSS) program. Because no individuals had injuries in both the pre and post-training periods, analyses to identify mean differences in the severity of injury and cost of injury between pre and post-training periods were run as independent samples t-tests. To identify whether there was a significant difference in the frequency of injuries between the pre and post-training periods, a chi-square test was computed. Results of the statistical analyses are reported in the next section.

Conclusion

Caregivers are challenged daily with providing timely, safe and quality care to patients in acute care facilities. Traditionally in this researcher's healthcare facility the emphasis has been on providing patients with a quality and safe environment. Clearly, our healthcare institutions need to equally emphasize the need to ensure that our caregivers are also afforded an environment of quality and safety. Study findings from the literature review and this project will enhance continued, measurable advances toward this important goal.

Chapter IV

Descriptive Statistics

Descriptive statistics of the sample on demographics and key outcome variables are presented in Table 2. The total sample (n=233) had a mean age = 43.18 (SD = 12.12.87), was 87 percent women, 86 percent were of White/ Caucasian ethnicity with the remaining 14 percent categorized as other. No individuals experienced an injury in both the pre and post-training periods, with 10 total injuries reported in the pre-training period and 6 reported in the post-training period. Seventy percent of the pre-training injuries (7 of the 10 injuries) were due to a back injury whereas eighty percent of the injuries incurred during the post training period were back related.

Table 2. Descriptives of the sample and key variables (N = 233).

	Total Sample	New Hires	Long-term Hires
N	233	89	144
Mean Age (SD)	43.18 (12.87)	31.37 (8.92)	50.47 (8.92)
% Female	87%	84%	90%
% White/Caucasian	86%	80%	90%
# Pre-training Injuries	10	7	3
# Post-training Injuries	6	2	4
% Pre-training Back Injuries	70%	57%	100%
% Post-training Back Injuries	80%	100%	75%
Mean Pre-test Severity	1.7 (0.7)	1.57 (0.5)	2.0 (1.0)
Mean Post-test Severity	1.0 (0.0)	1.0 (0.0)	1.0 (0.0)
Pre-training Total Cost	\$19129.00	\$3092.00	\$16037.00
Post-training Total Cost	\$898.00	\$273.00	\$625.00

Results

Upon reviewing results after some analyses, several outcomes were not statistically significant. This is likely an issue of not having enough statistical power to detect relationships. There were only 10 injuries in the pretest period and 6 injuries in the post period. While this is a 40% decline, it is too small a frequency of injuries for the chi-square test to significantly differentiate.

A t-test of independent samples was executed to determine whether the mean total cost at pretest was significantly different from the mean total cost at post-test. The analysis approached significance in the expected direction ($t [14] = 1.14, p = .13$), such that the post-training cost of injury was lower compared to the pre-training period. This means that while the total cost after the intervention was smaller, because of the small sample size the t-test did not have enough statistical power to detect a significant difference in cost.

However, when a t-test was computed to evaluate mean differences in the severity of the injury between pre and post-test periods, a significant difference was identified. In relation to injury severity, despite the fact that the sample size was small, injuries in the post-training period were significantly less severe in comparison to the pre-training period ($t [14] = 2.5, p < .01$). This is a significant result given the smallness of the sample.

Support of Hypothesis

Despite the fact that this study was small, and conducted over a relatively short period of time, the results related to severity of injury post program implementation clearly indicate potential benefit not only to employee well being, but to the financial bottom-line of the institution

Chapter V

Discussion

It is clear that healthcare organizations need to place a high priority on developing plans and policies to address the issues related to safe patient handling. The literature clearly supports this, as do the results of the research described in this study. Patient handling and moving tasks are physically demanding, performed under unfavorable conditions, and are often unpredictable in nature. High risk handling tasks are numerous including vertical transfers, repositioning in bed, toileting tasks, transporting in a bed or stretcher, ambulating patients, and lifting and holding extremities to name a few (Nelson & Baptiste, 2006).

Institute of Medicine Core Competencies

It is important to note that instituting such policies specifically reflect three of the five core competencies for healthcare professionals recommended by the Institute of Medicine for all programs and institutions engaged in the education of health care professionals (Institute of Medicine, 2009). Working in interdisciplinary teams is a core competency that was utilized in this project. It will be imperative for all disciplines to cooperate, collaborate constructively and communicate continually to assure that the endeavor is successful. Employing evidence-based practice is the second core competency that was used for this project, as research is integrated with our plan of action (Institute of Medicine, 2009). The third core competency involves the application of on-going quality improvement. This will involve developing the structure of the program, identifying the means to measure success, and a process for continuous improvement (Institute of Medicine, 2009).

Theoretical Framework

It is important to note that Lewin's first step in initiating change "unfreezing" was successfully completed within the institution pursuing implementation of the SPH program described.

The second step in Lewin's theory is moving (Schein, 1995). This is the phase when a clear plan of action to initiate the actual change is identified. Through a multi-disciplinary process this step has been successfully set in motion within this organization as implementation of a Safe Patient Handling Program is pursued. The final stage of Lewin's theory is refreezing (Schein, 1995). This involves efforts to assure that the "change" remains intact and continues. This will be critical as key staff or committed "players" must be involved at this stage of the process to provide on-going training and education. This group must have the capability and authority to re-assess criteria and recommend modifications to the program and needed. Plans must be in place to evaluate the effectiveness of the program on a regular basis.

Limitations

Limitations of this study included small timeframes of study, and relatively small samples. Despite these limitations, trends appear to be in the expected directions illustrating that the implementation of procedures and policies to promote safe patient handling may benefit both the health of care providers and institutional finances.

Strengths

Strengths of this study clearly indicated effort in a positive direction that promoted optimal outcomes in reducing the incidence and in particular the severity of employee work related injury due to patient handling activities.

Dissemination

Results of the success of this institution in implementing a comprehensive Safe Patient Handling Program have been shared with other institutions. Much information is related to overall comprehensive implementation and the numerous logistics involved, many of which were unexpected. Research regarding institutional progress in fully implementing a successful program will continue, with multidisciplinary devotion to the project that will result in great benefit to the entire organization.

Implications for Practice

Advanced practice nurses have the education and experience to effect positive change on many levels. These nurses practicing in the field of occupational health have first-hand information related to the incidence and severity of work related musculoskeletal injuries. Advanced practice nurses also are well positioned within health care institutions to educate and advise administration about the advantages of safe patient handling programs. Specific knowledge about their organizations allows for them to participate in observation and analysis of trends. It seems only appropriate that we strive to identify and initiate change projects that will have significant and positive effects on, not only our institutions, but also on the nursing profession.

Future Research

This study was conducted over a relatively short period of time pre and post implementation of a major project in a large healthcare institution. Similar additional research spanning longer timeframes post implementation, will further validate the importance of safe patient handling programs for all healthcare institutions.

Conclusions

The current study supported existing research that the implementation of comprehensive Safe Patient Handling programs can be beneficial to both employees and employers. How individual institutions plan and design programs is integral to their success. Continued monitoring and modification of programs, as appropriate, can keep them on track and successful. Improved quality of the work environment can promote staff retention, reduce lost time due to injury, and assist in recruiting quality staff, critical issues associated with the nursing shortage. The appropriate use of safe patient handling techniques must be integrated into the accountability of every caregiver. Creating an environment conducive to safe patient handling includes the safety of caregivers as well as patients.

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Appendix A



January 28, 2010

Institutional Review Board
St. John Fisher College
3690 East Avenue
Rochester, NY 14618

To the Institutional Review Board:

Patricia Ryan has permission to access Unity Health System Workers' Compensation data in the following data bases; CompWatch, PMA Cinch, Ulti-pro and the Unity Employee Health Safety Portal. She also has permission to access Unity Employee Health files.

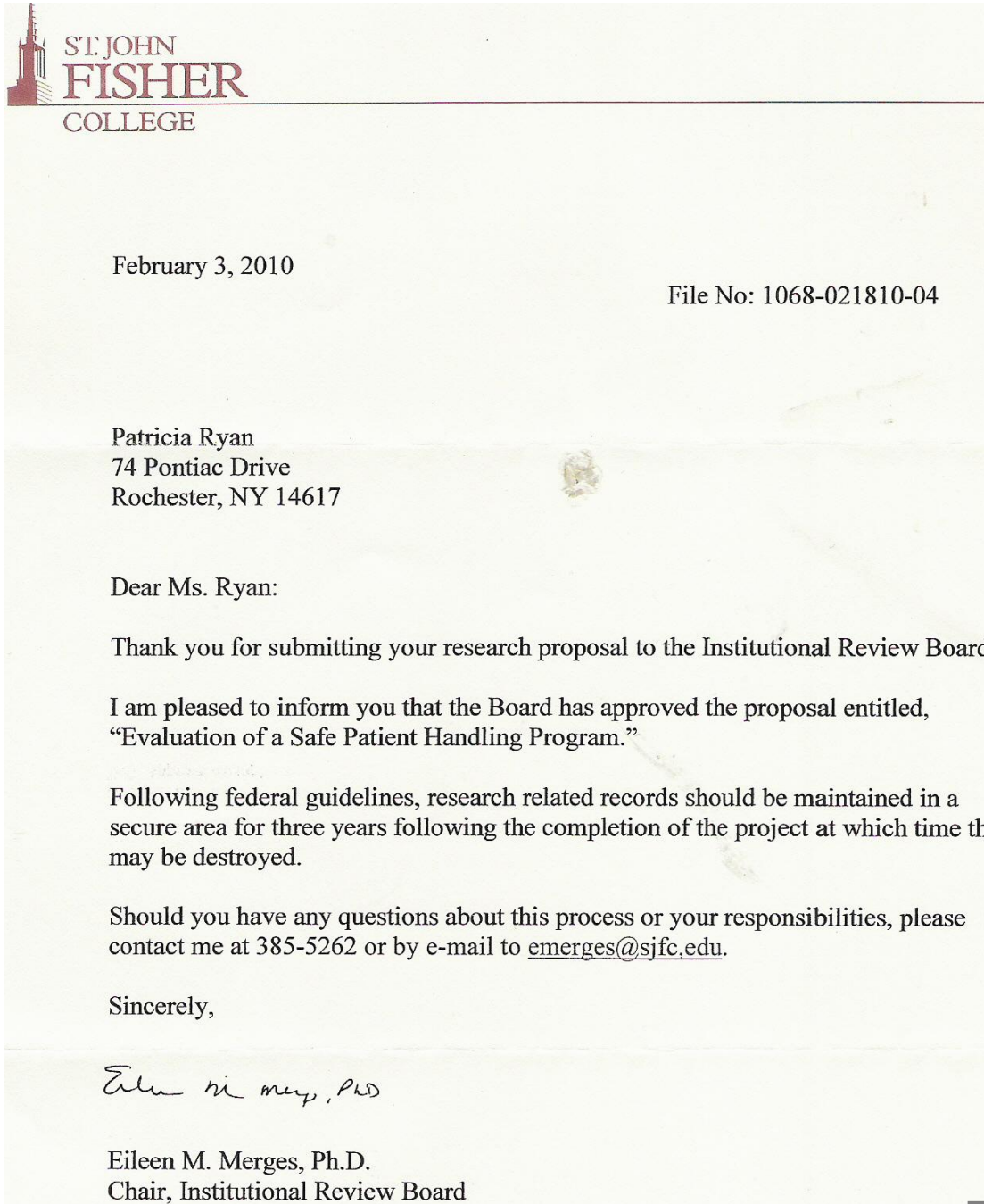
Review of this data is for the purpose of research required by her participation in the MS Graduate Program at the Wegmans School of Nursing.

Respectfully,

A handwritten signature in black ink that reads 'Maryalice Keller'.

Maryalice Keller
Vice President
Brand and Talent Management
Unity Health System

Appendix B



Appendix C



INSTITUTIONAL REVIEW BOARD

Unity St. Mary's Campus

89 Genesee Street

Rochester, NY 14611

(585) 368-3412

Date: 1/28/2010

Principal Investigator: P. Ryan

Title: Evaluation of a Safe Patient Handling Program

I reviewed the above referenced study and determined that it does not require continuing review by the Institutional Review Board and is classified as Exempt because the research involves retrospective chart review that will not allow for direct identification of human subjects

Please contact the IRB Office at 368-3412 should you have any questions.

George Nasra, MD

Chair