Work 78 (2024) 99–109
DOI:10.3233/WOR-230453
IOS Press

Work-related injury or work-related pain? A qualitative investigation of work-related pain and injury management among rehabilitation professionals[1]

Kimeran W. Evans[a,*], Douglas Myers[b] and Kathleen Rockefeller[c]
[a]*Division of Physical Therapy, West Virginia University, Morgantown, WV, USA*
[b]*Department of Community and Environmental Health, Boise State University, Boise, ID, USA*
[c]*College of Health Care Sciences, Nova Southeastern University, Clearwater, FL, USA*

Received 22 August 2023
Accepted 19 January 2024

Abstract.
BACKGROUND: Patient mobility tasks place rehabilitation professionals (Physical and Occupational Therapists) working in hospitals at high risk for work-related musculoskeletal disorders (WMSDs). However, when investigating engagement with a Safe Patient Handling and Mobility program (SPHM), administrative records at a level one trauma hospital showed that rehabilitation professionals reported zero work-related injuries over an eight-year period.
OBJECTIVE: As part of a qualitative study conducted to discover their unique work experiences, we explored some of the reasons that rehabilitation professionals might not report work-related injuries to their employers.
METHODS: Using a collective case study design, six focus groups were conducted with 25 members of the rehabilitation team within a level-one trauma hospital. Focus groups were recorded; transcripts were analyzed for emergent themes using first and second cycle coding procedures.
RESULTS: Participants in this study denied experiencing work-related injuries but frequently described working in pain, often attributed to patient mobility tasks. These experiences were not reported to employers. Self-management of their pain through co-worker treatment, over-the-counter medications, or informal alteration in job tasks were reported as common.
CONCLUSION: Administrative injury records may underrepresent injuries among rehabilitation professionals. This may be due to their perception of work-related pain as something different than work-related injuries, or that many of these rehabilitation professionals treat their own work-related pain and symptoms rather than report them. To get a more accurate assessment of injury frequency among rehabilitation professionals, researchers should gather information directly from the participants, and should inquire about work-related pain in addition to injury.

Keywords: Injuries, pain, rehabilitation, physical therapists, occupational therapists, hospitals, occupational groups

1. Introduction

Hospital workers in the United States experience one of the highest injury rates among all industries [1]. The most recent Bureau of Labor Statistics (BLS) data in 2021 reported an injury rate of 7.6 injuries per 100 full time hospital workers (FTE) [2]. This places it in the top 15 industries with highest reported worker

[1]This paper is based partially upon the primary author's dissertation work.

*Address for correspondence: Kimeran W. Evans PT, DPT, PhD, Associate Professor, Division of Physical Therapy, West Virginia University, PO Box 9226, Morgantown, WV 26506, USA. E-mail: kwevans@hsc.wvu.edu or 304-293-1732.

injuries. Many injuries among healthcare workers, especially in the acute care setting, are related to patient mobilization [3–5]. This is especially true for healthcare professionals (nurses and rehabilitation professionals) who regularly perform patient mobility tasks [4, 6–13] that include repetitive lifting and awkward posturing.

The recognition of these work-related injuries due to patient mobility have led to the formation of work safety programs aimed at improving work safety in acute care environments. These programs, known as Safe Patient Handling and Mobility (SPHM) programs, are comprehensive in nature and include engineering controls through large scale purchasing of mechanical lift equipment, implementing administrative policies and procedures to support the use of this equipment, and holding regular trainings and team meetings regarding the use of this lift equipment [14–17]. These programs have been shown to decrease the work-related injuries acquired during patient mobility tasks [18–21].

Though less studied than other healthcare professions, several studies have quantified work-related injuries among rehabilitation professionals (Physical and Occupational Therapists and Assistants) [4, 6, 13]. In a prospective cohort study of nearly 900 Physical Therapists nationwide, Campo et al found a one-year incidence rate of new musculoskeletal disorders of 20.7% and a prevalence of musculoskeletal disorders of 57.5% [4]. This same study found increased odds of experiencing a work-related injury among Physical Therapists when transferring or moving patients 6–10 times per day or repositioning patients in bed more than 10 times per day [4]. In a regional survey of 1,189 Physical and Occupational Therapists, Darragh et al found an incident rate of new work-related injuries of 17/100 Full Time Equivalents (FTEs) [6].

Despite this research that demonstrates that rehabilitation professionals do experience work-related injuries, there remains evidence that they do not report these injuries to their employer. Studies that suggest pride in their work and the choice to self-manage are potential reasons for this lack of reporting [22]. However, much remains to be learned about the injury experience in this work group who are heavily involved in patient mobility tasks in inpatient settings so that work-safety SPHM programs can be best fit and adopted by this work group [12].

As part of a larger study by the current study authors assessing rehabilitation professionals' engagement with an SPHM program in a large, Level 1 trauma hospital, it was observed that rehabilitation professionals reported no injuries to their hospital administrators over an eight-year period. Given the expected injury rates reported by the Campo and Darragh studies, both of which used survey methods to capture injury information, it was unlikely that no injuries had occurred in this population. Therefore, the purpose of this qualitative study was to explore the unique work-related injury experiences of rehabilitation professionals working in the acute care setting, including potential reasons for not reporting injuries experienced at work.

2. Methods

2.1. Research design

With a primary study goal of generating an in-depth description of a bounded system, a qualitative collective case study design was employed [23, 24]. The bounded system was an SPHM program and multiple (collective) cases were selected to capture perspectives within this system. The cases were the various rehabilitation professionals.

A collective case study approach allows researchers to study complex phenomena in its natural setting and provides a rich, holistic description of beliefs held by of the system's members [23, 24]. Cases were selected based on the study's purpose and what these participants can reveal about the system or topic of interest, namely, their work-related injury experiences and their perspectives and thoughts around these experiences.

2.2. Study site and worker population

The study site was a large academic medical center, which had established an SPHM program five years prior to the study. This SPHM program was comprehensive in nature including extensive lift equipment purchasing and administrative policy changes around patient mobility. The medical center employed approximately 50 full-time rehabilitation professionals who, by the nature of their work, took part in patient mobility/handling tasks.

2.3. Investigator perspectives

The study team consisted of two Physical Therapists with doctoral degrees in Occupational Health and one Occupational Health Research Scientist with

a doctoral degree in Epidemiology and research experience in this field, including qualitative focus group research. Perspectives on the study findings were enhanced by this diverse team. Team members discussed and recognized contributions and biases during the research process. No study team members worked directly with any study participants and no hierarchical relationships existed between any participants and any research team member.

2.4. Sampling strategy

Purposeful sampling methods were employed to gather data [24]. Following the collective case study approach, a group of participants most suitable for informing the researcher about the research problem under examination were sampled [24]. Therefore, Physical and Occupational Therapists and Assistants who routinely performed patient mobility tasks during their workday were recruited. Study site gatekeepers, who informed the population via word of mouth and emails which included a recruitment flyer, were utilized to recruit participants. Participants expressed interest to the primary study investigator via email.

This study was approved by the Institutional Review Board. Informed consent was obtained before the start of each focus group. Trustworthiness was ensured by including the IRB-approved cover letter with recruitment materials and by reviewing the same letter with participants at the time of the interview. Anonymity was also ensured in voice recordings and typed transcripts.

2.5. Data collection procedures

We utilized focus groups as the primary method for data collection because they allow for participant discussion and interactions [23]. Focus groups, when compared with individual interviews, can improve robustness of the discussion as participants can include thoughts or ideas that may be sparked by the discussion of other participants. This is particularly beneficial for topics, such as experiences at their workplace, which can be discussed comfortably in everyday life [23]. Focus groups participants consisted of various combinations of rehabilitation professionals and sessions were scheduled and structured based on participant availability. A semi-structured interview guide developed by study investigators was used to ensure discussion of work injury experiences and a variety of other work-related subjects. Sessions lasted between 60 and 90 minutes (*See Table 1 for Focus Group Guide*).

Originally, all focus groups were expected to take place in person. However, due to the COVID-19 pandemic, three of the six focus groups had to be held via Zoom virtual meeting technology. Sessions were recorded and alias names were used to ensure anonymity. Investigators took field notes during each session. All data were transcribed using the human transcription option through Rev.com [25]. Injury records for the years 2012–2020 were gathered from the hospital safety department. Injury records contained worker data including occupation, various injury characteristics, and situational factors around the reported injury.

2.6. Data analysis procedures

Thematic coding was used to analyze the qualitative data. Using this approach, investigators identified common feedback and established a "framework of thematic ideas" as described by Gibbs [26]. The transcribed data were analyzed independently by the primary and secondary investigators using first and second cycle coding procedures(27). Primary and secondary study authors met frequently to compare and discuss emerging themes. After first cycle coding was performed by hand, a chart was created in Microsoft Office Word for secondary coding and analysis that included initial codes and emerging themes as decided on by primary and secondary study authors. Attribute coding, descriptive coding (topic based) and *in vivo* coding (terms used by participants themselves) were the first cycle coding procedures employed. This was done using a sentence-by-sentence initial coding process and then holistic paragraph by paragraph coding to develop open code categories [27]. Secondary coding included pattern coding to group the initial codes and develop emerging themes.

3. Results

3.1. Study participants

Twenty-five rehabilitation professionals (11 Physical Therapists, 11 Occupational Therapists, and 3 Physical Therapist Assistants) participated in six focus groups over a nine-month period. Focus groups included between three and eight participants. The years of work experience among participants in the hospital setting ranged from 7 months to 14.5 years

Table 1
Focus Group Domains and Questions

Focus Group Guide	
Domain	Questions
I. Introduction and Work Description	• Let's go around the table and have each person say your alias, age, and job. • Describe the day-to-day aspects and requirements of your job. • What role does patient mobility play in your daily job tasks? • What are the greatest patient mobility issues that you face? • How has your job changed over time?
II. Work-Related Injuries	• What are your thoughts regarding hazards of patient handling for (nurses, rehab professionals)? • Describe work-related injuries for yourself or coworkers. • Which activities at work place yourself and your coworkers at greatest risk of injury? • What do you do to reduce your risk of patient handling injury at work? • What happens when someone is injured at work?
III. Safe Patient Handling Program Experiences	• In 2015, a lift equipment program was implemented in this hospital. How is this going? • What is working? What is not working? Why? • In what ways are you involved in the lift equipment program? • Describe the initial training process on the equipment. What worked? What might you improve? • Describe the ongoing training/retraining process on the equipment. • What are your thoughts on the use of the equipment to prevent work-related injuries? • How does the equipment change your day-to-day work? • How would you describe the patient reaction when lift equipment is used? • Describe the interaction of your profession with other professions regarding equipment use.
IV. Equipment Uses and Needs	• What type of equipment do you use most commonly? Least commonly? Which do you enjoy using the most? The least? • Are you more likely to use various devices with certain types of patients? Which types? Why? Why not? • What are some things that work well with the equipment? What needs improvement?
V. Organizational and Structural Effects	• In what ways is your director (boss) involved in the lift equipment program? • What does your director (boss) do to promote the use of the lift equipment? What could they do to better promote the use lift equipment? • What is your director's (boss') response to a concern with the lift equipment? A work-related injury?

and their overall time from graduation ranged from three to 26 years. All but one of the participants were female (*See Table 2 for Participant Demographics*).

3.2. Injury reports and qualitative themes

There were zero injuries reported to hospital administrators among rehabilitation professionals over an eight-year period, from 2012–2020 (per OSHA logs and hospital safety records). Qualitative methodology was employed to explore reasons behind this lack of reporting. Following qualitative data analysis, six primary themes related to work-related injury experiences among rehabilitation professionals emerged. These included the central role of patient mobility, task risk, non-reporting, working in pain, equipment's protective effect, and self-management measures. The relationship of these themes can be seen in Fig. 1.

Previous research has clearly established that patient mobility is a central role of rehabilitation professionals work that carries an injury risk with injuries acknowledged in this work group but not always reported. Additionally, lift equipment has been shown to decrease this risk of work-related musculoskeletal injuries when used as part of a comprehensive SPHM program. This study adds to the existing knowledge base by clarifying that the language used around work-related injuries and pain in this group is important as rehabilitation professionals may be more likely to acknowledge work-related pain than injury. Therefore, potential reasons for lack of reporting include defining these work-related events as pain and not injury while self-managing this pain through self-limiting of work-related tasks and performance of treatment techniques learned and practiced by rehabilitation professionals.

3.2.1. Central role of patient mobility

When describing their day-to-day work, participants overwhelmingly described patient mobility as the primary or central aspect of their job. Central to these patient mobility tasks was the idea of a therapeutic value to the mobility.

> "*PT, that is our job [patient mobility] . . . our biggest goal is to get people up and out of bed and moving, and then see how much help they need with that . . . mobility is what we do here*."

Table 2
Demographic Information of Focus Group Participants ($n = 25$)

Focus Group	Participant #	Sex	Profession	Total Work Experience (Yrs)	Acute Care Experience (Yrs)
1	1	F	PT	4	4
1	2	F	PT	8	8
1	3	F	OT	9.5	NR
2	4	F	PT	8	3
2	5	F	PT	3	3
2	6	F	PT	10	10
3	7	F	OT	12	3
3	8	F	PT	3	2
3	9	F	PT	5	3.5
4	10	F	OT	13	13
4	11	F	OT	10	8
4	12	F	OT	8	6
4	13	F	PTA	NR	7mo
4	14	F	OT	26	7
5	15	F	OT	NR	5
5	16	F	PTA	NR	3
5	17	F	PT	NR	14
5	18	F	PTA	NR	11
5	19	F	PT	NR	14.5
5	20	F	PT	NR	2
5	21	F	OT	NR	3
5	22	M	PT	NR	4
6	23	F	OT	3	2.5
6	24	F	OT	10	10
6	25	F	OT	4	4

PT = Physical Therapist, OT = Occupational Therapist, PTA = Physical Therapist Assistant. NR = Not reported.

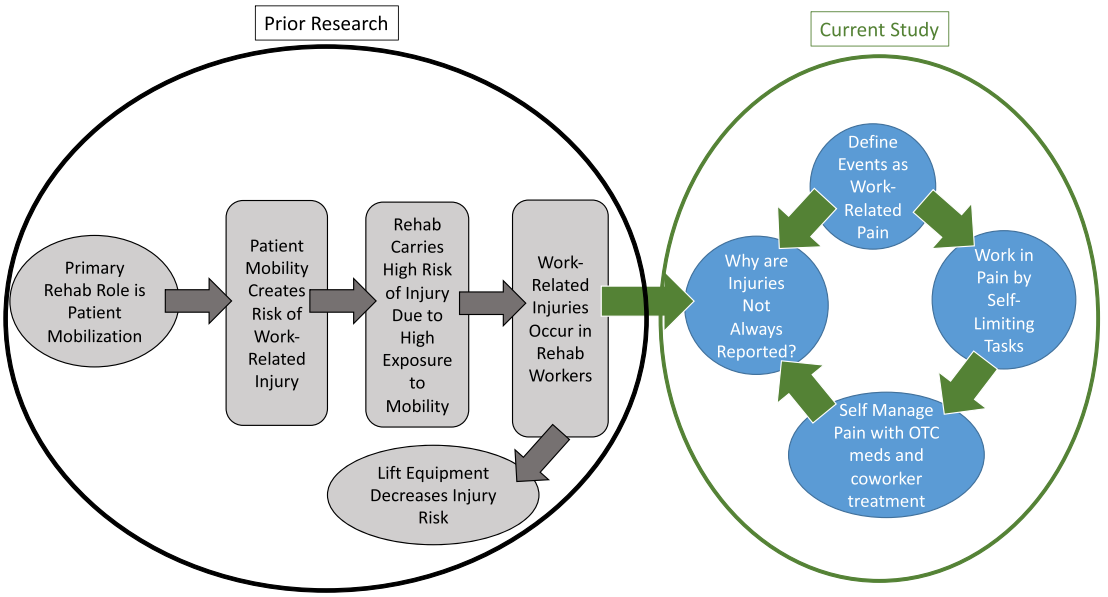

Fig. 1. Thematic diagram.

"*The only time I'm not mobilizing the patient is when I'm chart reviewing or documenting*."

Within this description of patient mobility, rehabilitation professionals explicitly illustrated the differences between themselves and nurses. These differences were described from a rehabilitation perspective and included patient involvement in the process and use of mechanically-driven mobility techniques.

"*. . . they're [nurses] doing to get a patient from A to B . . . and for us, we're trying to get the patient as involved in the movement as possible . . .* "

"*Nurses get the lift training but we have the skills and the knowledge set from being in school to know how to properly use our bodies to help that individual up into the [manual standing and raising aid].*"

3.2.2. Task risk

Multiple patient mobility tasks were cited as risky by participants. These included repositioning in bed, bed mobility/supine to sit transfers, and stand pivot transfers. However, there was no consensus on which patient mobility task presented the greatest risk.

"*I would probably say during bed mobility is where I am most at risk and have tweaked my back a couple of times, but nothing serious.*"

"*For me, it would be more during a lateral [stand pivot] transfer . . . because it's an awkward position to be in anyway, and I feel like you're already in a half squat yourself.*"

Some participants cited environmental factors including crowded or cluttered rooms, and greater patient dependence as risk factors.

"*Most times I can think of hurting myself is reaching for things in a patient room that is cluttered and/or crowded.*"

"*I definitely will have patients that require a lot more assistance and maybe more time is spent with them. So, usually the next day we're all pretty sore from that but not enough that it felt like I couldn't do my job safely.*"

3.2.3. Non-reporting

Participants in our study denied experiencing injuries at work. Additionally, no one reported a work-related injury to their manager but participants agreed they felt their manager would have been supportive should an injury report be warranted. They also denied serious injuries or having to miss work due to the pain or injury.

"*I have not been seriously hurt or anything like that. I will say, like if I have some larger patients for like a couple of weeks, I feel it. I can't ever say that I've gotten injured. Luckily.*"

"*I myself have never really been personally injured that I had to go see a doctor or go to employee health or anything at work.*"

"*. . . so I work in pain a good bit but I've never been out of work because of an injury.*"

3.2.4. Working in pain

Although participants denied experiencing injuries, several indicated they had worked in pain caused by job tasks. The frequency of working in pain varied greatly from several times a year to multiple times a week. Participants felt overall that the rate of injuries among rehab professionals was low especially when compared to nurses or other professions.

[When asked how common it is to work in pain]:

"*Honestly, just a couple of times a year . . . not very often.*"

"*Maybe once a week . . . .maybe a handful of times during the week, once or twice.*"

"*Although I think as a whole we have far fewer injuries than we hear about in other departments. Far fewer injuries than nursing for example.*"

3.2.5. Equipment's protective effect

Unequivocally, all participants reported that the use of the lift equipment during patient mobility reduced the risk of pain or injury although did not eliminate it completely. Some believed the equipment reduced risk more significantly than others. This was especially true with the manual standing and raising aid that was the most commonly used piece of equipment among this study population.

"*The more we use the lift equipment, I don't feel as strained or pulled muscles or anything like that.*"

"*. . . the [manual standing and raising aid], I think that's a huge saver of injuries personally.*"

"*. . . we talk amongst ourselves . . . oh that was a really heavy lift . . . we should have utilized the*

[manual standing and raising aid] or something to help us out. So, yes, I do see without the equipment, it's likely for injury amongst ourselves."

3.2.6. Self-management measures

Participants reported that self-treatment of work-related causes of pain was common through three primary methods including co-workers treating each other, the use of Over the Counter (OTC) medications, and self-limitation of work-related tasks. They were quick to state that one of their co-workers who used to work in an outpatient setting would perform hands-on, manual therapy treatments to manage their symptoms.

"*We have a few physical therapists who used to work in outpatient and they do a lot of manipulations and readjusting of all of us.*"

"*Whenever there was a heavier assist, I can almost tell immediately and have one of our PTs here put me back in alignment.*"

The second way that participants self-managed their work-related pain was through OTC medications. Some participants described having a bottle of ibuprofen within the rehab department that they shared when needed. However, other participants denied taking OTC medications.

"*We take some advil and move on with life.*"

"*We have a community bottle of [ibuprofen].*"

The final aspect of self-management of work-related pain described by participants was self-limiting their work-related tasks or having co-workers provide physical assistance while the pain persisted.

"*Yeah, I mean sometimes for me, it's as simple as switching sides or switching a dominant arm.*"

"*You tell your teammates, and they'll do more.*"

"*I think you limit yourself, probably, in the next days, while you are still injured.*"

4. Discussion

This study provides an in-depth description of the work-related experiences and injury management among rehabilitation professionals in acute care environments including the perceived risk of work-related injuries and methods to minimize this risk and subsequent pain. Broadly, this study is consistent with previous research in which patient mobility is described as the central role of rehabilitation professionals [5, 6, 28]. Patient mobility was described in this study as anything that involved purposeful and skilled movement of the patient from repositioning in bed, to sitting up out of bed (supine to sit transfer), to transferring from sit to stand, and ambulation. Central to these patient mobility tasks was the idea of a therapeutic value to the mobility. This was described by participants as prioritizing patient involvement in the mobility task. The central nature of patient mobility combined with the importance of a therapeutic value to the patient are unique to the rehabilitation team.

Participants in this study contrasted their role with that of nurses and perceived the nursing role to be more oriented to the end goal of getting patients from one point to another safely rather than working to involve them in the mobility process. This is most likely due to the varied and broad scope of nursing practice compared with a more central, primary role of patient mobility for rehabilitation professionals. The literature supports this hypothesis indicating that the role of nurses is quite varied and includes items such as providing a safe environment, communication, breathing support, eating and drinking support, elimination, cleansing and dressing, rest, controlling body temperature, mobility, work and play, and end of life care [29]. This broad and varied scope of nursing practice contrasts with our study among rehabilitation professionals where patient mobility is described as the central work task in this acute care environment.

Tasks and mechanics used by rehabilitation professionals when mobilizing patients may also differ from other professionals' (primarily nurses) [28]. These tasks often require longer duration or higher repetitions, as it is the central aspect of their patient care plan. Given that the specific work tasks are different, the work-related injury experiences and risks may also differ within this rehabilitation group.

Patient mobility tasks have been shown to increase the risk for a work-related injury [4, 8, 30, 31]. Despite this central role of patient mobility among rehabilitation professionals and its associated injury risk, the participants in this study denied experiencing injuries at work. When asked about their work-related injury experiences, study participants reported frequently working in pain but did not define these to be work-related "injuries." This theme is supported by hospital injury data at the study site in which zero members of the rehabilitation team reported injuries

in the eight years since SPHM program implementation (2012–2020).

Previous studies have suggested that the culture of independence and pride in the mechanics of their physical work has created a reluctance among rehabilitation professionals to acknowledge or report work-related injuries [6, 32, 33]. Cromie reported nearly 20 years ago that the idea of being seen as capable and hard-working may interfere with the recognition and reporting of injuries among Physical Therapists [32]. More recent work found that the central value among rehabilitation professionals was independence and a pride in their ability to perform lifting tasks safer than nurses [34].

Our findings suggest that the choice of wording when asking about work-related injuries among this work group might be important. When asked, all participants in our study denied injuries at work but were quick to state that they experienced pain during or after work-related tasks. A nationwide survey by Campo et al, found that when using a case definition of pain rated at 4/10 (on a 0 to 10 scale) lasting more than a week or present at least once a month, nearly 60% of Physical Therapists reported work-related pain during their career and 20% reported a new incidence of work-related pain within a one-year follow-up period [4]. This case definition did not include the word "injury". This was also seen in similar work using the same case definition in which 18% of Occupational Therapists and 16% of Physical Therapists reported a one-year incidence of work-related musculoskeletal symptoms [6].

When participants in this study experienced work-related pain, none reported this to their employer but instead chose various methods of self-management. These self-management strategies included treatment by co-workers, informal alteration in job tasks, and use of over-the-counter (OTC) medications. This is similar to previous work in this area in which Physical Therapists were not likely to report a work-related injury or seek medical treatment for the work-related pain [4]. The most common method of self-management among this study population was treatment by a co-worker. Participants often sought the care of co-workers who performed manual therapy treatments to the spine in order to help them manage work-related pain. A recent systematic review regarding work-related injuries among Physical Therapists found that over 61% of the PTs indicated that they had treated themselves or had sought treatment from a colleague for a WMSD [7]. A similar qualitative study with Physical Therapists who had been injured at work also reported seeking treatment from colleagues or other Physical Therapists [32]. This ability to self-manage is most likely an important reason for underreporting in this work group as they seem able to manage the pain acutely due to their training and skillset.

Informal alteration of work tasks was mentioned in this study and has also been reported in several previous studies among rehabilitation professionals [32, 33]. In a survey of Physical and Occupational Therapists in the mid-west, almost all participants continued to work even with a work-related injury and many of these reported altering their work habits due to the injury [6]. A survey of Physical Therapists and Assistants also reported that about 25% of therapists changed their work position in response to a work-related injury and about 40% increased their use or reliance on other members of the healthcare team [33]. Participants in our study also reported using OTC medications (primarily ibuprofen) to manage their symptoms. This avenue of self-management was either not reported in prior work or was denied by rehabilitation professionals who participated in previous research [32]. It should be noted that this alteration of work tasks was not something recommended by managers but rather designed by participants to keep working.

Despite rarely acknowledging or reporting work-related injuries, rehabilitation professionals in our study reported that the use of lift equipment did seem to decrease their pain and risk of injury. This was especially true with the manual sit to stand lift that they stated they used most commonly. This perception of the role of lift equipment in decreasing injury risk is consistent with a similar study among Physical and Occupational Therapists in which the results of focus groups indicated an acknowledgement of the role of the lift equipment in decreasing injury risk [35]. A recent narrative review of the literature regarding WMSDs among Physical Therapists described "self-protective behaviors" to avoid injuries and included mechanical lifts and slippery sheets as part of these strategies [7]. However, when directly comparing rehab professionals and nurses, Myers et al found that nurses were much more likely to acknowledge the protective role of lift equipment in decreasing injury risk [34]. More recent publications have found that current lift equipment does not meet rehabilitation professionals' needs and suggested potential changes that could improve therapeutic use of the equipment and, therefore, potentially reduce work-related injuries and pain [13, 36, 37].

As with any research study, there are both strengths and limitations to this project. The primary limitation of this study is the fact that this is a single-site study. Since qualitative case studies are not meant to be generalizable, comparisons must be made carefully and within the context of this setting and comparable settings in mind. In this case, it is worth noting that this setting was a teaching hospital in a small urban community and that comparisons outside this type of setting are particularly problematic. However, the SPHM program implemented is structured similarly to other SPHM programs nationwide and these findings may, therefore, be transferrable with consideration of contextual differences. In addition, many of our findings are similar to those demonstrated in other studies among rehabilitation professionals. More research at different study sites with varied methodology would help to validate these findings.

Additionally, due to the COVID-19 pandemic, the final three focus groups were held online. This has been previously cited as a less preferred method of small group discussion as participants may have less opportunity to respond to nonverbal cues of other participants due to lack of face-to-face discussion. However, study authors did not notice any appreciable change in the content of the discussion when compared to the three in-person focus groups performed pre-pandemic. Interestingly, the online method also significantly improved participants ability to participate given busy healthcare employee schedules.

Several study strengths also exist. These include the presence of a strong, comprehensive SPHM program at this facility, the willingness of the hospital employees to collaborate with this project, and the experienced and varied research team. The presence of an existing but relatively new SPHM program makes it an ideal time to study program effectiveness. This program meets all recommended criteria for an SPHM cited in several sources [20, 38–40]. This includes extensive equipment purchasing and strong training and support at the administrative and personnel levels. Program administrators and hospital employees were very open to and supportive of the research study. Finally, study investigators were able to combine varied but complementary experience in rehabilitation science, occupational health and qualitative research to design and analyze this qualitative project. After six focus groups with 25 total rehabilitation professionals, study investigators felt common themes had emerged indicating that saturation had been reached. The study purpose of discovering the specific details behind work-related injuries and management lends to the appropriateness of this qualitative collective case study to elucidate comment themes from the rehabilitation professionals' perspectives.

5. Conclusion

Rehabilitation professionals overwhelmingly described patient mobility as the primary aspect of their job. However, despite the fact that these patient mobility tasks have been shown to increase the risk of work-related injuries, zero injuries were reported by this staff of 50 rehabilitation professionals over an eight-year period. Participants in this study did not perceive pain initiated during work tasks as injuries, and they did not report these injurious events to their employer. Training for this work group that improves recognition of work-related pain as a potential work-related injury is suggested. Researchers studying injuries in rehabilitation professionals should be careful to inquire about work-related pain in addition to work-related injury, in case this perception regarding work-related injuries and pain is not unique to this study site. Additionally, our findings suggest that when measuring the effect of these SPHM programs on this work group, hospital injury records should not be the only source of information used but should be supplemented from information gathered directly from the workers.

Ethical (IRB) Approval *(protocol # 1903502326) through the West Virginia University Institutional Review Board.* Through this approval, this study complies with the Declaration of Helsinki ensuring adherence to ethical principles for medical research involving human subjects, including research on identifiable human material and data.

Informed consent

Informed consent was obtained prior to the start of each focus group using our IRB approved Cover Letter.

Conflict of interest

There are no conflicts of interest to disclose.

Acknowledgments

We would like to thank the rehabilitation professionals and administrators who supported and participated in this research project.

Funding

This research was supported in part by a grant from the U.S. Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health to the Johns Hopkins Education and Research Center for Occupational Safety and Health (award number T42 OH0008428).

References

[1] US Department of Labor. BLS Occupation Injury Rate Data 2018. 2018.
[2] (BLS) B of LS. Survey of Occupational Injuries and Illnesses 2018 Chart Package. 2018.
[3] Pompeii LA, Lipscomb HJ, Schoenfisch AL, Dement JM. Musculoskeletal Injuries Resulting From Patient Handling Tasks Among Hospital Workers. American Journal of Industrial Medicine. 2009;578:571-8.
[4] Campo M, Weiser S, Koenig KL, Nordin M. Work-related musculoskeletal disorders in physical therapists: a prospective cohort study with 1-year follow-up. Phys Therapy. 2008;88:608-19.
[5] Alperovitch-Najenson D, Treger I, Kalichman L. Physical Therapists Versus Nurses in a Rehabilitation Hospital : Comparing Prevalence of Work-Related Musculoskeletal Complaints and Working Conditions. Archives of Environmental & Occupational Health. 2014;69:33-9.
[6] Darragh AR, Huddleston W, King P. Work-Related Musculoskeletal Injuries and Disorders Among Occupational and Physical Therapists. Vol. 63, The American Journal of Occupational Therapy. 2009:351-62.
[7] Milhem M, Kalichman L, Ezra D, Alperovitch-Najenson D. Work-Related Musculoskeletal Disorders Among Physical Therapists: a Comprehensive Narrative Review. Int J Occup Med Environ Health. 2016;29:735-47.
[8] Darragh AR, Campo M. Work-Related Activities Associated with Injury in Occupational and Physical Therapists. Work. 2012;42:1-19.
[9] Vieria E, Schneider P, Guidera C, Gadotti IC, Brunt D. Work-related musculoskeletal disorders among physical therapists: a systematic review. J Back Musculoskelet Rehabil. 2016;29:417-28.
[10] Serranheira F, Sousa-Uva M, Sousa-Uva A. Hospital nurses tasks and work-related musculoskeletal disorders symptoms: A detailed analysis. Work. 2015;51:401-9.
[11] Bork BE, Cook TM, Rosecrance JC, Englehardt KA, Thomason MJ, Wauford IJ, et al. Work-Related Musculoskeletal Disorders Among Physical Therapists. Phys Ther. 1996;76:827-35.
[12] Harwood KJ, Darragh AR, Campo MA, Rockefeller K, Scalzitti D. A Systematic Review of Safe Patient Handling and Mobility Programs to Prevent Musculoskeletal Injuries in Occupational and Physical Therapists and Assistants. International Journal of Safe Patient Handling and Mobility. 2018;8:46-56.
[13] McCrory B, Ma J, Irons SL, Burnfield JM. Occupational injuries and patient lift usage among physical rehabilitation therapists. J Back Musculoskelet Rehabil. 2022;35(1):195-205.
[14] Department of Veterans Affairs and Veterans Health Administration. VA Directive: Safe Patient Handling Program and Facility Design. 2010.
[15] United States Department of Labor and Occupational Safety and Health Administration. Guidelines for Nursing Homes: Ergonomics for the Prevention of Musculoskeletal Disorders. 2009.
[16] Monaghan HM. Making Safe Patient Handling and Mobility Training Effective. Part 1. What to Teach, Where and When to Teach It and How to Teach It. International Journal of Safe Patient Handling and Mobility. 2019;9(4):143-8.
[17] Monaghan HM. Making Safe Patient Handling and Mobility Training Effective. Part 2. Assessing Competent Practice. International Journal of Safe Patient Handling and Mobility. 2020;10(1):37-41.
[18] Powell-Cope G, Toyinbo P, Patel N, Rugs D, Elnitsky C, Hahm B, et al. Effects of a national safe patient handling program on nursing injury incidence rates. Journal of Nursing Administration. 2014;44(10):525-34.
[19] Butler LA, Claycomb M, Stutzman S, Shutzer-Hill D. Reducing Patient Movement-Related Injuries Through the Development, Implementation, and Sustainability of a Comprehensive Safe Patient Handling and Movement Program. Am J Safe Patient Handl Mov. 2012;2(1):19-27.
[20] Yassi A, Cooper JE, Tate RB, Gerlach S, Muir M, Trottier J, et al. A Randomized Controlled Trial to Prevent Patient Lift and Transfer Injuries of Health Care Workers. Spine (Phila Pa 1976). 2001;26:1739-46.
[21] Kurowski A, Pransky G, Punnett L. Impact of a Safe Resident Handling Program in Nursing Homes on Return-to-Work and Re-injury Outcomes Following Work Injury. J Occup Rehabil [Internet]. 2019;29(2):286-94. Available from: http://dx.doi.org/10.1007/s10926-018-9785-7
[22] Cromie JE, Robertson VJ, Best MO. Work-related musculoskeletal disorders and the culture of physical therapy. Phys Ther [Internet]. 2002;82(5):459-72. Available from: http://www.ncbi.nlm.nih.gov/pubmed/11991799
[23] Merriam S, Tisdell E. Qualitative Research: A Guide to Design and Implementation. John Wiley & Sons; 2015.
[24] Creswell JW, Poth CN. Qualitative Inquiry and Research Design; 4th edition. Sage Publishing; 2017.
[25] Transcribe Audio to Text: Transcription Company & Website [Internet]. [cited 2020 Oct 6]. Available from: http://www.rev.com
[26] Gibbs G. Thematic coding and categorizing; Analyzing Qualitative Data. London: SAGE Publications, Ltd; 2007.
[27] Saldana J. The Coding Manual for Qualitative Researchers. Sage Publishing; 2015.
[28] Waters T, Rockefeller K. Safe Patient Handling For Rehabilitation Professionals. Rehabilitation Nursing. 2010;35:216-22.
[29] Kitson A, Conroy T, Wengstrom Y, Profetto-McGrath J, Robertson-Malt S. Defining the fundamentals of care. International Journal of Nursing Practice. 2010;16(4):423-34.
[30] Cromie JE. Work-related Musculoskeletal Disorders in Physical Therapists : 2000;80(4).

[31] Costa BR, Vieira ER, da Costa BR, Vieira ER. Risk factors for work-related musculoskeletal disorders : A systematic review of recent longitudinal studies. American Journal of Industrial Medicine. 2010;53(3):285-323.
[32] Cromie JE, Robertson VJ, Best MO. Work-related musculoskeletal disorders and the culture of physical therapy. Physical therapy. 2002;82(5):459-72.
[33] Holder NL, Clark HA, DiBlasio JM, Hughes CL, Scherpf JW, Harding L, et al. Cause, Prevalence, and Response to Occupational Musculoskeletal Injuries Reported by Physical Therapists and Physical Therapist Assistants. Physical Therapy. 1999;79(7):642-52.
[34] Myers DJ, Schoenfisch AL, Lipscomb HJ. Cultural influences on workplace safety: An example of hospital workers' adoption of patient lifting devices. Safety Science. 2012;50:494-501.
[35] Darragh AR, Campo M, Olson D. Therapy practice within a minimal lift environment: Perceptions of therapy staff. Work. 2009;33:241-53.
[36] Evans KW, Myers DJ, Rockefeller K, Rauscher K, Allen A, Gao W. A Qualitative Exploration of the Lift Equipment Uses and Needs of Physical and Occupational Therapists and Assistants Participating in Safe Patient Handling and Mobility Programs. International Journal of Safe Patient Handling & Mobility (SPHM). 2021;11(2):76-85.
[37] Rugs D, Powell-Cope G, Campo M, Darragh A, Harwood K, Kuhn J, et al. The use of safe patient handling and mobility equipment in rehabilitation. Work. 2020;66:31-40.
[38] Nelson A, Baptiste A. Evidence-Based Practices for Safe Patient Handling and Movement. Online Journal of Issues in Nursing. 2004;2004.
[39] Hignett S. Intervention strategies to reduce musculoskeletal injuries associated with handling patients: a systematic review. Occupational Environmental Medicine. 2003;60.
[40] Geiger JS. Establishing a physical therapist-driven model of safe patient handling and movement programs in a general hospital. Work. 2013;45:147-60.