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Reducing Lower Back Pain by Providing Training for Nurses Working for Nursing Home

Metropolia University of Applied Sciences

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Abstract

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Problem statement: The problem identified from clinical practice is that there are many incidences of sick leave and absenteeism due to back pain that are experienced by nurses in the nursing home and one contributing cause is improper use of manual handling.

Background: One of the most prevalent ailments requiring medical care is low back pain (LBP), and most common musculoskeletal disorder. Evidence shows that 75% of nurses in Finland experience low back pain.

Aim and objective: The aim of this quality improvement project is to decrease the number of back pain cases by fifty (50 %) percent among nurses in a nursing home by October 2024 by providing staff training. The objective of this proposed project is to introduce and utilize ergonomic tools such as electric adjustable beds and chairs, slide sheets and compression stocking slides through training of nurses.

Measurement: A self-report survey on lower back pain collects data on how frequently nurses experience lower back pain when performing nursing care using electric adjustable beds and chairs, sliding sheets, and compression stocking slides. Self-developed instrument will be used through Google form.

Design: The design to be used in this quality improvement project will be the model of improvement. The model of improvement is a framework that uses PDSA (Plan Do, Study, Act) cycle allowing a test of change.

Strategy: The main intervention of this quality improvement project is providing staff training on nurses working for the nursing home with the usage of ergonomic tools such as electric adjustable beds and chairs, sliding sheets and compression stocking slides. This allows acquisition of knowledge, skills, and updates with regards to manual handling techniques with ergonomics tools usage

Data Analysis: A run chart will be used to analyze data collected on how much variation there is in the process over time.

Conclusion: Safety is a top priority, not just for our patients, residents, or clients, but also for the nurses who meet their needs and demands. Nurses are the frontlines and so-called "new generation heroes" in this era, thus it is essential that we show them the reverence that they deserve.

Key Words	nursing home nurses, low back pain, training

Contents

1. Introduction

1.1. Problem statement

The problem identified from clinical practice is that there are many incidences of sick leave and absenteeism due to back pain that are experienced by nurses in the nursing home and one contributing cause is improper use of manual handling. Complaints about lower back pain among nurses are common, but it is not regarded as a serious issue in the nursing home. Nurses experience pain, particularly in the lower back, and therefore are required by physicians to be absent from work and take sick or medical leave. Furthermore, other employees may be required to work longer shifts to cover for the sick employee because of absenteeism precipitated by work-related illnesses such as lower back pain (Johnstone 2020). A risk for a career ending and professional shift for nurses was also observed putting at stake organization's manpower force. Long-term lower back pain can cause nurse dysfunction, which can lead to truancy at work and early retirement. (Igwesi-Chidobe et al. 2019.) Evidence shows that 75% of nurses in Finland experience low back pain (Tosunoz & Oztunc 2017). The Labor Force Survey (LFS) indicates that musculoskeletal disorders, related to work, which includes the induced by handling manually, represent for roughly 40% among all occupational illnesses (Health and Safety Executive 2016: 6).

Although there are some preventive measures being made available, the prevalence of nurses acquiring back pain is still at a high rate. Compared to the general population and other healthcare members, nurses are more likely to suffer from musculoskeletal disorder resulting in low back pain, which has been termed "epidemic in nursing". (Almaghrabi & Alsharif 2021.) Manual Handling training is not given regularly and adequately to all nurses, which includes patient transferring, lifting, turning, the use of ergonomics, and other nursing care activities that necessitate physical efforts or exertion. Despite the availability of lifting equipment such as hoists and other lifting accessories, nurses are seen using manual handling, and studies have revealed that many nurses' usual procedures do not include the usage of lifts. (Lee & Lee 2017.) Five (5) Why's Root Cause Analysis was used to identify the problem to be addressed in this study (see Table 1).

Table 1. Five (5) Why's Root Cause Analysis

Five (5) Why's Root Cause Analysis
Why do nurses experience back pain?
Why do nurses not utilize proper manual handling during nursing care?
Why is there a lack of knowledge on proper manual handling?
Why is there no training or refresher courses regarding proper manual handling?
Why does the institution do not provide regular training/refresher courses to nurses?

1.2. Background

One of the most prevalent ailments requiring medical care is low back pain (LBP) (Jeyakumar & Segaran 2018). Lumbago and lumbosacral discomfort are the common referred term for lower back pain, it is the most frequent kind of musculoskeletal disorder that arises above the gluteal folds and below the twelfth rib (Gaowgzeh 2018). Due to the manual lifting of patients, work-related musculoskeletal disorders (WMSD) are a serious safety problem in today's health care environment. Nurses transfer patients several times per day, causing persistent pain and potential harm. (Noble & Sweeney 2017).

Manual handling in nursing care includes lifting, moving, and transferring patients, as well as assisting their mobility. However, nursing staff all over the world have been concerned about the high risk of musculoskeletal problems associated with patient handling. (Lee & Lee 2017.) In addition, any transporting or sustaining of a load by hand or by human force is considered manual handling actions such as elevating, lowering, thrusting, tugging, carrying, or moving (Health and Safety Executive 2016: 9). The application of physical force to transfer weight is known as manual handling. The most dangerous component of the exercise is how it is performed (Johnstone 2020).

One of the most serious difficulties in nursing homes is the routine heavy lifting and repositioning of residents, which surpasses the lifting capabilities of most caregivers. Because of their size, weight, level of hostility, and proclivity to tumble or lose their equilibrium, the resident is difficult to carry and transfer. Moving patients into small restrooms and rooms crammed with medical equipment and furnishings makes it harder for the nurse to practice proper body mechanics. The nurse's spine is most vulnerable to damage when bending forward, as is required for many patient lifting, and moving jobs. (CDC 2014.)

The Manual Handling Regulations clearly outline three steps that must be taken to prevent and mitigate the associated risk with unsafe manual handling. The first is "to avoid unsafe manual handling operations," the second is " to estimate the risk of unpreventable workplace injury due to unsafe handling," and the third is " to reduce as much as possible the risk of workers impairment from unsafe manual handling." Employees should also follow established work processes, utilize any safety equipment provided appropriately, health and safety cooperation, inform management if something changes, recognize unsafe handling actions, and take effort to ensure that their actions do not endanger others. (Health and Safety Executive 2020.)

In addition, a safe resident lifting program including mechanical lifting equipment, instruction on how to use it, and a lifting policy can help nurses by lowering the risk of injury, enhancing job satisfaction, preventing recurrence of injuries, and reducing daily tiredness and suffering (CDC 2014).

Despite the widespread availability of modern devices and facilities for patient treatment, health-related and ergonomic challenges for healthcare workers are frequently neglected. A wide variety of reasons, including ergonomically unskilled workers, a lack of adequate techniques of manual handling and transferring patients, an inefficient working environment layout, and ineffective patient-transfer devices, imposed excessive work pressure on these personnel. (Nourollahi et al. 2018.) LBP was also discovered to be associated with educational level among nursing professionals. (Gilchrist et al. 2021).

Highlighted, research on the workplace risk and effect of not having enough preventive measures on musculoskeletal health in nurses is lacking and in many developing nations, lumbar spinal injuries are not yet recognized as occupational disorders. This may have a detrimental impact on general staffing shortages and hiring new nurses, leaving the retained staff nurses with a surging workload. (Gilchrist et al. 2021.) Moreover, staff members may need to work longer hours to cover for the sick employee due to absenteeism related to work-related illness like LBP (Johnstone 2020). Strong evidence exists where it suggested that working long shifts and has little time off recovery, cause work fatigue in nurses, which results in slower reaction times, errors in critical judgment, and a decreased desire to adhere to organizational policies and workplace health and safety regulations (Gilchrist et al. 2021).

2. Review of the Literature

The review is aiming to (1) recognize the factors that contribute to the frequency of lower back pain among nurses working for nursing home and (2) to explore interventions available to promote proper manual handling techniques to reduce back pain in nurses.

2.1. Data Search and Selection

The main concepts have been identified with the use of FACET/PEO analysis (Table 2). The main keywords used for this search were "nursing home nurses", "manual handling" and "back pain". Synonyms and related keywords for the main concepts were also identified. These search terms were combined with Boolean Operator to formulate a relevant search phrase. Key terms for the population use truncation to expand search.

Table 2. Facet analysis/ PEO - Boolean Operator, truncation

POPULATION: (Nursing Home Nurses)		EXPOSURE: (Manual Handling)		OUTCOME: (Back Pain)
Nursing Home Nurse **OR** Nursing home nurs* **OR** Geriatric nurs* **OR** Gerontologic nurs* **OR** Nurs* **OR** Registered Nurs* **OR** Staff nurs*	**AND**	Manual Handling **OR** Manual Lifting **OR** Patient Handling **OR** Ergonomics	**AND**	(Back **OR** "Low back" **OR** Lumbago **OR** LBP **OR** Musculoskeletal **OR** MSD **OR** Lumbar) (Pain **OR** Injury **OR** Disorder)

A database search was conducted from Medline and Cinahl (Table 3). Manual search from International Journal of Public Health and Clinical Sciences (IJPHCS) was also conducted. During the database search, we limited articles within the last 10 years of publication.

Table 3. Database search

Database / Date/ Limit	Search Phrase	Total # of hits/ citations	Papers/ Records included based on title	Papers/ Records included based on abstract	Papers/ Records included based on full text
CINAHL/ 17.11.2022 Limitations: Articles published in the last 10 years	Nursing Home Nurse OR Nursing home nurs* OR Geriatric nurs* OR Gerontologic nurs* OR Nurs* OR Registered Nurs* OR Staff nurs* AND Manual Handling OR Manual Lifting OR Patient Handling OR Ergonomics AND (Back OR "low back" OR lumbago ORLBP OR Musculoskeletal OR MSD OR Lumbar) AND (pain OR Injury OR Disorder)	299	115	70	1
Medline 17.11.2022 Limitations: Articles published in the last 10 years	Nursing Home Nurse OR Nursing home nurs* OR Geriatric nurs* OR Gerontologic nurs* OR Nurs* OR Registered Nurs* OR Staff nurs* AND Manual Handling OR Manual Lifting OR Patient Handling OR Ergonomics AND (Back OR "Low back" OR Lumbago OR LBP OR Musculoskeletal	171	70	45	1

	OR MSD OR Lumbar) AND (Pain OR Injury OR Disorder)				
Manual search - "International Journal of Public Health and Clinical Sciences" (IJPHCS) 17.11.2022					1
Total		470	185	115	3
Duplication	-	-	70	12	0
Total number of included studies	-	-	-	-	3

Criteria included for this review were focused on lower back pain within nursing home nurses and its interventions, language which is English, articles that are peer reviewed and are primary sources. Criteria excluded are all related to other healthcare professions, other languages and articles that are literature reviews (see Table 4).

Table 4. Criteria for Inclusion and Exclusion

Inclusion	Exclusion	Rationale
First criteria – Studies that focus on lower back pain among nurses in the nursing home.	Studies that are related to other health care professions.	Among all other healthcare professionals, nurses have the highest prevalence and risk of developing MSDs.
Second criteria – Studies that have interventions to deduct lower back pain within nursing home nurses.	Studies that have interventions related to other illnesses or diseases.	Interventions are only focused on the reduction of lower back pain not on other illnesses.
Third criteria – Language (English)	Languages other than English.	Other languages translation not available.
Fourth criteria – Peer reviewed, Primary source	Article that are literature reviews.	
Fifth criteria – Studies from the years 2012 to 2022	Studies later than the year 2012.	The information to be gathered should be up to date, the latest and updated.

2.2. Summary of Results

The summary of results mainly describes the factors that contribute to the frequency of lower back pain among nurses working for nursing home and interventions available to promote proper manual handling techniques to reduce lower back pain in nurses (see Table 5).

Table 5. Description of the selected studies.

Author(s), year, country	Purpose	Data Collection and analysis method	Number of participants	Major Findings
"Koppelaar, E., Knibbe J.j., Miedema H.S., Burdorf A., (2013)" Netherlands.	To evaluate the impact of individual and organizational factors affecting nurses' utilization of lifting equipment in healthcare.	− Cross-sectional study − Quantitative study − Structured Interview	n = 238	In nursing homes, only 8% of the nurses were categorized as consistently using lifting equipment during patient transfer activities. Individual factors and patient room features persisted as significant influences on nurses' decisions to utilize lifting equipment in the multivariate model. Awareness of workplace policies, the availability of patient-specific guidelines for lifting equipment uses, and a desirable ratio per patient of equipment for lifting were all associated with nurses' continued usage of lifting equipment (OR 5.85, 2.91, and 1.92). The existence of lifting device usage instructions in a patient's care protocol, as well as knowledge of current workplace laws, were all connected to nurses' motivation to utilize lifting devices during transfer activities with patients. Greater levels of the organizational hierarchy, as well as management support and a supportive management climate, related to these characteristics promoting nurses' persistent behaviour.
"Koppelaar, E., Knibbe J.j., Miedema H.S., Burdorf A. (2012)" Netherlands	To delineate prerequisite and actual utilization of ergonomic machines while performing activities of patient handling and evaluate the impact of mechanical load during activities of patient handling using ergonomic devices.	− Cross-sectional study − Nested analysis − Linear mixed- effect model	n = 186	By using ergonomic tools such as electronic adjustable bed, adjustable chair, slide sheet and compression stocking slides, awkward back postures and forces used in all forms of handling patient tasks were reduced. The ergonomic tools consumption reduced the mechanical burden, particularly the frequency of force application. Notable that the population consisted of 96% female.

Author(s), year, country	Purpose	Data Collection and analysis method	Number of participants	Major Findings
				Out of 520(100%), 357 (69%) the actual utilization of ergonomic tools during activities of patient handling activities. 1. Time spent in an improper back posture during patient encounters: Decreased by 43% in handling anti-embolism stockings, 33% in patient transfers, 24% in personal care of patients, 33% manually lifting patients. 2.Frequency of forces exerted: Lifting devices reduced by 64%, adjustable bed and shower chairs reduced by 38%, and an anti-embolism stockings slide reduced by 95%. Since using lifting devices was related with a much-decreased frequency of forceful exertions and length of awkward postures of the back in this study, a substantial decrease in the frequency of lower back pain is almost probably to be anticipated.
Eriyani, E., Azuhairi, A.A, (2016) West coast Malaysia	To identify the ubiquity of musculoskeletal disorders among nursing home staff, its link factors, and predictors to musculoskeletal disorders symptoms.	– Cross-sectional study. – Simple Random Sampling Method. – Modified Nordic Questionnaire.	n = 387	The result showed women were two times more likely than men to acquire musculoskeletal disorder (OR 2.0, confident interval (1.1-3.6). Respondents who believed that manual handling jobs are challenging were 2 times more likely to acquire MSD than respondents who believed their manual tasks were not demanding. In at least one area of the body, 50% of respondents were qualified for the criteria of "work-related musculoskeletal disorder" (WMSD). The highest prevalence factor of WMSD at different human body parts for the past twelve (12) months is the lower back with 33.8 %. WMSD at different body parts in last 7 days is also lower back 31.5%. Lifting or transferring a resident from a bed without assistance, bathing a client, and supporting a client who is falling were among the manual handling chores that respondents found challenging and that were strongly linked with WMSD

2.2.1. Factors contributing to the frequency of lower back pain within nursing home nurses

A. Nurses' behaviour in using lifting devices

Two-thirds of nursing home nurses exhibited favourable behaviour when employing lifting equipment. To sustain nurses' usage of lifting devices, unique patient procedures for lifting equipment and the lifting devices to patient ratio must be considered. Also, when utilizing lifting equipment, nurses must consider the peculiarities of a patient's room. (Koppelaar et al. 2013.)

B. Load of manual handling

Transferring and lifting the resident from the wheelchair and bed without any assistance, bathing the resident, pushing the wheelchair, putting on clothes, assisting the resident in walking, and assisting the resident when falling are the difficult manual handling task associated with the work-related musculoskeletal disorder (WMSD). Moreover, Respondents who thought manual handling tasks were difficult had a higher frequency of WMSD. With a p-value of 0.639, enough ergonomics tools are not associated with the prevalence of WMSD. (Eriyani & Azuhairi 2016.)

2.2.2. Intervention available in reduction of low back pain

A. Manual handling together with ergonomic tools

Manual handling with the use of ergonomic tools such as lifting devices, adjustable bed and shower chairs, and anti-embolism stockings slides has a significant impact on mechanical burden reduction, particularly on the frequency of force application, and during the manual handling the utilization of ergonomic devices is high. Also, during the manual handling activity the time spent in awkward posture has dramatically dropped, implying a lower chance of developing lower back pain or other work-related musculoskeletal diseases. (Koppelaar et al. 2012.)

3. Aim and Objective

The quality improvement project aims to decrease the number of back pain cases by fifty (50 %) percent among nurses in a nursing home by October 2024 by providing staff training. Training of staff allows nurses to acquire and increase knowledge and skills through lecture, simulation, and return demonstrations. The objective of this proposed project is to introduce and utilize ergonomic tools such as electric adjustable beds and chairs, slide sheets and compression stocking slides through training of nurses.

4. Measurement, Design and Strategy

4.1. Measurement

A self-report survey on lower back pain collects data on how frequently nurses experience lower back pain when performing nursing care using electric adjustable beds and chairs, sliding sheets, and compression stocking slides. Nurses will be asked to fill out a self-developed instrument using Google forms which will be used for the collection of data (see Figure 1). Collection of this survey will be done on a monthly basis (e.q. every 30th day of the month). A nurse champion will be designated for the collection of data.

Figure 1. Sample of Google form survey

Baseline measurement will be taken two weeks prior to the launch of the project through-out the whole nursing home (e.q. 5 wards) and will be used as the baseline information of the project. Data will be continuously gathered monthly after receiving the training (see Figure 2) until October of 2024. The project team and the designated nurse champion will be permitted to access data and all information of the project.

DATA FOR PDSA CYCLE 2	
Date of Collection	Frequency of low back pain experienced by nurses
3rd of July 2023 (BASELINE)	12
31-Aug-23	8
Sep-23	8
Oct-23	8
Nov-23	8
Dec-23	7
Jan-24	7
Feb-24	7
Mar-24	7
Apr-24	7
May-24	5
Jun-24	6
Jul-24	5
Aug-24	5
Sep-24	5
Oct-24	5
Median	6.875

Figure 2. Data documentation sample

4.2. Design

The design to be used in this quality improvement project will be the model of improvement. The model of improvement is a framework that uses PDSA (Plan Do, Study, Act) cycle allowing a test of change. It will start by constructing an aim, selection of correct measures and method of collection data, and formulation of ideas for improvement. Development of a plan to test a change (Plan), execute the test (Do), observe, assess, and draw conclusions from the test (Study), and then determine what changes, if any, to make for the following cycle (Act) will follow. (Institute for Healthcare Improvement 2017.)

The model of improvement is intended to provide a foundation for creating, testing, and bringing about changes that lead to improvement. To attain improvements, we must take

the time to plan and test changes, and we must avoid the temptation to make wholesale changes to systems. This way, we will be able to see what is working and what is not. Smaller changes can be undone and replaced with new ideas. (NHS Improving Quality 2014.)

Only after appropriate proof on a smaller scale has proved a beneficial result may innovative ideas be implemented. The PDSA cycles allow ideas to be presented in a safe, regulated manner, with minimal resistance, disruption, and resource utilization. Building on the lessons acquired from each PDSA cycle, different approach can be implemented with a higher possibility of success. (NHS Improving Quality 2014.)

A close collaboration with the chosen nursing home will be designed and implemented in all features of the project interventions. The nursing director, a nurse manager, a hired ergo coach, a physiotherapist and two registered nurses will be included in the project team to oversee the project. Registered nurses will be approached for their feedback and suggestions throughout the project process to be able to identify areas for improvement.

The quality improvement project will start from July 2023 until October 2024 in a specific nursing home (see Figure 3). The quality improvement project consists of several phases. The first phase is the preparatory phase which includes planning (PDSA cycle 1) for the first two weeks and collecting baseline data for the last two weeks of the month. The second phase will be the intervention phase which involves two strategies, the pilot group testing (PDSA cycle 2) for a month and the full implementation (PDSA cycle 3). The last phase will be the sustainability phase which will rely on the outcome of the intervention phase.

Figure 3. Project Timeline

4.3. Strategy

The main intervention of this quality improvement project is providing staff training on nurses working for the nursing home with the usage of ergonomic tools such as electric adjustable beds and chairs, sliding sheets and compression stocking slides. This allows acquisition of knowledge, skills, and updates with regards to manual handling techniques with ergonomics tools usage. Supportive interventions such as creation of posters, availability of organizational protocol on paper such as pamphlets or protocol handbook, use of ergonomic devices and long-term guidance for sustainability and feedback form or box for continuous improvement will also be made possible. The PDSA (Plan, Do, Study, Act) cycles will be used to assay elements of implementation to pull off and accomplish the aim of the project (see Table 6, Table 7 & Table 8).

Preparatory phase

PDSA cycle 1: The aim of this PDSA cycle is to develop a comprehensive training program for the nursing staff. A teaching plan through lectures, simulations and return demonstrations will be prepared along with the ergonomic tools needed such as adjustable beds and chairs, sliding sheets and compression stocking slides. The hired ergo coach will be the person responsible for the training. A prior email will be sent to all registered nurses with regard to the training. The training schedule will consist of two sessions. Nurse managers of each ward will arrange a duty roster allowing all registered nurses to be able to attend the training. Project team will provide feedback and comments if there are any amendments to be made. After all the preparations made, the comprehensive training program will be implemented starting from the pilot ward heading to the whole nursing home for the full implementation.

Table 6. Preparatory phase - PDSA cycle 1

Preparatory phase	
Aim	Cycle 1 (Comprehensive training program)
	The aim of this PDSA cycle is to develop a comprehensive training program for registered nurses.
Date	July 2023
Plan	The plan is to develop a teaching plan through lectures, simulations and return demonstrations will be prepared along with the ergonomic tools needed such as adjustable beds and chairs, sliding sheets, and compression stocking slides. The training will be divided into (2) two sessions. Nurse managers will be creating a duty roster intended for the training. A prior email will be sent to all registered nurses regarding the training.
Do	The hired ergo coach is the person responsible for the formulation of the teaching plan and the whole training course. The content is about proper manual handling with the use of ergonomic tools such as adjustable beds and chairs, sliding sheets, and compression stocking slides. Nurse managers of each ward arrange a duty roster allowing all registered nurses to be able to attend the training. The first session is in the morning and will accommodate the upcoming staff who are on the afternoon shift. The second session will be on the after, accommodating the morning shift. Staff who are on the night shift, day off and on leave will be given the freedom to choose which session to attend. Emails are sent to all registered nurses involved in the training.
Study	The project team provides feedback on the developed training program preparations and will give comments if there are areas need for amendments.
Act	After all the preparations and changes being made, the training program will now be implemented starting on the selected ward for pilot testing before the actual implementation and spread of the training.

PDSA cycle 2: This PDSA cycle aims to provide training for the pilot group that will focus on lowering the occurrence of lower back pain. In addition, initial training will check the viability of the project intervention before implementing the training to a larger group of nurses. A total of five (5) hours of training will be conducted which consists of lectures, simulation and return demonstration. At the end of the training, the project team will be able to document identified problems and unexpected circumstances that will happen during the training. The project team will be able to discuss and propose solutions and suggestions to improve the training before executing the project to a wider group of nurses.

Table 7. Preparatory phase - PDSA cycle 2

	Cycle 2 (Pilot Training)
Aim	The aim of this PDSA cycle is to provide pilot training for the pilot group using the developed comprehensive training program. In addition, this will prove the viability of the project intervention before implementing the training to a larger group.
Date	August of 2023
Plan	The plan is for the project team to select a pilot group that will receive comprehensive training which will be held in a conference room. The training will be based on the comprehensive training program developed by the ergo coach. At the end of the training session, the project team can provide their thoughts and ideas on how to improve the training.
Do	A total of five (5) hours of lecture, simulation and return demonstration will be attended by the pilot group. The training content is about proper manual handling with the use of ergonomic tools such as adjustable beds and chairs, sliding sheets, and compression stocking slides. The project team will be able to document the identified problems and unexpected circumstances that will happen during the pilot training.
Study	After identifying the problem that arises during the pilot study. The project team will be able to analyze and discuss further the identified problem and solutions. In addition, the project team will be able to reflect, improve and make necessary adjustments before implementing them in a large group.
Act	After further discussions and proposed suggestions for improving the pilot training. Modification of training will be implemented during the main intervention.

Intervention phase

PDSA cycle 3: This PDSA cycle is aiming to produce a comprehensive training program to allow all registered nurses in the nursing home to receive the same training which has been provided during the pilot group. To equip all nurses in the nursing home with knowledge and skills of proper manual handling and ergonomic devices, training will be provided with the help of an ergo coach. Training will focus on the proper manual handling and the use of ergonomic aids, with emphasis on focuses on the use of electrically adjustable beds, adjustable chairs, slide sheets and compression stocking slides. The

ergo coach will give two (2) hours of intensive lecture, one (1) hour simulation and two (2) hours return demonstration. Schedule of the training will be in a weekly basis for each ward in the nursing home. This will ensure that all nurses will be equipped with the necessary knowledge and skills regarding the topic. After nurses receive their training, nurses will answer an online survey through google form with the use of dichotomous scale every month and will be gathered by a nurse champion and result will be reported to the project team.

Table 8. Intervention phase - PDSA cycle 3

Intervention phase	
Aim	Cycle 3 (FULL IMPLEMENTATION)
	The aim of this PDSA cycle 3 is to provide comprehensive training to all registered nurses in the nursing home to receive the same training which has been provided during the pilot group.
Date	September 2023
Plan	The plan is to let all the nurses in the nursing home attend and receive training on how to reduce lower back pain by manual handling with ergonomic devices. In total, there are five (5) wards in the nursing home. The first ward is the pilot group, and the remaining four (4) wards will be scheduled for the training. The schedule of the remaining wards is as follow: - 1st week of September 2023 (ward 2) - 2nd week of September 2023 (ward 3) - 3rd week of September 2023 (ward 4) - 4th week of September 2023 (ward 5) At the end of every month, all nurses who participated in the training will answer a dichotomous questionnaire. The program team will be collecting all data every month until October 2024 for analyzation. The plan is, to have one ward per week to participate in the training program. The staff nurses will have a two (2) hours lecture, one (1) hour simulation and two (2) hours of return demonstration. An ergo coach will provide and facilitate the lecture.
Do	All nurses attend the training every week. One session in the morning and another session in the afternoon. This ensures that all staff nurses will be able to attend depending on their availability. In September 2023, all nurses in the nursing home are able to have the knowledge and ability to reduce the incidence of low back pain through the use of ergonomic aids. Nurses answer a self-report survey through google form every month. All the data is collected by the project team.
Study	The data that will be gathered every month will be used and inputted in a run chart. The run chart will be posted in every participating ward. This chart shows whether it decreased the occurrence of lower back pain among nurses. After gathering the data for a year, the project team will interpret the result. When it shows a positive result that the training conducted helps reduce the occurrence of lower back pain among nurses, the training will continue and be twice a year training program. However, if the training did not achieve its goal, the data will be analyzed,

	and further study will be conducted on why it did not achieve the desired result and how it will be improved in the future.
Act	The training program will be done twice a year. This will ensure that all nurses will be able to sustain and effectively do the skills that they have acquired. This will also benefit newly hired nurses to gain the knowledge and skill in lessening the occurrence of low back pain.

Sustainability phase

This phase aims that a comprehensive training program will be continuously provided to all registered nurses working for nursing homes. The project will be sustained by having a twice-a-year training course. The training program will still follow the same training program flow unless there is additional information and updates available. With these, it also allows newly hired nurses to be able to acquire the knowledge and skills beneficial at work. Moreover, the posters will be created to continuously remind registered nurses of the proper use of manual handling and ergonomic tools. The poster will be posted in the strategic areas within the nursing home premises (e.q. nurses' station, staff pantry, washroom, and elevators).

4.4. Potential Barriers and Facilitators

This quality improvement project will use the "Human barrier to change" tool to identify the potential barriers for this project. Change is necessary for advancement and improvement, which inevitably results in varied degrees of resistance. This tool assists in exploring personal perspectives on change and establishing responses to challenges and opportunities. (NHS Institute for Innovation and Improvement 2010.)

The "Human barrier to change" tool will start by proposing plans for change and test ideas out with staff members willing to play skeptics and devil's advocate. This can help prepare for future conflict. Nevertheless, for this to work effectively, the staff must have a protected environment where they can share their problems and viewpoints. Once potential barriers have been identified, use problem-solving methods like bullet proofing and brainstorming to assist you come up with solutions to overcome obstacles. (NHS Institute for Innovation and Improvement 2010.)

4.5. Data Analysis

Baseline data and the monthly data will be gathered and recorded to a run chart for analyzation. A run chart will be used to analyze data collected on how much variation there is in the process over time. In this chart, it will clearly show the interventions that have had an impact, and which one does not. In this chart also, it is very useful to add a goal or target line that represents where are we heading to and ensures everyone viewing the graph can see immediately where the work is at in relation to achieving the aim. (Clark et al. 2017.) The collection of all the data will be at the end of each month, that will allow staff to visualize success and room for improvement. Sample run charts to be used are shown in Figure 4 and Figure 5.
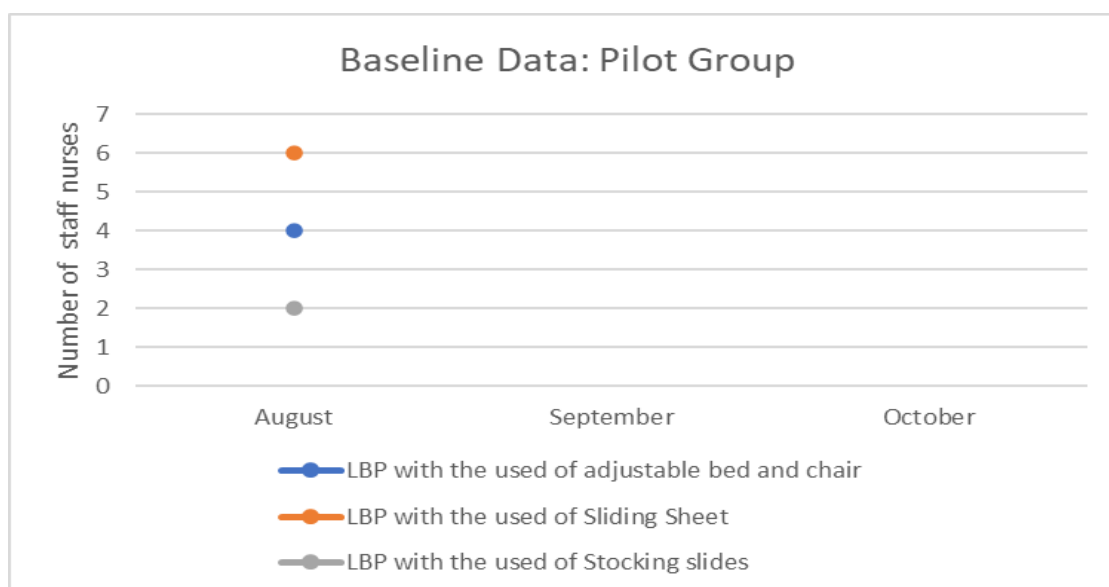

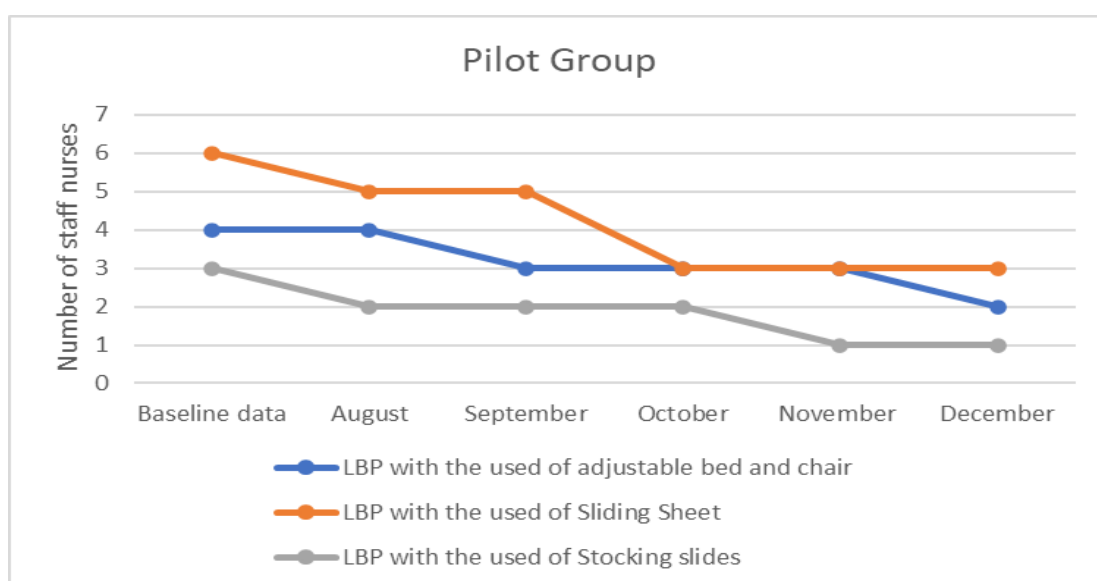Figure 4. Run Chart – Number of nurses experiencing back pain

Figure 5. PDCA Cycle 3 - Pilot group data

4.6. Privacy and Ethical Considerations

Ethics is the foundation of good research that will safeguard everyone participating in the research process by adhering to ethical principles (Doody & Noonan 2019). Thus, a research permit needs to be acquired from the City of Helsinki of Social Services and Health Care Division. Before applying for the permit, it is necessary to contact the statistical services of the social and health services of Helsinki to discuss and define the data content and its availability. Moreover, an appropriate operational unit will be ensured to have the right contact person, all throughout the process. (City of Helsinki 2022.)

Data protection act 1050/2018 is needed to be understood well before submitting the application. In context to the medical research act 488/1999, an ethical statement from the Helsinki Region Universities of Applied Science's human sciences ethics committee must be obtained. Furthermore, a data protection impact assessment will be conducted, and the Data Protection Ombudsman will be notified in writing of the results. (City of Helsinki 2022.)

From the website of the City of Helsinki, a research permit application form will be downloaded and filled up accordingly. A research plan, letter of information, questionnaire sample, privacy statement, data protection impact assessment, and ethical statement are the other documents that are needed to submit to the City of Helsinki registry office. The processing time will take up to two to six weeks. (City of Helsinki 2022.)

5. Reflection and Conclusion

5.1. Reflection

Running a quality improvement project in a nursing home places emphasis on how to respond and adapt to a changing environment, securing management support, acquiring data that will be used to reflect change, and engaging with the staff. Furthermore, a review of existing research will be critical in enhancing the quality improvement project that will be undertaken.

The methodology that is being utilized in this project is its strength. By carefully planning the process step by step will help this project to materialize. The Plan, Do, Study, Act (PDSA) cycle is a way of testing and learning which allows us to go thoroughly but in an

efficient way by testing and evaluating the ideas for change before continuing to the next cycle.

The inability to measure the severity of pain among registered nurses working for nursing homes is the limitation of this project. The frequency of pain was used as a measurement considering the quality improvement project aim which is to decrease the number of low back pain cases on nurses.

Data comprehension is critical in nursing homes and varies depending on the working environment. Obtaining baseline data allows the project team to understand what and how to address areas for improvement. The project team should examine data needed to keep the project running and accept feedback from project workers. The collecting of data will be the project's stronghold in determining how sustainable the intervention is. Providing knowledge, skills, and updates to employees will be a valuable asset to the organization. Change is constant, and it is critical to adapt, especially as new technologies emerge.

5.2. Conclusion

Safety is a top priority, not just for our patients, residents, or clients, but also for the nurses who meet their needs and demands. The creation of this quality improvement project will have a significant influence and will aid in the establishment of a foundation within the organization.

Nurses' welfare and health at nursing homes should be examined in terms of physical, mental, psychological, and work-life balance. This quality improvement for nurses in nursing homes is a great place to start in addressing this area of improvement, which is minimizing low back discomfort for nurses. This project will not only provide nurses with additional knowledge, skills, and updates but will also give them the impression that they are being cared for and heard. Nurses are the frontlines and so-called "new generation heroes" in this era, thus it is essential that we show them the reverence that they deserve.

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