

Patient handling in India—Evidence from a pilot study

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ABSTRACT

Background: Manual handling forms an important part of a health care worker's daily routine. Faulty techniques may result in musculoskeletal injuries in health workers and further injury to patients. **Objectives:** In our study, we assessed the techniques of patient moving and handling by health care workers in our hospital. Our aim was to educate them on standard moving and handling techniques and assess the impact of the same. **Methods:** We carried out a time-bound prospective clinical audit wherein we observed workers in the emergency department for a period of 2 weeks to evaluate their moving and handling techniques. This was followed by a training session where the workers were trained in "best-practices," and a 2-week period of reevaluation to assess compliance with standard practices. **Results:** During bed-to-bed transfers, we found improvements in the following seven parameters after the training session: (a) the use of good posture, (b) the use of wheel stoppers, (c) adjustment of bed height, (d) positioning the receiving bed parallel to patient's bed, (e) general risk assessment before transferring a patient, (f) involvement of at least three carers, and (g) the use of a standard command like "GO" before the transfer. **Conclusion:** Apart from serving the purpose of an audit, our study has revealed that the training of health care providers in safe moving and handling of patients is a neglected subject in India.

Keywords: Emergency care, moving and handling, patient care, safe handling, work-related injury

Introduction

Manual handling of patients forms an important part of a paramedic or nursing staff's daily routine. Handling is described as safe when it does not subject the person to any risk of injury from heavy loads, non-ergonomic postures, movements or excess repetition.^[1] Health care providers are prone to sustain injuries while moving or handling patients. Body parts most frequently injured during this process are the lower back, neck, thumb, upper back, and shoulders.^[2] Studies show that health care workers suffer from a high incidence of work-related musculoskeletal symptoms. Over 88% of health care workers report work-related pain in at least one body part.^[3] This could be in part because of faulty technique, and excessive workload among health care workers.

Occupational health institutions in India such as National Institute of Occupational Health (NIOH), The National Safety Council of India (NSCI), and the Indian Association of Occupational Health (IAOH) promote safety at construction sites, during road transportation, and carry out research such as evaluation of environmental stresses at the workplace.^[4] However, most organizations and health authorities in India overlook the need to implement safe moving and handling guidelines among health care providers.

Improper handling has been shown to injure patients or worsen a patient's injuries, leading to increased morbidity and prolonged hospital stay. In India, the majority of the patients transported by ambulance are not accompanied by a nurse or paramedic.^[5] Unlike countries such as the UK where emergency ambulances are part of the National Health Service (NHS), India does not have an efficient emergency ambulance service system. The Emergency Management and Research Institute (EMRI) in India, aims at

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providing emergency services within 20 min in urban areas and 40 min in rural areas.^[6] As a result of this delay, health care workers who are not trained in emergency services are required to care for the patient until the ambulance arrives. This calls for adequate training and assessment of all such health care providers especially in the field of patient handling and trauma care.

Objectives

- To assess the techniques used in patient moving and handling by the nursing staff and health care assistants in the emergency department.
- To train the staff on standard moving and handling techniques.
- To assess the impact of their training and examine their adherence to safe patient handling practices.

Materials and Methods

Type of study: Standard-based, prospective clinical audit—a pilot study.

Target group: Nurses and paramedical staff working in the accident and emergency (A and E) department of KMC Hospital, Mangalore.

Time period: 8 weeks comprising four stages:

Stage 1—2 weeks of data collection,

Stage 2—2 weeks of data analysis and training,

Stage 3—2 weeks of reauditing and

Stage 4—2 weeks of reanalysis and interpretation.

Sample size: This is a time-bound study in which health care workers in the emergency department were observed and assessed for a period of 2 weeks before and after the training.

Data collection method:

Stage 1

Nursing staff and healthcare assistants (hereby jointly referred to as carers) were observed by a team of doctors while handling patients for a period of 2 weeks. The doctors used a checklist-based proforma to assess and document the techniques used in patient handling.

They were observed for compliance with standard recommendations while performing bed-to-bed transfers and logrolling patients.

Stage 2

After the assessment, data from the observations made were analyzed and areas of limitations were recorded.

The carers were trained in safely moving and handling of patients by a team of doctors trained in proper patient handling techniques.

The training session comprised a lecture with the help of visual aids, as well as a practical demonstration with the help of volunteers. Carers were given the opportunity to practice these maneuvers under supervision.

Stage 3

The carers were evaluated to assess compliance and adherence to the techniques taught to them during the training session. The same checklist based proforma was used in this stage of the study.

Measures were taken to ensure that the carers were unaware of being observed.

Step 4

The data collected after the evaluation were analyzed and compared to the data collected before the training.

Our audit was based on standards set by the following institutes:

1. Moving and handling people guidelines by Accident Compensation Corporation (ACC), New Zealand.^[7]
2. Techniques for the manual handling of patients. University Hospital of Morecambe Bay. NHS Foundation Trust.^[8]

We used the guidelines set up by these institutions to format a checklist-based proforma that we used in our study.

Participant consent and ethics—All the healthcare workers who participated in the study were asked to sign an informed consent form. Ethics committee clearance was obtained from the Institutional Ethics Committee before the commencement of the study.

Statistical analysis—Data collected were analyzed using SPSS version 16 using descriptive statistics.

Results

In the 2-week period before training, we recorded a total of 136 patients, 42 bed-to-bed transfer and four logrolls. In the 2 weeks after training, we recorded a total of 116 patients, 50 bed-to-bed transfers and 12 logrolls.

We observed 12 nurses and 8 health care assistants during our study. None of them had received any formal training in moving or handling patients prior to this study. The most common complaint reported (as seen in [Table 1]) was back and shoulder pain (71.4%), followed by leg pain (28.5%). The number of patients who required assistance for ambulation but did not receive it was 27.9% before training. After training, this number dropped to 14.6%. None of the patients brought to the emergency department by an ambulance were accompanied by healthcare workers or paramedics throughout the study period [Table 2].

It is evident from Table 3 that during bed-to-bed transfer, good posture was maintained by 28.5% carers before and

96% carers after the training session. Stoppers or brakes were used by 28.5% carers before and 92% carers after the training. 45.2% carers adjusted the height of the bed and positioned the beds close to and parallel to each other before bed-to-bed transfer; this improved to 92% after training. The verbal consent of the patient was obtained by 19% of the carers before training and 60% after training. Risk assessment was done by 4.7% and 58% carers before and after training respectively. The use of a command like “go” at the time of transfer improved from 33.3% before training to 86% after. Three carers assisted in each bed to bed transfer in 45.2% of the cases before training and 94% of the cases after training.

During logrolls, assurance of patient safety and adjustment of bed heights before and after training was done by 25% and 66.6% of carers, respectively. Carers continued to show poor compliance with the use of hand sanitizers both before and after training [Table 4].

Discussion

Manual handling is estimated to be one of the main causes of work-related musculoskeletal disorders (MSDs). In the health care sector, between 1,500 and 2,000 per 100,000 workers were found to have MSDs.^[9] The incidence of work-related musculoskeletal injuries has been on the rise in all sectors of health care—among

doctors, nurses, healthcare workers, and physiotherapists.^[10-12] Studies by Yang *et al.*, as well as Alnefaie *et al.*, found that back, neck, and shoulder injuries were the most commonly sustained musculoskeletal injuries.^[11,12] Quantifying injuries due to manual handling is the initial step toward identifying the epidemic nature of this problem. Only then will we be able to take the first step toward rectifying it.^[13] A manual handling risk assessment done by the Movement and Assistance of Hospital Patients (MAPO) index in Iran in 2014, indicated that over 80% of the nursing staff was at risk of musculoskeletal injuries.^[14] The fact that 35% of the carers in our study had a musculoskeletal injury gives strength to this argument. A study by Rochman *et al.* found that the factors that influence lower back pain among nurses include knowledge about safe moving and handling practices and frequency of night shifts.^[15]

One of the most surprising findings from our audit was that none of the carers had any prior training in moving and handling patients. This matter is of grave concern because untrained health care workers may cause further injury to the patients presenting with trauma. A study by Bernardes *et al.* found that health care workers in developing countries lacked knowledge regarding adequate moving and handling practices.^[16]

Seven (35%) out of the 20 health care workers reported some form of injury while moving patients over the course of their careers. We observed a total of 252 patients during this audit. To our surprise, none of these patients were accompanied by health care personnel or a paramedic in the ambulance. The cause and implications of such a find are beyond the scope of this audit. This finding is corroborated by a study by Powell-Jackson *et al.*, which suggests that primary health facilities in India are below the minimum standards set by the government.^[17]

When we evaluated bed-to-bed transfers, we found improvements in seven parameters after the training session. These were:

- (a) the use of good posture while transferring a patient,
- (b) the use of wheel stoppers,
- (c) adjustment of bed height,
- (d) the positioning of receiving bed parallel to the patient’s bed
- (e) general risk assessment before transferring a patient,
- (f) involvement of at least three carers during each transfer,
- (g) the use of a standard command like “go” before the transfer.

These parameters were accepted and practiced by the carers, because they could be easily integrated into their work, prevented work-related low-back disorders (WLBDs), and MSDs. However, parameters such as getting verbal consent from the patients and preparation and use of roller boards were adopted by fewer carers. The inadequacy of enough carers and busy hours may have contributed to the suboptimal result of the abovementioned parameters. Assessment of adequacy of staff numbers may be required in light of this finding. Our hospital serves a multilingual population; hence, the language may have played an impeding role in taking verbal consent. A parameter that showed little/no improvement was the use of hand sanitizers,

Table 1: Nature of previous injuries of the carers

Nature of the injury (n=7)	
Back and shoulder pain	71.4% (5)
Leg pain	28.5% (2)

Table 2: Observations made in the emergency department

Observations	Before training (n=136)	After training (n=116)
Cases that visited the emergency department		
Medical	55.8% (76)	57.7% (67)
Surgical	28.6% (39)	24.1% (28)
Trauma	15.4% (21)	18.1% (21)
Total	100% (136)	100% (116)
Mode of mobilization		
Trolley	30.8% (42)	43.1% (50)
Wheelchair	42.6% (58)	48.2% (56)
Walking	26.4% (36)	8.6% (10)
Total	100% (136)	100% (116)
Distribution of assistance		
Patients who required assistance and received it	56.6% (77)	72.4% (84)
Patients required assistance but did not receive it	27.9% (38)	14.6% (17)
Patients who did not require assistance	15.4% (21)	12.9% (15)
Total	100% (136)	100% (116)
Cases that were accompanied by health care personnel		
Yes	0% (0)	0% (0)
No	100% (136)	100% (116)

Table 3: Observations made during the bed-to-bed transfer

Bed to bed transfer: criteria	Before training (n=42)	After training (n=50)
Use of hand wash/sanitizer before handling a patient	0% (0)	12% (6)
Preparation and use of slide/roller board	4.7% (2)	40% (20)
Getting verbal consent before the maneuver	19% (8)	60% (30)
Risk assessment	4.7% (2)	58% (29)
Good posture	28.5% (12)	96% (48)
Involvement of at least three carers for moving a patient	45.2% (19)	94% (47)
Adjustment of bed heights	45.2% (19)	92% (46)
Receiving bed positioned parallel to the patient's bed	45.2% (19)	92% (46)
Application of stoppers/brakes before a transfer	28.5% (12)	92% (46)
Use of a command, for example, "GO" at the time of a transfer	33.3% (14)	86% (43)
Use of hand wash/sanitizer after handling a patient	0% (0)	0% (0)

Table 4: Observations made during logroll

Logroll: criteria	Before training (n=4)	After training (n=12)
Use of hand wash/sanitizer before handling a patient	0% (0)	0% (0)
Getting verbal consent before the maneuver	50% (2)	25% (3)
Adjustment of bed heights	25% (1)	66.6% (8)
Assuring patient safety (second carer stands on the other side of the bed)	25% (1)	66.6% (8)
Use of hand wash/sanitizer after handling a patient	0% (0)	0% (0)

before and after handling a patient. There was no shortage of hand sanitizers in the department. This inadequacy could be explained by busy workdays and high patient load in the emergency department.

We observed an improvement in the number of patients receiving assistance after the training. We also recorded an increase in the number of bed-to-bed transfers and logrolls after training. This could be in part because of the training session which placed emphasis on attentiveness, and preemptive assistance as well as standard patient handling techniques. Another explanation could be variations in the condition of patients presenting in the emergency department.

A similar study by Eriyani showed that education on patient safety and handling showed a decline in the incidence of musculoskeletal injuries among nurses.^[18]

We noticed that while roller boards were available to the staff for transferring patients, pat slides, transfer boards, draw sheets,

turntables, and hoists were not. Guidelines dictate that transfer boards and drawsheets are essential during the bed-to-bed transfer of patients. The carers were trained to use these tools during our session, for future use and for the purpose of completeness.

A number of studies suggest that training in moving and handling is associated with better patient outcomes as well as lower rates of work-related musculoskeletal injuries. The use of simulation in training, as well as robot patients, have shown to have significant benefits.^[19,20]

National guidelines and legislature addressing moving and handling of patients have shown to improve knowledge among health care workers as well as reduce the incidence of musculoskeletal injuries among health care workers.^[21] A study by Kurowski *et al.* showed that training of caregivers resulted in lower rates of work-related injuries as well as a reduced rate of recurrent disabling injuries.^[22]

Our study had many limitations. The number of observations were low. Also, there was a disparity in the number of bed-to-bed transfers and logrolls observed before and after the training. This variation in numbers before and after the training is due to the time-bound nature of the study. The low number of logrolls could be attributed to the inadequate examination of patients as part of the secondary survey. Being a pilot study, we did not evaluate handling maneuvers such as making a patient sit up on the bed, transferring a patient from bed to wheelchair, etc., Our study reveals the need for undertaking further research on a larger scale and training nurses, health care workers, and paramedics in the field of patient moving and handling.

Relevance to primary care

This study was done with the primary goal of determining the deficiencies in patient moving and handling, and to train the health care workers in safe moving and handling techniques. This part of patient care is often overlooked, especially in the primary care setting, in which health care professionals often lack adequate knowledge and training with respect to best practices in patient handling. They are also unaware of the detrimental effect improper handling can have on the health of the patient as well as the long-term musculoskeletal symptoms and morbidity they may experience themselves. Primary care centers and clinics in India, particularly those in rural areas, receive a number of emergent cases. Primary care physicians and nurses are responsible for stabilizing the patient before referring the patient to a tertiary care center for management. Studies show that primary health care workers are occasionally required to manage emergency cases—including surgical emergencies, medical emergencies, and trauma.^[23] Training health care workers—including doctors, nurses, health care assistants, and paramedics—about safe moving and handling practices should be a priority of hospitals and health care organizations. Although major university hospitals, multispeciality hospitals, and urban

tertiary care centers may provide training to their health care staff, health care workers in primary care settings and rural areas do not receive adequate training. This is a matter of great concern and steps to address this issue must be taken. For this reason, we conducted this pilot study, in which we used an interactive method to train health care staff in safe moving and handling practices. We used a score-based system to assess the techniques used in patient handling before and after the training session. We found significant improvement in some domains of patient care. This training and evaluation system is easily reproducible and can be used in the training of health care workers in primary care settings and rural areas.

Conclusion

It is evident that nurses, health care workers, and paramedics aren't adequately trained with respect to safe moving and handling of patients. This may result in injury to patients and an increased incidence of work-related musculoskeletal injuries in the carers. This lacunae in patient care can be addressed by periodic assessment of health worker performance, mandatory training, and implementation of standardized hospital protocols for moving and assisting patients. Our pilot study focused on the same and exposed the potential deficiencies in equipment and training of healthcare personnel in our hospital.

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Conflict of interest

There is no conflict of interest.

References

- Warren G. Moving and handling: Reducing risk through assessment. *Nurs Stand* 2016;30:49-58.
- Vieira ER, Schneider P, Guidera C, Gadotti IC, Brunt D. Work-related musculoskeletal disorders among physical therapists: A systematic review. *J Back Musculoskeletal Rehabil* 2016;29:417-28.
- Cheung K, Szeto G, Lai G, Ching S. Prevalence of and factors associated with work-related musculoskeletal symptoms in nursing assistants working in nursing homes. *Int J Environ ResPublic Health* 2018;15:265.
- Saha RK. Occupational health in India. *Ann Glob Health* 2018;84:330-3.
- Crandon IW, Harding HE, Williams EW, Cawich SO. Inter-hospital transfer of trauma patients in a developing country: A prospective descriptive study. *Int J Surg* 2008;6:387-91.
- National Health Systems Resource Centre. Emergency Medical Service (EMS) In India : A Concept Paper [Internet]. New Delhi. Available from: [http://nhsrcindia.org/sites/default/files/Emergency Medical Service in India Concept Paper.pdf](http://nhsrcindia.org/sites/default/files/Emergency%20Medical%20Service%20in%20India%20Concept%20Paper.pdf). [Last accessed on 2019 Oct 26].
- Moving and handling people guidelines by Accident Compensation Corporation (ACC), New Zealand. [Internet] Available from: <https://www.acc.co.nz/assets/provider/1d98940288/acc6075-moving-and-handling-people-guidelines.pdf>. [Last accessed on 2019 Oct 26].
- Westbury S, Lindsay S. Techniques for the Manual Handling of Patients. University Hospital of Morecambe Bay. NHS Foundation Trust. 2017. [Internet] Available from: https://www.uhmb.nhs.uk/files/1615/1067/2135/Techniques_for_the_Manual_Handling_of_Patients_V2.1.pdf. [Last accessed on 2019 Oct 26].
- Health and Safety Executive. Health and safety at work Summary statistics for Great Britain 2017 [Internet] Available from: <http://www.hse.gov.uk/statistics/overall/hssh1617.pdf>. [Last accessed on 2019 Oct 26].
- Khairy WA, Bekhet AH, Sayed B, Elmetwally SE, Esayed AM, Jahan AM. Prevalence, profile, and response to work-related musculoskeletal disorders among Egyptian physiotherapists. *Open Access Macedonian J Med Sci* 2019;7:1692-9.
- Yang S, Lu J, Zeng J, Wang L, Li Y. Prevalence and risk factors of work-related musculoskeletal disorders among intensive care unit nurses in China. *Workplace Health Saf* 2018;67:275-87.
- Alnefaie M, Alamri A, Hariri A, Alsaad M, Alsulami A, Abbas A, *et al.* Musculoskeletal symptoms among surgeons at a tertiary care center: A survey based study. *Med Arch* 2019;73:49.
- Kharel U. The Global Epidemic of Occupational Injuries: Counts, Costs, and Compensation. RAND Corporation, Santa Monica, Calif., 2016 [Internet] Available from: https://www.rand.org/pubs/rgs_dissertations/RGSD377.html. [Last accessed on 2019 Oct 26].
- Abedini R, Choobineh AR, Hasanzadeh J. Patient manual handling risk assessment among hospital nurses. *Work* 2015;50:669-75.
- Rochman D, Mediani HS, Nur'Aeni A. Factors affecting low back pain among ICU nurses. *J Keperawatan Padjadjaran* 2019;6:271-80.
- Bernardes JM, Dias A. 1569 Health care workers' safe patient handling and movement knowledge: A cross-sectional study in a developing country. *Occup Environ Med* 2018;75(Suppl 2):A323.2-A323.
- Powell-jackson T, Acharya A, Mills A. An assessment of the quality of primary health care in India. *Econ Polit Wkly* 2013;48:53-61.
- Eriyani E, Azuhairi AA, Salmiah MS, RoslizaAM, Rafee MB. Effectiveness of safe patient handling intervention on musculoskeletal disorder among government nurses in elderly care homes west coast Malaysia: Study protocol. *Int J Public Health Clin Sci* 2019;6:222-36.

19. Lin C, Huang Z, Kanai-Pak M, Maeda J, Kitajima Y, Nakamura M, *et al.* Effect of practice on similar and dissimilar skills in patient transfer through training with a robot patient. *Advanced Robotics* 2019;33:278-92.
20. Higginson H. Increasing the use of simulation in training. *British Journal of Healthcare Assistants* 2019;13:34-7.
21. Lee SJ, Lee JH, Harrison R. Impact of California's safe patient handling legislation on musculoskeletal injury prevention among nurses. *Am J Ind Med* 2018;62:50-8.
22. 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* 2018;29:286-94.
23. Zakariassen E, Hunskaar S. Involvement in emergency situations by primary care doctors oncall in NorwayA prospective populationbased observational study. *BMC Emerg Med* 2010;10(5).