

The impact of manual handling training on work place injuries: a 14 year audit

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Abstract

Manual handling injuries represented both the highest costs and largest proportion of workers compensation claims for the South Australian Department of Human Services from 1995 to 1999 (Risk Management Services 2000). There is evidence to suggest the manutention method of manual handling training can reduce workplace injuries. A retrospective audit of injuries was conducted at Metropolitan Domiciliary Care Southern Region, a community health service agency, to determine the effects of introducing the manutention method of manual handling to the agency. The workers most likely to sustain a manual handling injury were paramedical aides. For this workgroup, the incidence and severity of injuries were significantly reduced for the period following the introduction of the manutention method of manual handling training.

Background

Manual handling injuries (also known as body stressing injuries) have been defined in Australia as muscular stress occurring as a result of moving or lifting objects. They include muscular stress occurring without any object being handled (National Occupational Health and Safety Commission 1999). In South Australia the Occupational Health Safety and Welfare Act (1986) provides the legislative framework for ensuring worker safety. Employers must control risks by redesigning a hazardous task where reasonably practicable, and providing appropriate training, including safe manual handling techniques (Occupational Health Safety and Welfare Regulations (1995).

Manual handling injury claims represented the highest costs and greatest proportion of worker injury claims in South Australia (SA) between 1995 to 1999 (Risk Management Services 2000). Within the SA Department of Human Services (DHS), these injuries exceeded 1000 per annum and accounted for almost half the number of claims made by health units. Information obtained from WorkCover (a South Australian Government corporation responsible for injury management throughout the state) indicates that the top 10% of manual handling claims were responsible for around 80% of all injury costs.

Nurses and care workers are the most likely occupations to suffer body stressing injuries within SA health units of DHS. The Australian Nursing Federation (ANF SA Branch 1997) cites that in 1995-96, manual handling injuries sustained by nurses or employed carers in SA cost over \$11.3 million (average \$22,257 per injury). According to WorkCover, indirect costs are estimated to be 5-8 times greater. Risk Management Services at DHS indicated that the cause of injury was most frequently the manual handling of other people, and that manual handling training appeared to have a positive effect on incidence and claims figures (Risk Management Services 2000). They recommended that the 'minimum lift policy' in place at many DHS hospitals needed to be supported by set procedures, education programs and 'forward thinking' lifting techniques.

The 'No Lift, No Injury' approach to manual handling was introduced in hospitals and residential care facilities in SA in June 2000. A Victorian project reported significant reductions in manual handling claims amongst nursing staff following the adoption of the 'No lift' policy (DHS Vic, 2002). Nursing and convalescent homes in SA reported significantly fewer injuries related to lifting residents since 1998 (Work Cover 2000). However, injuries related to other 'handling' or moving of residents have remained high. Silverstein, Rockefeller et al (2003) reported that the widespread adoption of 'zero lift' in Washington State nursing homes had reduced trunk stresses but increased shoulder loads in care workers and nursing staff. Use of equipment such as hoists requires a set of manual handling skills to position slings and move the hoist safely.

Community based care is growing throughout Australia as consumers and governments embrace the notion of older people continuing to live in their own homes (AIHW 2002). Metropolitan Domiciliary Care is the largest provider of services and supports to people living in their own homes throughout Adelaide. In Metropolitan Domiciliary Care Southern region (MDC-S) 170 full time equivalent (FTE) staff were employed in 2002. Most clients are aged over 75, and all have moderate to severe disabilities. MDC-S provides a mix of allied health services, case management and support services, with paramedical aides (PMAs) and care workers providing the bulk of the direct client care. Paramedical aide work involves frequent manual handling tasks such as moving, showering and dressing clients, and assisting with exercise and mobility programs. With the growth in community care, comes the need to research and prevent injuries to workers who provide these services in unpredictable environments. With hospital and residential care settings being the initial main focus for prevention programs such as 'No lift, no injury' in SA, there has been little research published on effective manual handling programs for workers in such settings,

In 1993 in response to its manual handling injury problems, MDC-S introduced the manutention method of manual handling training to the agency for its clinical staff. Since 1999, all new direct care staff have received at least two days training for the manual handling tasks required in their work, and are required to have an annual skills update. Accredited trainers from Manual Handling Australia (a business unit of MDC-S) provide initial training and updates for staff. Each trainer has both Australian and French accreditation in manutention and many years training experience. All trainers have completed the Australian National Training Authority (ANTA) level 4 Workplace Assessment and Training Certificate.

The manutention (Dotte 1979) approach to manual handling uses principles and techniques from a wide variety of sources. Postures and movements are taught to minimise strain on the body. These moves are based on biomechanical principles and were developed from skills used in high risk "manual handling" sports such as weight lifting, abseiling and martial arts. Trainees are taught to use these skills in a manner that minimises the forces needed to move the load. Emphasis is placed on eliminating lifting where possible, using appropriate equipment and alternative ways of moving a load. It does not replace mechanical lifting aids and other handling equipment, but teaches safe use of these devices. In exceptional or life-threatening situations where manual lifting must occur, techniques are taught to achieve this as safely as possible. A great deal of attention is paid to the moving and repositioning of people for actual tasks, rather than just lifting situations.

In a review of interventions to prevent manual handling injuries, Straker (2000) acknowledged useful aspects of the manutention techniques; however the amount of controlled research in this area was limited. Best (1997) reported a reduced incidence of back pain amongst a group of nurses in aged care who received manutention training when compared with a control group. Unpublished occupational health and safety data from the Sir Charles Gairdner Hospital in Perth and from the Queen Victoria Nursing Home in Tasmania indicated a significant decrease in the rate of manual handling injuries and claims since the introduction of manutention manual handling training by these organisations. The Royal District Nursing Service (RDNS) in South Australia reported a 40% decrease in injuries in the first year of manutention training (RDNS 1997). There was a verbal report from RDNS of a more recent slight increase in injury rates subsequent to a reduction in the amount of manual handling training provided.

Preliminary incident and injury data collated by MDC-S (SDCRS 1998) suggested a decrease in the incidence of injuries for staff who had training in the manutention method of manual handling. Clearly, there is a need for further evaluation of the effectiveness of the manutention method of manual handling training. With the

10 year history of this method at MDC-S an internal audit of manual handling incidents and injuries was conducted. The aim of this study was to determine whether the introduction of manutention manual handling training had affected injury rates and severity within the agency.

Method

Data Sources

Incidence of injury data from 1/7/94 was taken from internal electronic incident records from MDC-S occupational health and rehabilitation office. This data included demographic information about the worker involved. Severity of injury was measured using workdays lost and was taken from regular reports from the MDC-S pay office. All days lost data prior to 1/7/93 was taken from preliminary evaluation data (SDCRS 2000). Approval was given by the Chief Executive Officer of MDC-S to investigate internal manual handling injury rates among MDC-S employees. All injury and personal information about employees was kept strictly confidential, and no identifying data was included in the report.

Data Limitations

MDC-S injury records prior to 1/7/94 and days lost data prior 1/7/93 were handled externally by a separate insurer and this information was not accessible for verification. From 1/7/94 injury records began to be kept internally at MDC and these data were checked for reliability. From 1989 to 1993 there were 30 injury cases where the number of days lost for that injury were missing. For the purpose of this audit these injuries were treated as not resulting in any days lost. Therefore the days lost before the introduction of the manutention method of manual handling were most likely to be under reported.

Manual Handling Injury Classification

Injuries were classified according to the Type of Occurrence classification system used by the National Occupational Health and Safety Commission (NOHSC 1999) and all state Worker's Compensation bodies. This system classifies repetitive movement injuries as manual handling or body stressing injuries. Given the aim of the audit was to determine the effectiveness of manual handling training, only injuries involving a direct muscular stress injury from manual handling (Type of Occurrence codes 1&2) were included for analysis. Inter-rater reliability of classifications was ensured by using both an objective research officer and a clinical professional to classify injuries and compare classifications. If there was any doubt regarding the nature of an injury, due to incomplete information in the injury records, then clinical professional opinion for the appropriate workgroup was sought in order to clarify the type of injury. Some problems were found with the earlier preliminary data due to poor classification criteria for types of injury causes. This was rectified for records from 1/7/94 onwards through using the Work Cover classification method.

Incidence and Severity of Injuries

Incidence and days lost were calculated for all manual handling injuries at MDC-S. As PMA were a high risk group, the audit focused analysis on this work group. Two periods were chosen for comparison purposes for PMA staff. The first period comprised the 5 years prior to the introduction of manutention training for PMAs in July 1994. The second period totaled 9 years from the introduction of manutention to the end of June 2003. The number of manual handling injuries was recorded for each individual year. Injury rates were calculated as the ratio of injury incidence per full time equivalent staff member (FTE). Severity of injury was recorded by calculating the days lost from each injury up until 30th June 2003. No attempt was made to measure the impact of injuries in terms of effects on staff or medical costs. Injuries that resulted in days lost were analysed between time periods.

Manual Handling Training

Data from MDC-S manual handling training records was examined for PMA staff. Number of staff trained each year was recorded and analysed in relation to incidence of injuries. The standard training program provided to PMA staff was an initial 15 hours of manual handling training.

Data Analysis

Data analysis was conducted using SPSS V11 statistical software. The ratio of injury per full time (FTE) staff was compared for the two independent time periods using an unpaired t-test (significance level, $p < 0.05$). The distribution of days lost was not normal, so the Mann-Whitney U test (significance level, $p < 0.05$) was used for post-hoc analysis of days lost.

Results

Incidence of Manual Handling Injuries

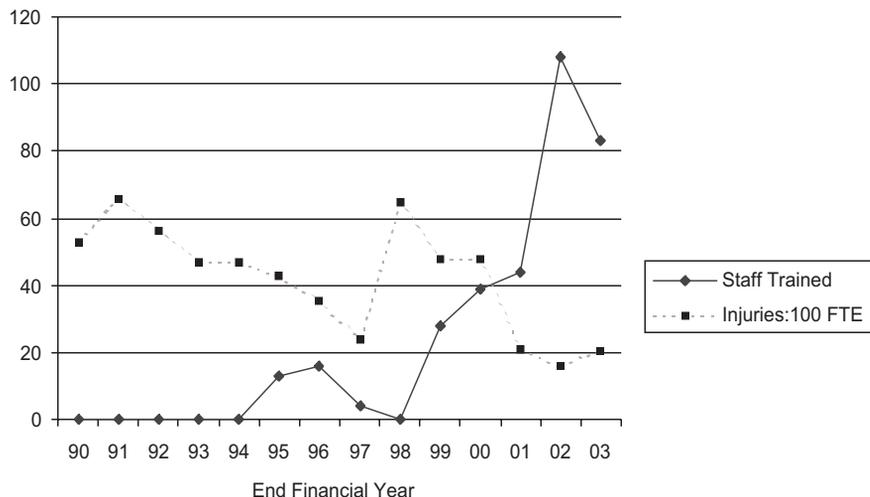
Over the 14 year period audited, there were 355 manual handling related injuries incurred by MDC-S workers. These comprised 50% of the total number of reported injuries (714) recorded. A total of 4758 working days were lost due to these manual handling injuries. Four catastrophic injuries accounted for 1843 (39%) days lost. Table 1 shows that 281 (79%) of the manual handling injuries were incurred by paramedical aides (PMA). However PMAs only comprised 35% of the MDC-S staff with an average of 48 (range 45-56) full time equivalent staff over this period. Allied health clinicians (Occupational Therapists, Physiotherapists, Podiatrists, Social Workers,) and Clinical Health Nurses at MDC-S incurred 18 (5%) manual handling injuries, despite comprising 30% of the workforce. For staff apart from PMAs and clinicians there were a total of 56 (16%) manual handling injuries. As PMA injuries were so significant, all subsequent analysis involved PMA injuries.

Table 1: Manual Handling Injuries by Work Group

Employee Category	% Total Staffing	MH Injuries	% of Total Injuries
PMA	35%	281	79%
Allied Health & Nursing	30%	18	5%
Home Helpers	13%	22	6%
Administration	17%	17	5%
Other Staff	5%	17	5%

Figure 1 shows the rate of injuries (per FTE) as well as staff trained in manutention for each year. The annual rate of 54 manual handling injuries per 100 PMA for the pre-manutention period ('90-'94) dropped significantly to 35 injuries annually for the period ('95-'03) following the introduction of manutention for PMA staff ($p=0.04$). Figure 1 shows a sharp increase in injuries in the '97-'98 year coinciding with a reduction in staff training programs due to budget cuts. Following 2 years with virtually no PMA training, programs were reintroduced and a decision was made to make training mandatory for all new staff. Since the reinstatement of the training programs, the injury rate has continued to decline (figure 1).

Figure 1: Manual Handling Injury Rates and Staff Training



Injury Severity

PMA staff incurred 94% of the injuries (N=49) resulting in more than 10 days lost, and 88% (4187 days) of the total days lost to manual handling injuries at MDC-S. Of the 281 PMA injuries, 64% resulted in no lost work days. Table 2 represents injuries which resulted in days lost. Differences in mean days lost between the two time periods for these injuries indicates a change in the severity of injuries. Actual injuries have been adjusted to account for staffing level changes by reporting these as the number of injuries (with days lost) per 100 full time equivalent PMA staff. There was a significant reduction (p=0.006) in days lost per injury from the five year pre-manutention period to the nine year period following the introduction of manutention. The significant drop in days lost for each injury, combined with lower injury rates, resulted in a marked drop in days lost to MH injuries each year following the introduction of manutention.

Table 2: Changes to Injury Severity

Period	Annual Injuries with days lost (per 100 FTE)	Mean days lost per injury (SD)	Annual days lost	Total days lost
Pre-manutention 7/89-6/94	18	61.8 (126)	507	2534
Post-manutention 7/95-6/03	14	25.5 (66)	187	1683

Discussion

Incidence of Manual Handling Injuries

The significant drop in the rate of manual handling injuries over a nine year period included a year ('97-'98) when the injury rate increased to 65 injuries per hundred FTE. Budget pressures in that year resulted in a freeze on training programs for new staff as PMA staff numbers were reduced by 10%. This may have resulted in greater work loads and an influx of untrained staff as a number of more experienced PMA staff were offered separation packages. The rise in injuries that year prompted MDC-S to make it mandatory for all new staff to

receive manual handling training prior to starting work at the agency. Clearly there appears to be a relationship between the number of training programs offered each year and the rate of injuries that year and subsequently. The decreased rate of injuries between periods is consistent with the results of Best (1997) and the data from the Sir Charles Gairdner Hospital in Perth and from the Queen Victoria Nursing Home in Tasmania. Finally, the current results are consistent with the reports from the Royal District Nursing Service (1997).

Severity of Manual Handling Injuries

Paramedical aides suffered 80% of the manual handling injuries at MDC-S, and were more likely to have a more severe injury as measured by days lost. This finding emphasises the high risk nature of the paramedical aide work and is consistent with the findings of earlier reports about direct care workers (Risk Management Services 2000, ANF SA Branch 1997). However, over a 14 year period, coinciding with the introduction of manual handling training, manual handling injuries have become significantly less severe for this work group. These results indicate that for the workgroup that is at greatest risk of injury the manutention manual handling training may be reducing the severity of injuries. This has positive implications for those individuals working in high risk occupations, the clients receiving services, as well as for costs (both direct and indirect) incurred by the organisation as a result of workplace injuries. These results are consistent with previous preliminary data and anecdotal evidence collated by MDC-S (SDCRS 1998, 2000).

Level of Training

The allied health and nursing work groups incurred only a single day lost over this period, which may be explained by the PMA work group doing a high percentage of the routine manual handling tasks at MDC-S. The reduced incidence may also be explained by the greater amounts of manual handling training received by the clinical professionals both as undergraduate students, as well as at MDC-S. These same work groups may also have historically under reported manual handling injuries. The rationale for requiring occupational therapists and physiotherapists to do more manual handling training has been that they are better able to instruct paramedical aides and care workers if they have been comprehensively trained. The combination of paramedical aides performing a high percentage of client related manual handling at the agency, and receiving lower levels of training, creates a high risk grouping at MDC-S. Manutention is a skills based motor learning method of manual handling that requires participants to learn how their body moves in order to safeguard themselves. Paramedical aides and other direct care workers should be targeted to receive manutention manual handling training with regular skills updates.

Limitations of the Present Study

The use of "days lost" as an indicator of injury severity, whilst having good face validity, may present some limitations. Although all days lost should only have been taken as a result of an injury, it is possible that other factors could be contributing to time taken off work. A further limitation of this study was the age of the data collected. There was some missing data and some question as to the overall accuracy of early records due to different record keeping systems and agents. As record keeping began to be kept internally from 1993 the data from this time onwards was more easily verified. However, the decision to treat missing days lost data conservatively for the pre manutention period (by assuming there were no days lost) may well have weakened the effect of the introduction of manutention.

A problem with the classification of manual handling injuries that had previously existed was rectified with the adoption of WorkCover injury classifications. The limited nature of pre-1994 data records necessitated the use of previous classifications for that period. Information on the cause of injuries was scant and factors that are influenced by training were not possible to isolate. Additionally, as manual handling training records have only recently been formally organised some of the earlier data may incorporate a slight margin of error. Current record keeping processes will mean that future progressive audits will not be subject to these limitations, as questionable data will no longer be included in the analyses.

As this study involved a retrospective analysis of training and injury record data, there may have been other factors contributing to the patterns of results that were not controlled for. These factors may have been local

changes in work practices and reporting, or changes in the community (such as the introduction of 'no lift, no injury' in SA) to reduce manual handling injuries. The 'no lift, no injury' approach to dealing with manual handling injuries was introduced in some hospitals and residential care facilities beginning in June 2000. MDC-S has not introduced this approach and thus it is unlikely to have influenced the results of this study. These final limitations would be overcome in prospective controlled research into the efficacy of the manutention method of manual handling.

Conclusion

Manual handling injuries to health care workers remains an issue of great consequence to the health care industry, especially in community settings that are likely to be the preferred places to deliver services in the future. This study suggests that training in the manutention method of manual handling can reduce the incidence and severity of workplace manual handling injuries. This has positive implications for workers in high-risk occupations, those clients receiving services and for organisations delivering services in the community.

Workers at the highest risk of incurring a manual handling injury should be targeted for training using the manutention method. Optimal levels of training required to reduce injury severity and incidence need to be determined.

The most severe injuries that have catastrophic consequences for workers and employers require further research. As these manual handling injuries account for a significant proportion of costs to employers, they need to be investigated on an individual basis to identify and address contributing factors. Training is only one of the control methods for reducing risk associated with hazardous tasks. The judicious use of equipment, changes to work systems and ensuring staff are adequately trained, are critical to safe manual handling practices.

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