

## Case Report

## Effects of Transfer Training on Musculoskeletal Pain in the Caregiver of a Stroke Patient: a Case Report

Atefeh Taghizadeh; Shahriar Parvaneh\* ; Setareh Ghahari; Asghar Dadkhah  
*University of Social Welfare and Rehabilitation Sciences, Tehran, Iran.*

Taher Taheri  
*Centre for Neuro Science, Khatamol Anbia Hospital, Tehran, Iran.*

Peymaneh Shirinbayan  
*Pediatric Neuro-Rehabilitation Research Center  
 University of Social Welfare and Rehabilitation Sciences, Tehran, Iran.*

The purpose of this case report was to evaluate the effectiveness of training of transfer techniques to a caregiver of a person who had suffered a stroke in decreasing musculoskeletal pain, depression and anxiety. This study adopted a single subject research design to evaluate the effectiveness of transfer-techniques training on musculoskeletal pain, depression, and anxiety in a 25-year-old female caregiver of a person with a stroke. The study was completed in four phases, including a baseline evaluation (1st and 3rd week), training (3rd, 5th and 7th week), post-training (9th week), and follow-up evaluation (11th week). During the 1st week, demographic and descriptive information (such as age, time since diagnosis, cognition and independence of daily living) were collected from the stroke patient. Also, pain severity, anxiety and depression levels of the caregiver were evaluated. In weeks 3, 5 and 7, transfer training was undertaken. The patient was involved in the training with the caregiver under the supervision of an occupational therapist in their own home. The effectiveness of the training with regard to musculoskeletal pain and depression and anxiety levels of the caregiver was evaluated in the 5th, 9th and 11th weeks. The data were analyzed using a visual analysis of trends and levels. The results showed a decrease in pain severity, anxiety and depression during training and post-training. The changes continued during the follow-up stage. This study suggests promising results for the effectiveness of the transfer-techniques training and justifies further clinical trials. A larger trial is required to confirm the effectiveness of transfer training in improving pain management in caregivers of stroke survivors.

**Keywords:** Stroke, Caregiver, Musculoskeletal pain, Transfer Training

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### Introduction

Caregivers play a prominent role throughout the post-stroke recovery process. A stroke survivor's caregiver is often the most important source of long-term support during recovery and rehabilitation. Caregiving can have a significant impact on caregivers (1,2). Not only do caregivers have to continue to fulfil their usual roles within their own families (such as being a mother and/or a breadwinner), they also have to care for the survivor and possibly take on the stroke survivor's responsibilities as well (3,4). Stroke recovery may take at least two years, and the majority of the support during this period comes from caregivers (5). Providing care for a stroke patient can cause

high levels of emotional, mental and physical stress (6,7). It can be overwhelming to be suddenly thrust into the position of caregiver with little or no warning (8). However, more often than not, the well-being of caregivers is not considered (7).

Movement disabilities resulting from a stroke necessitate caregiver support for transfers from one place to another (9,10). This can result in a significant and ongoing physical load on the musculoskeletal system, often resulting in musculoskeletal pain in caregivers (11,12). Research shows that pain correlates strongly with anxiety and depression (13,14). Therefore, health professionals should be encouraged to develop comprehensive programs to address caregivers' physical and

\*All correspondences to: Shahriar Parvaneh, email: <sh.parvaneh@gmail.com>

emotional problems. Unfortunately, there is a lack of training for caregivers in physical transfer techniques. Caregivers usually have little or no training in correct transfer techniques (10). Caregiver training and education is critical for positive outcomes for both stroke patients and their caregivers (15). Using these ideas and results, we created a transfer-techniques booklet for caregivers based on academic transfer training programs for occupational and physical therapists and nurses. The transfer training was administered to a caregiver of a stroke survivor in three sessions over six weeks, and we investigated its effects on the pain, depression and anxiety levels of the caregiver.

### Methods

**Case Report** - The participant in this case study was the main person helping with the physical transfers of a 33-year-old man with a diagnosis of stroke (left hemiplegia). The caregiver was a 25-year-old woman and the patient was her husband. She was not in paid work and was a full-time housewife. Since her husband had the stroke, she has worked 15 hours a day as his caregiver.

The patient was a first-time stroke participant and it had been 3 months and 24 days since the stroke. He sustained a right-brain thrombotic stroke. He was medically and neurologically stable at the time of baseline assessments, and was totally dependent for his mobility and self-care, based on the Modified Barthel Index (15). His caregiver used a manual wheelchair to ambulate him within the house and outside of the house. The Mini Mental State Examination (MMSE) was used to assess his cognitive status, and his score was 21. He had received outpatient occupational therapy, physical therapy, and speech therapy since the onset of stroke. A signed consent form was obtained from the stroke participant and his caregiver prior to the study.

**Procedure** - Data in this research was collected over a period of 11 weeks (baseline, training, post-training, and follow-up), starting at the beginning of January and continuing through to the middle of March 2013. The caregiver was selected because she was the main caregiver and felt constant pain in nine parts of her body, based on the Nordic Questionnaire. Data on the stroke participant was collected using a demographic questionnaire, CT scan and MRI (stroke subtype, lesion location), MMSE, Modified Barthel Index, and Line Bisection Test. We also collected baseline data on the

caregiver's musculoskeletal pain, depression, and anxiety. The caregiver's assessments also included demographic details.

After the baseline assessment, the training program was administered to the caregiver and participant in their home environment on the 3rd, 5th, and 7th week. The first training session lasted three hours. The second and third sessions were a practice of the previous training session and lasted approximately two hours. The training program in this study generally included transfer techniques based on Bobath concepts, ergonomic principles aimed at reducing the physical load on the caregiver's musculoskeletal system, and the fulfilment of the patient's need for care. One of the key points of this program was in encouraging the participant to be involved in the training program. In this study, we also implemented home adaptations based on a risk assessment, such as adjusting the bed to the correct height (waist level when providing care; hip level when moving the participant) and installing grab bars on the top of the bed.

A training booklet was also created based on previous transfer training interventions, and was given to the caregiver at the end of the first session. Telephone follow-ups were conducted to motivate the caregiver to continue using the skills obtained during the training. Post-training and follow-up assessment was done two weeks after the training phase (on the 9th week), and four weeks after the training (on the 11th week) respectively. Outcome measures for the caregiver in these two assessments included the pain questionnaire and Hospital Anxiety Depression Scale (HADS). The pain questionnaire in this study was a combination of the Nordic Questionnaire and the Visual Analogue Scale (VAS). The caregiver determined the areas where she felt pain and marked the severity of pain on a 10 cm line. We also used HADS as a scale to evaluate depression and anxiety. This measure has been used before for patients with musculoskeletal disorders (16). It consists of 7 questions for depression and 7 questions for anxiety (a total of 14 items), with responses being scored on a scale of 0 to 3. The scores for each subscale (anxiety and depression) can range from 0 to 21. The level of depression and anxiety of the person can be categorized as normal (score of 0-7), mild (score of 8-10), moderate (score of 11-14), or severe (score of 15-21) (17). A study in Iran has shown the reliability and validity of the Farsi version of the HADS (18). Data were analysed using a visual analysis of level and trend.

**Results**

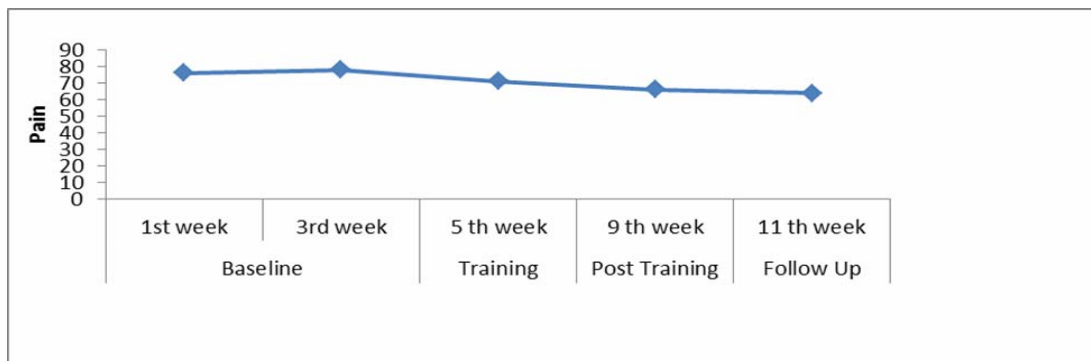
After three training sessions, the caregiver no longer felt as much pain as before and the use of medication to relieve pain, as well as the pain severity scores, gradually decreased. The results of the pain questionnaire during the training, post-

training and follow-up periods showed significant improvement. Table (1) shows the baseline, training, post-training and follow-up results for pain severity in specific parts of the body and in the total body recorded.

**Table 1.** The baseline, training, post-training and follow-up results for pain severity

| Parts of body  | Baseline |          | Training | Post Training | Follow-up |
|----------------|----------|----------|----------|---------------|-----------|
|                | 1st week | 3rd week | 5th week | 9th week      | 11th week |
| Neck           | 10       | 10       | 8        | 8             | 7         |
| Right Shoulder | 4        | 5        | 4        | 4             | 4         |
| Left Shoulder  | 6        | 7        | 6        | 5             | 5         |
| Right Elbow    | 6        | 6        | 5        | 5             | 5         |
| Left Elbow     | 10       | 10       | 10       | 8             | 8         |
| Back           | 10       | 10       | 8        | 6             | 5         |
| Hip            | 10       | 10       | 10       | 10            | 10        |
| Knee           | 10       | 10       | 10       | 10            | 10        |
| Ankle          | 10       | 10       | 10       | 10            | 10        |
| Total Body     | 76       | 78       | 71       | 66            | 64        |

And fig (1) shows the decrease in the severity of the caregiver’s total body pain during the training, post-training and follow-up phases.



**Fig 1.** Severity of the caregiver’s total body pain during the training, post-training and follow-up

The severity of the caregiver’s pain decreased during the training period. Both the level and the trend changed over the period from the baseline to the end of training. Not only there was a difference in the levels, but also a marked difference in the trend was noted in favour of the transfer-techniques training program.

While the focus of the study was to examine the effectiveness of the training program on musculoskeletal pain, the depression and anxiety levels of the caregiver were also measured in the 1st, 9th and 11th weeks. Table (2) shows the depression and anxiety scores during the pre-training, post-training and follow-up phases.

**Table 2.** Depression and anxiety scores in 3 phases.

| HADS       | Pre-Training<br>1st week | Post-Training<br>9th week | Follow-up<br>11th week |
|------------|--------------------------|---------------------------|------------------------|
| Anxiety    | 14                       | 9                         | 7                      |
| Depression | 14                       | 9                         | 8                      |

And fig (2) shows the decrease in the caregiver’s depression and anxiety scores after the training program.

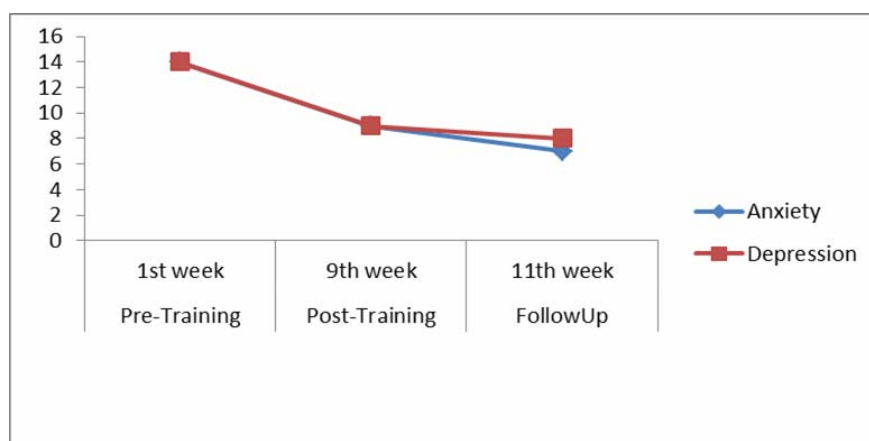


Fig 2. caregiver's depression and anxiety scores after the training program

### Discussion

In this case study, the primary aim was to investigate whether training transfer techniques can improve the musculoskeletal pain, depression, and anxiety of the caregiver. The results showed a decrease in pain severity for the caregiver through the training, post-training, and follow-up phases in comparison to baseline 1 and 2 results, and also a decrease in depression and anxiety level in the post training and follow-up assessments. Looking beyond the decrease in pain, depression, and anxiety scores, the caregiver reported significant changes across the phases. She improved from being reliant on pain relief medication at the start of this study to a person who no longer takes pain-related medicine. Moreover, by the end of this study, the patient was involved in transfer and the caregiver did not bear the entire workload. Our findings show promising results for training programs in improving pain severity, and, because of the link between chronic pain and its affective components (i.e. depression and anxiety), it consequently decreased depression and anxiety.

Previous research has investigated the effectiveness of transfer training on musculoskeletal pain of nurses, physiotherapists, and occupational therapists and reported various results (19-21). Hignett's systematic review looked at intervention strategies to reduce the risk factors associated with patient handling activities for nurses. They categorized the research results into three categories: multifactor interventions, single-factor interventions, and interventions based on technique training. The results of their systematic study showed that interventions predominantly based on technique training had no impact on injury rates. Even so, multifactor interventions, based on a risk assessment

program, were most likely to be successful in reducing risk factors related to patient handling activities (11). The current study supports the theory that introducing transfer techniques based on a risk assessment program has an effect on decreasing musculoskeletal pain. It is not reasonable to compare this research results with studies on nurses or rehabilitation personnel, because they care for several disabled patients on a daily basis. The caregiver in this study provided care for one disabled stroke patient and therefore endures a lower physical load than nurses and others who work in rehabilitation centres. Keeping this in mind, no other studies have been reported on the effectiveness of transfer training on musculoskeletal pain of stroke patient caregivers.

### Conclusion

In relation to depression and anxiety levels, we did not find any study with similar protocol training. However, Karla et al.'s study showed a positive effect of a training protocol on depression and anxiety levels of stroke caregivers, where transfer training was a part of their comprehensive training protocol (22). Future research is needed to investigate the findings of our study in a larger group of caregivers of people with strokes. A combined psychological and physical training protocol may result in even more positive effects on caregivers. This is a possible area of future research that was not addressed in this study.

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