**Return to Work for People with Hand Injuries: Strategies and Barriers**

**ABSTRACT**

**Introduction.** The socio-economic burden of a hand injury in South Africa can be substantial, particularly for manual labourers whose job tasks are physically demanding and require hand function. Barriers to work-related transitions occur on an economic, social and political level, as well as on a therapist- and client-specific level. **Aim.** The study aimed to identify the strategies and barriers encountered by occupational therapists to facilitate the work-related transition process after a serious hand injury. **Methods**. A descriptive cross-sectional design was utilised. A questionnaire was developed for the study through a rigorous development process that included piloting. The final instrument was disseminated as an online questionnaire to occupational therapists working within the field of return to work and hand injuries. As no data were available on the number of occupational therapists working within this field, convenience sampling was used with snowballing as a strategy to increase the number of possible respondents. Data were exported into Microsoft Excel and descriptive analyses were conducted. **Results.** Forty-three occupational therapists completed the questionnaire. Respondents mostly focused on treating components of function (100%), addressing activities of daily living (97.67%) and issuing home programs (97.67%) as direct intervention strategies to facilitate work-related transitions. One of the least used strategies was issuing assistive devices for work (30.23%). The least used work-specific strategies included conducting worksite visits, observing clients (or proxies) completing work tasks in the workplace and implementing work trials. Financial support and compensation were viewed as both an asset and a barrier. **Conclusion.** Without knowledge about the representativity of the study sample, the results of this study cannot be generalised. However, the therapists who responded to the questionnaire were offering a range of strategies to address work-related transitions for people with serious hand injuries, despite the numerous barriers that exist.

**Keywords:** Upper extremity, Vocational Rehabilitation, Work-related transitions

**BACKGROUND**

The socio-economic burden of hand injuries in South Africa is substantial. Hand injuries incur costs to the individual, employers and the state. This is particularly noticeable in the government health sector, where many clients are manual labourers whose job tasks are physically demanding. The intrinsic job demands of manual labour require hand function, with specific skills in dexterity and manual handling. Therefore, sustaining a hand injury will typically result in functional deficits requiring medical intervention and rehabilitation and will impact on the person’s capacity to work1. Occupational therapists are equipped to provide therapy and vocational rehabilitation to people with hand injuries. Substantial evidence has been produced in the United Kingdom on the benefits of vocational rehabilitation2.

More than a decade ago, it was reported that 1 million workers in the United States of America sustained hand injuries annually3. Canadian statistics have shown that 28% of 630,000 work-related injuries in 2003 were to the hand4, while one-fifth of cases presenting to European emergency departments are hand injuries5. There are no accurate prevalence statistics for hand injuries in South Africa. Considering the high levels of violence and road traffic accidents in South Africa6, we assume that hand injuries are likely to be more prevalent than Europe and North America.

South Africa has large income inequalities despite the abolishment of *Apartheid* in 1994. This has affected the level of skills of informal workers in the South African labour force7. In low- and middle-income countries, the economy is dependent on manual labour for the propagation of industrialization. Equipment used by manual workers is often unsafe and unregulated by safety laws in developing countries, which may contribute to hand injuries in South Africa8.

The majority of South Africans do not have healthcare insurance9 and are therefore reliant on the public sector for healthcare. People in higher income brackets can afford healthcare insurance and thus to receive treatment in the private healthcare sector9. The private sector has better human resourcing than the public sector, despite more people being dependent on the government sector for healthcare10. Transport costs, travelling distances and the type of transport available contribute to the barriers South Africans face in accessing healthcare7.

Occupational therapists draw on a variety of strategies to facilitate work-related transitions. The frequency of using these strategies is however unclear. In Norway, the most effective vocational rehabilitation strategy was found to include the prompt placement of the client back into work11, while an Australian study reported the most important and most used skills within vocational rehabilitation were case management and personal counselling12. A study conducted in Australia found that the reported frequency of *actual* and *ideal* use of strategies differed 13.The authors did, however, find an overlap of strategies that were used with the same frequency across all types of work-related interventions13.

Barriers to work-related transitions occur at an economic, social and political level, as well as on a therapist- and client-specific level13. An Australian study found that the barriers to ideal practice in conducting work-related assessments related to occupational therapists working in isolation, and lacking training and experience13. Client-specific barriers included a lack of motivation to return to work and clients who do not speak English as a first language. The most prominent work barriers included a lack of consistency in the workplace, the work environment and the employer’s attitude13. External barriers included industrial issues, delayed referrals and legislative problems among others.

The current study was nested within a larger mixed-methods study that explored the successful transition of people with serious hand injuries to work. The quantitative phase of the study aimed to identify the strategies occupational therapists in South Africa were using to facilitate work-related transitions, as well as to determine the barriers that are encountered. Identifying which strategies occupational therapists use to facilitate work-related transitions could inform the development of best practice guidelines which will assist clients to receive the best care in this area of occupational therapy service delivery.

The study had three objectives:

To establish which strategies occupational therapists use in their practice.

To determine the frequency of use of the various strategies.

To determine the barriers identified in work-related transitions.

**METHODS**

The STROBE guidelines have been used to report this study14.

**Study Design**

This phase of the larger study made use of a descriptive cross-sectional research design. A cross-sectional study was considered appropriate as the authors wanted to obtain descriptive data from occupational therapists to identify which work-related transition strategies are being used and to draw comparisons between the different strategies15. Cross-sectional questionnaires are useful to measure the frequency that various work-related transitional strategies are being used15 and to determine the variety of barriers encountered by study participants.

**Population and sampling**

The population comprised all occupational therapists in South Africa working within the field of hand/upper limb rehabilitation and vocational rehabilitation or work practice. As no data were available on the number of occupational therapists working within this field, non- convenience sampling with snowballing was used to include as many occupational therapists as possible.

**Instrumentation**

A questionnaire was developed and pilot tested prior to finalisation.

***Questionnaire development***

The items in the questionnaire were developed from two sources. Firstly, as part of a scoping review, a thematic analysis was conducted to identify the different types of strategies used by occupational therapists to facilitate work-related transitions for clients with hand injuries (Uys, Van Niekerk and Buchanan, in review). Questions were formulated from the codes that made up the theme “strategies that occupational therapists use to enable work-related transitions” in the scoping review. Secondly, an inductive analysis was undertaken of interview transcripts from an overarching study conducted in 2017 that explored South African occupational therapy practice related to work transitions after serious hand injury(Buchanan & Van Niekerk, in review). Codes were identified on the strategies the therapists used and questions were formulated from these codes.

The questionnaire comprised two sections namely, work-related transition strategies used by occupational therapists, and demographic information (see Table 1). Within the section on work-related transition strategies, questions were grouped according to the client’s stage of recovery (e.g. acute, rehabilitative and return to work phases) and sub-divided into: direct occupational therapy treatment strategies, indirect occupational therapy treatment strategies, provision of emotional support, specific work-related strategies, and assets and barriers to work-related transitions.

The questionnaire made use of a combination of ordinal scales and text boxes. A four-point rating scale was chosen for most questions (43 of 67) as it is known to enhance validity and reliability when measuring individuals’ opinions16. Four-point rating scales are also beneficial as the repetitive style of asking the questions has been found to improve the response rate17. The textboxes contextualised the responses or contributed new considerations to the existing questionnaire. Questions with four-point rating scales were supplemented with a textbox to provide an opportunity for additional descriptive information to the frequency of strategies used to facilitate work-related transitions, which is widely regarded as complex. The questionnaire was refined during the pilot testing phase after which it was finalised.

***Testing validity and utility***

Face validity, content validity and specific aspects of clinical utility of the questionnaire were investigated through a piloting process.

*Pilot sample:* Threeoccupational therapists employed at three different academic institutions across the country and with a clinical background of at least five years in the field were invited to participate. These participants were chosen so as not to involve any potential respondents for the main study in this pilot phase and to obtain diverse input on the clarity and relevance of the questionnaire to the research question. Experts within the field of work-related transitions or hand injuries were involved in this process to increase the likelihood of obtaining reliable and accurate responses18.

*Procedure:* The three participants were recruited via email or telephonically. On agreeing to participate, each participant was emailed the questionnaire which they completed in their own time.

After receiving the completed questionnaires, responses were checked for consistency by looking for logical patterns. The first author arranged individual face-to-face or Skype meetings with each participant to systematically critique the clarity of each question. Content validity was evaluated by appraising the comprehensiveness of the questionnaire and checking that the questions represented all characteristics the authors intended to measure19. Participants also determined whether any questions could be removed, added or reformulated, without compromising content validity20.

For clinical utility, the clarity of instructions, formatting of questions and response options, completion time interpretation of questions and clinically relevance21 were evaluated with the same three occupational therapists. Clinical relevance related to the appropriateness of the strategies for occupational therapy practice in South Africa and the likely barriers that would be encountered. Participants also commented on the conciseness and comprehensiveness of the questionnaire.

Feedback from the pilot study participants was tabulated and systematically discussed item by item. Where the feedback improved clarity, changes were made. Revisions included changing or removing words for clarity, adding a definition of case management, expanding a question to include synonyms (for example, components of function and performance skills), dividing concepts such as activities of daily living into instrumental and basic activities of daily living, providing examples for some items and adding text boxes to capture additional comments. The response options were initially in most cases, hardly ever and never. After the pilot study improvements were made. One pilot participant recommended adding a further response option to make the three-point rating scale a four-point rating scale.

**The final Questionnaire**

The final questionnaire consisted of two sections (details shown in Table 1) and contained an information page, consent form and inclusion criteria.

**[Insert Table 1. here]**

**Data Collection Method**

The questionnaire was developed as an online survey as the most economical way of ensuring that participants from across the country could participate in the study. Additional benefits included the flexible formatting of the questionnaire (which permitted questions that were not relevant to the respondent to remain hidden), being able to limit the number of questions on each page, allowing respondents to answer the questions at their convenience and ease of sharing the link with colleagues. The questionnaire could only be completed if the respondent met the self-selected inclusion criteria.

The electronic platform, SUrveys.sun.ac.za, was used to conduct the online questionnaire. A link to the questionnaire was distributed to the entire population of occupational therapists to recruit as many respondents as possible. The questionnaire was shared through the Occupational Therapy Association of South Africa (OTASA) and the Metropole Occupational Therapists in Health (MOTH) group mailing distribution lists. The link was also posted on social media platforms, namely LinkedIn and relevant Facebook groups (Occupational Therapy, University of Cape Town, OT Comserv 2017, ST's, PT's, OT's, DT's and Audio's!, Maties se beste OTs and 2017 Community Service Allied Health Professionals) between 27 May 2019 and 5 August 2019 and was shared with occupational therapists known to the first author for further distribution. Therapists who received the invitation to participate in the study were required to determine their eligibility by self-selecting options from the inclusion criteria. The questionnaire was available for ten weeks and 4 days (25 May 2019 to 6 August 2019). Reminders was sent via a mailing list on three occasions (11 July 2019, 24 July 2019 and 5 August 2019).

**Data management and analysis**

Data from completed questionnaires were exported from SUsurveys into Microsoft Excel for analysis. As the data were not normally distributed, medians and ranges were determined for numerical variables. Descriptive statistics were used to calculate frequencies and percentages for the different strategies used to facilitate work-related transitions. No additional analyses were conducted as the aim of the study was to describe current practice.

**ETHICS**

The Human Research Ethics Committee of the University of Stellenbosch (HREC reference number: S18/05/098) and the University of Cape Town (HREC reference number: 537/2018) granted permission for this study. The identity of research participants was anonymous as no personal information was required.

**RESULTS**

The SUsurvey platform showed 762 incomplete responses where the respondent either did not complete the questionnaire fully or only realised while completing it that it was not relevant to them. Forty-three occupational therapists met the inclusion criteria and completed the questionnaire. Respondent profiles are presented first, after which the results are presented according to the sections in the questionnaire, namely: direct occupational therapy treatment, indirect occupational therapy intervention, provision of emotional support, specific work-related strategies, and assets and barriers in work-related transitions.

**Respondent profile**

*Table 2* presents the respondents’ biographical and context-specific data. The respondents worked predominantly in the private sector, and in urban areas in Gauteng or the Western Cape. Although they were relatively experienced (median of 10 years) occupational therapists, they were less experienced in facilitating work-related transitions (median of 4 years). Slightly more than half (53.5%) did not have a postgraduate qualification in hand - or vocational rehabilitation. Of all respondents, 67.8% saw fewer than ten clients (range: 2 – 200 clients) with serious hand injuries who required assistance with a work-related transition per month.

A high percentage (83.7%) of respondents treated workman’s compensation clients. A legal framework was almost always used by most of the respondents (83.7%). A few respondents almost always assisted with the workman’s compensation application (16.7%). Of the seven respondents working in the government sector, only two (North West and Gauteng) saw workman’s compensation clients.

**[Insert Table 2. here]**

**Occupational Therapy Strategies**

***Direct Occupational Therapy Treatment***

Respondents indicated how often they had used various techniques as part of a return to work protocol (refer to Figure 1). The least used technique was issuing assistive devices for work while all respondents addressed components of function. Addressing activities of daily living and issuing clients with a home program were almost always used (by > 90%) to facilitate work-related transitions. Respondents primarily used the International Classification of Functioning (ICF) framework for clients in the acute phase of treatment and the Person, Environment and Occupation (PEO) model for those in the chronic phase. The chronic phase is generally defined as a phase starting three months after the day of the hand injury, in which the symptoms of the hand injury including the person’s ability to work, are still persisting. Other models used included the Model of Human Occupation, the Model of Creative Ability, Affolter Approach and the Biopsychosocial Model.

**[Insert Figure 1. here]**

***Indirect Occupational Therapy***

With regard to indirect occupational therapy services, every respondent provided education and almost all contacted medical and rehabilitation professionals (93.0%) (see Figure 2). The respondents also contacted their clients’ employers (79.1%).

**[Insert Figure 2 here]**

***Provision of emotional support***

The respondents identified how often they provided emotional support in a variety of ways (see Figure 3). Responding to their client’s stage of grief (91.7%) and considering psychological and psychobiological components of function (86.0%) were almost always included in the provision of emotional support. Additionally, they used motivational strategies (81.40%) and coping strategies (79.1%). The types of motivational strategies used included: identifying external and internal motivators; positive reinforcement and feedback; goal setting; measuring progress numerically with photographs and videos; re-education; motivational interviewing; the use of meaningful activities; planning a routine; choosing motivators according to a client’s priorities and interests; applying principles of Vona du Toit's Level of Creative Ability; participation in fun leisure activities that require similar function as the clients work and making clients aware of their capability and feeling of accomplishment; Cognitive Behavioural Therapy (CBT); using activities with a time component to put a numerical value to progress, projects with an end-product and goals that incorporate strengthening to be able to return to a favourite activity.

Pain was largely treated proactively before it became a problem (76.7%) or treated as it became apparent (81.40%). Screening for DSM-V (Axis 1) psychological diagnostic categories (e.g. Mood disorders, such as major depression, and anxiety disorders, such as Post-Traumatic Stress Disorder) was seldom considered (76.7%). Respondents indicated that they would use tests such as the Progressive Goal Attainment Program, the Depression, Anxiety Stress Scale (DASS) and the Beck’s Depression Inventory Test to screen for psychological diagnostic categories.

**[Insert Table 3. here]**

***Specific work-related strategies***

The respondents often obtained a job demand analysis based on information provided by the client (83.7%) and from the employer (55.8%). Of the respondents, 53.5% seldomly conducted worksite visits, 48.8% seldomly used actual work tasks and 62.8% seldomly observed a client (or proxy) completing actual work tasks. See Figure 4 for the frequency of specific work-related strategies used.

**[Insert Figure 3 here]**

***Work-related suggestions***

This item requested respondents to indicate how often they were making recommendations for specific work-related strategies, such as workplace accommodations, light duty and an early return to work. The occupational therapists almost always recommended: a graded return to work (88.4%), return to work as soon as the client is medically and functionally able (88.4%) and workplace accommodations to the client (81.4%). Workplace accommodations were less often suggested to the employer (67.4%). Additional suggestions included ergonomic education and discussions with various stakeholders including the client’s colleagues and employer. Four respondents explicitly noted that they would suggest job modifications or workplace accommodation and not “light duty” (see Figure 4).

**[Insert Figure 4 here]**

**Assets and Barriers in Work-Related Transitions**

Anxiety relating to return to work (97.7%), pain (95.35%), fear about returning to work (95.35%) and desire for compensation (90.7%) were the most frequent barriers identified. The number of treatment sessions with a client (55.8%) was indicated as the most common asset for work-related transitions. Figure 5. depicts the assets and barriers that respondents identified in work-related transitions. With regard to additional assets and barriers for work-related transitions in their settings, respondents identified more barriers than assets. Barriers included financial constraints, access to healthcare due to distance, the client’s attitude and insight and work specific constraints. Work specific constraints included aspects such as the employer’s willingness to assist, an employer’s refusal to consider a graded return to work program, the type of work contract that the client had and the client’s work history. One respondent commented that personal protective equipment was a challenge in many industries as the job may require wearing gloves, which may not be possible for a client with finger amputations. Furthermore, the same respondent explained that “light duty” is not feasible in specific industries due to the risks involved.

**[Insert Figure 5 here]**

**DISCUSSION**

This study aimed to establish the strategies used by occupational therapists and the barriers experienced in facilitating work-related transitions in people with serious hand injuries. The respondents in this study drew on a variety of strategies to facilitate work-related transitions depending on the setting in which they worked and appeared to be fulfilling a central role in facilitating the successful reintegration of people with hand injuries into the work environment.

Respondents mostly focused on treating components of function, addressing activities of daily living and issuing home programs as direct strategies to facilitate work-related transitions. This focus is well established with the underpinning rationale that hand injuries that limit engagement in activities of daily living such as work, require rehabilitation to restore functional components or adaptations where function cannot be restored20. As adaptations occur over a long duration, they require the integration of both physical and psychosocial components21.

One of the least used strategies was issuing assistive devices for work. Assistive devices, which include assistive technology in the workplace, have been found to be an expensive option for some people and may lead to feelings of isolation22. Education was provided by all the respondents. It has been established that informing a client of their diagnosis, precautions and adequately preparing the client for what to expect from the process of return to work contributes to successful work-related transitions20. Occupational therapists often discuss these aspects with their clients during a consultation or provide clients with an educational handout as a method to improve compliance22. The least used work-specific strategies were conducting a worksite visit, observing a client (or proxy) completing work tasks in the workplace and implementing a work trial. This could be related to cost implications and time-constraints of the occupational therapist; however, this will need to be investigated further. It would also be useful to determine the barriers to worksite visits to better understand how these issues can be addressed in future research.

Pain has been found to complicate a client’s functional outcome in the short and long-term23. It is therefore noteworthy that most respondents in this study treated pain proactively and seldom addressed pain only as it became apparent. It is also well-documented that psychiatric comorbidities and psychosocial factors are of paramount importance for clients with pain and traumatic hand injuries23. The American Occupational Therapy Association (2016) stated that people with serious hand injuries that require worker role adaptations will need an occupational therapist to consider psychological factors in addition to workplace modifications and traditional biomechanical approaches24. Most respondents in this study seldom screened for DSM-V (Axis 1) psychological diagnostic categories with their hand injured clients. Despite this, respondents addressed their client’s stages of grief associated with the loss of limb and associated function, addressed psychological and psychobiological components of function and facilitated the development of coping skills.

While we did not categorise the barriers by sector of work, it is likely that occupational therapists treating workman’s compensation clients in the private sector may experience similar barriers to those found in the government sector such as the distance clients have to travel to receive occupational therapy, cost implications to access occupational therapy among other economic and social challenges7. In addition to the direct costs incurred by clients, there are various indirect costs which may include a reduction in wages, time away from the workplace, transport costs to attend healthcare appointments and costs to the employer25. For clients who are breadwinners, the indirect costs to their family and community are extensive. In a study conducted in a tertiary hospital in South Africa, it was noted that 85% of the hand injury clients interviewed, earned less than 600US$ monthly (range R1000.00 – R9,000/month), despite being the breadwinners of their family26. It is likely that a breadwinner in a South African family who is earning minimum or close to minimum wage, will experience significant financial stress if they are unable to work for any length of time, which highlights the need for further studies to understand the value of financial compensation for breadwinners who have been injured.

Financial support and compensation were viewed as both an asset and a barrier. It is important to note that although occupational therapists identified a client’s desire to obtain a disability grant as a barrier to their intervention, many South Africans are dependent on grants to survive and to access healthcare9. Therefore, these clients need financial support to attend occupational therapy and to alleviate the financial pressure of not being able to work. However, given the high rates of unemployment and the competitive labour market in the country, some people with hand injuries may want to receive compensation to ease their financial constraints, which may affect their motivation and compliance with occupational therapy treatment. It would also be useful to closely consider the value of workman’s compensation in rehabilitation to inform policy and service delivery.

A thorough procedure was used to develop the questionnaire with inclusion of expert-driven pilot testing to assess face and content validity. The questionnaire was only available electronically which may have prevented some therapists from participating. The number of questionnaire responses is a limitation to the generalizability of the study, with some provinces not being represented at all. In addition, as we did not have information about the number of occupational therapists in the population, the results cannot be generalised nationally nor to the public and private sectors.

 This study aimed to identify the strategies that were being used; it did not attempt to explore the evidence to support these strategies. Therefore, it may be useful to conduct a systematic review to evaluate the quality of evidence to support the work-related transitional strategies that are being used for people who have sustained hand injuries. The questionnaire used a four-point rating scale which is known to produce results that are clustered around extremes; this may have resulted in polarised results. In addition, the barriers considered in the questionnaire related only to the client and their context. Additional barriers such as the occupational therapist’s level of experience and employer-related aspects were not considered.

**CONCLUSION**

It is clear that in a country with high levels of unemployment, the occupational therapists in this study were contributing in a variety of ways towards facilitating work-related transitions despite the numerous barriers they experienced. This study has uncovered the importance of identifying the barriers to work-related transitions as they influence the outcome to inform clinical practice, particularly within South Africa with its economic, political and social complexities.

 While some strategies for work-related transitions described in international studies (such as issuing assistive devices for work) may not be feasible in contexts such as South Africa, others (such as facilitating early work-related transitions) are relatively easy to implement and were therefore used more regularly in this study. As it is unclear why assistive technology or assistive devices are seldom used to facilitate work-related transitions, further research is required in this area. Occupational therapists should be cognisant of fear, anxiety, pain and the desire for compensation as barriers to work-related transitions that require urgent and early intervention. The occupational therapists in this study realised the importance of emotional and psychological support in relation to managing work-related transitions.

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**CONFLICT OF INTEREST**

We declare that there is no conflict of interest.

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