The Use of Psychosocial Services Post Hand and Upper Limb Injury and Trauma: A Pilot Study

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Abstract

Background: Research demonstrates that hand injuries may cause psychological difficulties. To enhance recovery, therapists must provide appropriate referrals. The purpose of this study was to explore the use of psychosocial services by occupational therapists (OTs) and certified hand therapists (CHTs) post hand and upper limb injury or trauma. **Methods:** A quantitative survey design was implemented using a self-made questionnaire, which consisted of questions regarding demographic information, types and frequency of hand and upper limb injuries, psychiatric diagnoses, frequency of psychosocial service referrals, frames of references used, types of psychosocial assessments and interventions employed, and barriers to psychosocial services. The questionnaire was randomly distributed to 29 therapists. **Results:** The most frequently recorded frame of reference was the Biomechanical. Only 17.2% participants implemented psychosocial assessments. Sixteen of the 29 participants referred to 9 possible psychosocial services; however, majority of referrals were “occasionally.” OTs specialized in mental health, behavioral specialists, and social workers were recorded with the least amount of referrals. A Spearman rank correlation found a weak, but significant inverse relationship between referrals by therapists and years of experience as an OT or CHT (-0.322 and -0.351 , $P < .05$, respectively). **Conclusions:** Therapists appear to be biomechanically oriented which may impact outcomes. An inverse correlation was found where the less experience participants had, the more likely they were to refer to psychosocial services. The results emphasized the lack of psychosocial assessments, interventions, and referral services being used by therapists. Further education to therapists, third parties, and other health professionals is warranted.

Keywords: psychological services, CHTs, occupational therapy, hand injuries, referrals

Introduction

Research has shown that patients who have sustained hand and upper limb traumas may suffer from acute and long-term psychological difficulties. A review by De Sousa et al¹² identified 209 articles that focused on psychological issues in hand trauma. Seventeen articles were further analyzed revealing commonly reported sequel which included posttraumatic stress disorder (PTSD), work avoidance, appearance and body image issues, sleep disturbance, pain, and psychosocial and marital functional difficulties. Gustafsson et al²⁰ revealed that with acute traumatic hand injuries, nearly half of patients have increased levels of traumatic stress symptoms and that one-third demonstrate signs of mood disorders such as anxiety and depression. Williams et al²⁸ found that patients who had sustained hand injuries met diagnostic criteria for PTSD, depression, or both, which had a negative effect on general health status

within 1 month post injury. Furthermore, when psychosocial factors are not treated early in the acute phase, patients may suffer from financial, occupational, and recovery issues impacting quality of life.²⁶

Severe hand injuries can also result in a wide range of long-term consequences affecting the physical, psychological, social, and economic aspects of a person's everyday life.²¹ Long-term consequences may include avoidance of the work environment where the injury occurred.¹⁷ Work-related hand trauma patients have been shown to have

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greater avoidance of return to work (RTW) at 6 months than patients with non-work-related traumatic injuries.²⁵ Psychosocial factors secondary to hand injuries have been shown to significantly impact not only RTW rates but also personal well-being and motivation.¹⁰ These psychological difficulties may further impact occupational performance. In a study focusing on long-term effects, Bell et al⁴ explored traumatic hand injuries and their impact on functional tasks. The data revealed more than 90% of participants experienced some level of ongoing difficulty in occupational performance post injury. Due to physical limitations and inability to perform everyday tasks, 42.9% of participants expressed withdrawal from previously enjoyed activities. Bell et al⁴ found 27.5% of participants were more dissatisfied with quality of life which may also be linked to decreased body image, personal identity, and self-worth post injury. In addition, difficulties in function may have a psychological effect,²¹ thereby creating a perpetuating cause and effect cycle between psychological problems and function.

According to Grunert et al,¹⁵ “the disability caused by the psychological disorder can often be more pervasive than that due to the hand trauma.” Bear-Lehman³ found that a referral to an occupational therapist (OT) during the acute stages was positively related to RTW. The author concluded that factors other than exercises and wound management influence RTW and that there should be a focus on psychosocial factors and supports. However, these psychosocial factors and their short- and long-term outcomes are often overlooked in the field of hand therapy with the emphasis primarily focused on the physical recovery.⁶ In a study by Chan and Spencer,¹⁰ which examined the relationship between physical recovery and psychosocial adaptation, engagement in occupations and relationships, perceived outcomes and expectations, and adaptive issues and strategies, none of the participants indicated use of formal counseling services.

Including other health professionals into the care of patients with hand injuries may have psychosocial benefits, thereby impacting functional outcomes. Meijer et al²² investigated the cost-effectiveness of multidisciplinary treatment in patients with upper extremity musculoskeletal disorders. The psychological intervention, which consisted of 2 physical and 2 psychological sessions twice weekly with a fifth session of relaxation exercises, was aimed at preparing participants to RTW by setting and achieving goals, improving coping strategies, and utilizing cognitive techniques and education. Return to regular working hours raised to 86% after 12 months of intervention, whereas the control group only achieved 73% of their usual working hours. The intervention group demonstrated improvement in physical functioning, physical disabilities, kinesiophobia, and recovery rate.

The purpose of this study was to explore the prevalence and use of psychosocial services by OTs and certified hand

therapists (CHTs) who frequently work with patients who have sustained trauma or injury to the hand and upper limb. Furthermore, the researchers were interested whether psychosocial factors were being addressed during evaluation and treatment post injury.

Materials and Methods

A survey research design with a purposive sampling method was utilized. Participants were identified through a web-based search of appropriate facilities which included OTs and CHTs from the states of New Jersey, Pennsylvania, and Maryland. Inclusion criteria were identified by the following: (1) Participants had to be licensed and practicing OTs or CHTs treating patients with hand and upper limb injuries or trauma; (2) participants had to be currently working with patients with hand and upper limb injuries or trauma population at least once a week in an outpatient rehabilitation setting; and (3) participants had to be working in New Jersey, Pennsylvania, or Maryland.

The quantitative measurement tool implemented was a self-made 24-item questionnaire. Questions pertained to demographic information, types and frequency of hand and upper limb injuries and trauma, psychiatric difficulties, frequency of referrals to various psychosocial services, frames of reference, types of psychosocial assessments and interventions used, and barriers regarding referrals to psychosocial services.

The following terms were used in the questionnaire and throughout the research. Hand trauma was defined as damage to multiple aspects of the hand occurring simultaneously distal to the radiocarpal joint.²⁷ This could include multiple aspects such as soft tissue, bone, tendon, and nerve injuries. While a hand injury was defined as any injury to the bone and soft tissues distal to the radiocarpal joint.²⁷ Upper limb included the area distal to the glenohumeral joint and proximal to the radiocarpal joint.²⁷

After receiving institutional review board approval, directors of rehabilitation or site directors were contacted and then educated on the data collection process. Once permission from the site director was received, researchers requested a telephone number in which therapists could be reached at their facility. The researchers then contacted OTs and CHTs via telephone. An explanation of the research study and purpose was provided along with a request to participate in the study.

After agreement to participate was obtained, researchers hand delivered a site permission letter along with a self-made questionnaire, a cover letter explaining the research purpose, and an anonymous consent form. Participants who returned the enclosed questionnaire demonstrated their willingness to participate in the research study. A deadline of 2 weeks was provided to complete the questionnaire. Three-digit numerical codes were randomly assigned to all

participants, thus removing all personal identifiers from questionnaires to ensure participants remained anonymous.

Once the questionnaire was completed, it was placed in a sealed envelope by the participant, which was then returned to the rehabilitation or site director who then placed it in a master envelope. One week following the delivery of the questionnaire, participating facilities were contacted via telephone and requested the status of the questionnaire. If participants completed the questionnaire, researchers personally retrieved the master envelope of anonymous questionnaires from the site. If participants had yet to complete the questionnaire, a reminder of the deadline was provided to promote a higher response rate. The distribution method was altered as per request from one facility. A director from one site requested an electronic copy of the questionnaire to be emailed to additional satellite locations; permission was granted from the rehabilitation director prior to the emailed distribution.

Data from all participants were imported into SPSS version 21.0 for analysis. For each item on the questionnaire, numerical value was assigned to each item response. A code book was created to categorize the statistical frequency of responses. Missing data or incomplete surveys were reviewed for any retrievable data to be used during analysis. Descriptive statistics such as frequencies and Spearman rank correlation were used to organize and describe the characteristics of the data set.

Results

A total of 19 questionnaires were delivered to various facilities in the states of New Jersey, Pennsylvania, and Maryland. Of the questionnaires distributed electronically, 8 were returned via email while 2 were mailed. A total of 29 questionnaires were received and analyzed. A 100% response rate occurred for the hand-delivered questionnaires. However, a response rate for the electronically delivered surveys via email could not be determined due to an unknown forwarding distribution number.

The demographics survey collected information regarding sex, education level, therapy designation (OT vs CHT), years of experience as an OT or CHT, and number of conferences attended (see Supplemental Table 1). Participants in the study consisted of 8 males (27.6%) and 21 females (72.4%). Responses showed that the majority of participants maintained a bachelor's degree of education ($n = 20$, 69.0%), whereas the remaining number of participants practiced with a master's level degree ($n = 9$, 31.0%). Regarding further education, 17 participants (58.6%) reported attending 0 to 1, 6 (20.7%) reported attending 2 to 3, 1 (3.4%) reported attending 4 to 5, and 4 (17.2%) of the participants reported attending 5 or more conferences. A greater number of participants were identified as CHTs ($n = 19$, 65.5%) compared with OTs ($n = 10$, 34.5%).

Participants were requested to indicate the number of years of experience practicing in the field of OT. Two participants reported working less than 5 years (6.9%), 4 participants reported working 5 to 9 years (13.8%), 5 participants reported working 10 to 14 years (17.2%), 3 participants reported working 15 to 19 years (10.3%), and 15 participants reported working 20 or more years (24.1%). The mode of years of experience practicing in the field of OT was 20 or more years ($n = 15$, 51.7%). Participants were also asked to indicate the number of years of experience in hand therapy. Four participants reported working less than 5 years (13.8%), 5 participants reported working 5 to 9 years (17.2%), 7 participants reported working 10 to 14 years (24.1%), 6 participants reported working 15 to 19 years (20.7%), and 7 participants reported working 20 or more years (24.1%). The mode of years spent practicing in hand therapy was 10 to 14 years of experience ($n = 7$, 24.1%).

Participants were provided with 10% interval options regarding the percentage of patients who presented with hand and upper limb traumas. The most frequently recorded response was 51% to 60% of patients ($n = 8$, 27.6%), followed by 41% to 50% of patients ($n = 5$, 17.2%). Percentage intervals of 61% to 70% ($n = 0$) and 91% to 100% ($n = 0$) were of the least frequently chosen. Likewise, participants were provided with 10% interval ranges concerning the percentage of patients presenting with hand and upper limb injuries. The most frequently recorded response was 91% to 100% of patients ($n = 16$, 55.2%). Percentage intervals of 11% to 20% ($n = 1$, 3.4%), 21% to 30% ($n = 1$, 3.4%), 51% to 60% ($n = 1$, 3.4%), 71% to 80% ($n = 1$, 3.4%), and 0% to 10% ($n = 0$) were of the least recorded percentage ranges.

The self-made questionnaire provided an open-ended format regarding participants to list the top 5 injuries or traumas encountered during practice (see Figure 1). The most frequently reported injuries and traumas were fractures ($n = 50$), followed by tears ($n = 28$). Sprain/strains ($n = 5$), thumb carpometacarpal (CMC) arthroplasty ($n = 3$), and other injuries ($n = 3$) were recorded as the least commonly treated injury in therapy. Other injuries and traumas mentioned by participants included joint replacements, pain, and flaps.

Participants were asked to select a percentage interval that best represented the frequency of patients diagnosed with a specific mental health disorder post hand and upper limb injury or trauma (see Table 1). Participants were provided with three options to choose from within 25% intervals. Within the percentage interval of 0% to 25%, PTSD proved to be the most frequent ($n = 28$), followed by anxiety ($n = 25$) and depression ($n = 23$). For the percentage interval 25% to 50%, depression was recorded as the most frequent ($n = 4$), followed by anxiety ($n = 2$) and PTSD ($n = 0$). In the 50% to 75% interval, depression ($n = 2$) and anxiety ($n = 2$)

Figure 1. Most common hand and upper limb injuries and traumas treated by occupational therapists and certified hand therapists.
 Note. CMC = carpometacarpal.

Table 1. Cumulative Frequency Distribution of Patients With Traumatic Hand/Upper Limb Injuries Who Have Been Diagnosed With PTSD, Anxiety, or Depression (N = 29).

Variable	n	%	Cumulative
PTSD			
0%-25%	28	96.6	96.6
25%-50%	0	0.0	0.0
50%-75%	1	3.4	100.0
75%-100%	0	0.0	0.0
Anxiety			
0%-25%	25	86.2	86.2
25%-50%	2	6.9	93.1
50%-75%	2	6.9	100.0
75%-100%	0	0.0	0.0
Depression			
0%-25%	23	79.3	79.3
25%-50%	4	13.8	93.1
50%-75%	2	6.9	100.0
75%-100%	0	0.0	0.0

Note. PTSD = posttraumatic stress disorder.

were the same in frequency while PTSD ($n = 1$) was the least. No participants responded to the interval of 75% to 100%.

The self-made questionnaire allowed participants to choose from 14 models or frame of references with an additional option of "other" that applied to their practice (see Figure 2). The most frequently recorded model or frame of reference was the Biomechanical ($n = 28$), followed by Model of Human Occupation ($n = 18$) and Occupational Adaptation ($n = 12$). Occupational Behavior ($n = 9$), Person Environment Occupation Performance ($n = 9$), Motor

Control and Learning ($n = 8$), Sensory Integration and Processing ($n = 7$), Cognitive Behavioral ($n = 3$), Applied Behavioral ($n = 1$), Ecology of Human Performance ($n = 1$), Life Span Development ($n = 2$), Allen Cognitive Levels ($n = 1$), Psychodynamic ($n = 1$), and Toglia Dynamic Interactional Approach ($n = 0$) were among the least recorded.

Seven options of assessments were offered in the self-made questionnaire, which included the Beck Depression Inventory, PTSD Scale, Hospital Anxiety and Depression Scale, Beck Anxiety Scale, Hamilton Anxiety Scale, Short Form 36 (SF-36), and an option to choose "other" (see Figure 3). Only 5 of the 29 (17.2%) participants recorded utilizing psychosocial assessments in OT treatment (one participant reported using more than 1 assessment). The assessment most reportedly used was the SF-36 ($n = 3$, 10.3%), followed by the option of "other" ($n = 2$, 7.8%) and the Beck Depression Inventory ($n = 1$, 3.4%). Other assessments identified by participants included the McGill Pain Questionnaire; the Disabilities of the Arm, Shoulder, and Hand (DASH); the Patient-Specific Functional Scale (PSFS); Patient-Rated Wrist Hand Evaluation Outcome Questionnaire (PRWHE); and Psychosocial Pain Scale.

Participants were provided with 7 categories to select and check all that applied for psychosocial interventions utilized during therapy (see Figure 4). The categories consisted of relaxation techniques, meditation, massage, visual imagery, pet therapy, group therapy, and an option to list "other methods." The most frequently reported intervention was massage ($n = 21$), followed by visual imagery ($n = 18$) and relaxation techniques ($n = 18$). Meditation ($n = 3$), group therapy ($n = 0$), and pet therapy ($n = 0$) were the least chosen options among psychosocial interventions. Other methods indicated by participants ($n = 6$) included

Figure 2. Theories and frame of references guiding occupational therapists and certified hand therapists.

Figure 3. Psychosocial assessments utilized by occupational therapists and certified hand therapists.

Note. SF-36 = Short Form 36; PTSD = posttraumatic stress disorder.

Figure 4. Psychosocial interventions utilized by occupational therapists and certified hand therapists.

mirror box therapy, therapeutic use of self, graded motor imagery, and narrative therapy.

Participants were asked whether their clinic or facility provided referral services to support groups, counselors, psychologists, psychiatrists, surgeons, family doctors, social workers, behavioral specialists, and OTs specialized in mental/behavioral health. Fourteen participants (48.3%) responded yes while 15 participants (51.7%) responded no. In addition, participants were asked whether they as therapists provided referral services to counselors, psychologists, psychiatrists, support groups, behavioral specialists, OTs specialized in mental health, surgeons, family doctors, and social workers (see Table 2). Of the 29 participants, 16 participants (55.2%) recorded yes to providing referrals for psychosocial services. The most frequently reported barriers to providing such referrals by therapists was insurance company restraints ($n = 14$), followed by minimal awareness ($n = 11$). Limited resources ($n = 9$), physician referral ($n = 8$),

and cost ($n = 6$) were among the remaining frequently reported barriers presented by facilities as per participant report.

Regarding distribution of referral to psychological services (see Table 2), majority of participants reported referring to counselors occasionally ($n = 7$), psychologists occasionally ($n = 10$), psychiatrist occasionally ($n = 10$), support groups occasionally ($n = 8$), behavioral specialists never ($n = 11$), OTs specialized in mental health never ($n = 12$), surgeons sometimes ($n = 8$), family doctor occasionally ($n = 6$), and social work never ($n = 6$). Participants were also requested to rank their use of the 9 possible areas for referral to psychosocial services along a 5-point Likert scale (see Table 3). Surgeons were reported as referred to the most by participants (mean = 3.69, SD = 0.79), followed by family doctors (mean = 2.81, SD = 1.05). OTs specialized in mental/behavioral health (mean = 1.25, SD = 0.45), behavioral specialists (mean = 1.31, SD = 0.48), and social workers (mean = 2.31, SD = 1.30) were recorded with the least referred.

Table 2. Frequency Distribution of Referrals to Psychosocial Services (n = 16).

Variable	n	%
Counselors		
Never	3	18.8
Occasionally	7	43.8
Sometimes	4	25.0
Often	1	6.3
Always	1	6.3
Psychologists		
Never	2	12.5
Occasionally	10	62.5
Sometimes	4	25.0
Often	0	0.0
Always	0	0.0
Psychiatrists		
Never	5	31.3
Occasionally	10	62.5
Sometimes	1	6.3
Often	0	0.0
Always	0	0.0
Support groups		
Never	5	31.3
Occasionally	8	50.0
Sometimes	3	18.8
Often	0	0.0
Always	0	0.0
Behavioral specialists		
Never	11	68.8
Occasionally	5	31.3
Sometimes	0	0.0
Often	0	0.0
Always	0	0.0
OTs specialized in mental health		
Never	12	75.0
Occasionally	4	25.0
Sometimes	0	0.0
Often	0	0.0
Always	0	0.0
Surgeons		
Never	0	0.0
Occasionally	0	0.0
Sometimes	8	50.0
Often	5	31.3
Always	3	18.8
Family doctors		
Never	1	6.3
Occasionally	6	37.5
Sometimes	5	31.3
Often	3	18.8
Always	1	6.3
Social workers		
Never	6	37.5
Occasionally	3	18.8
Sometimes	4	25.0
Often	2	12.5
Always	1	6.3

Note. OTs = occupational therapists.

Table 3. Mean, Standard Deviation, and Median of Referrals to Psychosocial Services (n = 16).

Variable	M	SD	Median
Support groups	1.88	0.72	2.00
Counselors	2.38	1.09	2.00
Psychologists	2.13	0.62	2.00
Psychiatrists	1.75	0.58	2.00
Surgeons	3.69	0.79	3.50
Family doctors	2.81	1.05	3.00
Social workers	2.31	1.30	2.00
Behavioral specialists	1.31	0.48	1.00
OTs specialized in mental health	1.25	0.45	1.00

Note. SD = standard deviation; OTs = occupational therapists.

A Spearman rank correlation which examined the relationship between referrals by therapists and years of experience in occupational therapy revealed a weak, but significant correlation of -0.322 at the $P < .05$ level. This reflected an inverse correlation, where the less experience participants had, the more likely they were to refer to psychosocial services. A Spearman rank correlation was also performed to examine whether there was a significant correlation between frequency of referral services provided by the therapist and years of experience working in hands. A -0.351 correlation was found indicating a weak relationship among variables at the $P < .05$ level. These results suggested the less experience participants had working in hand therapy, the more likely they were to refer to psychosocial services.

Discussion

OT is considered a holistic profession that “addresses physical, cognitive, psychosocial, sensory, communication and other areas of performance in various contexts and environments in everyday life activities that affect health, well-being, and quality of life.”¹ OTs are responsible for all aspects of the occupational therapy service delivery process including safety and effectiveness.¹ The primary goal of occupational therapy is to promote health and wellness throughout the life span by addressing all factors causing dysfunction in occupational performance. To prevent chronic psychosocial barriers to occupational performance, OTs need to incorporate psychosocial type of evaluations and interventions early in the rehabilitation process post hand and upper limb injury or trauma.

Although there is an abundance of literature supporting the negative impacts of underlying psychological factors post hand and upper limb injury or trauma, OTs and CHTs in this pilot study practice primarily using a physical based rehabilitative approach. The most common model and frame of references that the participants used to guide

treatment was the Biomechanical. The Biomechanical model considers addressing areas such as strength, endurance, and range of motion. Occupational therapy services provided to patients with traumatic hand and upper limb injuries may not be holistic, where all aspects of the patient including the sensorimotor, cognitive, and psychosocial characteristics of the patient are being addressed. Implementing and increasing the use of psychosocial based models and frames of references such as the Model of Human Occupation, Occupational Adaptation, Psychodynamic, Applied Behavioral, Cognitive Behavioral, and Occupational Behavioral may allow therapists to understand underlying difficulties. A review by Burton et al,⁷ which used best evidence synthesis, examined the evidence on management strategies for work-relevant upper limb disorders and recommended that the Biopsychosocial model should be considered because psychosocial factors are essential for vocational and disability outcomes.

A Spearman rank correlation coefficient was conducted, and a weak, yet significant relationship was presented between providing referral services and experience. This reflected that the less experience therapists have practicing in OT and hand therapy, the more likely psychosocial referral services will be provided. A possible hypothesis is that younger or more novice OTs and CHTs have a better awareness of psychosocial factors, with an emphasized foundation on holistic patient care. Experienced OTs and CHTs who commonly treat patients with hand and upper limb injuries and trauma may have become biomechanically specialized during years of practice. This may be due to the focus on the importance to improve range of motion, strength, edema, pain, and scarring to increase function. In addition, continued education such as conferences may be focused on physical aspects such as injuries, anatomy, surgical techniques, and therapy treatment options and protocols. The majority of participants (58.6%) indicated that they had attended 0 to 1 conferences, courses, or training seminars that addressed psychosocial issues secondary to hand and upper limb injury and trauma. It is important for educational opportunities in the field of hand therapy to include topics on psychosocial subjects and not concentrate primarily on the physical aspect of hand and upper limb injuries.

Despite the evidence for patients with hand injuries being at risk for psychological difficulties, only 5 (17.2%) of the 29 participants reported administering psychosocial assessments. The lack of psychosocial based assessments suggests that therapists working in hands typically focus on physical factors such as range of motion, strength, edema, and scarring. As a preventive measure, therapists and physicians should consider during evaluations not only physical difficulties, but also psychological issues. Due to the increased risk for patients to sustain PTSD, depression, or anxiety post hand or upper limb trauma, gaining an understanding of the person's psychological history may prevent

or minimize rehabilitation difficulties and improve outcomes in occupational performance.

Psychosocial based screenings or evaluations by both therapists and physicians during follow-up visits are recommended to provide appropriate referrals to health care professionals. Timely referrals to psychiatrists, psychologists, social workers, counselors, and support groups may allow patients to progress with therapies, RTW earlier, and improve function with activities of daily living and instrumental activities of daily living.

By not including evaluations which are client-centered, measure quality of life, and examine psychosocial factors, therapists may be omitting valuable information which may impact occupational performance and prevent chronic difficulties. Case-Smith⁸ measured functional outcomes of clients who suffered from a traumatic hand injury using the Canadian Occupational Performance Measure (COPM), DASH questionnaire, and SF-36. The study reported that the use of the COPM reinforced the development of client-centered interventions. The use of psychological assessments such as the PTSD, Hospital Anxiety and Depression Scale, Hamilton Anxiety Scale, Beck Anxiety Inventory, Beck Depression Inventory, SF-36, and COPM should also be considered to gain a more thorough understanding of underlying issues.

The data revealed that massage ($n = 21$), visual imagery ($n = 18$), and relaxation techniques ($n = 18$) were the most commonly used psychosocial interventions. However, the data does not infer the frequency to which these interventions are utilized by OTs and CHTs. Although participants indicated other methods of assisting patients with psychological difficulties, none indicated the use of pet therapy or group therapy. A qualitative study by Cederlund et al⁹ explored coping strategies utilized by participants 3 months after a traumatic hand injury while performing their daily occupations. Six central themes were identified, which included changes in occupational performance and patterns, processing traumatic experiences, receiving assistance, utilizing emotional strategies, and developing a social network. Cederlund et al⁹ recommended that emotional problems should be considered, social supports should be encouraged, and family should be engaged in the rehabilitation process. Opsteegh et al²⁴ found that even a limited number of symptoms influence RTW, and recommended that psychological assistance should be offered at all times throughout the acute hand injury rehabilitation versus when there are only clear indications of difficulties. Chan and Spencer¹⁰ recommended that counseling resources be identified in advance for referral purposes. For upper limb work-related disorders, Burton et al⁷ reported that multimodal interventions show considerable promise for vocational outcomes and that neither medical treatment nor ergonomic workplace interventions alone provide the most ideal results.

All participants reported that a percentage of their patients had been diagnosed with PTSD, anxiety, or depression. However, a frequency distribution of psychosocial referral services revealed that approximately half of the participants were not referred to psychosocial services. Among the 9 areas provided in the self-made questionnaire for referrals, participants reported referring to surgeons (mean = 3.69) the most, followed by family doctors (mean = 2.81). However, no information was obtained whether the patients were then actually referred to psychosocial services by surgeons and family doctors. In the remaining areas for possible referrals which included counselors, psychologists, psychiatrists, support groups, behavioral specialists, and social workers, a majority of referral frequencies were indicated in the "never," "occasionally," and "sometimes" categories. Interestingly, OTs who specialized in mental health either "never" or "occasionally" received referrals. Evidence supports that the earlier and more skillfully issues are addressed, the more likely that psychological difficulties will not limit functional outcomes.²³ Based on the long-lasting psychological effects of work-related hand injuries, Grunert et al¹⁸ and Grunert et al¹⁴ recommend the use of early intervention. Early intervention is considered the single best prognostic indicator for those experiencing flashbacks post severe hand trauma with RTW at significantly higher rates.¹⁴

The most frequently reported barrier to referrals was insurance companies (n = 14), followed by minimal awareness by therapists (n = 11) and limited resources (n = 9). These results suggest factors such barriers may play a role in the lack of referrals to psychosocial services. Education to insurance companies and conference organizers is important in creating awareness regarding the psychological impact of hand and upper limb injuries and trauma. The specific inclusion of psychosocial evaluations, interventions, and referrals to other services in the Position Paper on Hand Therapists' Scope of Practice² from the American Society of Hand Therapists may create a more holistic practice. Creating alliances with psychologists, psychiatrists, social workers and fellow OTs specializing in mental health may be beneficial in the creation of support groups. Support groups are common among diagnoses that have psychosocial implications impacting occupational performance. Support groups for illnesses such as cancer, rheumatoid arthritis, heart disease, burns, strokes, and epilepsy have all been shown to provide increased health benefits when compared with patients not involved in support groups,¹¹ and should be considered for patients with hand and upper limb injuries and traumas.

There were limitations to the study which need to be considered. As no standardized questionnaires were available to address the research question, a self-made survey was designed which lacked psychometric properties. However, face validity was established by submitting the survey to a group of OT graduate students, course instructors, and

the chair of the research study. Three states, New Jersey, Pennsylvania, and Maryland, were chosen to be included in the study with an uneven amount of participants in each state, which may not allow generalizability to the OT and CHT population. A larger sample size, which also includes physical therapists, should be included in future research. Questions involving an option to choose the number 0% accompanied with other numbers in an interval (ie, 0%-10%) may have caused issues with reliability and accuracy. This was due to the inability to know whether the participants intended to choose the number 0% or 10%. Finally, all participants reported that a percentage of their patients had been diagnosed with PTSD, anxiety, or depression. Understanding the exact severity of the psychological difficulties was not measured. Although some patients may have had a mood disorder, the severity may have not been great enough to warrant referral to psychosocial services.

Conclusion

Early detection of psychological factors and a specialized comprehensive approach are essential in facilitating involvement in occupations.¹⁹ As mentioned by Bonder,⁵ "our recognition of the holistic nature of function means that *all* therapists must assess psychosocial factors for every client." Psychosocial factors remaining untreated post injury may result in increased time and money demands on patients, therapists, employers, and third-party payers when addressing long-term effects.

Future quantitative research should be conducted to further explore OTs' and CHTs' use of psychosocial services for patients sustaining hand and upper limb injuries. The results of this study have the potential to help assist not only the OT profession but also educators, researchers, allied health services, clinicians, and students. The results of the study may also create awareness on the importance of a holistic approach in therapy. Through preventive care and education, addressing these underlying psychosocial factors is of the utmost importance for patients and their well-being.

The results of this research study indicated the lack of psychosocial assessments, interventions, and referral services provided by OTs and CHTs post hand and upper limb injury and trauma. Psychosocial factors are not typically being addressed during the rehabilitation process and therefore have the potential to cause chronic psychosocial distress and dysfunction in occupational performance. Awareness of psychosocial determinants post traumatic hand and upper limb injury is an area OTs have the responsibility and specialized skills to evaluate and treat. The practice and referral of psychosocial services is an important contribution to the recovery process for patients with hand and upper limb injuries or trauma, thus providing a client-centered holistic approach that is consistent with OTs' scope of practice.

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Ethical Approval

The Alvernia University institutional review board (IRB) has provided written consent for this study (IRB proposal reference number: 1112-020).

Statement of Human and Animal Rights

All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2008.

Statement of Informed Consent

Informed consent was obtained from all participants for being included in the study.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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References

1. American Occupational Therapy Association (AOTA). Occupational therapy practice framework: domain and process. *Am J Occup Ther*. 2008;56:609-639.
2. American Society of Hand Therapists. Position paper on hand therapists' scope of practice. <http://www.asht.org/practice/position-papers>. Published November 8, 2011. Accessed August 7, 2013.
3. Bear-Lehman J. Factors affecting return to work after hand injury. *Am J Occup Ther*. 1983;37(3):189-194. doi:10.5014/ajot.37.3.189.
4. Bell J, Gray M, Kingston G. The longer term functional impact of a traumatic hand injury on people living in a regional metropolitan Australian location. *Int J Ther Rehab*. 2011;18(7):370-382.
5. Bonder BR. Issues in assessment of psychosocial components of function. *Am J Occup Ther*. 1993;47(3):211-216. doi:10.5014/ajot.47.3.211.
6. Brown P. Body and soul. *J Hand Ther*. 1996;9(3):129-132.
7. Burton AK, Kendal NAS, Pearce BG, et al. Management of upper limb disorders and the biopsychosocial model. <http://eprints.hud.ac.uk/7486/1/burton.pdf>. Published 2008. Accessed August 7, 2013.
8. Case-Smith J. Outcomes in hand rehabilitation using occupational therapy services. *Am J Occup Ther*. 2003;57(5):499-506.
9. Cederlund R, Thoren-Jonsson A, Dahlin LB. Coping strategies in daily occupations 3 months after a severe or major hand injury. *Occup Ther Int*. 2010;17(1):1-9.
10. Chan J, Spencer J. Adaptation to hand injury: an evolving experience. *Am J Occup Ther*. 2004;58(2):128-139.
11. Davison KP, Pennebaker JW, Dickerson SS. The social psychology of illness support groups. *Am Psychol*. 2000;55(2):205-217.
12. De Sousa A, Sonavane S, Kurvey A, et al. Psychological issues in hand trauma. *Asian J Psychiatr*. 2013;14(1):1-12.
13. Finlay L. Holism in occupational therapy: elusive fiction and ambivalent struggle. *Am J Occup Ther*. 2001;55(3):268-276.
14. Grunert BK, Devine CA, Matloub HS, et al. Psychological adjustment following work-related hand injury: 18-month follow-up. *Ann Plast Surg*. 1992;29(6):537-542.
15. Grunert BK, Devine CA, Matloub HS, et al. Effects of litigation on maintenance of psychological symptoms after severe hand injury. *J Hand Surg*. 1991;16(6):1031-1034.
16. Grunert BK, Hargarten SW, Matloub HS, et al. Predictive value of psychological screening in acute hand injuries. *J Hand Surg*. 1992;17A(2):196-199.
17. Grunert BK, Matloub HS, Sanger JR, et al. Treatment of post-traumatic stress disorder after work-related hand trauma. *J Hand Surg*. 1990;15(3):511-515.
18. Grunert BK, Smith CJ, Devine CA, et al. Early psychological aspects of severe hand injury. *J Hand Surg*. 1998;13B(2):177-180.
19. Gustafsson M, Ahlström G. Problems experienced during the first year of an acute traumatic hand injury—a prospective study. *J Clin Nurs*. 2004;13(8):986-995.
20. Gustafsson M, Amilon A, Ahlström G. Trauma-related distress and mood disorders in the early stage of an acute traumatic hand injury. *J Hand Surg*. 2003;28B(4):332-338.
21. Gustafsson M, Persson L, Amilon A. A qualitative study of stress factors in the early stage of acute traumatic hand injury. *J Adv Nurs*. 2000;32(6):1333-1340.
22. Meijer EM, Sluiter JK, Heyma A, et al. Cost-effectiveness of multidisciplinary treatment in sick-listed patients with upper extremity musculoskeletal disorders: a randomized, controlled trial with one-year follow-up. *Int Arch Occup Environ Health*. 2006;79:654-664.
23. Meyer TM. Psychological aspects of mutilating hand injuries. *Hand Clin*. 2003;19(1):41-49.
24. Opsteegh L, Reinders-Messelink H, Schollier D, et al. Determinants of return to work in patients with hand disorders and hand injuries. *J Occup Rehabil*. 2009;19(3):245-255.
25. Sorrock G, Lombardi D, Courtney T, et al. Epidemiology of occupational acute traumatic hand injuries: a literature review. *Saf Sci*. 2001;38(3):241-256.
26. Stutts JT, Kasdan ML. Psychosocial aspects of hand injuries and diseases. *Occup Med*. 1998;13(3):513-519.
27. Venes D, Thomas CL. *Taber's Cyclopedic Medical Dictionary*. 19th ed. Philadelphia, PA: Taber's Cyclopedic; 2001.
28. Williams E, Newman T, Ozer K, et al. Posttraumatic stress disorder and depression negatively impact general health status after hand injury. *J Hand Surg*. 2009;34(3):515-522.