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| Study | Trauma condition | Key results | Disability-focused summary: clinical and research sequelae |
| Bear-Lehman and Poole, 2011 [2] | DRF/bilateral wrist/elbow fracture(s); finger/wrist sprain; tendon/palmar skin/wrist-level tendon, nerve, artery laceration; thumb amputation; hydraulic gun injury | IES-R overall total, intrusion, and hyperarousal subscales correlated with QuickDASH; the type of injury, length of time since injury and sex did not influence IES-R or QuickDASH | Disability and stress reactions could impede capacity to fully participate in therapy; learning effective coping strategies, adapting to injuries and engaging in therapy may aid recovery while experiencing stress reactions; particular attention should be given toward intrusion and hyperarousal states |
| Bekkers et al., 2014 [3] | Hand fracture NOS; laceration | NPTQ correlated with and accounted for 9.6% variability in QuickDASH controlling for demographic variables; they were bidirectionally related to participant goals and interpretation of advice from hand therapists; none of the hand therapy-specific questions were significantly associated with QuickDASH | HT recommendations can affect and be affected by NPT, which in turn affects disability; coaching should identify and generate adaptive responses to cognitive, emotional, and behavioral reactions to NPT, especially during intensive exercises; excessively cautious recommendations risk reinforcing NPT |
| Bot et al., 2011 [7] | Radius and ulna diaphyseal fractures | Significant association between DASH and arc of forearm rotation, wrist and elbow flexion-extension, radioulnar deviation, CES-D, PCS, age at injury, pain, and associated injuries; grip strength, pain, and PCS accounted for 56% variability in DASH; pain alone explained 40% variability in DASH | Disability correlates better with subjective and psychosocial aspects of illness such as pain, depression, and pain catastrophizing than objective measures of impairment; culture may have a strong influence on pain intensity, particularly in terms of the correlation between impairment and disability |
| Bot et al., 2012 [8] | Distal radius fracture (volar plating) | DASH had a significant association with pain, CES-D, PASS, wrist flexion and wrist extension; pain, PCS, wrist flexion accounted for 39% variability in DASH score; “open a tight or new jar” was the only task-related question for which impaired wrist motion remained in the best multivariable model | Variations in disability are best explained by symptoms and psychologic factors than objective measures of impairment, even at the level of specific upper extremity tasks; most variation remains unexplained; role of cognitive and behavioral therapies during recovery merits greater study |
| Bot et al., 2014 [5] | Proximal-interphalangeal joint sprain; PIPJ sprain plus volar plate bony avulsion; PIPJ dislocation | QuickDASH correlated with PSEQ and PHQ-9 (high), and days from injury to enrollment (medium) PSEQ, PHQ-9, and gender accounted for 51% variability; pain intensity associated with PSEQ, PHQ-9, and diagnosis (dislocation); lower PSEQ and diagnosis accounted for 24% variability in greater pain intensity | Recovery (ie, disability, pain, stiffness) is mediated largely by mindset and coping strategies, ie, self-efficacy; normal protective responses to discomfort (ie, catastrophic thinking) should be appreciated; patients should be reassured and supported in developing strategies to keep recovery on track |
| Bot et al., 2014 [6] | Finger injuries distal to PIPJ; fingertip laceration; distal/middle phalanx fracture; amputation (no revascularization, at level of distal phalanx, tip only and at level of middle phalanx) | Days between injury and final evaluation, PSEQ, PHQ-9, and additional procedures were associated with QuickDASH at 1 month; higher depression and injury mechanisms (saw-related compared with sport) explain 54% variability in QuickDASH; injury type and mechanism have limited influence | Psychologic factors (eg, catastrophic thinking, self-efficacy, depression) are important predictors of upper extremity disability and strong determinants of illness behavior (eg, pain experience, time off work); general empathy, optimal support, and evidence-based treatments, eg, CBT, should be utilized |
| Cederlund et al., 2010 [9] | Severe or major hand injury | DASH, SF-36 physical health, SDO, and self-assessed outcomes improved over time; however, lower SOC was associated with significantly higher DASH, lower SDO, lower SF-36 mental health, more sleep disturbances, and bodily pain | Patients with lower SOC may need extra support, more frequent F/U, verbal and written patient education, group participation, specialist review by mental health professionals and guided rehabilitation, eg, developing and using coping strategies to master ADLs; future rehabilitation should consider SOC |
| Chan et al., 2009 [10] | Hand injury NOS | DASH did not correlate with HISS or any IPQ-R component; patients, especially those with severe injury, were generally overoptimistic about treatment and recovery; those perceiving poor outcomes, chronic/cyclical duration, and low illness coherence tended toward negative emotional responses | Illness perceptions, behavior, and coping strategies may be influenced by preexisting beliefs over recent trauma or injury severity; effective pre- and postoperative symptom control may alter negative beliefs; overoptimism could misalign expectations leading to negative responses, behaviors, compliance, and outcomes |
| Constand et al., 2014 [11] | Distal radius fracture | PPPC and PRWE scores showed significant but not strong correlation, at initial assessment and 3 months postinjury; C-P alliance and PRWE-specific function subscale were significantly correlated at baseline; C-P dialogs and PRWE specific, usual function, pain subscales were significantly correlated at followup | Patient-centered care can optimize outcomes in the first 3 months post-DRF surgery; PPPC can be used to understand evolving patient perspectives, eg, C-P partnership (at baseline) to promote shared decision-making and C-P communication (at later stages of recovery); clinician training may be required |
| Das De et al., 2013 [12] | Distal radius fracture | DASH correlated significantly with CES-D, PCS, TSK, and PASS-20 overall but not in DRFs; WHYMPI and subcategories did not correlate; sex, diagnosis, employment status, TSK, and PCS accounted for 55% variability in DASH | Catastrophic thinking and kinesiophobia are important predictors of disability; thoughts on pain and avoidance of pain-inducing activities may be more important than those on partner support; greater than expected symptoms and disability should trigger strategies to manage modifiable factors |
| Dogu et al., 2014 [15] | Hand injury NOS | DASH, BDI, and IES-R significantly decreased from acute to later stages; 7.4% scored severe depression at acute stage and 5.5% at later stages; DASH, BDI, and IES-R significantly correlated in both stages but only acute stage DASH and IES-R explained a significant proportion of variability in DASH at later stage | Functional outcomes at later stages are impacted by functional status and degree of impact of events at the early stage; psychologic impact of events reduces significantly within 6-9 months postinjury; psychologic evaluation considering impact of events and functional outcomes may provide timely interventions |
| Döring et al., 2014 [16] | Hand, wrist fractures; mallett finger; soft tissue injury; animal bite | PROMIS UE PF and QuickDASH had strong correlation; PROMIS PI, work status (retired, unemployed) accounted for 63% variability in PROMIS UE PF; PROMIS PI accounted for 32% variability in QuickDASH; PROMIS UE PF, and QuickDASH showed no ceiling (0%) effects | PROMIS UE PF is a valid, reliable, and efficient in measuring upper extremity disability; there is value in measuring and treating psychosocial contributors of illness and measures of disability may be determining psychologic well-being and effective coping strategies than objective disease and impairment |
| Farzad et al., 2015 [17] | Hand fracture; nerve, tendon and combined injuries; burn; CRPS; amputation | DASH had intermediate correlation with AMA impairment; impairment plus gender accounted for 22% variability in DASH scores; MHQ had small correlation with AMA impairment and age; impairment plus age accounted for 23% variability in MHQ scores | Disability has a limited correlation with impairment; other factors, ie, physical (eg, pain, dominant injured hand), conditional (eg, time since surgery), or psychologic (eg, depression, adapting) should be considered in managing these patients |
| Golkari et al., 2015 [18] | Radial head fracture (minimally displaced); distal radius fracture | CES-D associated with not having an additional pain condition, more days between injury and final evaluation, and stronger agreement with "no pain, no gain"; symptoms of depression and catastrophic thinking, but not health anxiety, improved during recovery after injury | Psychologic measures associate with increased disability; depression and ineffective coping are part reactive and can be expected to improve over time; disease phase should be accounted for in the recovery process if psychologic measures are used as screening tools to predict outcome |
| Gong et al., 2011 [19] | Distal radius fracture | Strong association between depressive symptoms, disability, and pain but no differences in CES-D between DRF volar plating and casting; 73%-75% had major depressive disorder (CES-D threshold > 16) immediately postinjury; DASH and pain NRS accounted for 20% variability in CES-D at Week 0 and 58% at Week 24 | Early wrist movement post-DRF plating may not associate with reduced depression compared with cast immobilization during early rehabilitation; pain is an important predictor of depression; sufficient pain control should be achieved early postoperatively; early wrist motion should not be overly emphasized |
| Gruber et al., 2014 [20] | Acute injuries NOS | QuickDASH (final) correlated with PAM (enrollment); strongest predictors were older age and lower PSEQ, explaining 40% variability; QuickDASH decrease correlated with greater PHQ-2, PAM at F/U and lower PSEQ, with PSEQ explaining 4.6% variability | Early coaching of effective coping strategies, self-management, and engagement in self-care may improve disability and pain intensity; an active role in health is one aspect of self-efficacy; future studies, ideally RCTs, should assess the ability of interventions to improve self-efficacy and patient outcomes |
| Hageman et al., 2014 [21] | Acute injuries (closed tendon injury, fractures, laceration) | QuickDASH and pain intensity correlated with PSEQ, PHQ-2, SHAI-5, and marital status, but not CFS; pain intensity correlated with PSEQ and PHQ-2, but not CFS; PSEQ explained 35% variability in QuickDASH and PSEQ and PHQ-2, 29% variability in pain intensity; CFS correlated with PSEQ only | Upper extremity disability and pain intensity are limited more by self-efficacy than cognitive flexibility; interventions to improve coping strategies whilst interpreting nociception could decrease hand-specific disability than open mindedness; CBT may be required if general coaching fails to provide confidence |
| Helmerhorst et al., 2014 [22] | Arm injuries NOS | At 1-2 months postsurgery, 28% used opioids and use was strongly associated with PCS, PASS-20, CES-D, and PCL-C; mean SMFA and pain intensity were significantly higher in those using opioids irrespective of fracture site, injury severity, or treating surgeon | Greater than expected pain and disability and requests for opioids 1-2 months postfracture surgery should prompt consideration of stress, depressed mood, and ineffective coping; screening for psychologic factors (eg, low pain self-efficacy) and early deployment of CBT may reduce disability and opioid use |
| Janssen et al., 2015 [24] | Fracture shoulder, elbow, forearm, wrist, hand; finger amputation; MCPJ dislocation; soft tissue injury hand | PROMIS PI CAT, other pain conditions, being separated, divorced, or widowed accounted for 64% variability in QuickDASH; PROMIS PI CAT, PROMIS depression CAT, age, other pain conditions, living with partner/being married accounted for 47% variability in PROMIS PF CAT | Psychologic and circumstantial factors consistently account for a substantial amount of variation in symptoms and disability; the influence of coaching effective coping strategies on disability should be investigated and more adaptive pain behaviors should be incorporated into care |
| Jayakumar et al., 2015 [25] | Elbow, hand, humerus, forearm, wrist fractures; soft tissue injury hand; animal bite | Greater PROMIS PI CAT, male sex, other pain conditions and separated/divorced/single status accounted for 34% variability in PROMIS PF CAT; coping strategies were the most important contributor of disability; age correlated with activity enjoyment and had small correlation with disability | Disability relates less on physical impairment, including age-related impairment, than adaptation and resilience; decision-making during treatment should rely less on chronologic age and more on patient preferences and values; these include prior assessment of patient expectations, goals, and activity level |
| Keogh et al., 2010 [28] | Hand fractures | Constructs of pain anxiety, pain catastrophizing, and anxiety sensitivity, related in one form or another to pain and disability but the exact pattern was inconsistent; anxiety sensitivity and general negative mood were strong predictors of disability but the former was negatively correlated | Anxiety-related constructs in experiencing pain and disability may have implications on therapeutic care; the three anxiety-related constructs may be important in acute pain settings, indicating the development of disability; anxiety-related avoidance impacts pain; thus, tackling such behaviors may speed recovery |
| Kortlever and Janssen, 2015 [29] | Traumatic and nontrauma upper extremity conditions NOS | PROMIS PI CAT, PCS, PIPS, and PSEQ show substantial correlation in measuring coping strategies in response to nociception; PCS, PIPS, and PROMIS PI CAT reliably measure the construct and PSEQ its inverse; PROMIS PI CAT was quickest to complete with a strongest correlation with QuickDASH | All 4 instruments measure coping in response to nociception--a factor negatively impacting upper extremity disability; PROMIS PI CAT may be preferable as a result of brevity, good coverage, and reduced responder burden; PSEQ and PCS Qs may be useful for developing talking points and treatment foci |
| Mayland et al., 2017 [32] | Elbow, wrist, hand, finger, thumb fracture; tendon or nerve laceration; crush injury | Scores from anxiety measures posing more upper extremity-specific questions (ie, RRAQ, PASS-20) strongly correlated with higher disability over those with general anxiety (ie, T-anxiety, S-anxiety); 4 predictive variables accounted for 29% variability in disability; RRAQ total score explained 19% alone | Identifying recovery-related anxiety after less severe arm injuries is important and likely more relevant than general anxiety; RRAQ, pain, state and trait anxiety may decrease in order of prevalence and strength of association with disability; anxiety-related Qs should be phrased around recovery experience |
| Niekel et al., 2009 [35] | Distal radius fracture | CES-D, PCS, PASS-40, gender, and wrist fractures accounted for 25% variability in DASH, where psychologic factors alone explained 20% variability; CES-D, PCS, PASS-40, gender, and age accounted for 20% variability in QuickDASH where the psychologic factors alone explained 13% variability | Psychologic measures consistently explain greater % variation in DASH and QuickDASH; QuickDASH is more practical than the DASH but comparatively lower variation is explained; disability can be improved when considering all aspects of illness, particularly psychologic factors |
| Nota et al., 2016 [37] | Acute/trauma NOS | PROMIS ES and PROMIS IS were weakly and inversely associated with QuickDASH; PROMIS PI along with trauma, F/U patients, unemployed/unable to work, nonspecific arm pain, initial visit, and separated/divorced status explained 73% variation in QuickDASH; PROMIS PI alone explained 66% variation | Interventions enhancing coping strategies to help adapt to pain and remain active are likely integral to musculoskeletal care; secondarily, having someone to provide help with ADLs and emotional support may be important during the initial stages of adjustment; future studies should assess this prospectively |
| Novak et al., 2010 [38] | Upper extremity peripheral nerve injury (brachial plexus, single shoulder nerve, distal nerve) | PDI strongly correlated with DASH and IIS and had weaker correlation with pain intensity, explaining 69.9% variability in PDI; IIS and DASH scores were significantly higher in workers’ compensation compared with those without and those with brachial plexus injuries compared with peripheral nerve injury | Traumatic upper extremity nerve injuries are associated with substantial pain disability, upper extremity disability, and illness intrusiveness; disability associated with pain comprises more than pain intensity and impact of injury and pain on life domains should be considered throughout the assessment |
| Novak et al., 2011 [39] | Upper extremity peripheral nerve injury | DASH correlated with pain intensity which in turn strongly correlated with CISS and PCS; pain VAS, nerve(s) injured, time since injury, PCS, older age, work status, CISS, HADS, workers' compensation claim/litigation and female sex, explained 52.7% variability in DASH | Traumatic peripheral nerve injuries are associated with substantial disability, pain, and cold sensitivity; greater disability can be predicted by BPI, older age, pain intensity, work status, time since injury, cold sensitivity, and pain catastrophizing |
| Novak et al., 2012 [40] | Brachial plexus injury | High scores were observed in CISS, DASH, and pain intensity postinjury; DASH had significant correlation with VAS pain, MPQ, PCL-C, PCS, SF-36 physical; MPQ, DASH, and time since injury explained 33% variability in CISS with MPQ being the strongest predictor | Patients with brachial plexus nerve injury reported substantial cold intolerance, which was associated with the McGill pain rating index, upper extremity disability, and time since injury; future studies to evaluate treatments to minimize cold intolerance may decrease pain and minimize disability |
| Peters et al., 2016 [41] | Sprain, dislocation, mallet finger; hand fracture; wrist fracture; amputation, crush or laceration; elbow fracture | Higher PROMIS sleep disturbance CAT scores were not associated with increased PROMIS UE PF CAT scores, whereas PROMIS PI CAT scores were, accounting for 21% variability in PROMIS UE PF scores | Sleep disturbance does not appear to be strongly or directly associated with symptom intensity and magnitude of upper extremity disability compared with ineffective coping; it may itself be a function of less effective coping in a bidirectional relationship |
| Prugh et al., 2012 [42] | Elbow sports-related injury (ulnar nerve compromise; medial epicondylitis; valgus overload injury; elbow hyperextension injury) | TSK-FOI subscale demonstrated strong correlation with initial QuickDASH, change in QuickDASH and pain scale, whereas initial total FAB-Q did not; PCS did not correlate with pain scores and negatively correlated with initial and change in QuickDASH | Fear avoidance beliefs and catastrophizing are more effectively captured using subscales of measures (eg, TSK-FOI) than full measures in throwing athletes compared with general orthopaedic trauma populations; TSK-11 may be most appropriate during initial evaluation |
| Richards et al., 2011 [43] | Hand injury (amputations, fracture-dislocations, complex lacerations, infections, combinations) | 29% met or exceeded clinically significant depression and PTSD cutoffs; QuickDASH functional and pain subscales had moderate to large correlations with CES-D, SPTSS, MOS, SCS, and PSS; depression and PTSD symptoms were highly correlated; SCS and PSS positively associated with QuickDASH | Early psychologic intervention might improve patient coping as disability is strongly correlated with psychologic distress, which itself relates to function and pain; those experiencing elevated pain or psychiatric symptoms, frequently experience both; this may occur long after an injury has healed |
| Ring et al., 2006 [44] | Distal radius fracture | DASH had a significant moderate correlation with CES-D; variable, mild to moderate correlations were also observed with PASS; CES-D and gender were independent predictors of DASH with females having higher DASH for any given CES-D score; DASH scores had a large SD | Self-reported upper extremity-specific health status correlates with depression and pain anxiety but not neuroticism; the variability in patient-perceived disability likely arises substantially from psychosocial rather than physical factors and may be common to all health status measures |
| Roh et al., 2014 [46] | Distal radius fracture | Increase in PCS associated with decrease in grip strength, ROM, MHQ at Week 4; increase in PASS associated with decrease in grip strength, ROM and MHQ at Week 4 and grip and MHQ at Week 12; only age and fracture severity associated with MHQ at Week 24 | Pain-related psychologic mechanisms can influence early functional recovery and should be addressed when impairment, disability, or pain is expected to worsen, particularly in the first 12 weeks postsurgery; preoperative PCS and PASS scores can identify those at risk and trigger early psychologic interventions |
| Roh and Noh, 2015 [47] | Hand fractures | At 3 months: PCS, PASS-20, HISS injury severity, and treatment accounted for 38% variability in QuickDASH; at 6 months: only age and injury severity accounted for 21% of variability in QuickDASH | Poor preoperative pain coping skills associate with increased disability, weaker grip, and decreased ROM at 3 months postsurgery; recovery may be enhanced by addressing coping, especially in the first 3 months, where there is a strong correlation between variables; further research may demonstrate impact of screening and therapy |
| Ross et al., 2015 [48] | Hand and wrist fracture (unilateral--distal third radius or ulna, metacarpal, scaphoid, other carpal, multiple fractures) | Pain was significantly associated with disability; depression and stress but not anxiety were significant mediators of this relationship; depression and stress accounted for 21% variability in the relationship between pain and disability; only partial mediation was demonstrated | Psychologic interventions targeting the reduction of depression and stress may reduce pain-related disability associated with wrist or hand fractures, especially in the acute postfracture phase, ie, within 28 days from injury or surgery; many other factors are likely to mediate this relationship |
| Shields et al., 2015 [49] | Humeral shaft fractures | Satisfactory DASH scores decreased with increasing age and in the under 50s increased with the absence of a psychiatric history; satisfactory SST scores were more likely in patients without psychiatric history; satisfactory SF-12 PCS scores more likely with no psychiatric history and in the privately insured | Patient age, history of psychiatric illness, insurance type, fracture location, and CCI scores have a significant effect on patient-reported functional outcomes in humeral shaft fractures; these factors should be considered when counseling for prognosis and treatment; impact is likely age-dependent |
| Symonette et al., 2013 [50] | Distal radius fracture | Baseline emotional/informational support explained 4.7% variability of pain and disability outcomes at 1 year regardless of age, gender, and final radiographic alignment; other MOS social support subscales had no influence | Rehabilitative benefits of social support during initial visits should be considered and emotional/informational social support at the time of injury may have a significant impact on patient-reported pain and disability outcomes; further research should inform when and how this support affects outcomes |
| Vranceanu et al., 2014 [54] | Arm injuries NOS | 25% diagnosed with clinical depression and PTSD early on; rate of clinical depression persisted, whereas PTSD reduced 5-8 months postinjury; multiple injuries, AIS, opioid use explained 24%-29% variability in pain at rest, activity, and SMFA at Time 1; addition of CES-D, PASS-20, and PCS increased this to 49 and 55% | Psychologic impact of orthopaedic trauma suggests the importance of depression and PTSD screening; future studies should investigate treatments, eg, CBT-especially assessing impact of interventions at 1-2 months on later pain intensity and disability, which can continue beyond the timespan for physical recovery |
| Vranceanu et al., 2015 [55] | Arm injuries NOS | CBRR intervention had a 24% decline rate and 86% completion rate; significant differences were demonstrated between intervention and control arms in terms of pain with activity NRS, SMFA, PASS-20, CES-D, and PTSD with large effect sizes; no significant effect was observed with pain at rest | Psychosocial interventions, eg, CBRR, are feasible, acceptable, and potentially efficacious in decreasing pain intensity, disability, and coping variables; future large-scale RCTs are warranted to delineate actual impact versus placebo controls involving standard patient education, provider attention, and support |
| Williams et al., 2009 [56] | DRF/ulna/finger/metacarpal/middistal forearm/carpal bone/proximal forearm/elbow/humerus fracture; mangled hand/flexor/extensor tendon injury; amputation | 32% endorsed items consistent with PTSD and 20% with depression; PTSD patients had significantly lower SF-36 subscale scores of role emotional, bodily pain, social function, and mental health only; patients with concurrent PTSD and depression had a more deleterious effect | Psychologic status, especially in terms of PTSD and depression, negatively impacts general health status; these may have greater impact on those sustaining hand injuries compared with general orthopaedic injuries; early identification and intervention may improve long-term outcomes for PTSD and depression |
| Yeoh et al., 2016 [58] | Distal radius fracture | Levels of depression were 25%, 32%, and 26% at baseline, 3 months, and 1 year, respectively; baseline depression (CESD > 16) was the strongest predictor of worse 1-year SF-36 and DASH; baseline CESD > 16 was associated with complications and CRPS at 3 months | Depression and disability are strongly correlated; complications may associate with development of depression in those not initially depressed; baseline depression may also contribute to the development of CRPS; providers should be aware of the prevalence of depression and impact on outcomes |

DRF = distal radius fracture; IES-R = Impact of Events Scale-Revised; DASH = Disability of the Arm, Shoulder and Hand; NOS = nonspecific; NPTQ = Negative Pain Thoughts Questionnaire; HT = hand therapy; NPT = negative pain thoughts; CES-D = Center for Epidemiologic Studies-Depression scale; PCS = Pain Catastrophizing Scale; PASS, Pain Anxiety Symptoms Scale; PIPJ = proximal interphalangeal joint; PSEQ = Pain Self-Efficacy Questionnaire; PHQ = Patient Health Questionnaire; CBT = cognitive-behavioral therapy; SDO = satisfaction with daily occupation; SOC = sense of coherence; F/U = followup; ADLs = activities of daily living; HISS = Hand Injury Severity Score; IPQ-R = Revised Illness Perception Questionnaire; PPPC = Patient Perception of Patient Centeredness Questionnaire; PRWE = Patient-Rated Wrist Evaluation; C-P = clinician-patient; TSK = Tampa Scale for Kinesiophobia; WHYMPI = West Haven-Yale Multidimensional Pain Inventory; BDI = Beck Depression Inventory; PROMIS = Patient Reported Outcome Measurement Information System; UE = upper extremity; PF = Physical Function; PI = Pain Interference; CRPS = complex regional pain syndrome; AMA = American Medical Association; MHQ = Michigan Hand Questionnaire; NRS = numeric rating scale; PAM = Patient Activation Measure; RCT = randomized controlled trial; SHAI = Short Health Anxiety Inventory; CFS = Cognitive Flexibility Questionnaire; PCL-C = Post-traumatic Stress Disorder Checklist; SMFA = Short Musculoskeletal Function Assessment; MCPJ = metacarpophalangeal joint; CAT = Computer Adaptive Test; PIPS = Psychological Inflexibility in Pain Scale; RRAQ = Recovery Related Anxiety Questionnaire; T-anxiety = Trait anxiety; S-anxiety = State anxiety; ES = emotional support; IS = instrumental support; IIS = Illness Intrusiveness Scale; PDI = Pain Disability Index; CISS = Cold Intolerance Symptom Severity Questionnaire; HADS = Hospital Anxiety Depression Scale; BPI = Brachial Plexus Injury; VAS = visual analog scale; MPQ = McGill Pain Questionnaire; FOI = fear of injury; FAB-Q = Fear Avoidance Belief Questionnaire; SPTSS = Screen for Post-traumatic Stress Symptoms; MOS = Medical Outcome Study; PTSD = posttraumatic stress disorder; SCS = Social Constraints Survey; PSS = Perceived Stress Scale; CCI = Charlson Comorbidity Index; SST = Simple Shoulder Test; AIS = Abbreviated Injury Severity Scale; CBRR = Cognitions and Behaviours plus Physiological Symptoms.

**Appendix 3.** Synopsis of trauma conditions investigated, key study results, and disability-focused summaries