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Biopsychosocial factors that hinders and/or facilitate successful return to work:

A review of literature and knowledge of translation

Natacha Chimenti and Lianna Wong

Chair: George Tomlin

OT 636: Evidence Based Research

5/17/19

Abstract

Two community practitioners collaborated with the University of Puget Sound Occupational Therapy program and submitted the following clinical question: “What bio/psycho/social factors have been identified to hinder and/or facilitate successful return to work in addition to traditional work hardening/conditioning intervention for adults?” A literature review discovered 47 articles ranging from systematic reviews, descriptive, qualitative, outcome, and experimental studies. Evidence was synthesized by two reviewers into a critically appraised topic (CAT). Numerous facilitating (job satisfaction, employment accommodation, social support, multidisciplinary approach) and hindering factors (social isolation, depression, pain, self-perceived disability) were identified affecting one’s ability to return to work after various diagnoses.

Due to the lack of literature on interventions addressing the biopsychosocial factors specifically for vocational rehabilitation, another literature review was conducted for the knowledge translation portion of the project. This review resulted in 22 additional articles addressing effective interventions to alleviate pain and/or depression, used by various healthcare professions. The researchers provided a document with detailed flow charts to the community practitioners summarizing the findings. Satisfaction surveys were administered to both collaborators to assess their professional opinion about the potential use of these interventions in their settings. Further research should explore the effectiveness and applicability of the interventions identified in this study in vocational rehabilitation.

Executive Summary

Our research collaborators were interested in identifying the bio/psycho/social factors that impact one's ability to return to work after an injury. The purpose of our year-long capstone project was to investigate the current research that could answer the following question "What bio/psycho/social factors have been identified to hinder and/or facilitate successful return to work in addition to traditional work hardening/conditioning intervention for adults?"

For our search strategy we used the databases, ProQuest, Google Scholar, CINAHL, PubMed, University of Washington library, Clinical Key, PsycINFO, Collins Library, and Cochrane to search for potential articles. We identified a list of word combinations that we utilized across the databases and considered the first 5 pages to identify relevant articles. The inclusion criteria included peer reviewed articles published between 1980-2018, participants within the article had to be over 18 years old, and the articles could be in French or English. The exclusion criteria were any cognitive rehabilitation, cognitive work hardening, psychiatric rehabilitation, and any company-based programs. This search strategy resulted in 18 articles. Upon meeting with our chair/mentor, we decided that our search strategy was too vague, and could have missed potentially relevant articles in the proceeding pages of our search results. For a more robust search strategy, we limited the search results to 250 or fewer peer-review articles. We located our previous 18 articles and found an additional 29 articles with the second strategy. The 47 articles only included hindering (older age, anger, lower socioeconomic status, lower education, pain, depression, social isolation, lack of self-efficacy, stress, self-perceived disability, losing their roles in their daily lives) or facilitating factors (social support work/home, job satisfaction, multidisciplinary approach, employer accommodation, positive work values, and attitude) but did not provide treatment options to alleviate the barriers.

Upon presenting our findings to our community practitioners, it was determined that further research was needed for the knowledge translation portion to be applicable to their facility. With their assistance, two main categories were identified based on the factors that were identified : non-changeable factors and changeable factors. Finding potential interventions that could be implemented into the treatment sessions was determined to be the most beneficial for PINN. Due to the extensive number of factors identified impacting a person's return to work, the researchers focused on the changeable factors of pain and depression for the knowledge translation process because they were identified across multiple articles.

In order to find articles that addressed pain and depression treatments, we had to broaden our literature review search to include the literature of other health care disciplines, not just vocational rehabilitation. We searched the following databases; PubMed, PsycINFO, ProQuest, and CINAH. New word combinations were created for the knowledge translation portion of the project specifically tailored to find articles which discussed implementing effective interventions for clients suffering from pain or depression. All databases were searched using the same word combinations. Articles were only scanned when the search results were 250 or fewer. Based on the new search parameters the researchers found 22 relevant articles, which addressed interventions or screening that could be utilized into a therapy setting.

The knowledge translation product includes 11 flow charts illustrating potential intervention routes that occupational therapists or physical therapists could utilize to assist a client who is experiencing pain or depression. Some of the treatment approaches required additional training or referral to another healthcare provider, while other interventions could be performed by the therapy practitioners.

During the presentation with the community practitioners, they reported interest in implementing the depression screen, and stated that it could be easily incorporated into their initial client intake. Following the presentation, a survey was verbally administered to the community practitioners, to assess their satisfaction with and their view of the effectiveness of the knowledge translation portion. They indicated that they were satisfied with the consolidation of the information found in this portion of the research, however, the main critique that was expressed was the lack of information to practically implement some of the interventions into their practice.

CRITICALLY APPRAISED TOPIC (CAT) PAPER**Focused Question**

What bio/psycho/social factors have been identified to hinder and/or facilitate successful return to work in addition to traditional work hardening/conditioning intervention for adults?

Prepared By

Lianna Wong and Natacha Chimenti

Date Review Completed

5/6/19

Professional Practice Scenario

The CAT will provide the collaborator from a work hardening setting with factors that could potentially impact an individual's ability to return to work. This might allow the OT/PT to better defend their rates of return to work or improve them.

Search Process**Procedures for the selection and appraisal of articles****Inclusion Criteria**

Peer reviewed articles published between 1980-2018, adults 18+, French or English

Exclusion Criteria

Cognitive work hardening/ cognitive rehabilitation/ psychiatric rehabilitation, company-based programs

Search Strategy

Categories	Key Search Terms
Patient/Client Population	Work injuries, injured workers, Workers compensation
Intervention (Assessment)	Work hardening, work conditioning, vocational rehabilitation
Associative variable	Barriers, facilitators, factors, biopsychosocial factors, psychological factors
Outcomes	Outcome, return to work, following

Databases, Sites, and Sources Searched
CINAHL
ProQuest
PsycINFO
PubMed
Cochrane
Collins Library
Clinical Key

Search Outcomes/Quality Control/Review Process

The revised search strategy narrowed the number of articles to 250 per search, which gave us the opportunity to review every title. When a set of keywords generated more than 250 articles, we omitted the articles and modified the search. We additionally checked the box for full article and peer review. We attempted to relocate our previous articles (prior to 11/11) by narrowing our search throughout the different databases. We were able to locate all previous articles and found an additional 29 articles. We decided to omit using Google Scholar due to the amount of hits exceeding 250 articles despite adding additional search words. Depending on the databases, additional keywords needed to be added due to the number of articles generated. For example, on ProQuest the search required additional keywords to narrow the number of articles below 250. We used work hardening and work conditioning as our focal keyword. We used a combination of the same keywords across the different databases for consistency and optimal results. For example, we entered “factors AND (work hardening) AND (return to work) AND biopsychosocial” into ProQuest, which yielded 62 hits and utilized the same combination of keywords for work conditioning by entering “factors AND (work conditioning) AND (return to work) AND biopsychosocial”, which yielded 414 hits. We had to modify the search further for work conditioning and used “factors AND affecting AND (work conditioning) AND (return to work) AND biopsychosocial”, which generated 208 hits. Please refer to the keyword search table for additional information regarding keywords used. We skimmed through every title and eliminated titles if they solely focused on cognitive/psychiatric rehabilitation, employment-based programs, or appeared to be off-topic. When a title appeared to relate to our topic, we read through the abstracts and eliminated the abstract if it didn’t meet our inclusion criteria or strictly focused on cognitive rehabilitation or employment-based programs. We decided to omit strictly cognitive/psychiatric rehabilitation as PINN doesn’t get referral for strictly cognitive rehabilitation. It’s important to include articles that explore cognitive rehabilitation in combination with conventional rehabilitation as it relates more to PINN’s clientele. Since PINN is geared towards a biomechanical approach, exploring programs that incorporate a biopsychosocial approach with a work hardening/work conditioning program might offer a different perspective and provide useful information. Additionally, we began utilizing vocational rehabilitation to provide a broader view of the factors affecting return to work. Some databases such as PsycINFO did not generate any hits for work

conditioning or work hardening. Therefore, we had to broaden our search by including vocational rehabilitation. We included both barriers and facilitators to provide a full representation of the potential factors affecting workers and return to work. When unclear about a study, we both read it and discussed whether to include or exclude the article.

ORIGINAL CAT SEARCH (prior 11/11/18)

Keyword	Date searched	Database	# of hits	# excluded	# retained
Factors AND return to work	9-29-18	ProQuest	2,195,921	2,195,920	1
factors AND (return to work) AND (after injury) AND vocational rehabilitation	9-29-18	ProQuest	2,385	2,384	1
factors (AND) following (AND) work hardening (AND) return to work	10/18/18	Google Scholar	155 000	154997	3
Work hardening (AND) factors	10/20/18	CINAHL	27	24	3 New 1 duplicate 1 interloan requested (2)
vocational rehabilitation AND biopsychosocial AND outcome AND following	10/20/18	PubMed	4	3	1
psychological	10/20/18	ProQuest	178	176	2 duplicates

factors AND (work hardening) AND injured worker AND outcome					
biopsychosocial factors AND (vocational rehabilitation) AND outcome	10/20/18	ProQuest	637	634	3
Factors related to outcome following work hardening program	10/22/18	UW library search	18,859	18,857	1 duplicate 1 not available (requested by interloan and also a duplicate) (0)
Vocational rehabilitation AND barriers AND factors AND return to work	10/22/18	Clinical Key	283	281	2
Work hardening AND facilitator	10/22/18	CINAHL	0	0	0
Work hardening AND barriers	10/22/18	CINAHL	3	2	1
biopsychosocial factors AND vocational rehabilitation AND outcome	10/22/18	CINAHL	2	0	0
Work hardening AND facilitator AND work	10/23/18	PsycINFO	0	0	0

injuries					
Work hardening AND barriers AND work injuries	10/23/18	PsycINFO	0	0	0
Vocational rehabilitation AND barriers AND factors AND return to work	10/23/18	Collins library	3,911	3,909	2
Work hardening AND facilitator	10/23/18	PsycINFO	0	0	0
Work hardening AND barriers	10/23/18	PsycINFO	0	0	0
work hardening AND biopsychosocial AND factors	10/23/18	Cochrane	0	0	0
work hardening AND factors	10/23/18	Cochrane	5	5	0
(work hardening) AND factors AND (return to work) AND (injured workers)	10/23/18	ProQuest	232	228	4 (2 duplicate) (2)

NEW CAT SEARCH (11/11/18)

Key word	Date searched	Database	# of hits	# excluded	# of abstracts read	# of abstracts excluded	Full length article read	# retained
factors AND (after injury) AND (work hardening) AND outcome AND (return to work) AND psychosocial	11/11/18	ProQuest	188	181	10	6	4	4 new 3 duplicates
factors AND (after injury) AND (work conditioning) AND outcome AND (return to work) AND psychosocial	11/11/18	ProQuest	1110	1110 * too many hits	0	0	0	0
factors AND (work hardening) AND (return to work) AND biopsychosocial	11/11/18	ProQuest	62	60	2	2	0	2 duplicates
factors AND (work conditioning) AND (return to work) AND biopsychosocial	11/11/18	ProQuest	414	414 * too many hits	0	0	0	0
factors AND affecting	11/11/18	ProQuest	208	207	2	2	0	1 duplicate

AND (work conditioning) AND (return to work) AND biopsychosocial								
Work conditioning AND factors	11-11-18	CINAHL	11	9	1	0	1	1 duplicate 1 new
(psychological factors) AND (work conditioning) AND (injured workers) AND outcome	11/11/18	ProQuest	737	737* too many hits	0	0	0	0
(biopsychosocial factors) AND (vocational rehabilitation) AND outcome AND (return to work) AND barriers	11/11/18	ProQuest	212	208	4	3	1	1 new 3 duplicates
Work conditioning AND facilitator	11/11/18	CINAHL	0	0	0	0	0	0
Biopsychosocial factors AND work hardening AND outcomes	11/11/18	CINAHL	0	0	0	0	0	0
Biopsychosocial factors AND barriers AND outcome	11/11/18	CINAHL	4	4	1	1	0	0

(biopsychosocial factors) AND (vocational rehabilitation) AND outcome AND (return to work) AND facilitator	11/11/18	ProQuest	85	81	3	1		2 new 2 duplicates
Key word	Date searched	Database	# of hits	# excluded	# of abstracts read	# of abstracts excluded	Full length article read	# retained
Work hardening AND biopsychosocial AND outcome AND following	11/11/18	PubMed	0	0	0	0	0	0
Work hardening AND biopsychosocial AND outcome	11/11/18	PubMed	1	1	1	1	0	0
Work conditioning AND biopsychosocial AND outcome	11/11/18	PubMed	0	0	0	0	0	0
factors AND after injury AND work hardening AND outcome AND return to work AND psychosocial	11/11/18	PubMed	1	0	1	0	1	1 new

factors AND after injury AND work conditioning AND outcome AND return to work AND psychosocial	11/11/18	PubMed	0	0	0	0	0	0
factors AND predictors AND (vocational rehabilitation) AND outcome AND (return to work) AND (worker's compensation)	11/11/18	ProQuest	112	105	3	3	1	7 duplicates
Key word	Date searched	Database	# of hits	# excluded	# of abstracts read	# of abstracts excluded	Full length article read	# retained
(biopsychoso cial factors) AND (vocational rehabilitation) AND outcome AND (return to work) AND barriers AND predictors AND facilitator AND injury	11/11/18	ProQuest	49	45	7	3	4	2 New 2 duplicates
(biopsychoso cial factors) AND (vocational	11/11/18	ProQuest	209	197	12	7	5	4 new 8 duplicates

rehabilitation) AND outcome AND (risk factors) AND (return to work) AND predictors								
Work conditioning and barrier	11/11/18	CINAHL	1	0	0	0	0	0
Vocational rehabilitation AND barriers AND factors AND return to work AND outcome AND biopsychosocial	11/11/18	Collins library	195	189	2	0	2	1 new 5 duplicates
factors AND predictors AND (vocational rehabilitation) AND outcome AND (return to work) AND (worker's compensation)	11/11/18	Collins Library	334	334 * too many hits	0	0	0	0
Vocational rehabilitation AND barriers AND factors AND return to work	11/11/18	CINAHL	34	31	2	1	1	1 new 2 duplicates

factors influencing return to work AND vocational rehabilitation	11/11/18	Collins Library	8	6	1	1	0	2 duplicates
Work conditioning AND barriers	11/13/18	PsycINFO	1	1	0	0	0	0
Work hardening AND barriers	11/13/18	PsycINFO	0	0	0	0	0	0
Work hardening AND facilitator	11/13/18	PsycINFO	0	0	0	0	0	0
Work conditioning AND barriers	11/13/18	PsycINFO	0	0	0	0	0	0
Vocational rehabilitation AND barriers AND return to work AND injury	11/13/18	PsycINFO	27	23	5	2	3	3 New 1 duplicate
Vocational rehabilitation AND facilitator AND return to work AND injury	11/14/18	PsycINFO	11	10	1	1	0	1 duplicate
Vocational Rehabilitation AND Factors AND return "to" work AND injury	11/15/18	PsycINFO	147	132	15	4	11	9 new 6 duplicates

Work hardening AND facilitator	11/20/18	Clinical Key	1072* too many hits	0	0	0	0	0
Work conditioning AND barriers	11/20/18	Clinical Key	2023* too many hits	0	0	0	0	0
Work hardening AND barriers	11/20.17	Clinical Key	446* too many hits	0	0	0	0	0
Work conditioning AND facilitator	11/20/18	Clinical Key	3967* too many hits	0	0	0	0	0
(biopsychosocial factors) AND (vocational rehabilitation) AND outcome AND (return to work) AND barriers	11/20/18	Clinical Key	33	32	0	0	0	1 duplicate
(biopsychosocial factors) AND (vocational rehabilitation) AND outcome AND (return to work) AND facilitator	11/20/18	Clinical Key	34	33	0	0	0	1 duplicate

Results of Search

Summary of Study Designs of Articles Selected for the CAT Table

Pyramid Side	Study Design/Methodology of Selected Articles	Number of Articles Selected
Experimental	_1__Meta-Analyses of Experimental Trials _2__Individual Blinded Randomized Controlled Trials _0__Controlled Clinical Trials _0__Single Subject Studies	3
Outcome	_1__Meta-Analyses of Related Outcome Studies _1__Individual Quasi-Experimental Studies w/ Covariates _4__Case-Control or Pre-existing Groups Studies _4__One Group Pre-Post Studies	10
Qualitative	__3__Meta-Syntheses of Related Qualitative Studies _5__Group Qualitative Studies w/ more Rigor __1__prolonged engagement with informants _5__triangulation of data (multiple sources) _5__confirmation (peer/member-checking; audit trail) _5__comparisons among individuals, w/i a person _3__Group Qualitative Studies w/ less Rigor _0__Qualitative Study on a Single Person	11

Descriptive	9_Systematic Reviews of Related Descriptive Studies _4_Association, Correlational Studies __2_Multiple Case Series, Normative Studies, Descriptive surveys __0_Individual Case Studies	15
Mixed studies* *Primary study type listed first	_1_ O1/D1 _1_ D1/O1 _1_ O1/E1 _1_ D1/Q1 _2_ O3/D3 _1_ Q3/D2	7
AOTA Levels I-18 II-4 III-8 IV-5 V-0 III/IV - 1 Comments: There were eleven studies within our CAT table that were qualitative studies and did not have a AOTA Level.		<i>TOTAL number of articles = 47</i>

Results: Studies – Specifically work hardening/work conditioning

Author, Year, Jnl, Country	Study Objective	Study Design/ Level of Evidence/	Participants: Sample Size, Description Inclusion and Exclusion Criteria	Methods for enhancing rigor	Theme and Results	Study Limitations
Ashby et al. 2010 <i>International Journal of Therapy and Rehab</i> Australia	To describe the experiences in WH (6 wks) injured workers w/ chronic lower back pain	NR Q3 Group study less rigor	N = 11 M only Age range: 23-59 In: Participants previously held semi-skilled or unskilled jobs Ex: N/A	Taped interview and transcribed verbatim. Transcripts coded by two researchers	Participants often had an incorrect concept when describing the biophysical factors impacting their lower back pain, which often led to developing fear of movement Losing their roles w/in their daily lives reinforced their fear of movement. Relationship alterations/loss due to occupational role changes w/ friends, partners, and children due to fear of movement. Inability to do the same activities or no longer being able to support their family like before Social isolation sig impacted the participants Participants highly motivated about RTW, but self-doubt about keeping a job due to their fear of movement.	WH program might be very different due to country of origin Small sample size

Author, Year, Jnl, Country	Study Objective	Study Design/ Level of Evidence/	Participants: Sample Size, Description Inclusion and Exclusion Criteria	Interventions & Outcome Measures	Summary of Results	Study Limitations
Beissner et al. 1996 <i>Physical Therapy</i> USA	Identify factors that are associated w/ RTW following WH	III O4 3/6 Retrospective review of medical records	N= 115 M= 78 F= 37 Mean age: 37.49 In: Injured workers w/ SCI who participated in WH from 2 clinics in Midwest btw 08/91-10/92 Ex: missing or incomplete entry data	4 phase evaluation which included intake interview, psychosocial screening, neuromusculoskeletal evaluation performed by PT, and 4 hr fxnl evaluation. Each client's program developed by OT or PT 3 & 12 mo follow-up interviews after WH completion. Length of program varied from 5-43 sessions depending on achievement of goals or failure to progress.	3 mo follow up 68.7% RTW and 86.1% achieved case closure. 12 mo follow up 76.6% RTW and 90.1% case closure. 3 mo - Case closure determined by 5 potential variables: ↑age ↓ case closure, previously participated in WH ↓ case closure. ↑ satisfaction w/ program ↑ case closure. Prior surgery ↓ case closure 12 mo - Case closure ↑ age ↓ case closure. ↓ neurological signs ↑ case closure. Prior surgery ↓ case closure	Doesn't specify the level of injury of each participant. SCI can vary greatly, male population over-represented, only represents 2 clinics from Midwest

Author, Year, Jnl, Country	Study Objective	Study Design/ Level of Evidence/	Participants: Sample Size, Description Inclusion and Exclusion Criteria	Interventions & Outcome Measures	Summary of Results	Study Limitations
Burns et al. 1999 <i>Annals of Behavioral Medicine</i> USA	Identify factors associated w/ RTW for traumatic hand injuries after surgery	IV D2 1/3 Correlational	N= 71 M only N = 7 Therapists females OT/PT (1-7yrs exp) Multidisc WH program in Chicago/Oak Lawn workers comp Ex: alcohol/substance abuse, psychotic/bipolar disorders, couldn't read English	WH program 5-7 wks 2-4hrs/day on 1st wk 5-6hrs/day 2nd wk (cognitive behavioral w/ voc rehab meeting weekly) -BDI - depression -MPI - pain -Cook Medley Hostility Scale (Ho) -AOS -Anger expression Inventory -WAI (for both therapist and patient)	WAI-Therapist no association w/ WAI-client Ho scale, AOS, or BDI -Anger expression, hostility, and depression adversely affected pain adjustment causing neg affected patient- therapist relationship - hostility and anger expression affect working alliance (-) w/ PT/OT only from patient's perspective	Study didn't elaborate on reliability and validity of assessments Strictly M participant and F therapists

Author, Year, Jnl, Country	Study Objective	Study Design/ Level of Evidence/	Participants: Sample Size, Description Inclusion and Exclusion Criteria	Interventions and Outcome measures	Summary of Results	Study Limitations
Luk et al. 2009 <i>Journal of Orthopaedic Surgery</i> Hong Kong	Examine effectiveness of a multidisc rehabilitation (14 wks WH/WC/WR) for low back injuries and factors associated with RTW	III O4 2/6 One group pre-post test	N= 54 Age: 20-56 yrs In: hx of LBP & unresponsive to conventional medical tx Ex: acute fracture or dislocation or mentally/physically unfit to pursue a training program	2x 1hr back edu during wk 1 Phys cond (4 hrs PT/ 2 hrs OT) for 5 wks WC (3 hrs PT/ 3 hrs OT) for 4 wks WR (2 hrs PT/ 4 hrs OT) 3 wks Assessed at baseline, wk 7, wk 14, and 6 mos follow up for pain, self-perceived disability, lumbar ROM, isoinertial performance of trunk muscles, and depression level VAS ODQI ROM LIDO Worksheet II BDI	RTW: N = 28 (grp 1) Did not RTW: N= 26 (grp 2) -Waiting for re-employment N = 21 -Sick leave N= 4 -Retired N= 1 -↑ age ↓ RTW 6 mo follow up pain sig ↓ (p<0.001) - Self perceived disability sig ↓ from baseline to 6 mo follow up (p<0.001) -Lumbar flexion sig ↓ over time for participants who didn't RTW (p=0.043) -RTW participants trunk flexion/extension sig ↑ over time (p=0.001) -Only pulling (p=0.042) and pushing (p=0.017) demonstrated sig ↑ over time for grp1 and grp 2. -During 14 wk program change in pain not sig. - Pain sig ↓ from base - follow up (p<0.001)	The study doesn't mention the validity or reliability of the assessments Program might be different due to country of origin

Author, Year, Jnl, Country	Study Objective	Study Design/ Level of Evidence/	Participants: Sample Size, Description Inclusion and Exclusion Criteria	Interventions & Outcome Measures	Summary of Results	Study Limitations
Petersen 1995 <i>JOSPT</i> USA	Identify nonphysical factors that are associated w/ WH success	III O4 3/6 Retrospective review of medical records	N = 100 M= 73 F= 27 Age: 21-62 yrs Length of injury: 2 wks - 17 yrs In: physician referral, no contraindication for exercise, client agreement, no substance abuse, workers comp, completion of 2 wks treatment, diagnosed w/ musculoskeletal condition, not employed Ex: N/A	7.5 hrs/day program for average 4.3 wks. Included PT conditioning, work simulation, and psychological edu group focusing on pain and anxiety related to injury.	50% RTW, 26% completed program didn't RTW, 16% dropped, 8% non-compliant No sig difference btw all groups (RTW, completed, dropped, non-compliant) for RTW for surgical history vs no surgical history Sig ↑ in pain for severe vs simple diagnosis (p<0.05) Sig ↑ w/ RTW for workers w/ less pain vs. more pain (p<0.01). Sig ↑ w/ RTW for injuries less than 9 months (p<0.05). Sig ↑ in program completion for individual w/ high school graduated vs less than high school (p<0.05).	Length of injury 2 wks-17 years is too broad. Participants didn't all have the same length of program

Author, Year, Jnl, Country	Study Objectives	Study Design/ Level of Evidence	# of Papers Included, Incl/Excl Criteria	Interventions & Outcome Measures	Summary of Results	Limitations
<p>Schonstein et al. 2003 <i>Spine</i> Australia</p>	<p>To identify the effect of phys cond programs in reducing time lost from work for workers w/ back and neck pain</p>	<p>I E1 Systematic Review</p>	<p>N = 19 In: randomized trials including phys cond, WC, WH, or exercise programs. Adults w/ neck or back pain, # of sick days lost/work status. MEDLINE, EMBASE, CINAHL, PsycINFO, Cochrane Register of Clinical Trials, and PEDro Ex: N/A</p>	<p>Duration of programs 1-40 sessions (7 hrs/day for a total of 280 hrs, median = 60 hrs) Many programs included Cognitive behavioral/psychological aspects which assisted w/ pain management and returning to function. -Measured # of sick days</p>	<p>Phys cond ↓ # of sick days/yr vs solely GP care or pain management or exercise Phys cond combined w/ worksite evaluation ↓ sick days compared w/ clinical treatment (M=62). Most effective programs included phys cond w/ sig CBT aspects and demonstrates ↓ pain ↑ function CBT addressed (-) thoughts, unneeded medication intake, promote activity levels.</p>	<p>Study didn't include measures such as SD or p-value when providing the mean, which makes it difficult to assess Sample size is modest Not all studies included in the table</p>

Author, Year, Jrnl, Country	Study Objective	Study Design/ Level of Evidence/	Participants: Sample Size, Description Inclusion and Exclusion Criteria	Interventions & Outcome Measures	Summary of Results	Study Limitations
Voaklander et al. 1995 <i>Journal of Occupational Rehab</i> Canada	To identify factors associated w/ RTW following WH	II O3 3/6 Retrospective study	N= 1527 Workers' compensation clients from WCB Millard Rehab Center, AB btw 01/1992-10/1993	WH program up to 6 hrs/day for 5-9 wks Outcome: - RTW -discharged ready for work, but nothing available yet -referred to case manager due to factors such as noncompliance -compared two groups completed WH program vs did not	-36-45 y/o 85% more likely to RTW in both groups -lower edu =lower RTW -treated by health care/custodial rehab team had 43% and 52% lower chance of RTW -fracture dx-145% greater chance of RTW compared to sprains/strains -dislocations dx-59% lower chance to RTW when compared to sprains/strains -longer injury to admission time less likely to RTW -job attachment to pre-accident employer strongest predictor ->8 day absent from program, 38% lower chance to RTW	Due to retrospective study, limited C in variable measured weakened internal validity -Data was originally gathered for administrative purposes, not research. -Not all participants had a follow up mainly the unmarried/younger subjects -no data were presented concerning physical psychosocial or voc factors -no comparison for seasonal or regional employment

Results: Studies - Multidisciplinary program

Author, Year, Jnl, Country	Study Objective	Study Design/ Level of Evidence/	Participants: Sample Size, Description Inclusion and Exclusion Criteria	Interventions & Outcome Measures	Summary of Results	Study Limitations
Li et al. 2006 <i>Journal of Occupational Rehab</i> Hong Kong	Effect of a 3 wks training on work readiness program	I E2 6/10 RCT	N = 64 T group = 34 C group = 30 In: WMSD, sick leave > 6 mo, post rehab, age 20-59 Ex: previous history mental illness, non-related work MSD, pregnancy, severe spinal deformity	Multidisc. team w/ voc rehab, OT, counselor, social worker 3 counseling sessions/1hr strategies consciousness, self-efficacy, & decisional balance Group therapy everyday 3 wks/2-3 hrs w/ follow up evaluation. w/ pain & stress management. job preparation, & pre-employment training SFS self-report assessing one's ability to conduct functional activities LLUMC self-report assess daily tasks C-LASER assess work readiness C-STAI 2 self-reports assess anxiety SF-36 self-report assesses perceived overall health	SF-36 - sig ↑ difference btw T & C group (p=0.028), sig difference w/in T group pre/post (p<0.001), no sig difference w/in C group pre/post C-STAI – T group sig ↑ than C group (0.036), Sig ↑ w/in T group pre/post (p<0.001) SFS - no sig difference btw T & C group, no sig w/in T or C group pre/post LLUMC - no sig difference btw T & C group, no sig difference w/in T or C group respectively . C-LASER - no sig difference btw T & C group. No sig difference w/in T or C group	Didn't specify RTW outcome, T & C group not divided equally, occupations not specified, study conducted abroad, didn't specify the range for sick leave, depending on how long an individual has been out of work could impact result, wide age range

Author, Year, Jnl, Country	Study Objectives	Study Design/ Level of Evidence	Participants: Sample Size, Description Inclusion and Exclusion Criteria	Interventions & Outcome Measures	Summary of Results	Limitations
Lillefjell et al 2006 <i>Journal of Occupational Rehabilitation</i> Norway	To identify factors affecting RTW following multidisc rehab program	III O4 3/6 One group pre-post	N= 143 CP patients Age: 20-67 yrs In: N/A Ex: w/out diagnosed organic disease	57 wks multidisc rehab program w/ a biopsychosocial approach (5 wks for 6hrs/day 4x/wk) + (52 wks 6hrs/day 1-3x/wk) Start tx, during tx, and end of tx VAS COOP/WONCA HADS RTW	Baseline-end of tx ↑ strategies to RTW (4% to 80%) Sig ↑ in cognitive fx (p<0.001), physiological, and psychological fx (p<0.01). Sig ↓ pain (p<0.05). Sig ↓ in anxiety (p<0.05) and sig ↓ depression (p<0.01) . COOP/WONCA Sig ↑ health status on feelings (p<0.05), daily activities (p<0.001). Social activities (p<0.001) and health (p < 0.001).	Does not elaborate on what strategies to RTW entails Program length is longer than the program length for WH/WC in USA Additionally, program might differ since in Norway

Results: Studies - vocational rehabilitation program

Author, Year, Jnl, Country	Study Objective	Study Design/ Level of Evidence/	Participants: Sample Size, Description Inclusion and Exclusion Criteria	Interventions & Outcome Measures	Summary of Results	Study Limitations
Blackwell et al. 2003 <i>Rehab Counseling Bulletin</i> USA	To identify factors that could influence a worker's predictability to RTW	IV D2 1/3 Correlational	N=502 Injured worker in Montana receiving worker's compensation benefits and referred to voc rehab btw 1984-1991 and insured by State Compensation Insurance Fund and referred to the designated rehab provider for Voc Rehab. Ex: missing any of the relevant data	Age edu, attorney involvement, mandated voc rehab and time from injury to referral. Bi variate analysis to determine independent variables.	People who were < 50 years of age had more edu preinjury, referred for voc rehab services w/in 6 mo after injury and were not represented by an attorney were more likely to RTW.	Generalization of results from this study to injured workers is limited, because data was taken from a single rehab service provider Historical event of the enactment of the Montana Workers' Compensation Act of 1987 Of the 1,105 cases examined, 603 were missing one or more data points and were eliminated from the study

Author, Year, Jnl, Country	Study Objective	Study Design/ Level of Evidence/	Participants: Sample Size, Description Inclusion and Exclusion Criteria	Interventions and Outcomes	Summary and Results	Study Limitations
Hankins et al. 2015 <i>Journal of Occupational Rehab</i> USA	To develop a RTW model to identify the predicting factors for Minnesota workers	IV O3/D3 3/6 Pre-existing groups with covariates/Case series	N= 15,372 In: -Claims from injured Minnesota employees filed btw 01/2003-12/2011 -received voc rehab - no missing data from claims - age 18-64 - voc rehab benefits ended due to closure -claim closed by 09/2012 Ex: injured worker cannot be deceased or missing	RTW coded as: -no RTW -RTW (either part-time or full-time)	62.3% of claims RTW ↑ RTW associated w/ -no attorney involvement ↓ lvl of PI -longer job tenure -higher injury average weekly wage - injury affecting LE/trunk - ↑edu lvl Model developed had an overall 74.9% at correctly classifying RTW	Due to retrospective study, limited C in variable measured led to weakened internal validity No follow up on RTW Wide variety of jobs that makes it difficult to separate different types of job demands. Coded by only one individual

Author, Year, Jrn, Country	Study Objective	Study Design/ Level of Evidence/	Participants: Sample Size, Description Inclusion and Exclusion Criteria	Interventions & Outcome Measures	Summary of Results	Study Limitations
Hardison et al. 2017 <i>AJOT</i> USA	Explore predictive factors of success in comprehensive and general rehab programs as well as the contribution of occupations and activities intervention strategies provided through simulated work tasks	III O3 5/6 Retrospective study	<p>N=95 receiving first episode of care in the general occupational rehab program n=71 identified as entering comprehensive occupational rehab program for the first time</p> <p>Referred to outpatient facility in the midwestern US btw 2003 and 2011</p> <p>WRMSD in one or more body regions and no longer needed OT or PT, but unable to tolerate RTW.</p> <p>State funded workers' compensation paid for all services</p>	<p>Which is better for RTW: general program vs comprehensive</p> <p>Predictive factors of successful RTW</p> <p>Contribution of factors identified in the literature and impact of occupation-based activities</p>	<p>Clients more successful in general programs</p> <p>Previously reported client factors except gender were sig predictors of either program's success.</p> <p>Gender and therapeutic intensity were a predictor of success for both programs</p> <p>Participating in occupation-based activities was predictor of success in general occupational rehab program.</p> <p>Disorder severity for example pain and delay of treatment were predictive factors but weakly associated w/ success in the programs</p> <p>Men were more likely to succeed in general occupational rehab</p>	<p>Different time lengths of the program</p> <p>Retrospective study analysis did not include variables to develop the best-fitting predictive model</p> <p>Small sample size for each study group</p> <p>Did not look at psychological factors, socioeconomic descriptors and other factors related to clinical status.</p> <p>No follow up data to assess the rate of long-term success</p>

Author, Year, Jnl, Country	Study Objective	Study Design/ Level of Evidence/	Participants: Sample Size, Description Inclusion and Exclusion Criteria	Interventions & Outcome Measures	Summary of Results	Study Limitations
Li-Tsang et al. 2007 <i>Journal of Occupational Rehab</i> Hong Kong	Identifying work readiness of injured workers on long term sick leave	III O4 2/6 One group Pre-post	N = 75 Age: 20-65 yrs In: Previously participated in conventional rehab services and unable to RTW Ex: brain injuries, severe spinal injuries	Hong Kong Worker's Health Center RTW Program Measured on 3 occasions. Prior to RTW program , after program, after program & placement session 4 self-rated instruments -SFS -LLUMC -C-Laser -C-Stai -SF-36	Factors contributing to RTW -1st assessment model: classification rate of 73% C-LASER ↑ sub-score (Contemp/Action), ↑ SF-36 (social functioning, role emotional) ↑ RTW -2nd assessment model: classification rate of 66.7% C-LASER ↑ sub-score (Contemp/Action) -3rd assessment model: classification rate of 65.3% C-LASER ↑ sub-score (Actioners), ↑ LLUMC ↑ RTW	Does not mention the validity or reliability of the instrumentation Result table does not illustrate all of the self-rated instruments Relied on self-reported data

Author, Year, Jnl, Country	Study Objective	Study Design/ Level of Evidence	Participants: Sample Size, Description Inclusion and Exclusion Criteria	Interventions & Outcome Measures	Summary of Results	Study Limitations
Schultz et al. 2008 <i>Journal of Occupational Rehab</i> Canada	Evaluate RTW outcomes following proactive, combined clinical, occupational and case management-based interdisciplinary early intervention, provided in a workers' compensation environment within 4-10 wks of onset of back pain, to workers with medium and high risk for disability.	II O3 4/6 Case control study	<i>N</i> =72 In: high risk (<33% probability of RTW within 3 mo of assessment) or mod risk (34-65% probability of RTW within 3 mo of assessment), had to receive workers' compensation temporary partial or total disability benefits Ex: working more than 20 hrs/wk, pregnant, with a knee, hip, head, or neck injury and/or previous back surgery, not able to read or respond in English	Workers compensation. Early intervention compared to conventional case management for workers with high risk and mod risk of protracted disability.	At 3 mo post back pain onset, no statistically sig differences were identified in RTW outcomes, but by 6 mo, workers at a high risk who received early intervention were sig more likely to RTW than high risk workers who received conventional case management. Mod risk workers had no statistically sig difference in RTW If they are not at high risk then early intervention is not helpful.	Did not look at the long-term effects of early intervention Only within one setting of workers' compensation case management
Stice et al. 2009 <i>Journal of Occupational Rehab</i> USA	To identify if depression is a sig factor for injured workers in voc rehab Identify the role of work values in injured workers w/ depression	IV D2 2/3 Correlational	<i>N</i> = 253 M: 140 F: 113 Mean age: 44.6 yrs Most workers got injured from slips, falls, lifting heavy loads In: any injured worker w/ a voc rehab evaluation Ex: N/A	-COPEs-measures work values: investigative vs accepting SF-MPQ – pain BDI-II depression SRRS - stress	Participants demonstrated mod levels of depression (modal score was in the severe depression category) Additionally, pain and stress identified. Higher BDI-II sign associated w/ higher SRRS scores ($p < 0.005$), higher SF-MPQ scores ($p < 0.005$) and COPEs work value of accepting vs investigative ($p < 0.005$).	Wide range of injuries, list of occupations unknown (homogeneity vs heterogeneity unknown), inclusion is very broad by including any injured worker w/ a voc reha evaluation

Author, Year, Jnl, Country	Study Objective	Study Design/ Level of Evidence/	Participants: Sample Size, Description Inclusion and Exclusion Criteria	Methods for enhancing rigor	Theme and Results	Study Limitations
<p>Young 2010 <i>Scandinavian Journal of Work, Environment & Health</i> USA</p>	<p>To identify what facilitates continued RTW for Massachusetts workers who received voc rehab</p>	<p>NR Q3/D2 Group study with less rigor/correlational</p>	<p>N= 146 Recruiting individuals w/ a state approved RTW plan. Categorized into: -Off work phase -Re-entry phase: recently started working and has not met expectation goals -Maintenance phase: performing well and working for a longer period of time -Advancement phase: pursuing alternative work</p>	<p>Computer assisted semi structure proforma, which was pilot tested by experts within the field. Audio recording of interview. interviewers also took handwritten notes. They all received training to conduct semi-structured interview from the lead researcher. 2 researchers assisted w/ analysis of factors facilitating RTW and developing themes using flash cards. Cards coded using ICF Descriptive emergent code was also utilized if meaning wasnt fully captured.</p>	<p>Sig fewer individuals in off work phase who reported facilitatory factors compared w/ other phases (p<0.05) X² analyses used to test the significance between group differences, and when cell frequency <5 Fisher's exact test was applied n=121 (83%) reported being assisted by something that would facilitate maintenance at work. Facilitating RTW Environmental Influences : -Features of individual's working conditions (having duties within physical capacity and flexible working condition) - medications (off-work phase mostly and managing pain) -products (heat/ice, TENS, orthotics, back brace, knee pads) -services (PT and acupuncture) -supportive relationships (family, friends, coworkers, or people assisting them RTW through encouragement) Personal factors: -job satisfaction (maintenance phase mostly) -appreciation for being busy -attitude, determination, knowing your limits, asking for help Physical factors: -walking regularly -stretching daily -exercising</p>	<p>Type/severity of injury not discussed, which could potentially impact the recovery process. No follow up for individuals who didn't RTW at the time of the interview. This could offer further insight for these workers.</p>

Results: Studies – Program comparison

Author, Year, Jnl, Country	Study Objective	Study Design/ Level of Evidence/	Participants: Sample Size, Description Inclusion and Exclusion Criteria	Interventions & Outcome Measures	Summary of Results	Study Limitations
Cheng et al. 2007 <i>Journal of Occupational Rehab</i> China	To compare workplace-based rehabilitation programs to traditional clinic-based rehabilitation programs on effectiveness for RTW with work related rotator cuff disorder	E2 I/ 5/10 RCT/Pre-post test	N=103 In: work related rotator cuff tendinitis diagnosis by registered medical practitioner, >90 days from claim filing or date of injury, registered medical practitioner certified participant is physically fit to start fxnl training and work trail at a medium physical demand level of work based on the Dictionary of Occupational Titles, worker and employer participate in program w/ written consent, job coach allowed in workplace for onsite eval and T. Ex: severe tear of rotator cuff muscle to extent surgical intervention is req, symptoms magnification observed during fxn; capacity eval, refuse to join program, and phys cond deteriorated after receiving workplace training.	I: Clinic-based work hardening training Workplace-based work hardening training O: RTW	Prior to intervention, independent t-test showed no sig difference in AROM of injured shoulder jt and basic functional work capabilities Sig ↓ in perceived shoulder problems within WWH group vs CWH (p < 0.05) WWH group sig better improvement in active shoulder flexion, arm lifting force, high-near lifting force, carrying force, and overhead tolerance measures (p < 0.05) Pearson Chi-Square value was statistically significant ($\chi^2=11.095, p = 0.001$) showing 71.7% of workers in WWH group could return to normal or modified duties compared to 37.5% from the CWH group.	Did not look into self-efficacy as a potential factor affecting the results of this study. Could not control work environment Limited validity due to insurance carriers in other countries not covering on-site training. Only looked at RTW short term. Collateral workplace-based efforts could have contaminated results, but were not considered. Small organizations were not considered for the study.

Results: Studies – Follow-up

Author, Year, Jnl, Country	Study Objective	Study Design/ Level of Evidence/	Participants: Sample Size, Description Inclusion and Exclusion Criteria	Interventions and Outcome measures	Summary of Results	Study Limitations
Hara et al. 2018 <i>Journal of Occupational Rehab</i> Norway	To explore whether a boosted follow-up call following occupational rehabilitation affects RTW for injured workers	I E3 6/10 Prospective cohort study	N = 213 C = 109 Tx = 104 In: 18-59 yrs, MSD/CP/MH disorders, temp medical benefits (specific to Norway) Ex: severe MH disorder, substance abuse, addiction, pregnancy, returning to school, not completing rehab program	3.5 wks program w/ physical activity/mindfulness (ind/grp tx 6-7hrs/day) 2 post discharge RTW follow up -boosted RTW follow up + standard RTW follow up -standard RTW follow up (C grp) RTW coordinator informed about each participant's RTW plan and self-perceived barriers Monthly follow up for 6 mos w/ participants + local stakeholders via phone/ video conference or/face to face Primary Outcome: RTW Secondary Outcomes: Short form 8 for CP, 13-item Chalder Fatigue Scale, HADS, ISI, NFAS, days of paid work	RTW \geq 1 day/wk sig \uparrow for tx grp compared to C grp (p=0.042) at 6 mos After 1 yr post discharge RTW \geq 1 day/wk \uparrow Tx gr vs C grp (54.5% vs 44.8%) $\frac{1}{2}$ time work \uparrow Tx gr vs C grp (32.9% vs 28.1%) Full-time work \uparrow Tx gr vs C grp (18.8% vs 15.2%) No sig difference btw C grp and Tx grp w/ HADS, ISI, NFAS, 13-item Chalder Fatigue Scale, Short form 8 Days of paid work: 71 days for Tx grp vs 68 days for C grp in 1st yr	Program in Norway of unknown generalizability to other countries Study does not discuss in detail most of the secondary outcomes

Results: Studies –Back/neck/shoulder injuries

Author, Year, Jrnl, Country	Study Objectives	Study Design/ Level of Evidence	Participants: Sample Size, Description Inclusion and Exclusion Criteria	Interventions & Outcome Measures	Summary of Results	Limitations
Carriere et al. 2015 <i>Journal of Occupational Rehab</i> Canada	To identify if depression is a factor in determining recovery expectancy and RTW	III O3/D3 3/6 6pre-existing groups/normative	N = 109 6 Outpatient Clinics In: lumbar/cervical pain, CSST benefits, pain mild-severe Ex: disc herniation, vertebral fracture, ankylosing spondylitis, infectious disease, health condition that physical activity is contraindicated	3 PT tx/wk up to 7 wks -MPQ-PRI -BDI-II -Self-reported recovery expectancies to RTW -Demographics -Follow up interview 1 yr later (RTW: y/n)	66% RTW At follow up: No sig difference w/ pain and RTW btw F and M Depression/Recovery Expectancy ↑ BDI-II & ↓ RTW (p= 0.012) ↑ BDI-II & ↓ recovery expectancy (p<0.001) ↓ Recovery expectancy ↓ RTW (p = 0.009)	Article doesn't elaborate on context of PT tx. Mentioned about a sig association w/ age/ gender regarding RTW, but didn't identify the direction of the relationship

Author, Year, Jrnl, Country	Study Objectives	Study Design/ Level of Evidence	# of Papers Included, Incl/Excl Criteria	Interventions & Outcome Measures	Summary of Results	Limitations
Crook et al. 2002 <i>Journal of Occupational Rehab</i> Canada	To identify factors linked w/ work disability for injured worker w/ back pain	I D1 Systematic Review	N = 19 In: Prospective cohort studies, non- spinal injury, back pain, participated w/in 6 mos of injury/pain + follow up, MEDLINE, EMBASE, PsycINFO Ex: N/A	Time RTW/time lost Recurrence/Improvement Working/Not working Persistent disability/pain	Time RTW/time lost: ↑ age ↓ RTW, F ↓ RTW, challenges w/ colleagues or job problem ↓ RTW, previous hospitalization ↓ RTW Recurrence of injury: ↓ age/ M ↑ recurrence, poor lumbar extension ↑ recurrence, nurses and driver ↑ recurrence Working/Not Working ↑ age ↓ RTW, F ↓ RTW, ↑ children ↓ RTW, ↓ locus of control ↓ RTW Persistent Disability/Pain: Depression, fear avoidance, fxnl disability = ↑ risk of persistent disability	Small size sample Only includes prospective cohort studies

Author, Year, Jnl, Country	Study Objectives	Study Design/ Level of Evidence	# of Papers Included, Incl/Excl Criteria	Interventions & Outcome Measures	Summary of Results	Limitations
Selander et al. 2009 <i>Disability & Rehab</i> Sweden	Identify risk factors that affect RTW post voc rehab for workers w/ neck, back, shoulder injuries	I D1 Systematic Review	N= 43 studies In: RTW, published btw 1980-2000, work related disorders Ex: if RTW is not emphasized	RTW	<p>-Demographic factors: ↑age ↓ RTW, ↑ income ↑ RTW, ↑ Edu ↑ RTW, married ↑ RTW, rural living ↓ RTW, legal claim ↓ RTW, still being employed ↑ RTW</p> <p>- Psychosocial factors: ↑ self-esteem ↑ RTW, ↑ life satisfaction ↑ RTW, ↑ health ↑ RTW, ↑ depression ↓ RTW, ↓ health locus of C ↓ RTW, ↑ cooperativeness ↑ RTW, hypochondria ↓ RTW, ↑ motivation ↑ RTW, stable living ↑ RTW</p> <p>-Medical history factors: ↑ degree of injury ↓ RTW, ↑ pain ↓ RTW, ↓ ADL performance ↓ RTW,</p> <p>-Rehab factors: Multidisc program ↑ RTW Compared w/ single modal., providing edu. ↑ RTW, ↑ and of a job. client's influence ↑ RTW, ↑ understanding of workplace ↑ RTW, ↑ satisfaction w/ program ↑ RTW</p> <p>-Work factors: Ability to modify work ↑ RTW, unscheduled breaks ↑ RTW, ↑ job seniority ↑ RTW, public sector ↑ RTW</p>	Doesn't provide info regarding who screened the studies, didn't look into psychology-based database which could have broadened their results, wide range of dx examined, does not mention type of occupation, which could help determine the physical dem

Author, Year, Jrnal, Country	Study Objective	Study Design/ Level of Evidence/	Participants: Sample Size, Description Inclusion and Exclusion Criteria	Methods for enhancing rigor	Theme and Results	Study Limitations
<p>Soeker et al. 2008 <i>Work</i> South Africa</p>	<p>Perceptions and experiences of facilitators and barriers that affected individuals who received back rehab and their ability to resume their worker roles</p>	<p>NR Q2 Group study more rigor</p>	<p>N=26 In: medically diagnosed back problem, some form of employment before and after the diagnosis, received medical intervention and rehabilitation for diagnosed back problems. Rehabilitation within the study either meant physiotherapy and/or OT and/or work hardening, 18 years and older (participants up to age 60 years old) Ex: any form of psychiatric diagnosis according to the DSM-IV</p>	<p>Participants chosen randomly from two clinics. One pilot group and 6 focus groups. Videotaping of two sessions, and audiotaping of all focus group sessions. Audio and field notes were transcribed. Morse and Field method for analysis. Had participants review transcribed information for accuracy Compared themes within and against pilot group and focus groups</p>	<p>Themes: Feeling doubt (barriers), Facilitator-strategies (team effort, injury management, positive work culture, work placement strategies, edu w/in the workplace, micro-loans w/in the workplace, meaningful and satisfactory work experience, holistic team management) Feeling Doubted (Barriers): by stakeholders, older and less edu the individual the harder to find employment or RTW, lack of edu on disability management procedures by employers and rehab professionals, felt injuries could have been prevented if working in a safer environment, lack of meaning and satisfaction in work, employers failed to recognize true capabilities, distrustful attitude of the medical profession, lack of client-centeredness (physicians did not understand clients' work environment) inefficiency of the insurance companies, judgement, unsupportive and discriminatory poor communication between stakeholders (failure of physician failed to openly communicate with the employer) Facilitators: A team effort, effective communication and trust btw stakeholders, positive work culture (employers' attitudes), immediate and accurate placement w/in a supportive environment, formal/informal mechanism improved insight of workers w/in workplace, expense tx were exorbitant, seniority caused perception of empathy, respect and support, ↑↑ self-efficacy when work meaningful, coordinating services as a team and swift and timely referrals</p>	<p>Sampling method because it limited diversity and variation of responses Though participants reviewed their data for accuracy, it was not stated who officially reviewed the data for analysis, but infers that it was one researcher</p>

Author, Year, Jnl, Country	Study Objectives	Study Design/ Level of Evidence	# of Papers Included, Incl/Excl Criteria	Interventions & Outcome Measures	Summary of Results	Limitations
Steenstra et al. 2016 <i>Journal of Occupational Rehab</i> USA	Determine the factors that predicted the duration of sick leave in workers 6 wks post lower back pain.	I D1 Systematic Review	<i>N</i> =78 articles 16 chronic phase 6 subacute phase 37 acute phase 19 different phases or did not report duration of sick leave In: studies that included subjects w/ episodes of LBP and sick leave more than 6 wks, relations btw at least one prognostic factors and outcome and measured outcomes in absolute terms , relative terms, and survival curve or duration of sick leave. Search of articles in Medline, EMBASE, and PsycINFO from inception to 2012 Ex: N/A	Prognostic factors grouped into different categories: clinical, personal psychosocial, work related psychosocial and claim related prognostic factors and w/in each category the different prognosis factors were looked at for chronic and subacute phase of injury	-Clinical prognostic factors (sex/age, pain/fxn, tx, and health) <u>Chronic</u> : mixed evidence for MRTW (neg or no association), mod neg association btw RTW/ ↑ age, mod neg association btw RTW/pain and ↓ fxn/RTW, mod posit association btw ↑ Fxnl capacity eval/RTW, strong association btw delay tx/ delay RTW, mod association btw RTW ↑ general health and physical fxn <u>Subacute</u> : no association btw sex/RTW, neg association btw RTW and ↑ age, no association btw radiating pain/RTW and pain/RTW, mod posit association ↑ Fxnl capacity eval/RTW, mod posit association btw tx and RTW, lack of evidence for posit association btw health/RTW -Personal Psychosocial factors (recovery expectations, pain catastrophizing fear avoidance/coping, distress/depression/mental health) <u>Chronic</u> : Mod neg association for RTW and fear avoiding/pain catastrophizing/cognitive appraisal/coping <u>Subacute</u> : Mod neg association with RTW, fear avoiding/pain catastrophizing/cognitive appraisal/coping -Work Psychosocial factors (SES/physical demands/modified duties and social support/skill discretion/job satisfaction) <u>Chronic</u> : posit association btw ↓ physical demands/RTW, Strong positive association for RTW: high SES, posit association btw modified duties/RTW, higher edu/RTW <u>Subacute</u> : posit association btw ↓ physical demands/RTW, no association btw edu/RTW	Did not clearly state inclusion or exclusion criteria, but instead referred to another study that was done by the same authors Since this was a prognostic study, could not examine the effectiveness of interventions. Some studies looked at interventions, some did not, which would affect prognosis factors.

Author, Year, Jnl, Country	Study Objectives	Study Design/ Level of Evidence	# of Papers Included, Incl/Excl Criteria	Interventions & Outcome Measures	Summary of Results	Limitations
Wessels et al. 2006 <i>European Spine Journal</i> Germany	To identify what predicts the outcome in non-operative treatments for chronic lower back pain	I O1 Systematic Review	N = 13 In: 18+, CP low back ≥ 3 mos, prospective, participants received exercise, behavior, or multimodal tx, English/German Medline, Embase, PyscINFO Ex: N/A	Aquafit classes, PT 2x/day for 3 wks, behavior therapy, Phys cond 3x/wk for 6 hrs/day for 12 wks Pain, RTW, disability/fxn	- ↑ Physical performance ↓ pain ($r = 0.30-0.35$) - ↓ disability ↓ pain ($r = 0.72$; $r = 0.49$) - conflicting association w/ RTW and pain - fear of movement and RTW mixed evidence - cognitive coping and appraisal ↓ pain - 4 studies did not find a sig association btw RTW and ↓ depression	Small sample size Studies are measuring different outcomes and using different tx at different intervals, which is difficult for making comparison

Results: Studies – SCI

Author, Year, Jnl, Country	Study Objectives	Study Design/ Level of Evidence	# of Papers Included, Incl/Excl Criteria	Interventions & Outcome Measures	Summary of Results	Limitations
Anderson et al. 2007 <i>Journal of Voc Rehab</i> USA	To review the literature of articles that examine determinants of return to work for people who experience SCI	I D1 Systematic Review	N=101 In: published between Jan 1975 to Dec 2006, from database CINAHL, EconoLit, ERIC, SWAD, Embase PsycINFO, Pubmed, Web of Science databases Ex: NA	Determinants of return to work measured by 14 common factors: edu, type of employment, severity of the lesion, age, time since injury, gender, marital status, and social support, voc counselling, medical problems, employer's attitudes, race, psychological state, and environment.	Number of variables associated w/ RTW, there was not a clear conclusion. Relationship btw factors were weak and did not represent the full complexity and multidimensional nature of the RTW process.	Comparisons between studies were hard because of different protocols Different literatures reviewed had different definitions of employability,

Author, Year, Jnl, Country	Study Objective	Study Design/ Level of Evidence/	Participants: Sample Size, Description Inclusion and Exclusion Criteria	Methods for enhancing rigor	Theme and Results	Study Limitations
Chan et al. 2005 <i>Work</i> China	Investigate barriers and important factors that might hinder local SCI victims from seeking and sustaining jobs and to look at the value of employment from the client's perspective	NR Q3 Group study less rigor	<p><i>N</i>=16 In: -Employed group- 18 to 50 y/o, post injury for at least 1 yr, sustained employment (open employment, full time or part-time) after injury for at least 6 mo.</p> <p>-Unemployed-18 to 55 y/o, post injury for at least 1 yr and never employed, or used to work after injury but could not maintain the job for at least 6 mo</p>	<p>Did record and transcribe data, but did not peer or member check</p> <p>Triangulation: dividing the unemployment group up into two groups, but did not do the same for employed group</p> <p>Compared: unemployed and employed groups and examined difference between them.</p>	<p>Themes: Job consideration and exploration, job seeking, offering and RTW, job maintenance and advancement, perceived value of work</p> <p>Facilitator: financial issues and personal motivator, younger w/ ↑ self-esteem and ↓ financial burdens, interpersonal factors and networking, optimism, maintaining job easier than seeking, mental stimulation, social interaction, and sense of purpose and personal growth</p> <p>Barrier: physical impairment ↓ RTW, psychological effects as important as physical impairment in re-employment, ↓ self-esteem, ↓ gov assistant if RTW, low edu levels (breadwinners could not find jobs w/ equal salaries, perceived discrimination, low confidence, pessimism, <u>physical environmental barriers have minimal effect of RTW</u>, bowel management & pressure sore prevention, facing colleagues, social security system changes, environmental factors due to physical and financial considerations.</p> <p>If fail to RTW then they should be given advice and skills training in job seeking and negotiation, job development, and job retention</p>	<p>Small sample size once divided into groups</p> <p>Most of the unemployed participants had no work experience at all</p> <p>Overlooked important issues in job maintenance</p> <p>Psychological issues were raised, such as the effects of optimism on re-employment, could not be verified</p> <p>Cannot conclude causal relationship between the psychological factors mentioned by the participants and their voc outcomes</p> <p>All participants asked to volunteer and were from one hospital within one setting since as stated primary goal was not to generalize findings</p>

Author, Year, Jrnl, Country	Study Objectives	Study Design/ Level of Evidence	# of Papers Included, Incl/Excl Criteria	Interventions & Outcome Measures	Summary of Results	Limitations
Lidal et al. 2007 <i>Disability and Rehab</i> Norway	Investigate RTW and employment in people w/ SCI , current employment rates, factors that influence employment, interventions aimed at helping people to obtain and sustain productive work.	I O1/D1 Systematic Review	N~283 In: 123 Ex:~160 In criteria: full length articles in English, PubMed/Medline, AMED, (ISI) Web of Science, EMBASE, CINAHL, PsycINFO and Sociological abstracts database.	Employment and RTW rates after SCI, Personal Significance, indicators associated w/ RTW and employment after SCI, social significance of employment in SCI, barriers to employment, employment status as predictor of other outcomes, employment data Interventions: VR, special programs, the job's ability to provide a supportive work environment.	High unemployment rates in individuals w/ SCI. Most successful RTW is seen in persons injured at a younger age, less severe injuries, and w/ higher fxnl independence. On average interval btw injury onset and the RTW is long Employment rates improve w/ years after injury Barriers: transportation, health and physical limitations, lack of work experience, lack of sufficient edu or training, physical or architectural barriers, discrimination by employers, and loss of benefits.	Lack of specific intervention analysis Only articles in English btw 2000-2006

Results: Studies – Chronic pain

Author, Year, Jnl, Country	Study Objectives	Study Design/ Level of Evidence	# of Papers Included, Incl/Excl Criteria	Methods for enhancing rigor	Theme and Results	Limitations
Magalhães et al. 2017 <i>Cadernos de Terapia Ocupacional</i> Brazil	To explore the HCP perspective and approach to assist RTW for individual w/ chronic pain	N/R Q1 Meta-analysis	N= 6 In: peer reviewed CP, focus RTW, HCP perspective ProQuest, PsycINFO, BSC, EMBASE, CINAHL, Pubmed. Using chronic pain, RTW, therapist, English only Ex: acute pain, not qual methods, , demographic not explained	Two researchers screened the articles and a 3rd researcher arbitrated if a disagreement occurred, Critical Appraisal Skills checklist ≤ 7	-Social interactions/ RTW: Stigma ↓ RTW, stereotype among HCP individual w/ CP = difficult, HCP perceive some colleagues as barriers for patient’s RTW due to not addressing stigma, delays RTW blaming patients w/ CP Attitude, family values, community support affect RTW, HCP believes relieving patient from chores ↓ RTW by ↓ independence -Bureaucracy/coordination/RTW: Interdisciplinary team ↑ RTW HCP perceives employers as barriers due to being unsupportive Scheduling of tx sessions act as barriers due to hours/coordination HCP felt overwhelmed w/ knowledge required for RTW -Communication btw HCP/Patient Researchers discovered HCP difficulty to communicate w/ patients due to language barriers, lack of time, ↓ visit/↓ time. ↑ communication ↓ fear/misconception -HCP unclear w/ roles in RTW HCP perceived their roles to provide exercises, ergonomics and postural recommendation vs. providing psychosocial support. Research suggests psychosocial support as most important factor for CP -Congruence btw HCP/ Patient views/goals w/ RTW HCP must consider cultural beliefs of patients	Small sample size Perspective only from HCP/some insight provided by researchers, but nothing from the patient’s view Only English articles

Results: Studies – ABI

Author, Year, Jnl, Country	Study Objectives	Study Design/ Level of Evidence	# of Papers Included, Incl/Excl Criteria	Methods for enhancing rigor	Theme and Results	Limitations
Donker Cools et al. 2016 <i>Disability & Rehabilitation</i> Netherlands	To identify factors affecting RTW for individuals w/ ABI	N/R Q1 Meta-synthesis	N= 27 In: non progressive ABI, RTW, 18-65 yrs, paid job or looking for job pre-injury, English, Dutch, and German, PubMed Ex: Borghouts criteria list ≤ 6	Excluding low quality articles by using Borghouts list of criteria, 2nd author replicated the selection of 1st author via random sample, if disagreement, 3 rd author was the arbitrator	Disease/disorder: ↑ inpatient rehab length of stay ↓ RTW. Inconsistency w/ acute hospital and RTW Function/structures: inconsistency to no evidence for RTW and association w/ cognitive/physical function Activities: ↓ level at discharge or admission ↓ RTW, ADL independence ↑ RTW for 1st time stroke patients Age/gender: for both ABI/TBI inconsistent evidence for RTW Edu: ↑ edu ↑ RTW Pre-injury occupation: if previously employed prior to injury ↑ RTW Marital status: if married ↑ RTW Ethnicity: white ↑ RTW compared to other ethnic groups	Small sample size, only one database utilized, which limits the number of articles that could be analyzed.

Author, Year, Jnl, Country	Study Objective	Study Design/ Level of Evidence/	Participants: Sample Size, Description Inclusion and Exclusion Criteria	Methods for enhancing rigor	Theme and Results	Study Limitations
Lundqvist et al. 2012 <i>Brain Injury</i> Sweden	To describe the factors affecting individuals w/ ABI for RTW	NR Q2 Group study more rigor	<i>N</i> =14 <i>M</i> =8 <i>F</i> =6 In: received voc rehab btw 2005-2009, working after discharge, post-acute state, medically stable, Independent in ADL/IADL Ex: N/A	Neuropsych conducted interview and OT took additional notes, tape recorded and transcribed. Coding into themes/sub-categorizing, 2nd OT peer reviewed coding, triangulation.	1 informant worked ¼ time 9 informants worked ½ time 1 informant worked ¾ time 3 informants worked full-time Self-continuity: ↑ motivation, ↑ driving force, ↑ self-responsibility, and ↑ endurance = ↑ RTW Coping: ↑ awareness and acceptance = ↑ RTW Social factors: supportive family, friends, and employer. Having a social life = ↑ RTW Rehabilitation professionalism: knowledge from rehab team, listen to concerns = ↑ RTW Health insurance policy: having to fight against the insurance/not flexible was identified as a difficult barrier.	Small sample size, independence in ADL/IADL limits the range of individuals with ABI who work, population is very homogeneous w/ edu <i>M</i> = 13 years Although insurance was an inhibiting factor, might not fully generalize to the US healthcare system
Materne et al. 2017 <i>Work</i> Sweden	↑ knowledge of opportunities and barriers of successful RTW in patients with ABI	NR Q3 Group study less rigor	<i>N</i> =10 In: 18-65 y/o, RTW after ABI, participation in voc rehab and RTW for 1 year at least 20 hr/wk, communicate in spoken Swedish, ability to work full time prior to injury Ex: known drug or alcohol abuse, severe ABI or other illnesses that could affect RTW.	Peer checking: one person conducted the interview, another transcribed, and then a third person with the person who conducted the interview would listen/read the transcription and then categorized the articles independently then worked together at the last stage to formulate themes.	Themes: Individually adapted rehab, motivation for RTW, and cognitive and social abilities. Results: an individually adapted voc rehab is important for a successful RTW, and it is important that the individual is involved with their own rehab plan as well as incorporating societal influences such as relatives, colleagues, and employers. Motivation essential goal setting as a facilitator for success, but it can be a barrier by causing frustration if the client's motivation exceeds their current abilities. Awareness of cognitive and social abilities essential to find strategies that contribute to handling potential challenges that individuals may face when RTW.	Some participants had memory problems Only took place in Sweden from one outpatient facility.

Author, Year, Jnl, Country	Study Objective	Study Design/ Level of Evidence/	Participants: Sample Size, Description Inclusion and Exclusion Criteria	Methods for enhancing rigor	Theme and Results	Study Limitations
Soeker, et al. 2012 <i>Work</i> South Africa	To describe the perceptions and experiences of individuals w/ brain injury w/ regards to RTW rehabilitation programs	NR Q2 Group study more rigor	<p><i>N</i>=10</p> <p>In: diagnosed w/ BI mild or mod by Glasgow Coma Scale, employed before and after diagnosis in work for 6 mo. Received medical intervention and rehab such as physiotherapy, speech therapy and/or OT, lived in Cape Town and 18+ yrs, lived 1 yr w/ BI, understood verbal questions, and communicated effectively in English and Afrikaans, selected from diverse race and gender groups</p> <p>Ex: severe head injury, additional psychiatric diagnosis according to the DSM IV</p>	<p>Participants from different setting: hospital and an organization</p> <p>10 interviews, roughly 60 min each for each participant, took place from Jan 2008 to Dec 2009</p> <p>Audiotaped recording of all interviews, and field notes were transcribed.</p> <p>Participants checked summary of finding from their interview to ensure accuracy</p> <p>Condensed interview information to formulate common themes among all participants, but also included specific characteristics that were facilitators or barriers to RTW.</p>	<p>Positive characteristics of a successful intervention program: Multidisc rehab (holistic physical and cognitive rehab), work screening by OT (realistic indicator of whether cope in work or not), Transparency w/ employer, assessment of multiple work skills (try multiple job to find a good fit to current functional capacity), ergonomic accessibility, OT dept assess motivation of client, family counselling, fostering self-determination, respectful interaction btw the client and therapist, & govt support.</p> <p>Negative characteristics of an intervention program: delays in the disability grant application process, poor networking amongst health professional and employer resulting in not provided with alternative work in their companies, and experienced difficulties when they tried to RTW, employer disrespects employee's right to be accommodated in the workplace (did not want to reasonably accommodate the employee in the reduced capacity)</p>	Only one female participant

Author, Year, Jnl, Country	Study Objective	Study Design/ Level of Evidence/	Participants: Sample Size, Description Inclusion and Exclusion Criteria	Methods for enhancing rigor	Theme and Results	Study Limitations
Van Velzen 2011 <i>Scandinavian Journal of Work, Environment & Health</i> Netherlands	To describe the factors that affect RTW for individuals w/ mod to severe ABI	NR Q2 Group study more rigor	N=12 M=9 F=3 2 yrs after discharge from inpatient rehab In: non-progressive acute ABI/TBI, 18-60, read Dutch, work prior injury, could participate in voc rehab	Sent questionnaire prior to interview for participants/families to gather info audio-recorder . Interview pre-tested via pilot interview Coding, transcriptions, interviewer and author coding; if disagreement, 3rd author included.	3 individuals work full-time (40-80hrs/wk) 6 individuals work part-time (3-30hrs/wk) 2 participants volunteering (2-18hrs/wk) 3 participants w/out work Limiting factors RTW: physical/cognitive fatigue, visual/hearing deficits, ↓ muscle strength, ↓ balance, ↓ physical fitness, UE/LE impairments, ↓ concentration, jobs that requires alternating btw multiple tasks, lack of edu to employers/colleagues and inability to drive. Facilitating factors RTW: motivation, support from employers, support from families, humor.	Homogeneous population
Wilbanks & Ivankoa 2015 <i>Disability & Rehabilitation</i> USA	To identify the factors that facilitate RTW for individuals with SCI	NR Q2 Group study more rigor	N = 4 M=3 F=1 Age: 42-57 yrs 3 w/ cervical SCI 1 w/ thoracic SCI	Triangulation photos of informant-identified ATI, script developed by researcher supported literature, recorded interviews, transcribed, code-recoding independently	Resources helpful to ↑ RTW, and ↑ maintaining work: -state related services helpful such as assistance for modifying vehicle -injury occurred > 20 yrs ago - back then OT/PT offered for much longer in inpatient -excellent medical care with continual follow up from physician -supportive work -assistive tech Motivation important for ↑ RTW: -↑ extrinsic: social support, role models, rehab professionals -↑ intrinsic: independence, ambition, work ethic -↓Health insurance: possible lost of medical benefits Challenges of work: maintaining a schedule, stamina, being underestimated, incorporating bladder/bowel program to work schedule, misconception that money from gov. is enough to live on Benefits of work: ↑ social network , keeping body/mind active, ↑self esteem	Age range is limited

Results: Studies – Burn injury

Author, Year, Jrnl, Country	Study Objectives	Study Design/ Level of Evidence	# of Papers Included, Incl/Excl Criteria	Interventions & Outcome Measures	Summary of Results	Limitations
Esselman et al. 2007 <i>Arch Phys Med Rehab</i> USA	Identify barriers to RTW after burn injury as identified by the patient	II D3 Descriptive survey (cohort) 1/3	<i>N</i> =154 from 3 burn centers In: Employed at least 20 hrs/wk at the time of injury Met ABA criteria for major burn injury Ex: not working at the time of injury, did not have access to a telephone, and did not speak English, unless at University of Texas, who accepted Spanish speakers. <i>N</i> = 21	Survey based on Work Experience Survey (WES) a structured interview to identify essential job fx in 6 categories: physical abilities, cognitive abilities, task related abilities, social abilities, working conditions, and company policies Identify essential job fx that are barriers to work. Initial paper survey, then follow up telephone survey	Physical barriers were the main indicator for not RTW Long term effects from burns caused psychosocial issues to develop	Did not look at job retention Wide range in degrees of burn and surface area, which makes it difficult to assess
Quinn et al. 2009 <i>Burns</i> USA	Factors affecting RTW following a burn	I D1 Systematic review	In: original publications from peer-reviewed journals in English, evaluation RTW, Medline (1950-2008) Ex: Editorials, commentaries	RTW and factors affecting RTW	Mean RTW = 66.4% -Total body surface area most important factor for RTW -Full thickness sig factor ↓ RTW - ↑ hospital length of stay ↓ RTW -Pre-existing conditions ↑ period of time before RTW -Those with facial burns mostly reported change of occupation, but didn't RTW -Previous psychiatric history sig ↓ RTW	Only investigated one database, some studies included were retrospective which limits C variable

Results: Studies – Traumatic hand/limb injury

Author, Year, Jnl, Country	Study Objectives	Study Design/ Level of Evidence	Participants: Sample Size, Description Inclusion and Exclusion Criteria	Interventions & Outcome Measures	Summary of Results	Limitations
Hou et al. 2012 <i>Scandinavian Journal of Work, Environment & Health</i> Taiwan	To identify factors that affect RTW for workers w/ traumatic limb injury and RTW trajectories	IV D2 1/3 Prospective study	N = 804 M= 574 F= 230 > 50% blue collar/married/high energy injury Participants recruited during hospital stay between 12/2009-12/2011 In: 20-65 yr, hospitalization w/in 14 days of injury Ex: unable to read/answer survey, TBI, SCI, internal organ injury	-Occupations White-collar workers Blue collar workers -Injury energy (high = mva, fall)(low = cut, crashing/crushing by equipment) -Injury part -Length of stay hospital -WHOQOL-BREF - assess QOL -BSRS-5 assess depression -Self-efficacy RTW question -Disturbance for daily life participation: question -Assessed at 1,3,6,12,16, and 24 mos post injury.	Trajectories: Fast RTW (21.5% prob) - w/ stable RTW after 1 mo follow up (M= 38.1 yrs) Average RTW (50.7% prob) - RTW w/in 6 mos Slow RTW (27.8% prob) unsustainable RTW throughout 2 yrs follow up. (M= 46.7 yrs) Slow RTW grp = ↓ edu lvl, blue collar, 1 or 2 LE injury, severe disturbances in daily life, no self-confidence to RTW w/in 1 mo. BSRS = 3.7, ↑ age, ↑ hospital stay, more likely single or divorced Average RTW grp: BSRS 2.8, more likely married vs Slow RTW grp Fast RTW grp = more likely married, vs Slow RTW grp, ↑ edu (>12 yrs), mod to high self-efficacy, ↓ hospital stay, BSRS= 2.5 No sig difference btw grps for WHOQOL-BREF and gender for determining which RTW trajectories	The authors did not describe the validity or reliability of the self-efficacy and disturbance of daily life questions

Author, Year, Jnl, Country	Study Objective	Study Design/ Level of Evidence/	Participants: Sample Size, Description Inclusion and Exclusion Criteria	Interventions & Outcome Measures	Summary of Results	Study Limitations
Roesler et al. 2013 <i>Journal of Occupational Rehab</i> Australia	Identify factors associated w/ RTW for traumatic hand injuries after surgery	III/IV D3 2/3 Descriptive survey	N= 192 From local outpatient clinic Stage 1: n = 192 (< 4 wks) Stage 2: n = 150 (> 4 wks) (1 participant didn't agree to do stage 2; 41 excluded from original stage 1 due to needing a second surgery) Age: 18-63 yrs Blue collar: 66.6%	Outpatient hand therapy 60-item stage 1 questionnaire -pain scale -job satisfaction -GSES measuring Self-efficacy -PANAS - negative affect schedule of the positive negative affect scale -MHSS Modified Hand Injury Severity Scale 85-item stage 2 survey Brief cope scale 28 item scale adaptive/maladaptive coping skills 18 item multidimensional health locus of control MHLC, PHLC, CHLC -included repeated measures from stage 1	Stage 1: best fitting model for data (91.7% prediction lvl) = ↑ # of people in household, ↑ self-efficacy, and ↓ pain = ↑ RTW Stage 2 best fit model (62.1%) : ↑ injury severity, fewer # of people in household, ↑ negative affect, and ↑ external locus of control = ↓ RTW	-Pain scale used might (0-5) may not be as reliable as the VAS -article states 151 potential stage 2 participants of whom all but 1 agreed to participate in stage 2 (n=150).

Author, Year, Jnl, Country	Study Objectives	Study Design/ Level of Evidence	# of Papers Included, Incl/Excl Criteria	Interventions & Outcome Measures	Summary of Results	Limitations
Shi et al., 2014 <i>Journal of Hand Therapy</i> Canada	Investigate factors that prevent RTW in people who have had a traumatic hand injury	I D1 Systematic review	<p>$N= 8$ studies</p> <p>In: participants worked in paid employment at the time of injury, injury was work related or eligible for worker's compensation program, injury was limited to the hand, traumatic work related injury that involved the hand bone, jts, or muscle, RTW was defined as return to employment, at least one variable was investigated as a potential predictor of RTW, study design was prospective, retrospective, or cross-sectional design 1980-Sept 2013, only English articles</p> <p>Ex: military services and athletes as employment, case reports or case series w/ samples size <20,</p>	Age, gender, edu, income, pre-injury occupation, work compensation status, treatment related variables, impairment severity of injury, and location of injury, personal factors	<p>Greater impairment due to physical injury severity and low pre-injury income are associated w/ prolonged time to RTW.</p> <p>Age, gender, edu level, no consistent impact on RTW.</p>	<p>Studies had low to mod quality in sampling and methodology, vague descriptions of target pop, lack of blinding to outcome assessors, and lack of validated outcome measures in predicting RTW</p> <p>Limited number of studies reviewed</p>

Results: Studies – Stroke injury

Author, Year, Jnl, Country	Study Objective	Study Design/ Level of Evidence/	Participants: Sample Size, Description Inclusion and Exclusion Criteria	Methods for enhancing rigor	Theme and Results	Study Limitations
Schwarz et al. 2018 <i>Journal Occupational Rehabilitation</i> Germany	Carry out a meta-synthesis of the qualitative studies that have identified the facilitators and barriers to RTW after stroke and derive recommendations for future interventions.	NR Q1 Meta-analysis	N=14 In: articles in English or German, between 2000 and 2015, Ex: non-qualitative studies, if no information about facilitators and barriers of RTW after stroke, other languages except English or German	Data extraction by one person (BS) and then check and validated by two different people (MS & DCS). BS and MS independently assessed methodological quality using the Critical Appraisal Skills Program and quality assessment guidelines by MacEachenet al. 3 step synthesis of data Triangulation: article from different countries from multiple data cites in English or German	RTW factors related to stakeholders in the RTW Process: minor impairments can hinder/be key barriers to the RTW after a stroke. Challenges such as fatigue, exhaustion, tiredness, and weakness can also cause problems. Underestimation and overestimation of impairment can result in ineffective vocational reintegration. Motivation can be an important factor within a successful RTW process but can be deterred by lack of social support. Workplace support through flexibility of hours, task and environment as well as social support from colleagues, supervisors, and within the disability management practices all facilitate successful RTW. Graded RTW and work trials, work adaptations and job replacements support RTW if there is equality to the former job in qualitative and financial equality. Adaptiveness, purposefulness, and cooperativeness.	-high income countries

Author, Year, Jnl, Country	Study Objectives	Study Design/ Level of Evidence	# of Papers Included, Incl/Excl Criteria	Interventions & Outcome Measures	Summary of Results	Limitations
Wang et al. 2014 <i>Work</i> USA	Investigate factors that influence RTW after a stroke	I D1/Q1 Systematic Review/Meta-analysis	<i>N</i> =42 articles In: 1975-2011 Pubmed database, employment described after stroke and related issues, articles in English Ex: N/A	Based on International Classification of Fx, Disability and Health framework: body fx or structure, activity participation, environmental factors, and personal and psychosocial factors. Demographics variables and job factors Factors categorized: positively associated w/ RTW based on statistically sig, positively associated w/ RTW based on qualitative inference, negatively associated w/ RTW based on statistically sig, negatively associated w/ RTW based on qualitative inference, and not a RTW predictor based on not being statistically sig	RTW had a higher probability when a pt had a shorter hospital stay, less stroke severity, higher level of ADL functional performance, more supportive social and work environment, and had white collar/professional job.	Years of working experience, walking speed, dexterity, grip strength, lifting strength, computer skills, independent drive, work modification, assistive technologies/devices, and public or para transport support have not been studied. Only used Pubmed. Psychosocial factors and environmental factors were examined using qualitative interviews Studies from different cultures make it hard to generalize results based on cultural and social differences Did not critically evaluate the methods of each study

Results: Studies – Identifying factors among different injuries

Author, Year, Jnl, Country	Study Objective	Study Design/ Level of Evidence/	Participants: Sample Size, Description Inclusion and Exclusion Criteria	Interventions & Outcome Measures	Summary of Results	Study Limitations
Booth-Kewley et al. 2013 <i>Journal of Occupational Rehab</i> USA	Investigate predictors of recovery among US marines who had musculoskeletal injuries of the back, knee or shoulder	II O2 4/6 preexisting groups	N=134 In: musculoskeletal injury to the back knee or shoulder; participated in the original study of 222 participants, US Marine Ex: multiple injuries, fractures, tumors, and serious medical conditions other than musculoskeletal injuries, scheduled to separate from the military within 1 year	Fear avoidance belief, recovery expectations, and depression. Additional predictors based on past research: optimism, pain catastrophizing, supervisor support, and job satisfaction.	No sig difference in between responders and non-responders of completing the survey when measuring factors such as the site of injury (back, knee, or shoulder), age, ethnicity, education level, marital status, or military pay. Strongest predictor of injury recovery after 1 year was recovery expectations, with 5 times higher to recover than participants with low expectations. Univariate level found recovery expectations, pain severity, and fear-avoidance beliefs to be predicted factors for injury recovery Multivariate logistic model showed recovery expectations and pain severity as predictors of injury recovery. Mod correlations (p<0.01): fear avoidance about work and physical workload of job (r=0.55); depression and pain catastrophizing (r=0.52); pain severity and pain catastrophizing (r=0.49) and job satisfaction and supervisor support (r=0.46). Sig correlation (p<0.01): pain catastrophizing (r=-0.41), fear avoidance about work (r=-0.30) and pain severity (r=-0.27) Sig correlated with overall recovery composite score: pain severity (r=-0.45, p <0.01), recovery expectation (r=0.40, p <0.01), pain catastrophizing (r=-0.35, p <0.01) and fear avoidance (r=-0.19, p<0.05).	Homogeneity of sample population limits generalizability. All participants in the military 60% response rate for the follow-up survey, females were more likely than males to complete follow up survey Small sample size could have limited the power to detect predictive associations for the multivariate analysis. Did not include an objective measure for the severity of the injury Relied on self-reported data

Author, Year, Jnl, Country	Study Objectives	Study Design/ Level of Evidence	# of Papers Included, Incl/Excl Criteria	Interventions & Outcome Measures	Summary of Results	Limitations
Cancelliere, et al. 2016 <i>Chiro & Manual Therapies</i> UK	Identify common prognostic factors for RTW among different injuries and comparing this to the outcomes	I O1/E1 Systematic review	N=56 In: English, peer reviewed, systematic review of quantitative primary studies, working age >18 y/o, any work or non-work-related injury or illness, prognosis: any measurement associated w/ RTW Ex: narratives, letters, editorials, commentary, dissertations, books and book chapters, conference proceedings, meeting abstracts, lectures and addresses, primary studies, non systematic, qualitative	Prognosis Factors: Using the International Classification of Functioning, Disability and Health (ICF) framework four categories to organize the data: Personal (age, sex); Body structure and fx, environmental, activity limitations and participation restriction RTW	RTW outcomes influenced by prognostic factors in all 4 ICF domains. Positive RTW: outcomes were higher edu and socioeco status, higher self-efficacy and optimistic expectation recovery w/ RTW, ↓ severity of the injury/illness, RTW coordination, and multidisc interventions that include the workplace and stakeholders. Neg RTW: older age, being female, higher pain and disability, depression, higher physical work demands, previous sick leave and unemployment, and activity limitations Important RTW interventions: RTW coordination, occupational training, conditioning, workplace-based interventions, work accommodations, and contact btw the various stakeholders.	Only one reviewer screened titles and abstracts. Did not assess risk of bias for primary studies. Maj of the review studies on MSD and interpreted conclusion differently.

Author, Year, Jrnl, Country	Study Objectives	Study Design/ Level of Evidence	# of Papers Included, Incl/Excl Criteria	Interventions & Outcome Measures	Summary of Results	Limitations
Crisp 2005 <i>Journal of Rehab</i> USA	To identify the important factors that impact employment for people who have SCI, TBI, amputations, chronic pain, MI/CABG and severe mental illness.	I D1 Systematic review	N=75 In: focus exclusively on one of the six groups, authors clearly described the objectives of the research, sample selection, data collection and analysis, prospective and retrospective studies, w/ multivariate statistical analyses w/ samples w/ high generalizability and reliability, Retrospective studies using univariate statistical analyses w/ 50 or more participants, predictor variables consisted of socio-demographic, psychosocial and clinical variables, and outcome measure was RTW or employment status after onset of disability. Ex: N/A	Severity of disability, Socio-demographic factors, Psychosocial factors, enduring employment status	Severity of disability: RTW more likely when residual abilities and pre-injury skills were able to be used in a less physically demanding job for amputees and SCI, type of cognitive deficit in TBI, socio-demographic and psychosocial factors were more sig related in chronic pain, and psychosocial factors had a larger impact than clinical factors w/ people who had mental illness. For people w/ MI/CABG their perception of their health status, expectations regarding future employability, anxiety and depressive symptoms.	Few of the studies addressed voc services as predictors of voc outcomes. Did not look at voc rehab in conjunction w/ clinical or community-based services. Need to look at factors influencing long term employment stability.

Author, Year, Jrnl, Country	Study Objectives	Study Design/ Level of Evidence	# of Papers Included, Incl/Excl Criteria	Interventions & Outcome Measures	Summary of Results	Limitations
Fadyl & McPherson 2008 <i>Journal Occupational Rehabilitation</i> USA	To explore potential factors in work disability focusing on expectations and injury perceptions To determine the	I D1 Systematic review	<i>N</i> =17 studies In: one or more of these variables 'recovery of work ability' and return to work, injury perceptions, fear-avoidance beliefs and pain catastrophizing English language, articles up to March 2007 Ex: after March 2007	Influence of injury perceptions on RTW The influence of expectations on RTW	No firm conclusions on influence of injury perceptions. Pain catastrophizing relates to injury perceptions, and influences RTW outcome and amenity to change through intervention Influence of Expectations on RTW: little that can be concluded	Did not look at the complexities of factors to return to work. "Expectation" as a variable in injury to RTW was truly looked at and if they have been resolved
Lin et al. 2016 <i>Occupational Medicine</i> Taiwan	impact of psychiatric symptoms on RTW after occupational injury	I D1/O1 Systematic review	<i>N</i> =5 studies In: In English, between January 1980 and December 2014, age 18-60 y/o, only studies with intervention or observational study design, PubMed, MEDLINE and PsycINFO database papers Ex: Qualitative Studies, review, case reports and series, cadaveric studies, biomechanical studies, and laboratory studies	Interventions: Pain-Disability Prevention program a cognitive behavioral risk factor-targeted intervention for work disability, Outcomes: RTW	Factors neg associated with RTW were older age and not medically consolidated. M who had higher expectations, about their capacity to resume work, considered their work more important, and received work support from colleagues and worker comp benefits more likely to RTW Intervention studies: factors associated with RTW were early and late changes in catastrophizing, time off work and final catastrophizing and pain severity PTSD symptoms and depressive symptoms appear to be negatively associated with RTW but not enough information to draw any conclusions based on the Downs and Black and Crombie checklist. Prevalence rates of RTW ranged from 31 to 63%.	All articles reviewed came from North America and published in English. 3 articles participants were workers' compensation benefit claimants. Majority of studies looked at did not report on the participants that did not respond.

Author, Year, Jnl, Country	Study Objectives	Study Design/ Level of Evidence	# of Papers Included, Incl/Excl Criteria	Interventions & Outcome Measures	Summary of Results	Limitations
Street & Lacey 2015 <i>Work</i> Australia	↑ the current state of understanding of individual demographic and psychosocial characteristics associated with extended absenteeism from the workforce due to a workplace injury	I D1 Systematic review	<p>N=9 studies</p> <p>In: Cochrane, EBSCOhost (CINAHL, Medline Complete, Humanities Source and PsycINFO, ProQuest and Science Direct. peer -reviewed journals between January 1990 and November 2012</p> <p>Tracked participants return to work status over a minimum of 3 months, identified predictors of poor RTW outcomes, and heterogeneous sample of workplace injuries</p> <p>Ex: Non-English articles, studies recorded only single injury cohorts, only injury related predictors of RTW. Brain and trauma injury studies. If the study only includes qualitative measures or subjective measures such as cessation</p>	<p>Demographic and injury related predictors of RTW outcomes</p> <p>Age, Gender, Marital Status, dependent family members, edu, employment variables, injury predictors, psychosocial predictor</p>	<p>Number of demographic characteristics-older age, female gender, divorced marital status, two or more dependent family members and limited labor market competitiveness are predictive of poor return to work outcome.</p> <p>Injury and psychosocial predictor variables included injury severity, injury location and psychosocial assessments of negative attitudes and poor expectancy outcome</p>	<p>Range of participants in study 32 to 28,473.</p> <p>Comparison and assessment of the external validity of each predictive variable was further made difficult by the heterogeneity</p>

Abbreviation List

Btw: between
C: control
Contemp: contemporary
CP: chronic pain
Dept: department
DSM IV: Diagnosis and Statistical Manual for Mental Disorders
Edu: education
Eval: evaluation
Ex: exclusion
Fx: function
Fxn: functional
Gov. Government
Gp: general practitioner
Grp: group
HCP: healthcare provider
Hr: hour
ICF: International Classification of Functioning, Disability and Health
In: inclusion
Ind: individual
LE: lower extremity
Maj: majority
MH: mental health
MI/CABG: Myocardial infarction.coronary artery bypass grafting
Mo: month(s)
Mod: moderate
Multidisc : multidisciplinary
MSD: musculoskeletal disorder
N/A: not addressed
Neg: negative
OT: occupational therapy
PI: personal injury
phys cond: physical conditioning
posit: positive
Prob: probability
Rehab: Rehabilitation
RTW: return to work
Sig: significant
SF-36: Short form of Health Survey
Socioeco: socioeconomic
T: training
Tx: treatment
UE: upper extremity
Voc rehab: vocational rehabilitation
WC: work conditioning
Wks: weeks
WH: work hardening
W/: with
W/in: within
WMSD: work related musculoskeletal disorder
WrTBI: work-related traumatic brain injury
Yrs: years
↑ : increase
↓ : decrease

Summary of Key Findings

Summary of Experimental Studies

Four experimental studies were included in the CAT and examined different aspects, such as comparing programs, post-work hardening training and performing follow up calls post-vocational rehabilitation. In summary, vocational rehabilitation programs appear to improve overall health. Additionally, incorporating a psychological approach by promoting self-efficacy and mindfulness in combination with physical conditioning appeared to be most effective. According to Hara et al. (2018), it could be beneficial to add a boosted-follow up call following occupational rehabilitation for injured workers. Finally, workplace rehabilitation might be more effective for certain type of jobs compared to clinic-based programs by improving physical performance for lifting/carrying (Cheng & Hung, 2007).

Summary of Outcome Studies

Overall, multidisciplinary programs appear to have a higher success rate for return to work compared to other programs by improving physical performance and decreasing pain. Only one study demonstrated improvement in cognitive and psychological function, therefore one should interpret these results with caution (Lillefjell et al., 2006). Educating clients plays an important role in recovery across the studies. The main psychosocial barrier identified to impact one's ability to return to work is depression, which is prevalent across a wide range of conditions/injuries. One systematic review focusing on chronic lower back pain identified four articles that didn't find a statistically significant association between reducing depression symptoms and return to work (Wessels et al., 2006). Optimistic recovery expectations and a supportive social environment were identified as important facilitators across the studies. Job satisfaction was mentioned in a few studies as a facilitator. There was mixed evidence about fear avoidance and fear of movement due to reaggravating the pain. Medical factors such as severity of injury/condition and pain have been identified across the studies as a barrier, except for one systematic review on chronic low back pain, which didn't report any association (Wessels et al., 2006).

Summary of Qualitative Studies

Overall the qualitative studies investigated biological, social and psychological factors that would be a barrier or facilitate a person's RTW. Regardless of injury or disability, the general theme that determined if a person RTW that was

reported was the perception and/or actual support that they received from medical professionals, colleagues, their employers and family. If they felt that they were unsupported, or misunderstood, by any of these groups, it created a barrier for them to return to work. However, if the employer, family, and client were actively participating in the treatment process, with a multidisciplinary approach emphasizing transparency of expectation, progress, and services, RTW rates increased. This, along with education of colleagues for changes of the client's role or work modification, also increased a client's successful RTW. All studies that looked at demographic factors such as age and education, found that older workers and those with less education had a harder time reentering the workforce. Motivation and financial incentives were important facilitators for a person to consider going back to work. However, Schwarz et al. (2018) indicated that motivation can become a barrier due to the restrictions of physical limitations causing increased frustration and decreased motivation. Additionally, misconception from colleagues that one could survive on government financial aid, and therefore did not need to work, created tension and a feeling of judgment for the client within the workplace (Schwarz et al., 2018). A couple studies found that financial incentives could become a barrier, due to either a decrease in government assistance if they find a job, or the perceived judgment from colleagues that the government assistance is enough to sustain an individual. It also became a barrier in one study for people who were older, had a lower education, and were the breadwinners of the family. When their injury prevented them from obtaining a job that paid the same as prior to the injury, financial incentives became a barrier, because they were not willing to RTW for a lower paying job. SCI clients found the barrier that prevented them from RTW was incorporating the schedule for their bowel bladder program as well as changes to accommodate their physical limitations.

Summary of Descriptive Studies

Numerous descriptive studies were included and explored a wide variety of factors and injuries/conditions. Two studies examined the factors affecting one's ability to return to work following a burn injury. According to a systematic review, workers with full thickness, facial burns, and previous psychiatric history reduced return to work (Quinn et al., 2010). The other study identified physical barriers from the burn injury as the main indicator for not returning to work and potential development of psychological issues due to the long-term effects of burn injury (Esselman et al., 2007). Longer hospital stay, mental illness, divorced, and older age were identified as barriers throughout different diagnoses/injuries. One systematic descriptive study didn't identify age as a

factor, but had a limited sample size (Shi et al., 2014). Additionally, lower functional performance was mentioned in several studies as another barrier affecting return to work. One specific study examined the therapeutic relationship from both the client and health care provider's perspective and revealed no commonalities, but such findings should still be interpreted with caution due to the limited research (Burns et al., 1999). Several demographic factors were identified in affecting one's likelihood to return to work across a variety of conditions/injuries, such as younger age, higher education, married, and higher socioeconomic status. Two of the studies (Anderson et al., 2007 & Fadyl & Mcpherson, 2008) did not find a clear conclusion or a significant association for the variables examined and RTW due to the complexity of factors that affect a person's ability to RTW.

Implications for Consumers

Injured workers are the consumers. Research demonstrates that biopsychosocial factors affect one's ability to return to work. Although only one study examined the therapeutic alliance between both clinician and clients, one must take into consideration the potential differences in perspectives between the two parties. Therefore, the client might need to discuss their concerns with their vocational rehabilitation counselor or therapist. This may be challenging for the clients due to initiating such discussion with a stranger might be outside of their comfort zone. Self-advocating is crucial for the client in order to facilitate their recovery.

Implications for Practitioners:

Being client-centered is the foundation to occupational therapy treatment. Occupational therapists strive to approach a client's treatment from a holistic standpoint. Physical barriers are more obviously observed and perceived, but the psychological and social factors that may be influencing a client's ability to RTW may be more subtle and the client may be less forthcoming with information regarding those factors. Being sensitive to all the interactions that impact the client, can be used to help guide them through difficult relationships. It can also be used as an opportunity to provide education and promote self-advocacy within the client. This information can be used by other practitioners to promote a multidisciplinary approach, and transparency throughout treatment. One of the main implications of the research found was that clients did not feel that employers and colleagues had a complete understanding of changes that needed to be made, or were not supportive of the client returning to work. When clients did successfully RTW, it was because the client felt that the medical professional/therapist/psychologist worked to inform the employers of

the progress and changes that would be required and offered solutions to how to implement them into the workplace. When transparency and multidisciplinary approaches were utilized, the client was not only successful in RTW to work, or maintaining their current position, but they also had a longer time period of sustaining a job.

Additionally, according to several studies, CBT or following up with the workers appeared to improve overall health and return to work. This emphasizes the importance of providing the necessary resources and support to clients to optimize their success. It is essential to identify the client's needs by using a client-centered approach and guiding the client throughout the process. This might help mitigate potential barriers such as lack of employer support, and stigma, and help by supporting self-advocacy

Implications for Researchers:

There were only a few studies that looked at the long-term maintenance of a job. While prognostic factors of RTW is a very broad and a complex topic, where multiple factors could impact a person's ability or motivation to return to work, further research into breaking down the complexity is needed to see if there are key factors that influence a person's RTW. The studies looked at broad themes, or multiple factors at once and then generalized based on their findings, with many comparing so many factors that results were sometime inconclusive or not statistically significant. There needs to be more research on specific psychological and social factors that could affect RTW. There also needs to be more research done on ways or programs that can improve some of the psycho and/or social barriers that clients face, rather than just identifying barriers or facilitating factors. Possible questions for the future could be: What interventions help facilitate RTW when a client has depression due to their injury or illness? What strategies help ease injury related anxiety?

Some of the factors that were identified as having an impact on RTW could not be controlled or changed, such as age. In the studies that age was evaluated as a variable affecting RTW, people who were older had a ↓ RTW. Given that the age of when the client sustained their injuries or became ill is uncontrollable, further research should look at possible interventions or steps could be taken that would positively influence their RTW. Future research focusing on how much the therapeutic relationship between the client and the clinician would be a possible factor that could impact a person's motivation or desire to RTW.

Bottom Line for Occupational Therapy Practice/ Recommendations for Best Practice

Therapeutic use of self must be utilized continuously to provide a holistic and client centered approach. Occupational therapists must be aware of the biopsychosocial factors affecting an individual's ability to return to work. Understanding these factors will help the clinicians advocate for their clients and mitigate the wide range of barriers. Additionally, occupational therapists will provide their clients with proper resources to facilitate their recovery and return to work. Lack of a supportive environment is a debilitating barrier that was identified across numerous studies. Occupational therapists are fully equipped to assist their clients in finding a support group to promote social participation, which could potentially help with improving return to work. Education should be incorporated within the intervention and should include self-advocacy. Educating the clients throughout the process is essential to ensure continuity of care, client involvement, and injury/disease management.

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Involvement Plan

The meeting focused on discussing the bio/psycho/social factors that have been identified in literature to hinder and/or facilitate return to work. During the meeting, the collaborators listed all factors on a whiteboard and created two main categories: non-changeable factors and changeable factors. Age and socioeconomics were examples of non-changeable factors. The changeable factor category was further divided into three categories which are vocational, biopsychosocial, and personality traits. Although non-changeable factors may play an important role with return to work, the collaborators decided to focus mainly on the changeable factors for the next stage of the research project. They are mainly interested in factors that can be addressed by the therapist and incorporated into their client's treatment plan.

Due to the extensive number of factors identified, the collaborators suggested to select a few factors from one of the three categories and research the literature for evidence-based interventions. There is a lack of literature for interventions addressing the biopsychosocial factors within the context of vocational rehabilitation. Therefore, as discussed with our collaborators, we researched interventions that were identified across various healthcare professions. We created an annotated bibliography and designed a flowchart for two factors that had at a minimum of 3-4 articles to support an intervention. The flowcharts provide detailed information regarding evidence-based interventions for both depression and pain. The knowledge translation involved the implementation of a flowchart, providing the therapists at PINN with clinical practice guidelines on how to approach different changeable factors that may be exhibited by their clients. We anticipated to provide an in-service at PINN, but due to time limitations, we met informally to discuss the findings instead.

Organization contextual factors: PINN is a vocational rehabilitation facility that have multiple locations across the state of Washington. The focus of our implementation will be at their Tacoma location.

Barriers:

- The facility is mainly reimbursed by L&I insurance, which could prevent the clients from returning their previous job due to L&I policy.
 - If a client is fixated on returning back to their previous job, but is unable to meet the requirements regardless of how much therapy they have, they can be discharged if they meet the requirements of a less desirable job
- Many different injuries from a large range of demographic features.
 - The unchangeable factors of a client may affect their motivation/ability to RTW.
- Does not currently have a psychiatrist on staff
 - If there are mental health issues affecting the client, psychology is not part PINN's therapy services. The client will have to be referred out.

Facilitators:

- Outside source of a vocational counselor who is the mediator between the client, therapist and employer.
- Therapy is tailored to the individual and the requirements of their job.

Departmental/Individual factors:

Barriers:

- Potential lack of/miscommunication between departments of PINN and L&I.

- Diverse perspectives on the approach to rehabilitation may lead to differing priorities on how to get a person to RTW among PINN's OT/PT teams
- Clients come in with unchangeable factors and process their injuries in a different way. May not always be able to predict how a person reacts to their injury.
- Client's expectations of RTW may not match therapist's goals

Facilitators:

- Being client centered and working with the client to find obtainable goals.
- PT/OT have a common goal of getting a person to RTW.
- Including family members into the therapy process.
- Longer sessions, multiple times a week, with the client to help set up a routine for therapy and establish an extended block of time to observe the client and work on the changeable factors.

Initial Anticipated timeline

Task	Deadline Date	Steps with Dates to achieve final outcome
Conduct a research screen for several changeable factors that are listed under the three categories that have been mentioned more than once in the CAT and identify the factors that have literature on intervention or treatment plans.	3/1/19	2/25 - Create excel spreadsheet to identify which changeable factors are being mentioned the most frequently within CAT. Screen the following database: CINAHL - 2/27 ProQuest - 2/27 PsycINFO - 2/28 PubMed - 2/28

Based on our findings, create an annotated bibliography for the changeable factor category/categories that has/have the most applicable results.	3/10/19	Work on the annotated bibliography via google doc on the following days: 3/1, 3/2, 3/10
Submit a hard copy of our annotated bibliography to our chair for review	3/11/19	Submit to chair for review.
Create a rough draft of the flowchart/booklet based on annotated bibliography results	3/23/19	Will create a google doc with the information from the annotated bibliography. Plan to work on the following days: 3/18, 3/20.
Prior to submitting the flowchart/booklet to collaborators, get approval from chair	3/25/19	Submit the hard copy draft to George by 3/25/19.
Submit the final flowchart/booklet to our collaborators	4/1/19 - 4/2/19 depending on collaborators' availability	Will be emailing our collaborators on 3/25 to schedule a meeting to submit our final flowchart/booklet. Wait to receive the rough draft from our chair and have corrections done by 4/1/19.
As discussed with collaborators, possible presentation to PINN to explain our flowchart/booklet *This is to be determined*	4/9/19-4/12/19 depending on collaborators' availability	Depending on their availability - will be following up via email the week prior for scheduling if needed. (per their response from the email on 3/25).

Check with collaborators to see if adjustments need to be made to the flowchart/booklet to make it more “user friendly”	One week after submission of the flow chart/booklet to the collaborators OR one week after the presentation.	Send an email to collaborators one week after submission to see if adjustments need to be made.
Conduct follow up with collaborators	4/24/19 - 5/1/19 *depending on whether we are conducting an in-service	Send email to collaborators on 4/17 (if no presentation occurred) or 4/24 (if presentation occurred) to schedule a follow up meeting to discuss the implementation results.

Scheduled Interim of Completion Date

Task	Anticipated date	Actual date Achieved	Notes if not achieved per anticipated date
Screened literature to identify factors that have literature on intervention/treatment plans.	3/1/19	3/1/19	Deadline met
Created annotated bibliography for pain and depression.	3/10/19	3/10/19	Deadline met
Submitted annotated bibliography to chair.	3/11/19	3/11/19	Deadline met
Created a rough draft of flow charts based on annotated bibliography.	3/23/19	3/28/19	Additional time required due to amount of research articles found.
Submitted the final document version to collaborators.	4/1/19	4/11/19	The previous step postponed the timeline.

Presented to collaborators and provided survey.	4/9/19-4/12/19	5/1/19	The previous step postponed the timeline.
Conducted follow up with collaborators	4/24/19 - 5/1/19	5/1/19	Due to limited time, we surveyed the collaborators after presenting the findings. No follow up was conducted.

Knowledge Translation Activities

The knowledge translation (KT) process required additional research from our original CAT due to the lack of evidence-based interventions addressing the specific hindering factors within a vocational rehabilitation setting. After a thorough meeting with our collaborators, the next stage of the KT process was to conduct another literature review identifying the interventions for two changeable factors. A spreadsheet was created to illustrate all factors that were identified within the CAT and we recorded the number of articles that mentioned each changeable and non-changeable factor. Based on this spreadsheet, we were able to visually distinguish articles which had investigated the same factors. As instructed by our collaborators, we did not further explore the non-changeable factors.

Depression, pain, self-perceived disability, and social isolation were the most common changeable factors. A research screen was conducted to determine which two factors had at least three to four articles with supporting interventions. It was more arduous than expected to find research articles addressing social isolation and self-perceived disability. After careful review of ProQuest, PsycINFO, CINAHL, and PubMed, we located several scholarly articles for pain and depression.

The next stage focused on creating an annotated bibliography of the literature in order to further organize our findings. A total of 29 articles were included in the annotated bibliography, but we omitted 7 articles due to lack of statistically significant interventions or whether treatment

occurred within inpatient rehabilitation. After careful thought, we decided that an inpatient setting would be too different compared to a vocational rehabilitation setting. The interventions from our KT are either outpatient or community-based programs. We kept a total of 22 articles and created a document with detailed flow charts illustrating the different types of interventions, screens, and whether a referral is suggested, or additional training is required (Appendix A). Additionally, some flow charts were tailored to assist individuals with a specific condition such as chronic back pain or cervical pathologies. The document was designed for both occupational therapists and physical therapists, but contained some interventions that were initially utilized within the field of psychology, such as cognitive behavioral therapy. A legend was included to illustrate which healthcare professionals were administering the intervention. We did not anticipate the amount of time it would take to create each flowchart due to the extensive amount of information. Additionally, there was not enough room within the chart to incorporate additional details about the different interventions. Some research articles included a detailed treatment plan and we included them on separate pages to provide the collaborators with step by step instructions. According to the literature, the interventions that statistically significantly helped mitigating the effect of depression across all diagnoses were acceptance and mindfulness, biofeedback, cognitive functional therapy, cognitive work hardening, cognitive behavioral therapy, and a condition management program. Acceptance and mindfulness-based interventions, cognitive behavioral approach, psychosocial intervention, and biofeedback were identified in literature to have a positive effect in pain reduction. It is important to note that these are general statements and the flow charts illustrate in detail the suggested regimen dosage for chronic pain, low back pain, and cervical pathologies. We submitted the document for approval to our chair prior to emailing the final version to our collaborators on 4/11/19.

The final stage of the KT process was meeting with our collaborators to discuss our flowcharts, address questions, and administering our satisfaction survey. We originally planned on conducting 3 weeks follow up meeting to review the applicability of our research project , but due to scheduling conflict and delay with the flow chart completion, we were not able to do so. The collaborator meeting took place at PINN, Tacoma on 5/1/19 and we discussed our flowcharts in detail for 90 minutes. This final meeting was such an essential component of the knowledge translation process because it gave us the opportunity to further discuss the potential applicability of the evidence-based interventions within their clinical practice, such as cognitive behavioral therapy (CBT) and biofeedback. Further details are provided in the following section regarding the survey results as well as the effectiveness of the project's outcome.

Measuring Outcome and Effectiveness

We monitored the outcome of our flowchart by verbally administering a satisfaction survey to the collaborators after our meeting presentation to determine if the presented information was helpful and whether it could potentially be incorporated within their setting.

Steve and Lee answered all questions verbally and we recorded the results onto the survey on our laptop. Additionally, the survey included open-ended questions to provide additional feedback such as potential barriers or facilitators within PINN that could affect the feasibility of incorporating aspects of our research findings. Additionally, the last question gave the collaborators the opportunity to elaborate on additional information they would have liked to receive (Appendix B).

At this stage, the satisfaction survey was a preliminary measure to monitor the effectiveness of our knowledge translation due to inability to conduct a post-presentation follow-up with our collaborators. Therefore, it is not feasible to fully capture the effectiveness of our research. Additionally, the lack of literature pertaining to evidence based-interventions for pain and depression within the setting of work hardening and work conditioning impacts the implementation aspect of our knowledge translation.

The outcomes of our project were received favorably and both community practitioners expressed strong interest in incorporating the depression screen into their evaluation procedure. Both collaborators expressed that they enjoyed the practicality of the brief depression screen due to only having two questions, which can be administered quickly. We discussed that the screen can be utilized to further examine the effect of depression and their clients' ability to return to work by comparing their score and return rate. Additionally, they reported that the flowcharts were thoroughly informative. The main critique, based on the survey and with further discussion with our collaborators, was the lack of direct research to support the practical implementation of

specific interventions within their setting. The survey was a combination of quantitative and qualitative questions. There were 4 quantitative questions in regard to the quality and satisfaction of our project. The practitioners were asked to answer the questions based on a 1-5 scale, with a 1 score indicating a low score, and 5 being a favorable high score. For the quantitative portion of the survey, the average score for both surveys combined was 4.375 and the scores ranged between 4 and 5. Lee and Steven rated (4/5) for question (#1): How helpful do you think the flowcharts will be for your practice? On question (#2): How satisfied are you with the knowledge translation portion (the flow chart) of our project? Lee rated “exceeded expectations” (5/5) and Steven rated our project (4/5). Both collaborators rated “will incorporate” (5/5) for question (#3): for the interventions that do not require additional training, how likely is it you would incorporate them into your practice”. The community practitioners both rated (4/5) for question (#4): Some of the interventions require more training for the practitioner to implement it effectively. How likely is it you would send your employees for this training?

For the qualitative portion, the collaborators reported the following as barriers that they foresee with implementing some of the interventions “Gross understanding of the available procedures. People have to understand what the interventions should be, but also having to apply it.” Additionally, they stated “ How do we grade the interventions? What is the next step and what barriers do we have with L&I?” As far as aspects within their practice that will assist with implementing the interventions, they both reported “initial intake, structure intake process, and initial evaluation.” Based on the 2 surveys’ preliminary results, our knowledge translation project was partially successful, but more research is needed to further investigate the detailed procedures for these interventions and their overall applicability within PINN.

Evaluation of the Overall Process of Project

The research process was arduous, rewarding, and educational. At first, we didn't realize that we were undertaking such an extremely large project, due to our small group size and the number of articles found for the CAT. Formulating the research question took longer than we expected due to requiring additional guidance from our chair/mentor, as the original question was too broad. Collaborating with our community practitioners and chair/mentor, played a vital role throughout this year long project.

Our initial search strategy required refinement to maximize the retrieval of relevant articles and to improve the robustness of our findings. This created additional work, as we had to relocate all of our previous articles, strategize word combinations to return 250 or less result, and then scan every article. Our CAT draft deadline got postponed due to extensive number of articles found, 47 articles including the previous 18 articles, from the updated search strategy.

The knowledge translation portion of our project took a different turn than we originally anticipated. The CAT provided the foundation for KT, but more research was required to further investigate two changeable factors. It was challenging to manage this additional research while still trying to plan for the KT portion. Many steps were required prior to creating our flowcharts, but the involvement plan helped tremendously for tracking our progress. Additionally, we were surprised by the number of articles found from our search, which postponed the due date for our flowcharts. This delay greatly impacted our timeline by affecting our ability to conduct a follow up.

Although we experienced several hurdles along this journey, this year long project was enriching and provided us with the necessary tools to critically analyze literature, as well as, utilizing the knowledge from research into clinical practice.

Future Recommendations

Our initial research found many bio/psycho/social factors changeable and non-changeable factors, which could inhibit or facilitate a person's desire to return to work.

However, when investigating potential interventions and non-medical treatments, which could be utilized into helping people overcome barriers to return to work, the literature was lacking. Current research for implementing interventions was difficult to find specifically related to a vocational rehabilitation setting. Future research should explore the remaining changeable factors and identify potential interventions that can be incorporated into a vocational rehabilitation setting, which could help individuals return to work.

Due to time we focused only on the changeable factors of pain and depression. However, other changeable factors could be investigated such as social support, stress levels, other mental health diagnosis, self-efficacy, support from their job, or job satisfaction. Further research into the effectiveness of the types of interventions, such as Cognitive Behavioral Therapy (CBT) or biofeedback could be investigated to determine effectiveness in facilitating a person's return to work when implemented into the treatment sessions. Additional research into the effectiveness of a specific treatment program to practically implement into a vocational rehabilitation setting is needed, in order to facilitate a person's return to work.

Though the non-changeable factors would be hard to investigate and to address as a therapist, these should also not be disregarded. Future research could investigate a non-changeable factor, such as age. The majority of research demonstrated that older individuals are less likely to return to work following an injury compared to their younger counterparts. While the therapist has no control over their client's age, finding research that addresses approaches to increase motivation or other barriers associated with older clients, may be beneficial for the

therapist. Further research is needed to investigate the potential interaction of biopsychosocial factors and finding practical interventions to assist in mitigating these hindering factors to facilitate an individual's return to work.

Appendix A – Knowledge Translation Product

Introduction

Pain and/or depression can be debilitating barriers to a person's ability to return to work. Based on our research we have found 22 articles that promote interventions or interventions in conjunction with current treatment that could alleviate some of the negative side effects of pain or depression.

The structure of the flowcharts generally follows this format:

Top box: Topic

Second box/boxes-Considerations for all: Acceptance and mindfulness interventions and education* which should be incorporated into all interventions addressing pain or depression. The branches off these boxes are either further actions that are required or treatment guidelines within the literature (*education is only in the depression flowcharts).

Third level of boxes-Types of intervention: These boxes are the interventions that the literature supported to benefit clients with pain or depression. The types of interventions are not arranged in any specific order because the literature did not compare types of interventions against each other, except for CBT and CBT-B , which is discuss under Fig. 4 below.

Fourth level of boxes-Intervention components: These “branches” of the previous level are the components of the specific intervention and include the duration range of each intervention. They are in no specific order. Due to spacing limitations, some of the “branches” from the third level are positioned vertically.

Brief description of each figures:

Fig. 1: This illustrates the pain screening process. According to research, acceptance and mindfulness-based should be incorporated into treatment.

Fig. 2 -5: The following flow charts demonstrate the interventions that are most effective for low back (Fig.2) , chronic (Fig. 3 & 4), and cervical pathology pain (Fig. 5).

- **Fig.4:** The research article specifically compared both cognitive behavioral therapy vs. cognitive behavioral therapy with biofeedback. They were both equally effective for improving pain. ⁶

Fig. 6: According to the literature, it is recommended to administer a depression screen with all clients. This illustrates the two types of screens that can be administered. The screens can be downloaded on the website: <https://www.phqscreeners.com/select-screener/36> ¹³. Select PHQ-9 or Brief PHQ and desired language, as it has been translated in a wide range of languages. There is a specific hyperlink for the instruction manual available as well on the home page.

Fig. 7 & 8: Fig. 8 is an enlarged flow chart of Fig. 7. These flow charts indicate interventions that the literature indicates should benefit clients with depression. The studies did not examine a specific diagnosis but had multiple diagnoses among their participants. Overall, the research indicated that acceptance & mindfulness-based interventions and client education about depression should be incorporated into treatment sessions regardless of other types of intervention/approach being implemented. Additionally, therapists should be further educated about depression and knowing when to refer to another specialist.

Fig. 9 & 11: These flowcharts are organized based on the literature investigating clients with specific diagnosis. In the literature, depression symptoms developed after the client was diagnosed with an Acquired Brain Injury (Fig. 9), Spinal Cord Injury (Fig. 10) or Mood Disorder (Fig. 11).

Intro to flowchart key

Some of the boxes are color coded, which indicate that a specific healthcare professional was delivering the intervention. The multicolored boxes indicate that the interventions were delivered by a combination of healthcare professionals or can be administered by either of the following professions. For example, an OT and PT were a part of a treatment vs a PT or an OT could administer the intervention. For the boxes that were not colored, a healthcare provider was not indicated in the study. Each flow pathway has a superscript citation and the reference list is located at the end of this document.

Key:

The intervention was administered by:



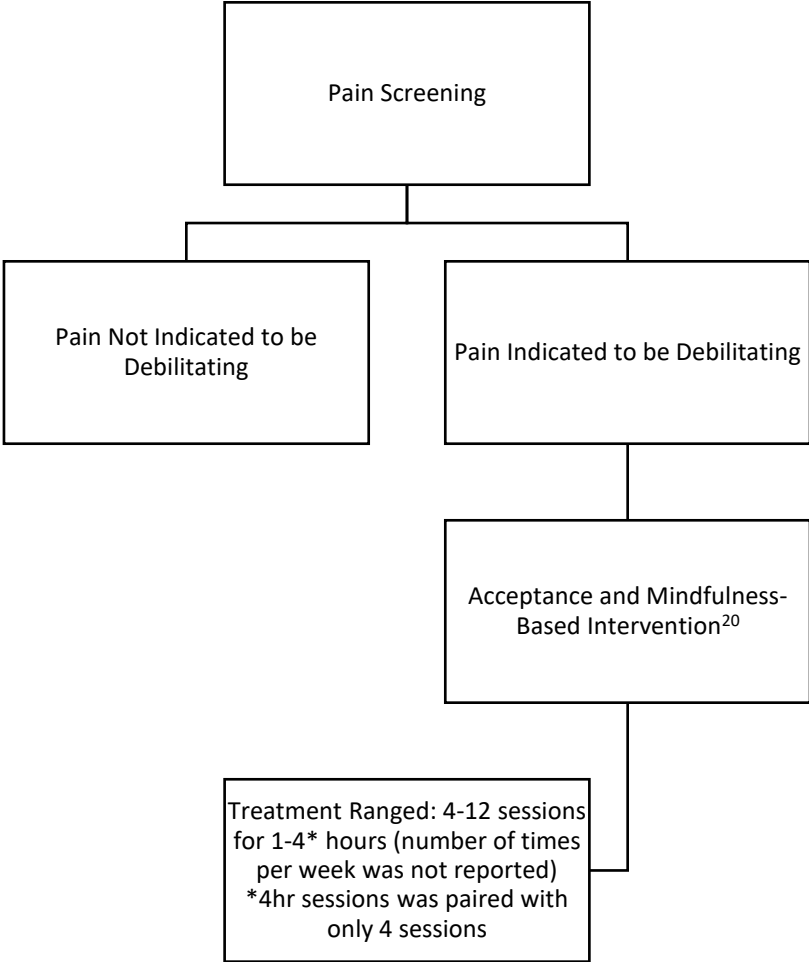


Fig. 1

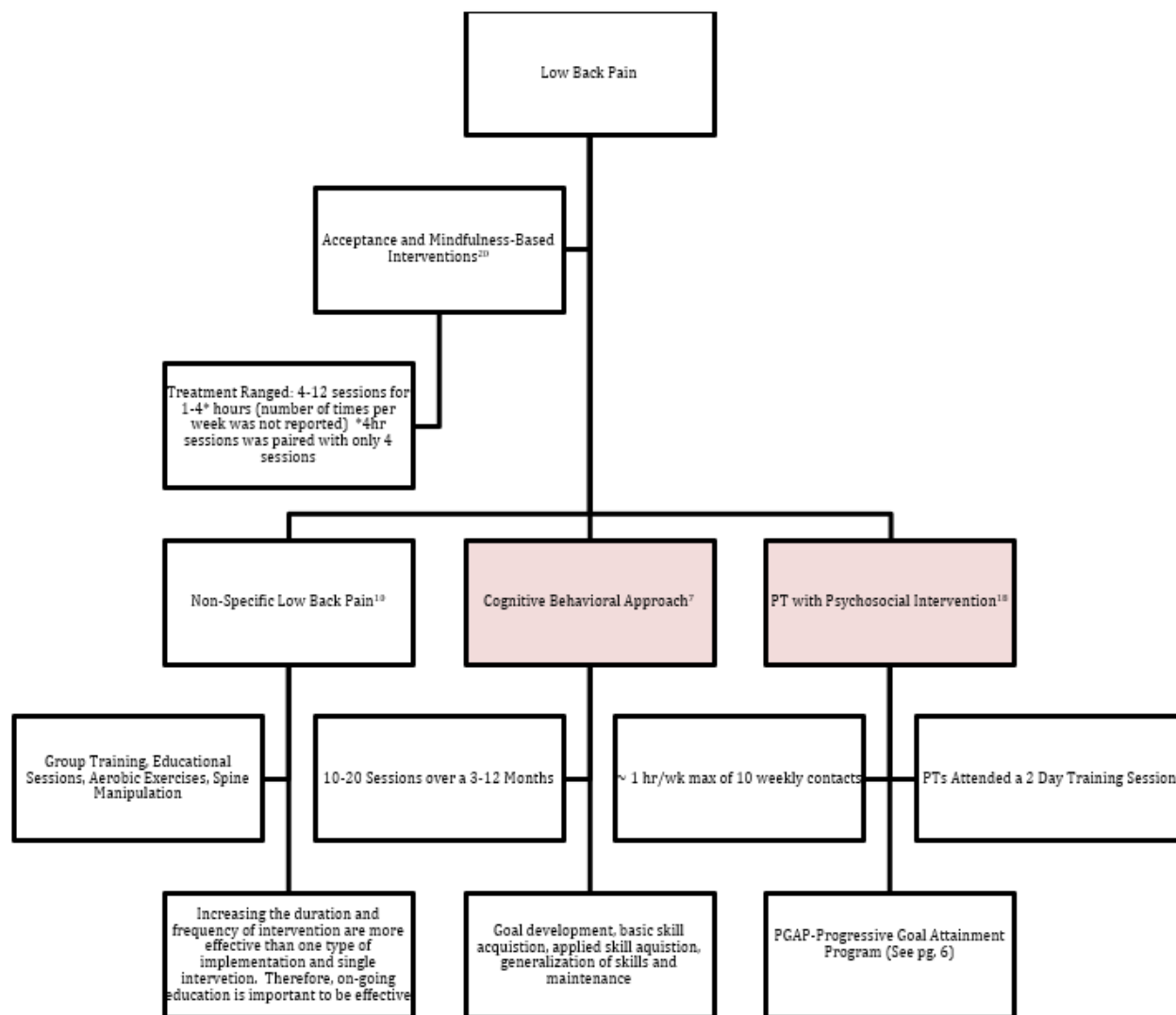


Fig. 2

Sullivan, M. J. L., & Adams, H. (2010). Psychosocial treatment techniques to augment the impact of physiotherapy interventions for low back pain. *Physiotherapy Canada*, 62(3), 180–189. <https://doi.org/10.3138/physio.62.3.180>

Progressive Goal Attainment Program:

Session 1: Use of disclosure and validation techniques to establish therapeutic relationship, instruction on the use of the Client Workbook

Session 2: Introduction to activity planning, re- establishing pre-injury activity structure and walking routine

Session 3: Goal setting, planning activity involvement in relation to goals

Session 4: Techniques targeting disability beliefs, mid-treatment evaluation

Session 5: Evaluation feedback, introduction to thought monitoring to target catastrophic thinking

Session 6: Exposure techniques to facilitate re-engagement in previously avoided activities

Session 7: Continued application of techniques addressed in Sessions 5 and 6

Session 8: Applying task-decomposition techniques to feared activities of the workplace

Session 9: Final evaluation

Session 10: Evaluation feedback and discharge planning

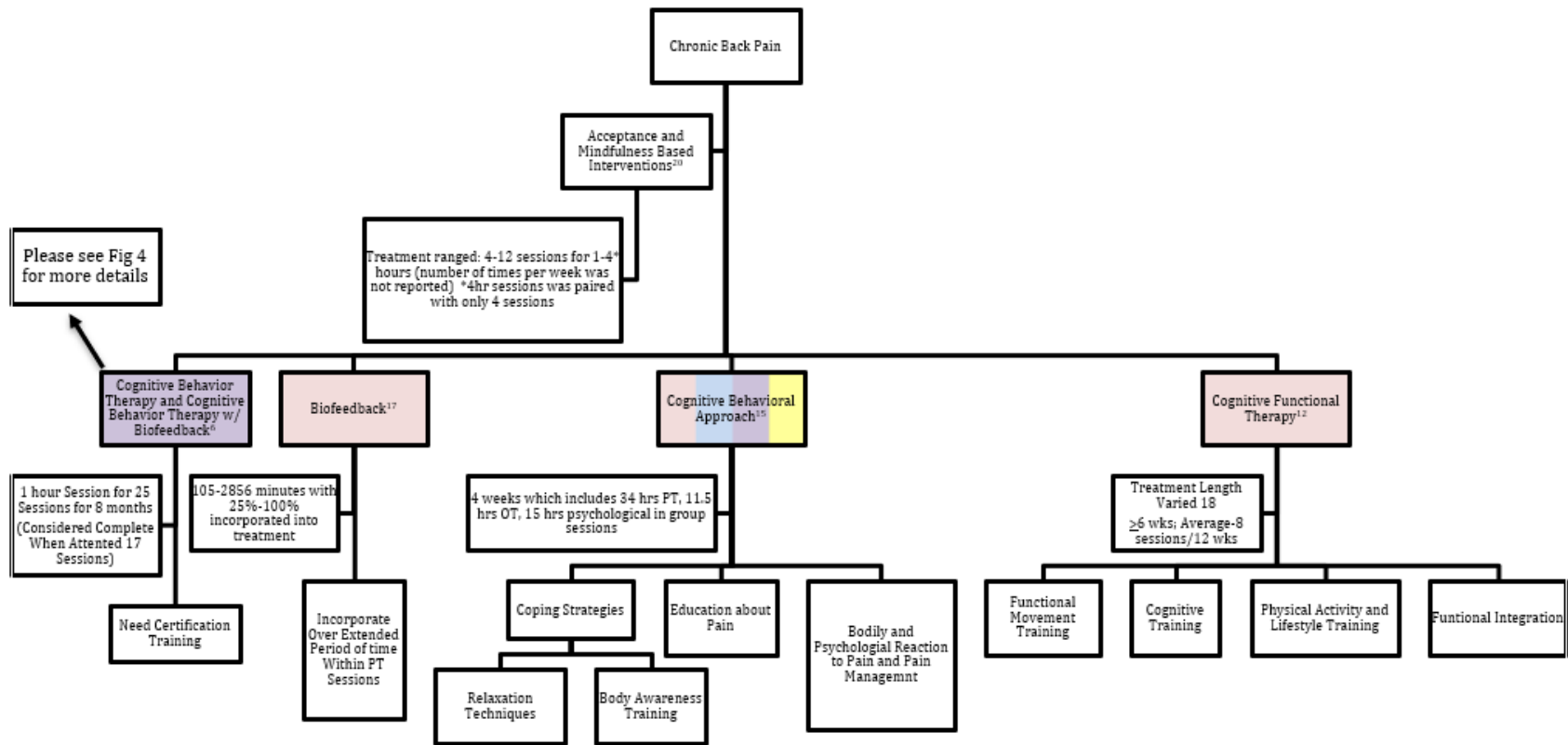


Fig. 3

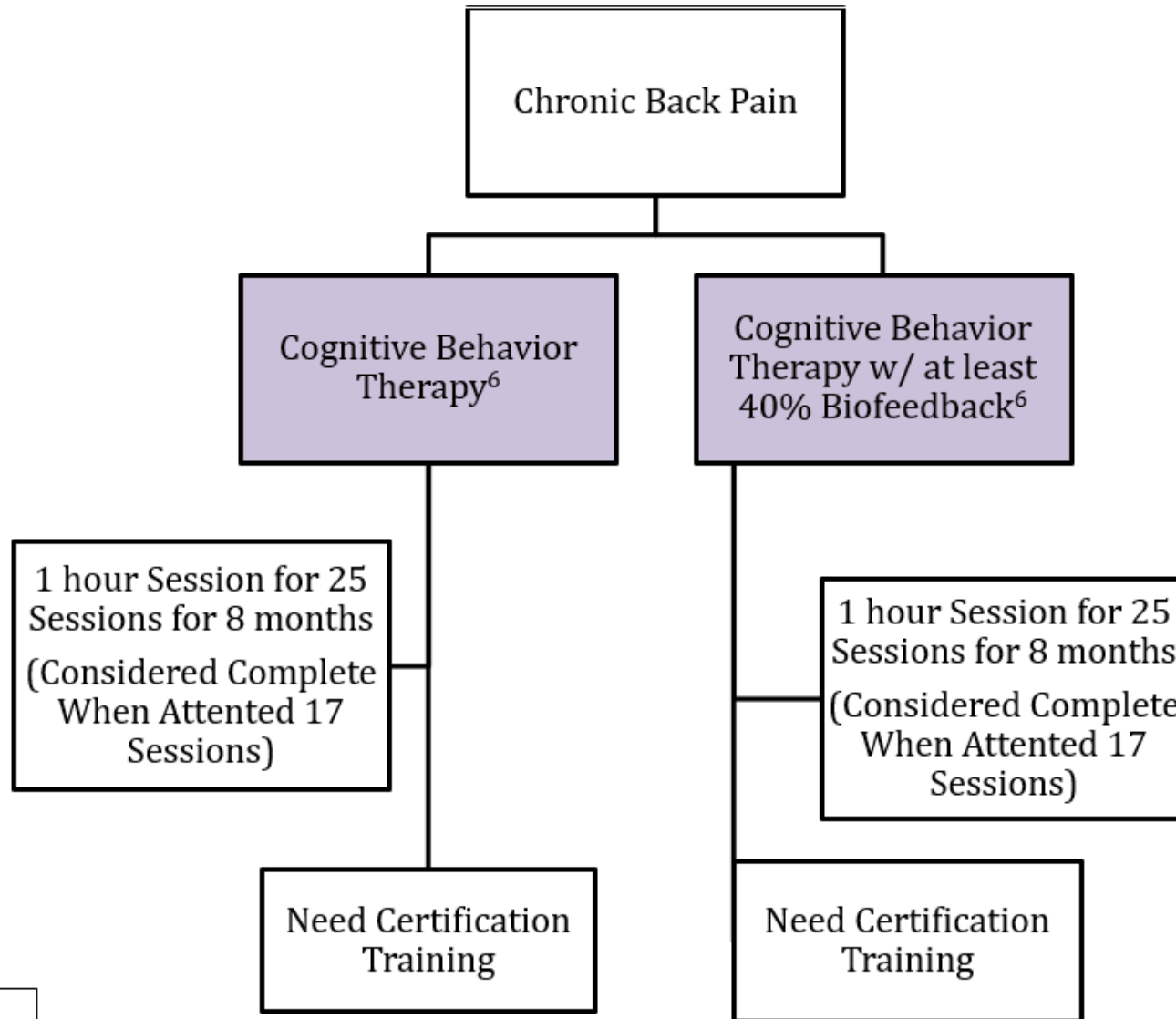


Fig. 4

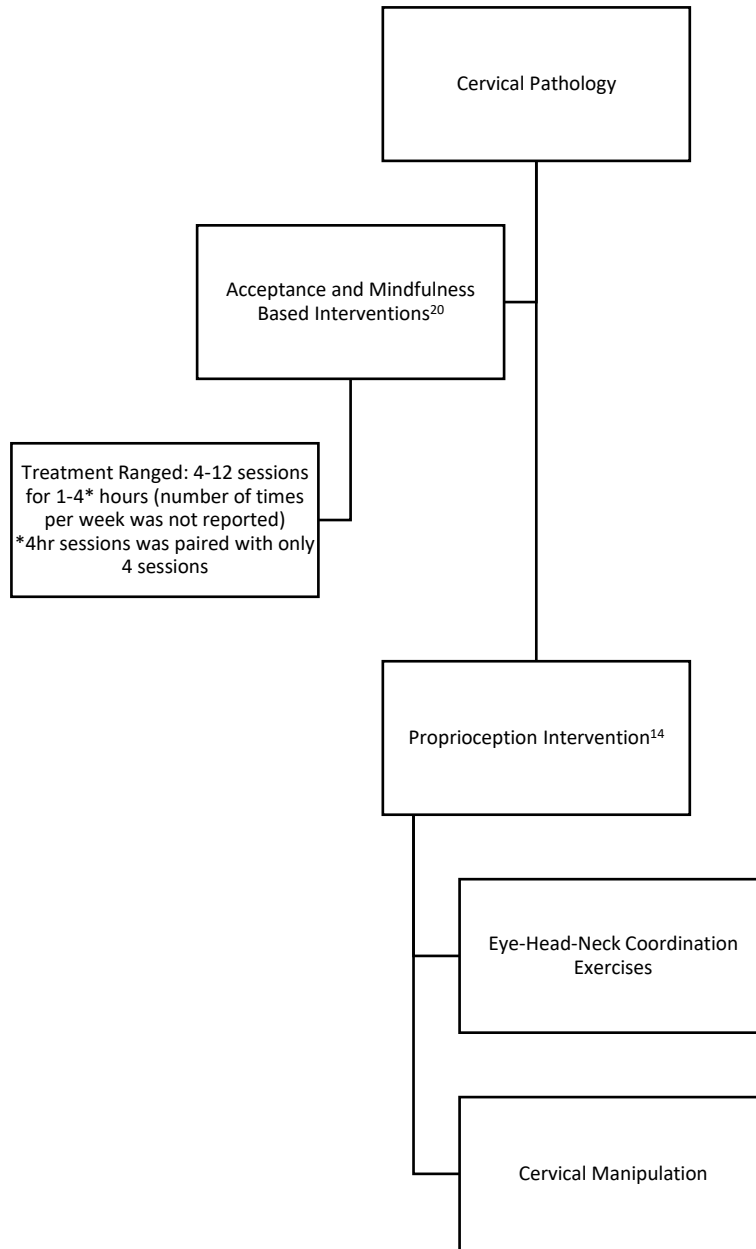


Fig. 5

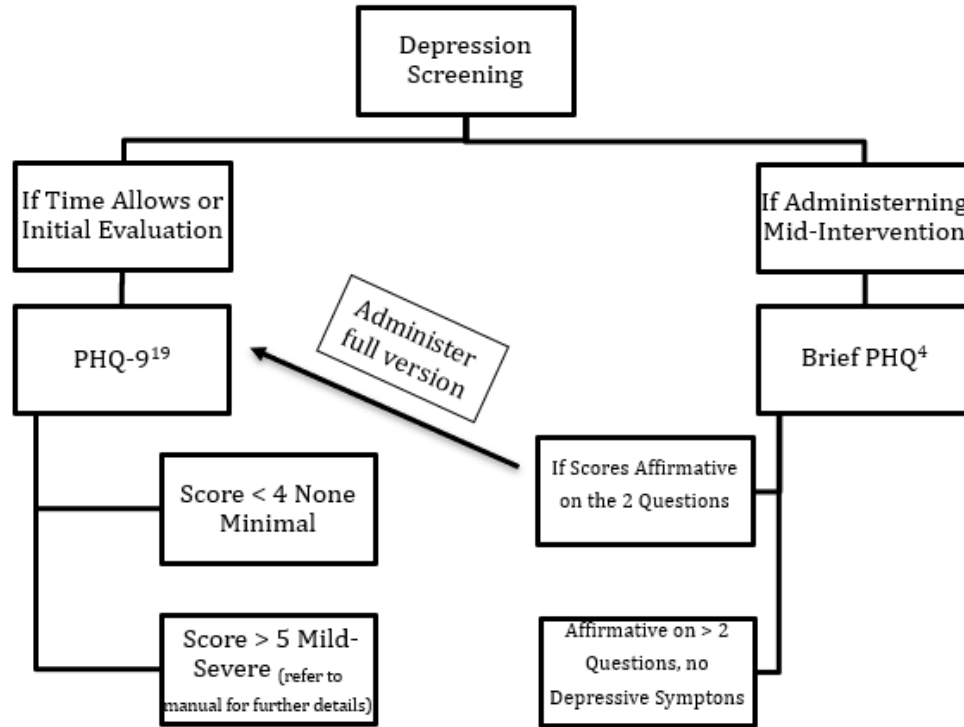


Fig. 6

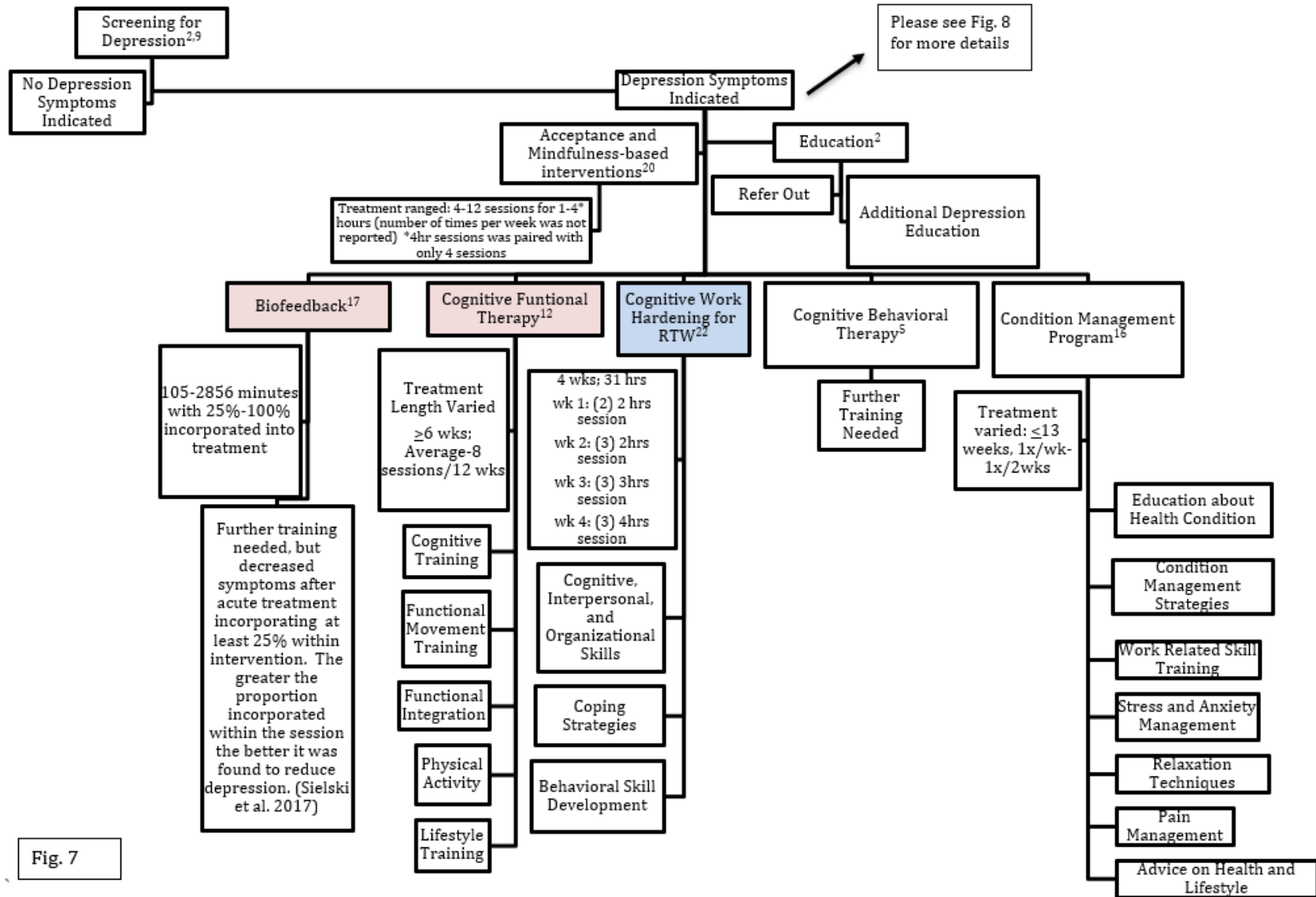


Fig. 7

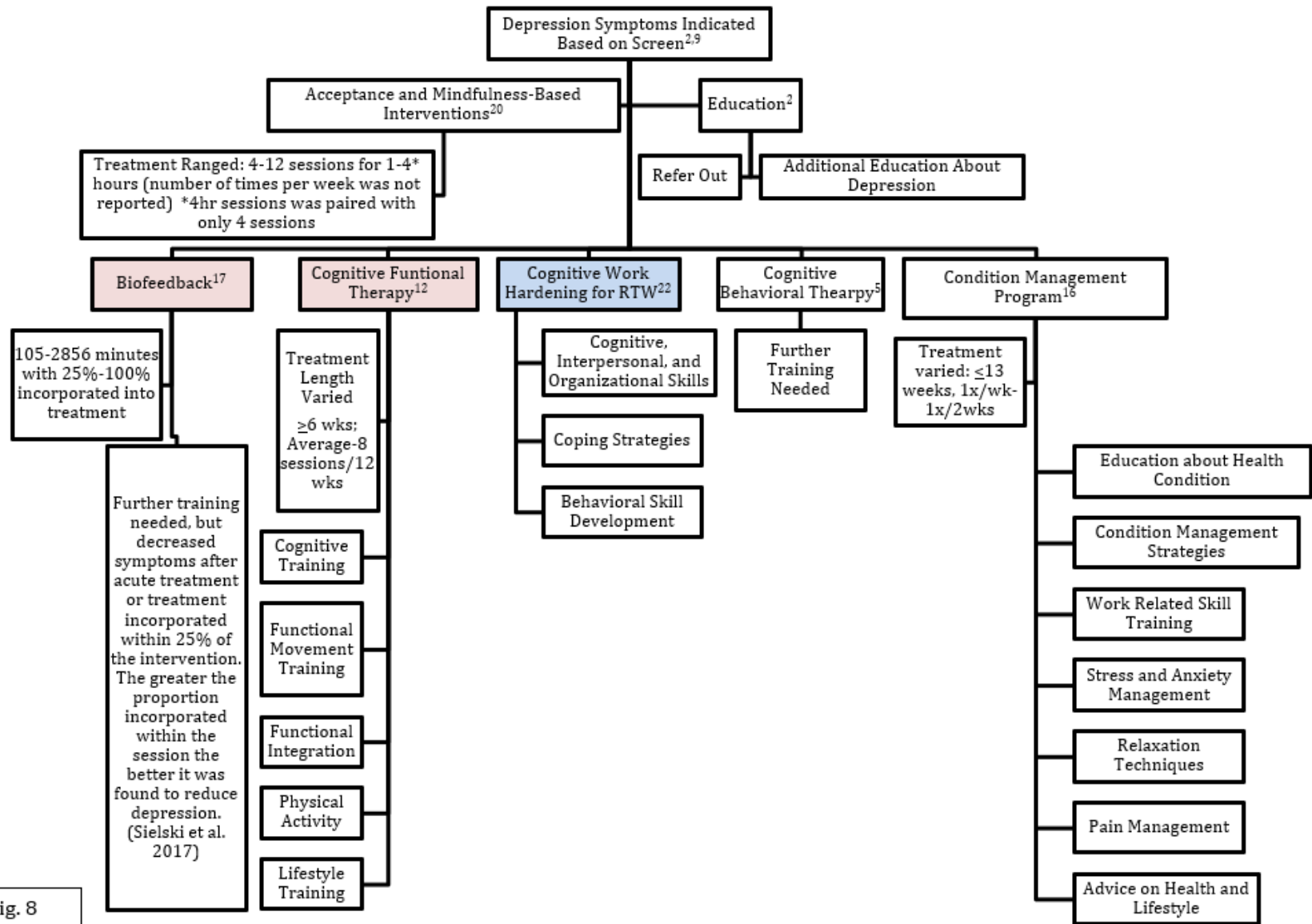


Fig. 8

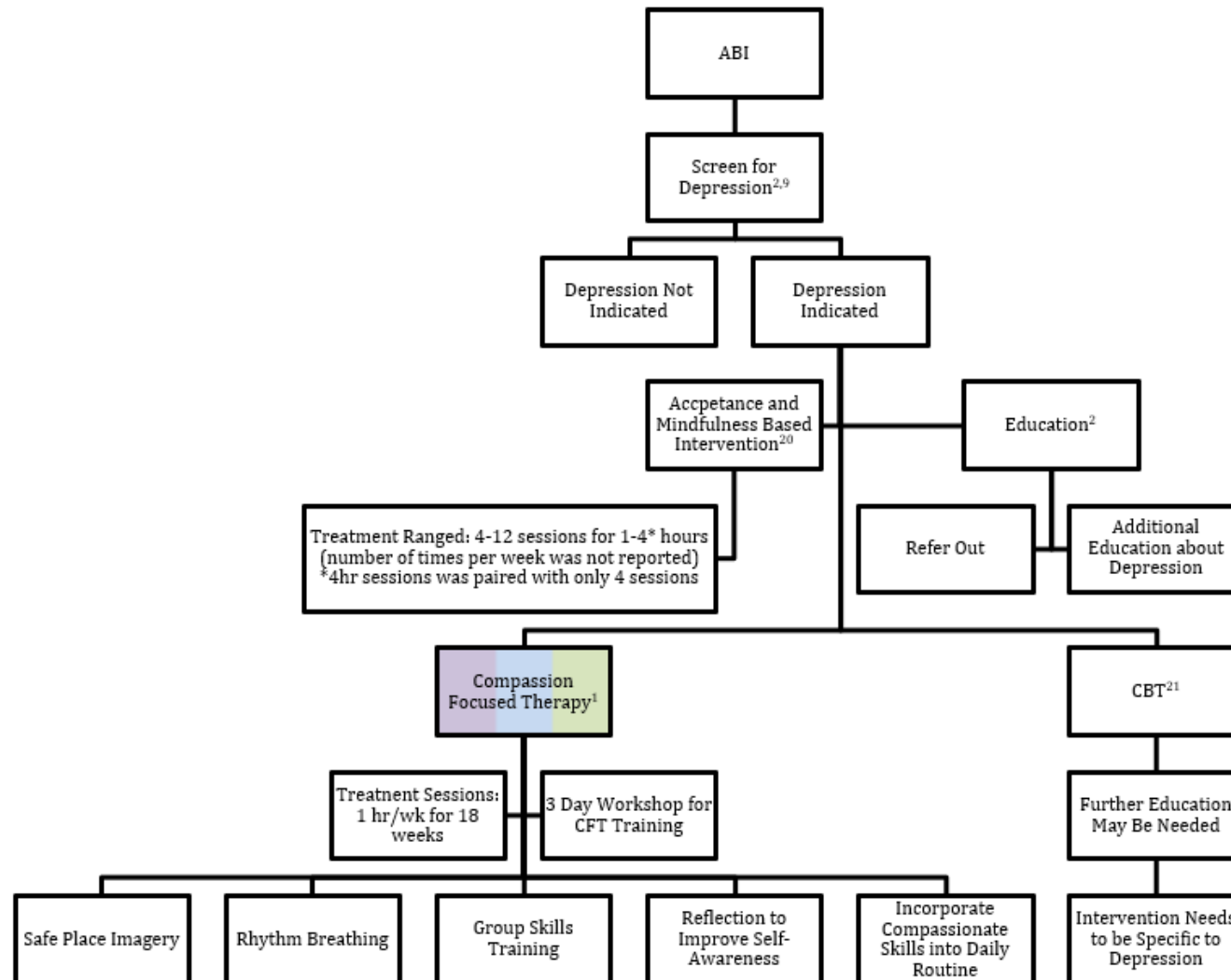


Fig. 9

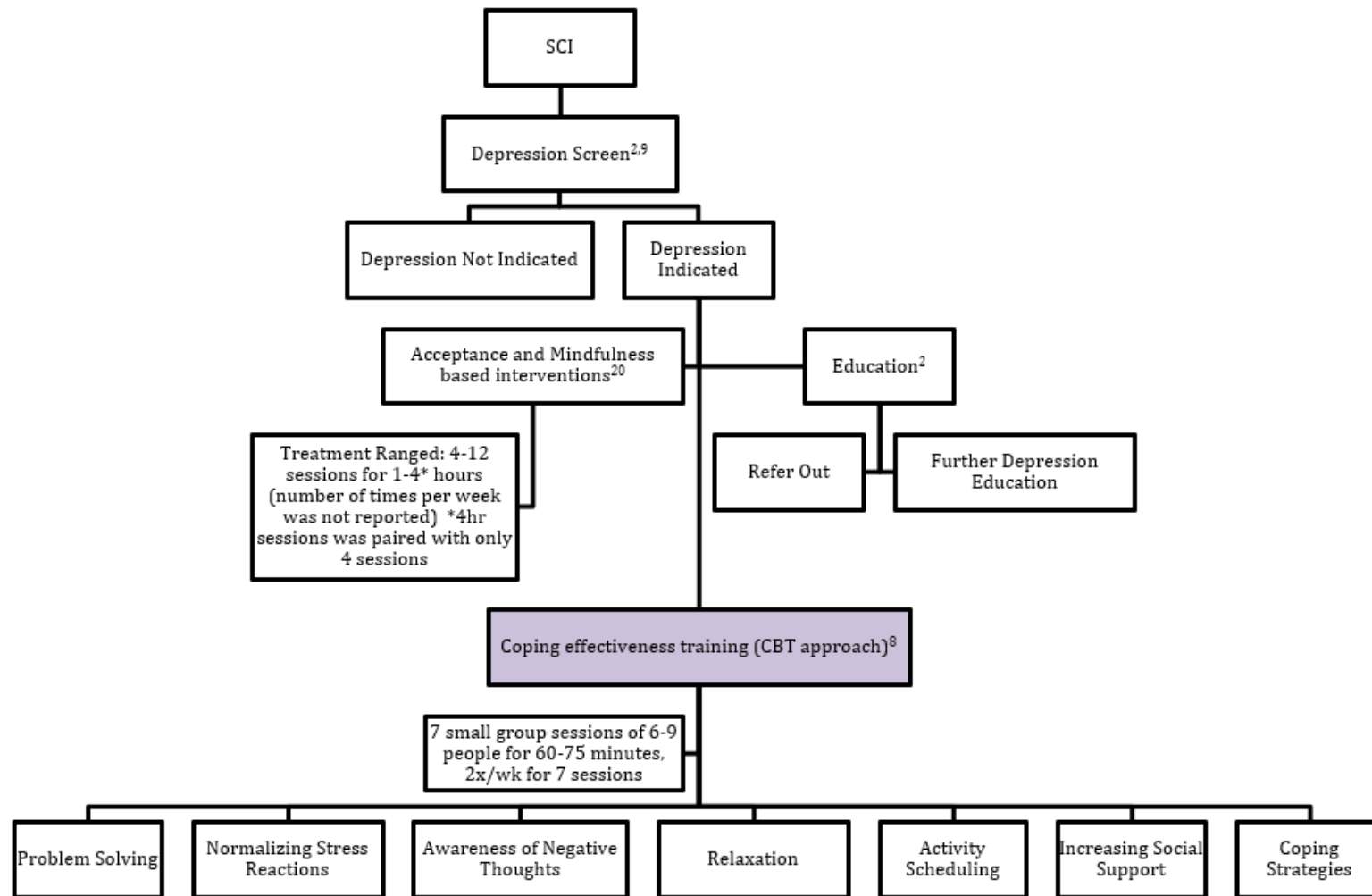


Fig. 10

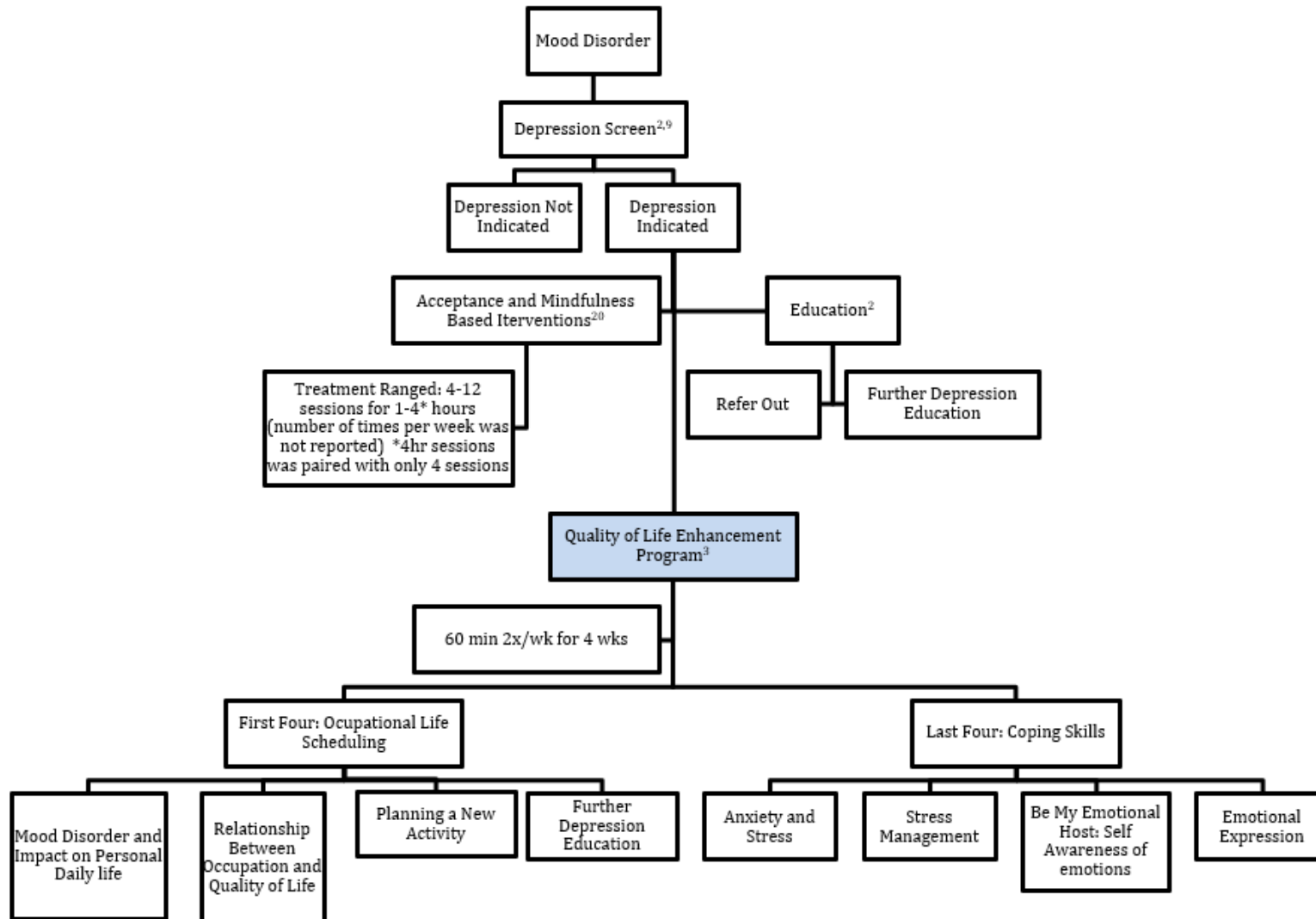


Fig. 11

Table 1 Group Sessions in the Quality of Life Enhancement Programme in This Study.

Session	Topic	Content of the session	Predictors of the quality of life model
1.	The mood disorder and its impact on personal daily life	Self-awareness of mood disorder and occupational participation	Sense of mastery, sense of competence
2.	The relationship between occupation and quality of life	Introduction of the concept of quality of life and occupation; awareness of personal roles	Sense of mastery, sense of competence
3.	Time management	Time management in daily life; self-awareness of lifestyle re-design	Sense of mastery, sense of competence
4.	Planning a new activity	Planning to participate in a new activity	Sense of mastery, sense of competence, environmental resources
5.	Anxiety and stress	Self-awareness of the anxiety and stress	Level of depression, level of anxiety, sense of mastery, sense of competence
6.	Stress management	Strategies of stress management	Level of depression, level of anxiety, sense of mastery, sense of competence
7.	Be my emotional host	Self-awareness of own emotion	Level of depression, sense of mastery, sense of competence
8.	Emotional expression	Expression of emotion	Level of depression, sense of mastery, sense of competence

Can be found on p. 27

Chen, Y.-L., Pan, A.-W., Hsiung, P.-C., & Chung, L. (2015). Quality of life enhancement programme for individuals with mood disorder: A randomized controlled pilot study. *Hong Kong Journal of Occupational Therapy, 25*, 23–31. doi.org/10.1016/j.hkjot.2015.04.001

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Appendix B - Survey**Survey for Knowledge Translation Research Project****Please rate the following questions on a scale of 1-5.****How helpful do you think the flow charts will be for your practice?**

1	2	3	4	5
Not Helpful				Definitely

How satisfied are you with the knowledge translation portion (the flow chart) of our project?

1	2	3	4	5
Not Satisfied		Met Expectation		Exceeded Expectations

For the interventions that do not require additional training, how likely is it you would incorporate them into your practice?

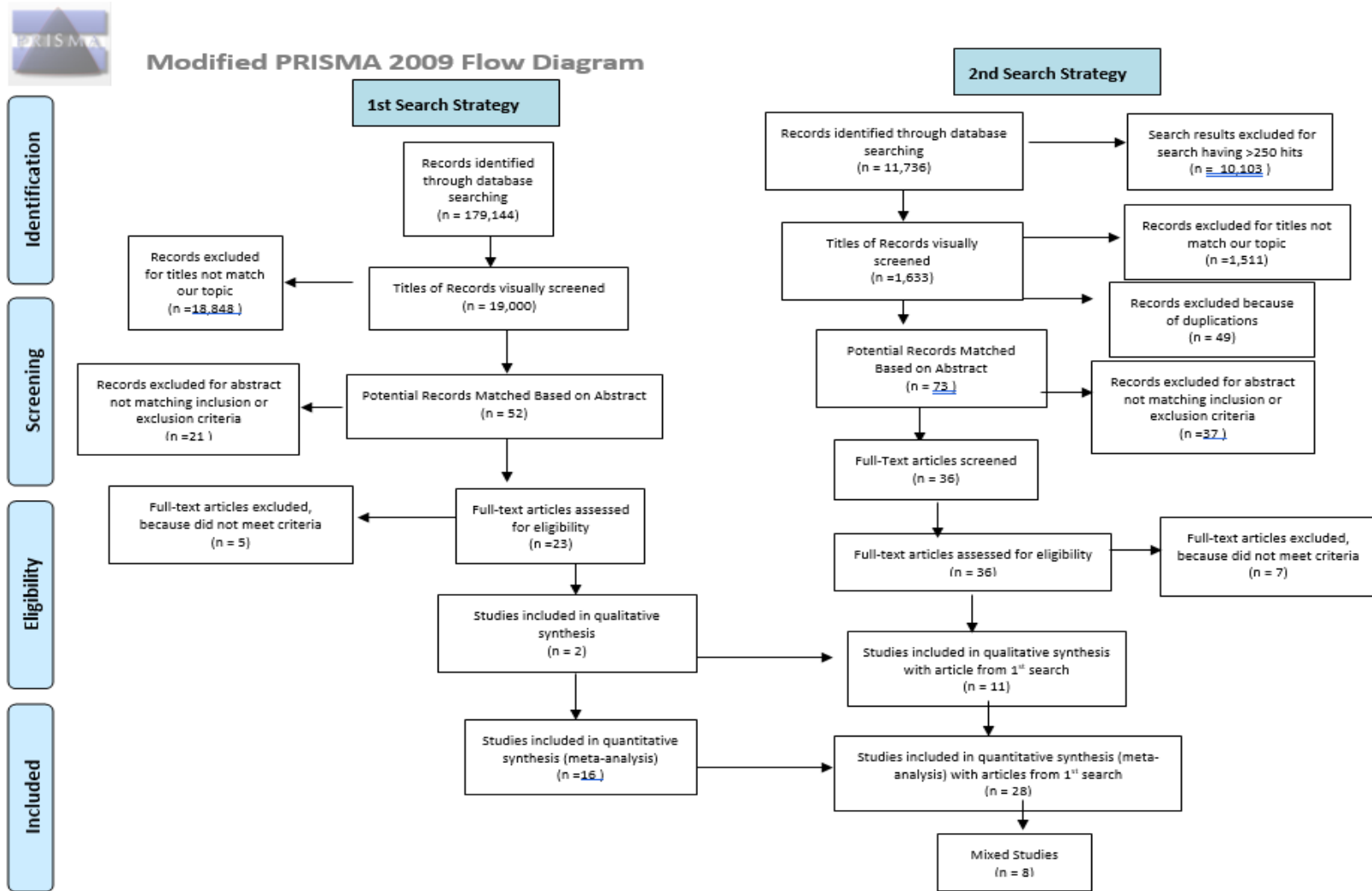
1	2	3	4	5
Not Likely				Will incorporate

Some of the interventions require more training for the practitioner to implement it effectively. How likely is it you would send your employees for this training?

1	2	3	4	5
Not Likely				Definitely

Short Answer Questions:**What barriers do you foresee with implementing some of the interventions that were listed to be beneficial within our flow chart?****What aspects in your practice environment would assist you in implementing these interventions in your practice?**

Appendix C - Prism



Modified From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

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