Bachelor's project

NTNU
Norwegian University of Science and Technology
Faculty of Medicine and Health Sciences
Department of Neuromedicine and Movement Science

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Cognitive functional therapy as a treatment approach for Nonspecific chronic low back pain: A literature review

Bachelor's project in Human Movement Science
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Kunnskap for en bedre verden

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Abstract:

Aim: To evaluate the effect of Cognitive functional therapy (CFT) on the improvement in disability and decrease in pain intensity amongst adults with Nonspecific chronic low back pain. ***Methods:*** A literature search was performed in the databases PubMed, Web of Science and Google Scholar. The participants in the studies were ≥18 years old, had Nonspecific chronic low back pain, and the CFT was based on an individual based exercise program. ***Results:*** Eight studies were included, and five of them compared CFT to a control group. Within the CFT groups, all of the studies found an improvement in disability and decrease in pain intensity. When compared to a control group, the results from four of the five studies found a statistically significant greater improvement in disability in the CFT group, and three studies found a statistically significant greater decrease in pain intensity in the CFT group. ***Conclusion:*** The results indicate that CFT is effective for improvement in disability and decrease in pain intensity amongst adults with Nonspecific chronic low back pain. However, more research on this topic is needed.

Hensikt: Å evaluere effekten av Kognitiv funksjonsrettet behandling (KFB) på bedring av funksjon og reduksjon av smerte intensitet blant voksne med uspesifikke kroniske korsryggssmerter. ***Metode:*** Et litteratursøk ble gjennomført på databasene PubMed, Web of Science og Google Scholar. Deltakerne i studiene var ≥18 år, hadde uspesifikke kroniske korsryggssmerter, og KFB var basert på et individ rettet treningsprogram. ***Resultat:*** Åtte studier var inkludert, hvor fem av dem sammenlignet KFB med en kontrollgruppe. Innad i KFB gruppene, fant alle studiene en bedring i funksjon og nedgang i smerteintensitet. Sammenlignet med kontrollgrupper viste resultatene fra fire av fem studier en større statistisk signifikant bedring i funksjon i KFB gruppene, og tre av studiene fant en større statistisk signifikant nedgang i smerteintensitet i KFB gruppene. ***Konklusjon:*** Resultatene indikerer at KFB er effektiv for bedring i funksjon og nedgang i smerte intensitet blant voksne med uspesifikke kroniske korsryggssmerter. Det trengs derimot mer forskning på dette feltet.

Key words: Cognitive functional therapy, Disability, Nonspecific chronic low back pain, Pain

1. Introduction

Low back pain (LBP) is a common musculoskeletal disorder which has been documented as one of the leading causes of activity limitations and absence from work. LBP can be defined as "*pain and discomfort, localized below the costal margin and above the gluteal folds, with or without referred leg pain"* (1). During our lifetime, most of us will at some point experience at least one episode of LBP. The lifetime prevalence of LBP in adults in western countries is documented to be around 49% to 70% (2). In a global burden of disease study from 2010, it was shown that LBP was one of the top ten high burden diseases and injuries (1).

Around 85-95% of the LBP cases are classified as nonspecific low back pain (NSLBP), which means LBP without any identifiable cause (1). NSLBP is usually separated into three groups based on the duration of the back pain; acute (<6 weeks), sub-acute (6-12 weeks), and chronic (>3months) (2). There is growing evidence that nonspecific chronic low back pain (NSCLBP) is a multidimensional health disorder, where an interaction between cognitive-, emotional-, social-, physical-, behavioral-, and lifestyle factors, together with an unhelpful behavioral response to pain, can lead to a vicious cycle of pain, distress, and disability (3).

It is known that lifestyle factors can be important in LBP, and that there is a U-shaped relationship between physical activity and disabling LBP (4). It is assumed that fear-avoidance beliefs might have an influence on the development of NSCLBP, and that for some, negative beliefs about pain and/ or negative illness information can lead to a catastrophizing response. This can lead to fear of activity and avoidance behaviors, which has been demonstrated to be linked to the degree of disability experienced amongst patients with NSCLBP (5,6). For people with long-lasting back pain, it is usually recommended to reach the recommendations for weekly physical activity (the minimum of 150 minutes of moderate-intensity, or 75 minutes of high intensity per week, or a combination), to use their back and not be too overly careful. Improvements in physical activity can be achieved both with cognitive behavioral interventions and by different types of exercise therapy (7).

In an overview of different clinical practice guidelines for the management of NSLBP in primary care, it was concluded that the recommendations in most of the guidelines were the use of nonsteroidal anti-inflammatory drugs (NSAIDs) and antidepressants, exercise therapy, and psychosocial interventions (8). The different approaches have lately been criticized for

being too unidimensional, and for failing to reflect the biopsychosocial nature of disabling LBP (4). In a clinical update on the management of chronic musculoskeletal pain (CMP), the key aspects of a biopsychosocial approach for CMP is discussed, and evidence- based guidance on exercise prescription is provided. For CMP it is widely accepted that consequences of persistent pain, including pain catastrophizing, fear of movement, and anxiety, appear to be main contributors to the level of pain and disability. According to this clinical update, a biopsychosocial treatment model is considered to be the most efficacious treatment approach for chronic pain (9).

One type of treatment that includes a biopsychosocial approach for the management of NSCLBP is Cognitive functional therapy (CFT). CFT is a relatively new person-centered, behavioral intervention, which was developed as a behavioral self-management approach to individualize the management of disabling LBP (4). CFT is based on three interrelated components; making sense of pain, exposure with control, and lifestyle change. Making sense of pain is the cognitive component of CFT. This process outlines how different circumstances, negative beliefs about pain, and maladaptive emotional and behavioral responses can lead to a vicious cycle of pain, distress and disability. Exposure with control is a process of behavioral change through experiential learning, that is designed to discourage pain beliefs, and to normalize provocative movements and behaviors. It is a focus on targeting and retraining functional activities that the patient is avoiding due to fear of pain gradually and sequentially. In addition to the functional activities, the approach also targets functional conditioning amongst those with a deficit in muscle strength and/ or endurance. The last component, lifestyle change, includes physical activity and lifestyle training. An individualized exercise program based on the patient's activity and/or exercise preferences and which goals the patient has, with an emphasis on normalization of movement, is created. In this case, it is important to address the effect of unhelpful lifestyle habits such as a sedentary lifestyle, sleep deficits, and stress, and how it can affect disability and pain. Methods such as breathing exercises, relaxation techniques, and mediation techniques are also incorporated (10,11).

CFT is a treatment approach for the management of NSCLBP that facilitates the heterogeneity of the patients by addressing the biopsychosocial nature of LBP. It was originally developed as a treatment approach for disabling LBP, but it has also in a few cases been tried out amongst patients with other CMP disorders such as Nonspecific chronic neck pain (NSCNP) (12). Lately, the most used treatment approaches for NSLBP have been criticized for being too unidimensional, and it has been suggested that a biopsychosocial treatment model, such as

CFT, might be more effective in the management of chronic pain (4). The aim of this literature review is to evaluate the effect of CFT on the improvement of disability and the decrease in pain intensity among adults with NSCLBP.

2. Method:

The literature search was performed using the electronic databases PubMed, Web of Science, and Google Scholar. The search words used were “nonspecific chronic low back pain” AND “cognitive functional therapy”. The search was restricted to articles after the year 2000, and peer-reviewed articles written in English. This resulted in 71 results on PubMed, 18 results on Web of Science, and 704 results on Google Scholar. Furthermore, a manual search on systematic reviews on the topic was conducted to see if that resulted in any relevant articles. In the end, eight articles were chosen based on inclusion and exclusion criterias; five articles from PubMed, two articles from Web of Science, and one article from Google Scholar.

2.1 Inclusion- and exclusion criterias:

The inclusion criteria for this literature review were studies that used CFT as a treatment approach for patients aged ≥18 with NSCLBP, and the primary outcome of the studies had to be disability and/or pain intensity. The study designs included Quasi-experimental design, Randomized controlled trials (RCT), Case-control, Case reports, and Multiple case-cohort study. In the measurement of pain intensity, the studies had to use a type of numeric rating scale. For example a scale from 0-10 to rate their pain, where 0 equals no pain, and 10 equals the worst pain imaginable. Different types of rating scales used were The Visual analogue scale (VAS), Numerical rating scale (NRS), Numerical pain rating scale (NPRS) and Pain intensity numerical rating scale (PINRS). In the measurement of disability, a form of self-reported questionnaire, such as The Oswestry disability Index (ODI), The Roland Morris disability questionnaire (RMDQ) and The Quebec Back pain disability scale (QBPDS) was used. Studies with a treatment group under the age of 18 and with a group based exercise intervention was excluded.

3. Results:

Eight studies studying the effect of CFT on the decrease in pain intensity and/or improvement of disability as primary outcomes among adults with NSCLBP were included. Multiple types of study design were included; RCT, quasi-experimental design, case-control, multiple case-

cohort, and case reports. Five of the eight studies compared the effect of CFT with a control group; either core muscle strengthening, Usual spine center care, or Manual therapy and exercise (MT-EX).

Table 1*:* Characteristics of the included studies

Study	Study design	Selection	Intervention
Kumar, P.M., et al. (2020) (13)	A quasi-experimental design	*n* =40 CFT (n)=20 control group (n)=20 age=18-40	**CFT** Treated for 2 alternate days for 3 months **Control group** [core muscle strengthening] treated for 2 alternate days for 3 months Short aerobic program stretches, lumbar flexion, and extension. Balance and motor control exercises.
O'Keeffe, M. et al. (2020) (14)	RCT	*n*= 206 CFT (*n)*=106 Control group *(n)*= 100 age= 18-75	**CFT** Comprehensive interview + physical examination initial session:1hr, follow-ups: 30-45min weekly basis the first 2-3 sessions, and then 1 session every 2-3 weeks. **Control group** [Group based exercise and education] Up to six classes over 6-8 weeks (1hr and 15min), with up to 10 participants in each class. three components: pain education, exercise and relaxation
Ussing, K., et al. (2020) (15)	case-control study	*n*= 222 CFT (n) =37 control group (n) =185 age= 18-75	**CFT** Initial session: 1hr, subsequent sessions: 45 min . Maximum of eight treatment sessions over a period of up to 12 weeks. **Control group** [Usual spine center care] Evaluated by a physical therapist, identifying relevant exercises, outlining a rehabilitation plan of a maximum of 12 weeks.
Fersum, K.V., et al. (2019) (3)	RCT	*n* = 63 patients CFT group (*n*)= 30 Control group (*n*)= 33 age= 18-65 years old	**CFT group** Initial session: 1hr, follow-ups: 30-45min 12 weeks intervention period: weekly basis the first 2-3 sessions, and then 1 session every 2-3 weeks **Control group** [MT-EX] 12 weeks intervention period; Initial session: 1hr, follow-ups: 30min. Comprehensive interview + physical examination + OMPQ Joint mobilization or manipulation techniques applied to the spine

			or pelvis. General or motor control exercises (home exercise)
Filho, N.M. (2016) (16)	Case report	*n*= 1 age= 32 years old gender: female	**CFT:** 12 consultations over 40 days.
Filho, N . et al. (2016) (17)	Case report	*n* =1 age= 49 years old gender: male	**CFT:** 6 weeks intervention.
O`Sullivan., et al. (2015) (18)	Multiple case-cohort study	n=26 age: 18-65 years old	**3 phases:** **A1:*Baseline measurement of pain and functional disability*** -3 months - Collected on 3 occasions, 6 weeks apart ***B: CFT intervention*** - minimum duration of 6 weeks ***A2*: *12 months, no-treatment follow-up period*** - follow-ups at 3-, 6-, and 12 months after completion of treatment
Fersum, K.V., et al (2013) (19)	RCT	*n*= 121 patients CB-CFT group (*n*) =62 control group (*n*)= 59 age= 18-65 years old	**CB-CFT:** 12 weeks intervention period: Initial session: 1h, follow-ups: 30-45min Weekly basis the first 2-3 sessions, and then 1 session every 2-3 weeks. **Control group** [MT-EX]: Comprehensive interview + physical examination + OMPQ 12 weeks intervention period: Initial session 1h, follow-up: 30min. - Joint mobilization or manipulation techniques applied to the spine or pelvis. - general or motor control exercises (home exercise)

CB-CFT= classification based- cognitive functional therapy, CFS= cognitive functional therapy, LST= Lumbar stabilization treatment, MT-EX= manual therapy and exercise, OMPQ= orebro musculoskeletal pain questionnaire, RCT= randomized controlled trial

Table 2: Reported outcome measure of pain intensity and disability

Study	**Measurement method**	**CFT: mean (SD)**	**Control group: mean (SD)**	**CFT vs. control group: (mean difference, 95%CI)**
Kumar, P.M., et al. (2020) (13)	***Pain intensity*** (VAS)	baseline 7.84 (0.834) 3 months: 1.79 (0.787)***	baseline 8.00 (0.882) 3 months: 2.68 (0.885)***	p=0.004**
	Disability	baseline 58.42 (17.952)	baseline 60.53 (17.964)	p=0.025*

	(QBPDST)	3 months: 11.97 (7.563)***	3 months: 16.79 (5.303)***	
O'Keeffe, M. et al. (2020) (14)	***Pain intensity*** (NRS)	baseline 6.17 (2.17) Post intervention 2.91 (2.47) 6 months 3.77 (2.72) 12 months 4.31 (2.5)	baseline 5.69 (2.23) Post intervention 4.6 (2.39) 6 months 4.44 (2.36) 12 months 4.88 (2.74)	 0.76 (-0.02 to 1.54) 0.65 (-0.20 to 1.50)
	Disability (ODI)	Pre intervention 32.05 (12.55) Post intervention 16.15 (9.74) 6 months 20.19 (15.46) 12 months 21.07 (13.62)	Pre intervention 33.51 (12.61) Post intervention 26.11 (13.96) 6 months 28.49 (16.96) 12 months 28.43 (16.0)	 8.65 (3.66 to 13.64)*** 7.02 (2.24 to 11.80)**
Ussing, K., et al. (2020) (15)	***Pain intensity*** (NRS)	baseline: 6.5 (1.2) 6 months: 3.3 (2.4) 12 months: 3.7 (2.5) mean change (95%CI) -3.1 (-3.8 to -2.4)***	baseline:6.5 (1.5) 6 months: 4.6 (2.5) 12 months: 4.4 (2.6)	0.0 (-0.6 to 0.6) -1.1 (-1.8 to -1.5) *** -0.7 (-1.3 to 0.0) *
	Disability (RMDQ)	baseline: 60.8 (15.3) 6 months: 22.2 (22.1) 12 months: 33.3 (30.4) mean change (95%CI) -30.3 (-37.9 to -22.7)***	baseline: 61.5 (15.4) 6 months: 43.9 (25.9) 12 months: 40.3 (26.0)	-0.7 (-6.5 to 5.1) -20.7(-27.2 to -14.2) *** -8.1 (-17.4 to 1.2)
Fersum, K.V., et al. (2019) (3)	***Pain intensity*** (NPRS)	baseline 4.7 (2.0) 3 months: 1.9 (0.2) 1 year: 2.5 (0.3) 3 years: 2.4 (0.3)	baseline 5.2 (0.9) 3 months: 3.7 (0.2) 1 year: 3.5 (0.2) 3 years: 2.9 (0.2)	0.315 -1.7 (-2.4 to -1.0) *** -0.9 (-1.6 to -0.3) ** -0.7 (-1.6 to 0.2)
	Disability (ODI)	baseline 21.4 (8.0) 3 months: 8.5 (0.8) 1 year: 11.0 (1.2) 3 years: 9.9 (1.1)	baseline 24.2 (8.4) 3 months: 17.6 (1.0) 1 year: 18.5 (1.5) 3 years: 16.6 (1.4)	0.182 -8.7 (-11.1 to -6,2) *** -6.9 (-10.3 to -3.6) *** -6.4 (-9.8 to -3.6) ***
Filho, N.M. (2016) (16)	***Pain intensity*** (VAS)	baseline: 4/10 3 months: 1-2/ 10		
	Disability (ODI)	baseline 42% 3 months: 14%		
Filho, N . et al. (2016) (17)	***Pain intensity***	baseline: 3/10 1 week: 1/10 3 weeks: 0/10 6 weeks: 0/10		
	Disability (ODI)	baseline: 28% ODI 1 week: 16% 3 weeks: 8% 6 weeks: 0%		
O`Sullivan., et al. (2015) (18)	***Pain intensity*** (NRS)	Baseline: 4.3 (1.9) post-intervention: 1.6 points lower 3 months: 1.5 points lower 6 months: 1.5 points		

		12 months: 1.7 points lower d=0.65 (medium effect size)		
	Disability (ODI)	Baseline: - ODI <20%; *n*=2 - ODI 21-40%; *n*=11 - ODI >41%; *n*= 13 Post intervention: 22 points lower 3 months: 23 points lower 6 months: 23 points lower 12 months: 24 points lower d=0.85 (large effect size)**		
Fersum, K.V., et al (2013) (19)	***Pain intensity*** (PINRS)	Baseline 4.9 (2.0) 3 months 1.7 (1.7) 12 months 2.3 (2.0) *mean improvemen*t: 3.2 [95% CI: 2.5-3.9]***	Baseline 5.3 (1.9) 3 months 3.8 (1.9) 12 months 3.8 (2.1) *mean improvement:* 1.5 [95%CI: 0.7-2.2]***	 -2.1 (-2.7 to -1.4) *** -1.3 (-2.1 to -0.5) ***
	Disability (ODI)	baseline 21.3 (7.5) 3 months 7.6 (6.7) 12 months 9.9 (9.8) *mean improvement:* 13.7 points [95%CI:11.4-16.1]***	baseline 24.0 (8.0) 3 months 18.5 (8.1) 12 months 19.7 (11.7) *mean improvement:* 5.5 [95%CI:2.8-8.3] ***	 -9.7 (-12.7 to -6.7) *** -8.2 (-12.6 to -3.8) ***

CFT= cognitive functional therapy, CMS= core muscle strengthening, d=cohen's d (effect size), NPRS= numerical pain rating scale**,** NRS= numeric rating scale, PINRS= pain intensity numerical rating scale, QBPDST= Quebec back pain disability scale tool, RMDQ= Roland Morris disability Questionnaire, VAS=Visual Analogue scale

*** *p<0.001, ** p<0.01, *p<0.05*

3.1 Disability:

All studies included found a great decrease in disability within the CFT group, and four (13,15,18,19) demonstrated a statistically significant decrease in disability. The multiple case-cohort study by O'Sullivan et al (18) demonstrated that CFT had a large effect size on disability. When compared to a control group, four of the studies (3,13,14,19) demonstrated a significantly greater improvement in disability in the CFT group. One study (15) found a statistically significantly greater decrease in disability in the CFT group at six months, but not at 12 months. In one of the case reports from Filho (17) the patient went from an ODI score

of 28 % to 0% in six weeks, and in the other case report (16), there was a reduction in disability from 42 % to 14 %.

3.2 Pain intensity:

All studies found a great decrease in pain intensity within the CFT group, and three of them (13,15,19) demonstrated a statistically significant decrease in pain. The study by O'Sullivan et al. (18) demonstrated that CFT had a medium effect size on pain intensity.
When compared to a control group, three of the studies (13,15,19) showed a statistically significant greater decrease in pain intensity in the CFT group. Both of the Case reports by Filho demonstrated a great decrease in pain intensity. Filho (17) reported no pain after six weeks of treatment, and Filho (16) reported that the pain was almost gone after three months.

4. Discussion:

The aim of this literature review was to evaluate the effect of CFT on the improvement of disability and/ or decrease in pain intensity amongst adults with NSCLBP. All of the studies included, showed an improvement in disability, and when compared to control groups, most studies demonstrated a statistically significant improvement favoring the CFT group. All of the studies displayed a decrease in pain intensity within the CFT group, but only three studies (13,15,19) showed a statistically significant decrease in pain when compared to the control group.

4.1 Lifestyle change:

Physical activity is often highlighted as an important lifestyle factor that might affect chronic LBP. As written in the introduction, there is a U-shaped relationship between physical activity and disabling LBP. Evidence indicates that persons with NSCLBP often experience physical activity intolerance, lower levels of physical fitness and function, and physical activity avoidance, which can lead to a more sedentary lifestyle than age- and gender-matched persons without NSCLBP. It is usually recommended for people with NSCLBP to try to maintain an active lifestyle, to strive to meet the same physical activity guidelines that are set for healthy individuals, and to avoid being sedentary as much as possible (4,20).

According to clinical practice guidelines for the management of NSCLBP, most guidelines recommend prescription of exercise therapy and psychosocial interventions (8). CFT is a biopsychosocial approach that includes both a psychosocial component where the patient's

beliefs about pain, movement, and his or her activity and/or exercise preferences and goals are taken into consideration. This is so that an individualized exercise program can be designed to help the patient with his or her LBP by getting out of the vicious cycle of pain and/or disability (4).

Since the cause of NSCLBP is unknown it can be difficult to choose a specific exercise modality. In a literature review done on exercise and NSLBP, it was shown that the patient's motivation and preferences should be considered in the design and implementation of exercise programs. Two of the studies included showed that an individualized exercise program produced a significantly greater decrease in pain intensity and disability in patients with subacute or chronic NSLBP. However, another study included in the review reported that a group exercise program might be better than a one-on-one program amongst some patients (21). In this literature review, one of the studies compared CFT with a group-based exercise program. This study found that CFT resulted in greater long-term improvements in disability, but not in pain intensity, and they concluded that physiotherapists should consider CFT over a group-based exercise approach for reducing disability related to Chronic low back pain (CLBP). However, they also recommend more head-to-head testing of CFT (14).

The two case reports (16,17) in this literature review show examples of how an individualized biopsychosocial treatment approach such as CFT can be accomplished. In one of the case reports (17), the patient was a 49-year-old man with NSCLBP, where the main problem was lack of confidence and stiffness in his left lower extremity when walking and climbing stairs. In this particular case, the choice of the exercise was lunge squat exercises with a focus on loading of the left lower limb. In the other case report (16), the patient was a 32-year old female with NSCLBP. This patient was afraid of movements such as bending over, sitting, and lifting weights, which led to a painful loss of normal physiological movement in the flexion direction. In this case, graded exposure exercises to restore lumbar flexion were prescribed. In both Case reports, walking was encouraged to change the patient's sedentary behavior. Even though both case reports only show results from one person, it can help us understand how CFT can be individualized based on the patient's preferences and goals.

4.2 Comparison of CFT with other treatment approaches:

The studies included in this literature review have compared CFT with manual therapy and exercise (MT-EX), group-based exercise and education intervention, core muscle training, and

usual spine center care. When comparing CFT with MT-EX (19) the results favored CFT on the decrease in pain intensity and improvement in disability when looking at the short-term effects (≤1 year). For the long-term effects, the results only favored CFT on the improvement in disability (3). As already mentioned, CFT was superior to group-based exercise and education intervention when looking at disability (14). In the comparison of CFT versus core muscle training, the results in the CFT group showed a significantly greater decrease in both disability and pain intensity (13). In the comparison of CFT with Usual spine center care, the results showed a significantly greater decrease in pain intensity and improvement in disability at six months follow-up, and decrease in pain intensity at 12 months follow-up (15). When comparing the results from CFT with other treatment approaches that are often recommended for the management of NSCLBP, it can seem like CFT might result in greater improvements, especially when it comes to disability. This might be because CFT has an approach that addresses the multidimensional nature of NSCLBP.

4.3 Long term effects:

The RCT study by Fersum et al. (3) was the first study to investigate the efficacy of the long-term effects of CFT on patients with NSCLBP. However, an RCT study done by Asenlof et al. (22) looked at tailored behavioral treatment and exercise based physical therapy in persistent musculoskeletal pain. The intervention in this study shared some similarities with the Fersum study. When treating NSCLBP with an individually tailored behavioral intervention targeting cognitions, motor behavior and activity, compared with usual physical therapy, Asenlof reported superior long-term outcomes (over 2 years) for disability, but no significant difference in pain intensity. These two studies together support the role of an individualized behaviourally orientated self-management approach to people with NSCLBP (3,22).

4.4 Limitations:

Two of the studies included in this review (16,17) are case reports, which looks at the effect of CFT on one individual. The results from these can, for obvious reasons, not be generalized, but were in this literature review used to understand how CFT can be individualized based on the patient's preferences and goals. In the case-control study by Ussing et al. (15) the recruitment procedure may have introduced a selection bias. The study was not randomized, and the recruiting physical therapists decided to whom they would offer participation.

However, to ensure similar baseline characteristics, the control group was retrospectively matched on a range of prognostic variables. The multiple case-cohort study by O`Sullivan et al. (18) did not have a control group, and for that reason, this study cannot be compared with another intervention. Because of the study design, the observed improvements could be influenced by other factors such as natural recovery, regression to the means, and other nonspecific effects.

One of the studies included in this review had a Quasi-Experimental design (13). Quasi-experiments are studies that aim to evaluate interventions but that do not use randomization, which is a weakness. Quasi-experimental studies are divided into four study design groups; Quasi-experimental designs without control groups, Quasi-experimental designs that use control groups but no pretest, Quasi-experimental designs that use control groups and pretest, and interrupted time-series designs. Out of these four groups, interrupted time-series designs have the highest study design quality, followed by a quasi-experimental design that uses control groups and pretest (23). The study included in this literature review had a control group, assessed pre, and post-measurements, and all selected subjects were randomly allocated into CFT-group and control group. Even though it is not an RCT study, it has a higher quality Quasi-experimental design.

Lastly, we should mention that a small sample size might be a limitation with most of the studies included. Only three of the eight included studies had a sample size of over 100 participants. Also, even though all studies used some type of numeric rating scale and questionnaire, the use of different measurement methods, makes it harder to compare the results. Ideally, it would have been preferable to only use RCT studies with the same numeric rating scale and questionnaire. However, seeing as CFT is a relatively new approach, it was not possible to find eight RCT studies with the same numeric rating scale and questionnaire that fit the inclusion criteria.

4.5 Future research:

After this literature review, it became clear that there were few studies about the effect of CFT on patients with NSCLBP, and most of the studies done on this topic appear to be performed by a group of the same researchers. As CFT is a relatively new treatment approach, more research and especially more RCT studies with longer follow-up periods and with more participants are needed.

5. Conclusion:

Based on the eight studies included in this literature review, the results showed that CFT is an effective approach for improvement in disability and pain intensity amongst adults with NSCLBP. Most of the studies concluded that CFT was superior to other recommended treatment approaches such as MT-EX and Usual spine center care in the improvement of disability. The results on the effect on pain intensity are less consistent on whether CFT is more effective than other recommended treatment approaches. However these results are not conclusive and further research is recommended on this topic.

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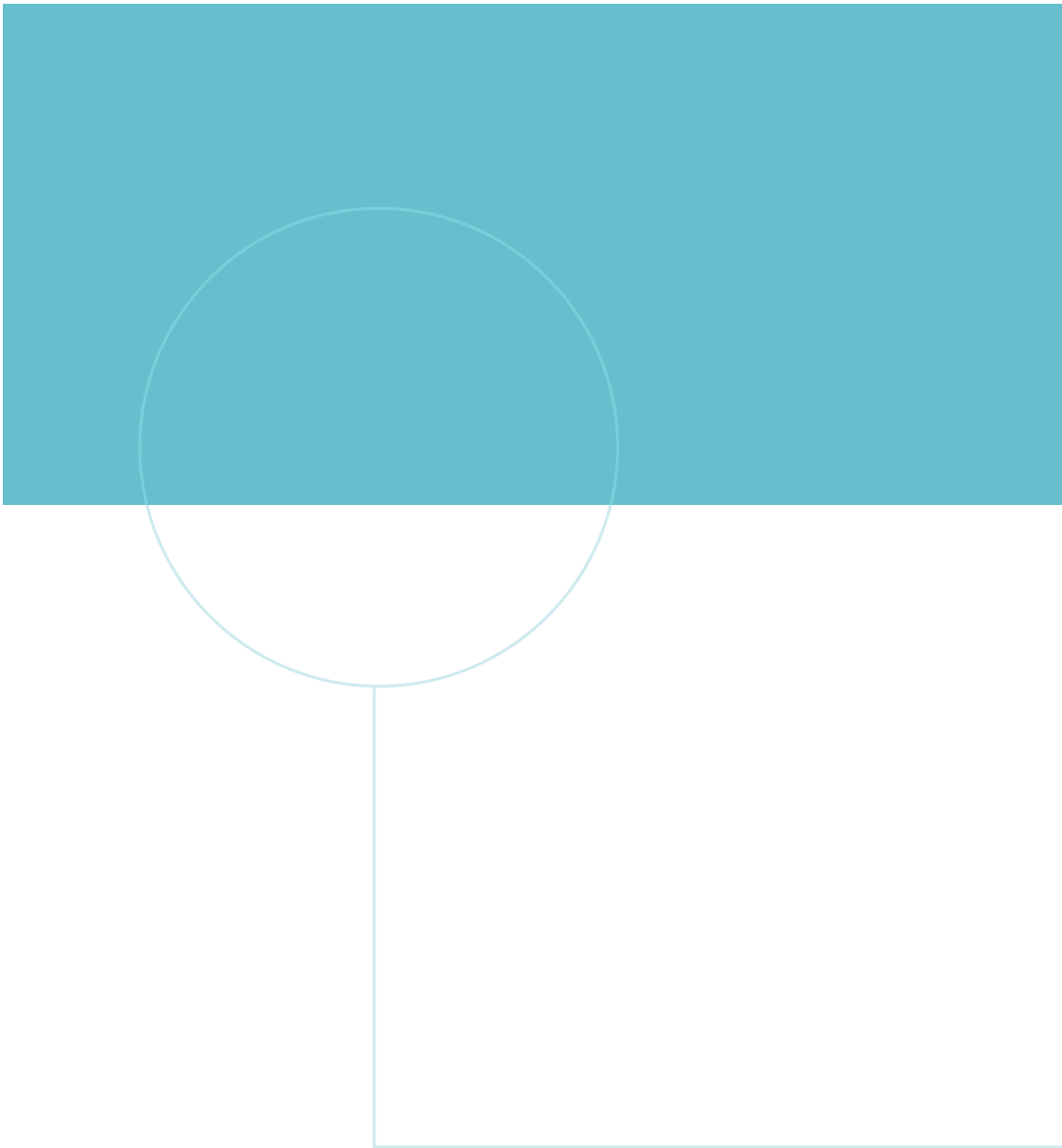

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