DET PSYKOLOGISKE FAKULTET

Ψ

Mindfulness- and Acceptance-based Treatment for Older Adults: A Literature Review

HOVEDOPPGAVE

Profesjonsstudiet i psykologi

Torkjell R. Aannø

Høst 2010

Veileder
Kia Minna Hynninen

Bi-veileder
Inger Hilde Nordhus

Abstract

Mindfulness- and acceptance-based interventions (MBI) have been suggested to be a suitable treatment alternative for older adults, as these interventions are easily administered in groups and can be tailored to the patients' level of functioning. The aim of this study was to review existing evidence for the effect and feasibility of MBI for older adults. MBI outcome trials with participants who were 55 years (range: 55 - 88) or older were included in the review. Eight studies were found, of which five were mindfulness-based stress reduction (MBSR) trials for chronic pain, and three were trials of dialectical behaviour therapy (DBT) or mindfulness-based cognitive therapy (MBCT) for depressive conditions. The MBSR trials demonstrated large effects for pain-acceptance, while showing only small effects for pain-experience. Significantly more chronically depressed recovered using anti-depressants when receiving also DBT treatment. MBCT treatment showed potential for depression relapse prevention. All trials were found feasible for older adults. The reviewed studies suggest promising effects of MBI for older adults. However, so far only few studies have been conducted, all with small and possibly biased samples, and/or without adequate experimental control. Larger controlled trials are needed to assess reliably the effects of MBI for older adults.

Sammendrag

Mindfulness- og aksept-baserte intervensjoner (MBI) har blitt foreslått å egne seg i behandling av eldre, da disse behandlingsformene lett lar seg praktisere i grupper, eller skreddersys den enkeltes behov. Formålet med denne studien var å foreta en litteratur gjennomgang, for å kartlegge om det fantes evidens for egnethet og behandlings-effekt av MBI for eldre. Bare studier som viste behandlings-utfall på mennesker minst 55 år (spenn: 55 – 88) ble inkludert i denne studien. Åtte studier ble funnet, hvorav fem av disse representerte mindfulness-basert stress reduksjon (MBSR) for kronisk smerte, og tre av disse utgjorde dialektisk atferdsterapi (DBT) eller mindfulness-basert kognitiv terapi (MBCT) for depressive tilstander. MBSR studiene viste stor effekt på aksept av smerte, men bare liten effekt for smerte-opplevelser. Signifikant flere kronisk deprimerte var i remisjon av de som fikk anti-depressiva kombinert med DBT behandling. MBCT behandling viste et potensial i å forhindre tilbakefall av depresjon. Alle studiene ble vurdert som egnet for eldre. Studiene som ble gjennomgått viste lovende effekt av MBI for eldre. Få studier har derimot blitt utført, med små og trolig mangelfulle utvalg, og/eller med utilstrekkelig eksperimentell kontroll. Det er behov for større kontrollerte studier for å måle hvorvidt MBI har pålitelig behandlings-effekt for eldre.

Content

Introduction

A dramatic increase in number of older adults is expected in the next decades in Europe and in the U. S. (SSB, 2010; UCB, 2010). This increase is suggested to represent a continuous world-wide trend, following increased birth-rates and declining numbers of infant mortality and deaths (McBee, 2009; WHO, 2010). According to the World Health Organization (WHO, 2010), the increase in number of seniors will provide challenges of both structural and economic nature, including increasing demands for health care.

Even though older adults are generally underrepresented in mental health care, mental health problems are frequent in late-life (Laidlaw et al., 2008; McBee, 2008; Smith, 2006). Although higher rates are commonly presented among the younger age groups, anxiety disorders seem to be among the most predominant mental health problems, in this age segment (Nordhus & Pallesen, 2003; Thorp et al., 2009). However, depression is a common co-morbidity in late-life anxiety, and 26 - 31 % of depressed older adults in treatment have co-existing anxiety (Gum & Cheavens, 2008). Anxiety, and generalized anxiety disorder in particular, often precedes depression, and is thus found to be a risk factor for development of depression in older adults (Stanley, Wilson & Novy, 2009). Depressed older adults with co-morbid anxiety report earlier depression onset, more chronic course, more severe symptoms, and more suicide ideation (Gum & Cheavens, 2008).

Prevalence rates of major depression range between 1 and 5 % for older adults in the community in Europe and in the U. S., increasing to 13. 5 % for in-patients in the U. S. (NIMH, 2010; Smith, 2006). In the U. S., 3 % of the population above 65 years suffers from clinical depression, 6 % showing a diagnosable depression, and 13 - 27 % presenting subclinical depressive symptoms (WD, 2010). It is moreover suggested that older adults are more vulnerable for depression as they grow older, thus demonstrating a successive risk factor (Smith, 2006). Depression is further conceived of as a significant factor predicting suicide

(MHA, 2010). Elderly patients commit suicide more often than any other age-groups (Lynch, Morse, Mendelson, & Robins, 2003), although such findings need to be interpreted in relation to obvious methodological uncertainties. In a recent publication, however, older adults above 65 years are reported to represent 20 % of all incidents in the U. S., and white males above 85 years are overrepresented by nearly six times the overall suicidal death rate (MHA, 2010).

Depression most frequently co-exists not only with anxiety disorders, but also with personality disorders, alcohol abuse, and cognitive impairment (Gum & Cheavens, 2008). Among the elderly depressed, 24 – 61 % suffers also from personality disorder, and the highest rates are found in in-patient care settings (Gum & Cheavens, 2008; McBee, 2008). Gum and Cheavens (2008) mention the prevalence of personality disorders is equivalent in older and younger adults in community samples (10 - 20 %). Diagnoses from clusters A and C are more frequent in older adults, with rare incidents for borderline personality disorder (Gum & Cheavens, 2008; Hunt, 2007). Older adults with major depressive disorder often have co-morbid personality disorders, and this combination is especially problematic in clinical practice (Lynch et al., 2007a). Personality disorders in older adults increase risk of Axis I disorders (such as depression), predict higher chronicity- and relapse rates of co-morbid depression, and poorer outcome of treatment (Lynch et al., 2007a).

Among the elderly, co-existing psychiatric and somatic diseases are common, as older adults have an increased susceptibility to chronic disabling diseases (Lunde, Nordhus & Pallesen, 2009a). Non-malignant pain is common among community-dwelling older adults, with 50 % prevalence internationally (Morone & Greco, 2007), of which 25 - 33 % suffer from chronic lower-back pain (Morone, Greco, & Weiner, 2008a). Experiencing losses of home, family, friends and health older adults may suffer from emotional problems and despair (McBee, 2009). This additionally influences the pain experience among the older adults, making coping a challenge in everyday-life (Lunde et al., 2009a). Pain in older adults is

associated with greater co-morbidity, increasing the risk for disability, decreased physical function, quality of life, sleep problems and depression (Morone, Rollman, Moore, Qin, & Weiner, 2009).

Chronic pain among older adults seems to be commonly undertreated (Ernst et al., 2008; Lunde et al., 2009a), or treated inadequately (Morone & Greco, 2007). This may be a consequence of inadequate pain-management by physicians, or inconsistencies in the patients' self-management of pharmacological treatment (Morone & Greco, 2007). Other reasons concern age-related side-effects from standard pharmacological treatment, and misconceptions of psychotherapeutic effects (Lunde et al., 2009a). Older adults have increased risk for polypharmacy, adverse side-effects and intoxication (Lunde et al., 2009a). Ernst et al. (2008) suggest that frequent age-related adverse treatment effects, may leave physicians with no other alternative than to advice the elderly to live with their pain.

Smith and Colleagues (2007) suggests similarly that depression in late-life is often untreated due to therapeutic pessimism. Older adults may receive both beneficial and adverse effects from pharmacological treatment, and at lower doses than the younger (Nordhus & Pallesen, 2003). Drug-compliance and interaction effects with additional illnesses are mentioned as concerns, and pharmacological treatment precludes significant psychological aspects, such as coping and interpersonal relationships (Nordhus & Pallesen, 2003). For similar reasons physicians may be wary of prescribing medicine to senior patients with anxiety (Nordhus & Pallesen, 2003) and depression (Smith, 2006).

The effects of anti-depressants and selective serotonin reuptake inhibitors (SSRIs) on elderly depressed are supported by research literature (Cuijpers, Straten, van Oppen, & Andersson, 2008; Laidlaw et al., 2008; NICE, 2010a; Pinquart, Duberstein, & Lyness, 2006). However, the referred studies (Cuijpers et al., 2008; Laidlaw et al., 2008; Pinquart et al., 2006) find anti-depressants only equal or minimally beneficial in effects, compared to

psychotherapy, and that cognitive behaviour therapy (CBT) in particular are effective for older adults. Lynch et al. (2003) refer to studies showing that both standard treatment and CBT have been effective treating late-life depression. However, the authors note that many older adults do not respond to SSRIs or psychotherapy alone, and that simultaneous treatment using both approaches may be preferable.

Psychological treatments for older adults

The National Institute for Health and Clinical Excellence recommends CBT and interpersonal psychotherapy as evidence-based treatments for depression, including adults from heterogeneous populations (NICE, 2010a, p. 19-23). Supplement SSRI treatment is offered depending on depression severity. Psychotherapy treatment for depression has shown equally effective for late-life as for younger adults (Cuijpers, Straten, Smit & Andersson, 2009; Woods & Lamers, 2010, p. 954). In fact, a range of psychotherapeutic techniques seem to be effective for late-life depression, including also psychodynamic therapy, problem solving treatment, and behavioural activation treatments (Cuijpers et al., 2009). Life review and reminiscence therapy have frequently been offered for late-life depression, based on strong empirical support (Woods & Lamers, 2010). Psychotherapy has not only proven effective for depression, but also for late-life anxiety (Nordhus & Pallesen, 2003) and chronic pain (Lunde et al., 2009a).

CBT is the most systematically researched treatment for depression in old age, with a focus on symptom-relief in the older adult in a directive, active and structured manner (Laidlaw et al., 2008). Laidlaw et al. (2008) conducted a controlled trial of CBT for late-life depression in primary care, incorporating typical CBT components such as activity scheduling and self-monitoring of mood-related thoughts. CBT had beneficial effects on mood and hopelessness, showing relief of symptoms after only eight sessions. The authors wish to disconfirm myths on the population, and stress that older adults showed interest for the

treatment, and the treatment was also feasible and effective. Although studies on late-life depression have often limitations, as a consequence of small sample sizes and methodological deficits, also studies with more rigorous designs suggest that CBT has beneficial effects, and is often preferable to active control conditions (Wilson, Mottram & Vassilas, 2009).

CBT has also shown effect on adults with anxiety states, including panic anxiety and generalized anxiety disorder (NICE, 2010b). Stanley and Colleagues (2009) showed that older adults, having generalized anxiety disorder in primary care, improved significantly in worry severity, depressive symptoms, and general mental health ratings concluding 10 sessions of CBT, and the effects were maintained at 12 months. The author address a lack of studies on late-life generalized anxiety disorder, and note that previous controlled trials are limited by including primarily well-educated healthy whites, compared to needs in primary care. Relaxation training has shown to be an effective ingredient treating late-life anxiety, and is easily administered to older adults (Thorp et al., 2009). This approach is often combined with CBT treatment for late-life anxiety and generalized anxiety disorder (Stanley & Novy, 2000; Stanley et al., 2009).

Considering chronic pain conditions and psychotherapy on older adults, a meta-analysis of 12 studies using cognitive and behavioural treatment interventions found medium effect-sizes for self-reported pain experience (Lunde et al., 2009a). No significant effects were found for depression, physical function or usage of medication (Lunde et al., 2009a). The authors conclude that CBT is efficacious for this target group, although included studies did not exclusively address older adults above 60 years. Older adults with chronic pain and significant medical co-morbidities are mentioned to require specific therapist qualifications (Lunde et al., 2009a). This include assessing different levels of functioning from several domains, including: (i) physical functioning; (ii) emotional functioning; (iii) sleep problems; (iv) quality of life; (v) depressive symptoms, and appropriate; (vi) pain-related scales (Lunde

et al., 2009a). Woods and Lamers (2010) claim that severe functioning on a clinical level is not age-specific but often age-related, and that none of these (*e.g.* cognitive impairment) preclude psychological treatment, though stress that specific adaptations may often be needed.

Even though CBT in particular has proven effective for a range of problems, new advancements in mindfulness- and acceptance-based approaches receive increasing popularity in research literature on heterogeneous populations (*e.g*. Baer, 2003; Hayes, 2004; Rizvi & Linehan, 2001). These approaches differ in both targets and approach from traditional psychotherapy, and are suggested to have the potential to provide a better treatment alternative for the elderly (Butler & Ciariocchi, 2007; Lindberg, 2005; McBee, 2008; McHugh, Simpson & Reed, 2010; Rejeski, 2008; Smith, 2004). Mindfulness is an essential element in the "new behavioural therapies", in combination with components from CBT (Hayes, 2004). Mindfulness involves specific reflective abilities of "meta-cognitions", and a distinct "meta-awareness" (Siegel, 2007).

In the literature, a distinction is made between acceptance- and change strategies, and it is suggested that acceptance-based approaches are beneficial, as compared to traditional CBT (Hayes, 2004; Hofmann, 2008; Hofmann & Asmundson, 2008; Lau & McMain, 2005; Longmore & Worell, 2007). It is suggested that acceptance is a better strategy for pain-related suffering (McCracken & Eccleston; 2005; McCracken & Vowles, 2008), and quality of life (Wicksell, Melin, Lekander & Olsson, 2009), and "what cannot be changed" (Hayes, 2004). Different from traditional CBT and behaviour therapy, these approaches emphasize the function of thoughts and behaviour, or the clients` relation to thoughts and experiences, rather than changing or controlling their contents (Hayes, 2004; Shapiro & Carlson, 2009). Mentioned approaches are all associated with beneficial effects on a range of medical disorders (Baer, 2003; Hayes, 2004; Rizvi & Linehan, 2001).

Study objectives

To my knowledge no review has been conducted exclusively on mindfulness- and acceptance-based treatments for older adults. For this reason, the aim of this thesis is to review current empirical literature on treatment studies on older adults within these approaches. My main objective is to examine the effect of mindfulness- and acceptance-based treatments for older adults. A secondary objective of this review is to study the feasibility of this treatment approach for older adults. Hence, I will address the following two questions: (i) Does the existing literature suggest that older adults could benefit from mindfulness- and acceptance-based interventions? (ii) Does the existing literature suggest that mindfulness- and acceptance-based interventions are feasible for older adults?

Framework and definitions

In this review older adults are defined as persons 55 years or older. There seems to be a general agreement of which treatment approaches comprise mindfulness- and acceptance-based interventions, this being mindfulness-based stress reduction (MBSR), mindfulness-based cognitive therapy (MBCT), dialectical behaviour therapy (DBT), and acceptance- and commitment therapy (ACT; Baer, 2006; Germer, 2005; Hayes, 2004; Roemer & Orsillo, 2009; Shapiro & Carlson, 2009; Siegel et al., 2009). These four treatment approaches represent what I will refer to as mindfulness- and acceptance based interventions (MBI) throughout this paper. It should be noted that the four mentioned approaches differ, in particular with regard to more emphasis on behaviour change strategies within DBT and ACT (Baer, 2003; Hayes, 2004; Roemer & Orsillo, 2009; Øst, 2008). This issue is considered beyond the aims of this review, and will not be emphasized later on.

My understanding of mindfulness and mindfulness meditation will be based on the work of Jon Kabat-Zinn (2004; 2008), and I will not focus on different versions of mindfulness. Neither will I focus on meditation techniques such as concentration meditation

or transcendental meditation or any other mind-body approaches. Further, I will not address research on mechanisms or active components associated with the concept mindfulness, or the four mentioned approaches (MBI). The review aims at giving a first summary of the potential of MBI for older adults across various target conditions. Therefore, no strict selection criteria were used with regard to study design, and no effort was made to summarize the results by statistical means. Effect-sizes will only be presented when reported in study. Considering feasibility, my main focus will be on rates of attendance- and program completion. Thus interest for participation, recrution, and related findings will not be addressed in this review.

I will start by describing briefly the concept of mindfulness and basic features of mindfulness practice. I will then present each of the four MBI approaches. Next, I will describe search procedures and qualifying criteria for inclusion in the review. The included studies and their most distinctive features will be presented thereafter. I will then discuss study findings with regard to effect and feasibility. Finally, I will present a summary of the findings, and based on these, suggest directions for future research.

Mindfulness- and acceptance-based approaches in psychotherapy

Although mindfulness as a concept derives from Buddhism, its phenomenological nature is suggested to share similarities to Western philosophical and psychological ideas (Shapiro & Carlson, 2009). The understanding of mindfulness as a concept is mentioned to have expanded implementing it into Western psychotherapy and clinical practice (Siegel et al., 2009). Jon Kabat-Zinn (2003) gives the following definition of mindfulness: “The awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment to moment” (as cited in Siegel et al., 2009, p. 19). Applying mindfulness to psychotherapy a following short definition is suggested featuring three basic elements, namely; (i) awareness, (ii) of present experience, (iii) with acceptance, hereby mentioned to capture mindfulness issues in both psychotherapy and

Buddhist literature (Germer, 2005, p. 7). Siegel et al. (2009) mention mindfulness may more easy be understood exploring the quite opposite, and mindlessness. According to the authors, people live most of their daily life being mindless, on “autopilot”, stuck in past memories and future fantasies, but mention we all can develop mindfulness through deliberate practice.

Mindfulness does not only relate to a conceptual understanding, but entails also a systematic mindfulness practice, involving openness, caring and discerning by intention in both knowing and shaping the mind (Shapiro & Carslon, 2009). Mindfulness meditation is suggested to involve a distinctive approach from both relaxation techniques and concentration meditation (Germer, 2005). In contrast, relaxation training is mentioned to aim at being more relaxed, while mindfulness meditation is described potentially to involve the quite opposite and being more disturbed, dependent on the object of awareness. The authors detail that the intention of mindfulness meditation involves attending also to unpleasant experiences, without attempting to make them go away, or to become less salient, in contrast to avoiding problems in life (Germer, 2005). Mindfulness meditation is also mentioned to be distinct from concentration meditation. Buddhist psychology is mentioned to differentiate between “vipassana” (insight) and “samatha” (concentration), in which mindfulness meditation represent the first (Germer, 2005, p. 15). Concentration meditation emphasizes directing- and re-directing attention to only one object, typically a sound or a mantra, avoiding other experiences as distractions (Baer, 2006). Baer (2006) explains that mindfulness meditation shares similarity in the initial phase, concentrating on one object (*e.g.* breath), whereas following phases differ in fundamental ways. In accordance with its most basic rationale, mindfulness meditation stresses the importance of paying attention to all experiences, trying to observe even the unpleasant ones, providing change through nonjudgmental observation of the wandering mind. Siegel et al. (2009) mention that meditation research has changed the last

decade, from studying relaxation response and concentration meditation, to a current focus more on mindfulness.

Most experts on the matter agree that mindfulness and acceptance cannot be fully understood without practicing them and cultivating them in daily life (Baer, 2006). There are several mindfulness practices in which all can be learned, representing either formal or in-formal practice (Germer, 2005). Formal mindfulness practice is mentioned to emphasize directing the attention in specific ways, for example by sitting quietly with awareness focused on present experience up to 45 minutes (Baer, 2006, p. 4). Germer (2005) notes that the rationale in formal practice is to reach deeper levels of mindfulness, and that a major goal of mindfulness-based approaches is to practice and cultivate in-formal mindfulness, meaning to apply skills into everyday life. The latter is mentioned to entail shorter exercises bringing awareness to everyday activities such as walking, bathing, eating or driving (Baer, 2006).

Mindfulness-Based Stress Reduction (MBSR)

MBSR was originally developed in 1979 by Jon Kabat-Zinn at the University of Massachusetts Medical Centre. MBSR was designed as a stress-reduction and relaxation program (Kabat-Zinn, Lipworth, & Burney, 1985), and modelled for treating various medical conditions (Kabat-Zinn, 2003). The intention was to offer treatment for people suffering from complex emotional, and physical, medical conditions that were intense and chronic in nature (Samuelson, Carmody, Kabat-Zinn, & Bratt, 2007). MBSR was intended to offer treatment for conditions for in which physicians were of no help (Germer, 2005, p. 11).

MBSR involves 8 - 10 weekly 2 - 2. 5 hrs group sessions, featuring presentation and practice of mindfulness skills, accompanied by group discussions, sharing experiences with regard to coping and stress (Baer, 2003). Participants are also expected to do homework assignments, for approximately 45 min, 6 days a week, utilizing provided material (Kabat-Zinn, 2003; Kabat-Zinn et al., 1985). This is an essential feature of the program, hence

homework compliance is reported to be associated with beneficial effects (Rosenzweig et al., 2010). It has been suggested that standard MBSR is an extensive program and may provide challenges for completion, herein the participants are required to commit to following individual homework and all classes (Baer, 2006). Moreover, a whole day (7 - 8 hrs) is devoted for mindfulness group activities, usually held by the 6th week (Baer, 2003), and often referred to as the full day retreat. There are several mindfulness skills in MBSR practice, including sitting, standing, walking and eating meditation, a body scan, and practicing stretching-, breathing-, and Hatha Yoga exercises (Baer, 2006; Germer, 2005). Jon Kabat-Zinn (2004) presents more details of these mindfulness skills elsewhere.

Research on the program has shown beneficial effects for a range of medical conditions found in heterogeneous populations (Kabat-Zinn, 2004), suggesting long-term effects of meditation up till 4 years after program (Samuelson et al., 2007). Several meta-analysis and reviews have been conducted, showing MBSR to be efficacious for different clinical populations (Baer, 2003; Bishop, 2002; Grossman, Niemann, Schmidt, & Walach, 2004; Toneatto & Nguyen, 2007). Baer (2003) did a meta-analysis on 22 MBSR studies, including controlled and uncontrolled trials on clinical populations. Baer found an overall effect of at least medium size (*d* .59) at follow-up, and concluded that MBSR was a "probably efficacious" treatment (Baer, 2003), referring to criteria given by the American Psychology Association (Smith et al., 2007). Similarly, Grossman et al. (2004) found medium effects-sizes (*d* .50) performing a meta-analysis on 10 controlled and un-controlled trials. Nevertheless, Baer (2003) finds methodological flaws in the reviewed studies, and notes that there is a need for more stringent control and larger, well-designed controlled trials.

Mindfulness-Based Cognitive Therapy (MBCT)

MBCT is mentioned to origin in the 90s (Shapiro & Carlson, 2009), integrating CBT elements with MBSR (Ma & Teasdale, 2004). MBCT was developed as a program for

depression relapse prevention, and it is offered in eight weekly two-hour classes for patients with major depressive disorder (MDD), currently in remission (between episodes; Ma & Teasdale, 2004). As MBSR, MBCT stresses both formal and in-formal meditation- and mindfulness practice in class and through homework assignments (Baer, 2006). However, MBCT differs in the didactics, and the teaching is focused on depression skills rather than stress reduction (Baer, 2006). MBCT does neither include the full-day retreat (Germer, 2005). Additions to MBSR program include class discussions, focusing on avoidance and acceptance of thoughts and behaviour, and practice, teaching and discussions of exercises from CBT model, and establishing a relapse prevention plan (Baer, 2006).

MBCT differs from traditional CBT by having a focus on one's relationship to thoughts, by using a "de-centred" approach, rather than using change-strategies and focusing on contents of dysfunctional thoughts (Baer, 2006; Segal, Teasdale, & Williams, 2004). The decentred relationship to thoughts is characterized by open curiosity for new experiences, in a non-judgmental way. Smith (2004) address that de-centring increases the patients self-acceptance and openness for experiences. Segal et al. (2004) claim that CBT lacks support for long-term effects in preventing depression recurrence for major depression. In accordance with the aim of MBCT, its premises derive from a model with substantial empirical support (Ma & Teasdale, 2004). This model emphasizes cognitive vulnerability to depression relapse, assuming that people who have had episodes of (unipolar) MDD differ significantly from those who have not, regarding distinctive negative thinking patterns in mildly depressive periods. The authors refer to research finding that the risk for relapse increases for each episode, and suggest that MBCT is targeting this concern (Ma & Teasdale, 2004). Authors refer further to MBCT studies, proving only effective for those experiencing three or more depressive episodes, and suggest that MDD patients differ as a function of number episodes

experienced. It remains unknown which components are efficacious in MBCT (Allen, Bromley, Kuyken, & Sonnenberg, 2009).

Considering results MBCT has replicated beneficial effects treating MDD relapse for patients in remission following 3 recurrent episodes (Ma & Teasdale, 2004; Teasdale, et al., 2000). The more recent study showed to halve depression relapse at 60 - weeks compared to treatment as usual. MBCT is mentioned to provide a cost-effective treatment alternative, designed to prevent recurrence of depression (Smith, 2004). The National Institute for Health and Clinical Excellence recommends MBCT for treatment of depression recurrence, implemented on adults having a history of at least 3 previous episodes (NICE, 2010a, p. 10).

Dialectical Behaviour Therapy (DBT)

DBT was originally developed by Marcha Linehan in the early 90s, for treating suicidal individuals with borderline personality disorder (BPD) (Lynch, Trost, Salsman, & Linehan, 2007b; Rizvi & Linehan, 2001). Standard DBT is mentioned to include both group-skills training classes and weekly individual 1 hour psychotherapy (Rizvi & Linehan, 2001). The group-sessions last weekly 2.5 - 3 hrs during 12 months, but adaptations are made for different populations (Lynch et al., 2007b). The BPD patient is offered skills-training by coaching on the telephone with the primary therapist when needed. Finally DBT therapist teams are to meet on a weekly basis to prevent burn-out, to increase the therapists` competence on the patients, and their adherence to the treatment model. Skills-training in groups, and featured telephone coaching, is mentioned to increase and generalize behavioural skills (Neacsiu, Rizvi, Vitaliano, Lynch, & Linehan, 2010). Individual therapy is in contrast offered to provide crisis management, and moreover to strengthen and address the importance of practicing these skills (Neacsiu et al., 2010).

Standard DBT treatment for BPD patients includes in total 50 skills, all origining from evidence-based research on efficacious treatment (Neacsiu et al., 2010). The skills are teached

using 4 distinctive modules, addressing different maladaptive functioning in BPD patients. These modules are mentioned to include: (i) mindfulness skills; (ii) emotion regulation skills; (iii) interpersonal effectiveness skills, and finally; (iv) distress tolerance skills. The first stresses participation in a non-judgemental way, by observing and describing the present moment. The second involves adopting strategies for changing emotions quickly, and further to prevent the occurrence of emotional expressive behaviour. The third ranges from basic social skills-training to include assertiveness, and further more goal-directed behaviour. The final module is mentioned to include both short-term and long-term change strategies, respectively by controlling impulsive behaviour, and more lasting change by radical acceptance of different life-events (Neacsiu et al., 2010).

DBT treatment is mentioned to be a comprehensive program following four successive stages, in which all stages are meant to be followed by achieving the goal in the previous protocol. Considering the main goal in DBT treatment this is mentioned literally to "…help the patient to engage in functional, life-enhancing behaviour, even when intense emotions are present" (Lynch et al., 2007b, p. 185). The authors mention to achieve this by intentionally integrating mindfulness-skills (acceptance), with simultaneous non-reinforcement of emotional provocative stimuli in the environment (behavioural change). DBT treatment is mentioned to therapeutically integrate both acceptance and change strategies (Rizvi & Linehan, 2001), and thus to reduce symptoms in the patient. Considering effects of treatment, studies on the matter emphasize the skills-training in DBT as an important component (Neacsiu et al., 2010). Nevertheless, it is still unclear which underlying components providing the change for BPD patients (Neacsiu et al., 2010).

Research findings on DBT suggest this treatment to be more efficacious than treatment as usual, regarding fewer in-patients stays in hospital, reductions in parasuicidal behaviour, and higher completion rates following treatment (Lynch et al., 2007b; Rizvi & Linehan,

2001). Since the origins, DBT has proven to represent an evidence-based treatment approach for BPD in eight controlled trials (Neacsiu et al., 2010). Since the development, several modifications have been made for DBT, treating other clinical disorders than BPD, including antisocial behaviour, eating disorders, and disorders of substance abuse with BPD co-morbidity (Rizvi & Linehan, 2001). A meta-analysis on DBT treatment from in total 13 controlled trials found moderate effects (*d* .58) across studies using treatment on BPD (9), depression (2) and eating disorders (2), including different populations and control conditions (Øst, 2008). DBT treatment is claimed to be a flexible approach which can easily be tailored the patients` level of functioning (Lynch et al., 2007b).

Acceptance and Commitment Therapy (ACT)

In accordance with its most basic premise for psychopathology, the primary goal of ACT is to create an increased psychological flexibility for the client (Hayes, 2004). This is demonstrated using 6 core principles and techniques, namely; cognitive defusion, acceptance, use of the observing self, contact with the present moment, personal values, and committed action (Hunot et al., 2010). ACT is mentioned to have the following goals: (i) perceiving thoughts, images, emotions, and memories as what they are, rather than what they appear to be; (ii) allowing these to come and go without struggling with them; (iii) accessing a transcendental sense of self; (iv) gaining awareness of, and receptiveness to, the here and now; (v) discovering what is most important to one's true self, and finally; (vi) setting goals in accordance to values, and carrying them out responsibly (Hunot et al, 2010, p. 4). Hayes (2004) explains that ACT constitutes of acceptance- and mindfulness skills (A) by the first four- (i - iv), and commitment- and behavioural skills (C) by the last four principles (iii - vi) mentioned above. A fundamental assumption in ACT has its roots in Relational Frame Theory and contextual behaviourism, being concerned of the functions of thoughts and in-context behaviour. To fully understand the basic philosophical and methodological premises

underlying ACT, the founder Stephen C. Hayes (1993; 1999) has provided a curriculum (as cited in Hayes, 2004; Hunot et al., 2010).

Hayes (2004) explains that psychopathology rises from cognitive fusion, and the use of wrong strategies, where more control is the problem. For the client to be able to understand problematic issues, he/she has to realize or experience creative hopelessness, using metaphors or behavioural techniques therapeutically, until mentioned goals (i - iv) are achieved, and the client reaches acceptance (A) for change. To account for committed action, ACT is mentioned to use exposure, skills-training and goal-setting, not differing from traditional behaviour therapy (Hunot et al, 2010). Baer (2003) mentions that ACT uses several strategies similar to other mindfulness-approaches (MBI). A central assumption and target in ACT is that clients with psychopathology and cognitive inflexibility have a tendency for experimental avoidance, in which avoidance of thoughts and behaviour increase their likelihood of being experienced (Baer, 2003). It is suggested that ACT shares similarities to DBT, both having a focus on an ongoing “acceptance-and commitment dialectic”, and that progress depend on engagement and committed action from the client (Hayes, 2004, p. 22 - 23). Homework and behavioural exercises are implemented therapeutically in this process. The client is meant to start up practicing committed action in small concrete steps, building up larger behavioural patterns, using both acceptance- and change strategies when needed. Achievement in cognitive flexibility presumes that the client is fully responsible for his/hers own behavioural patterns.

Considering research results, ACT is suggested effective for a range of conditions including different populations (Baer, 2006; Hayes, 2004; Roemer & Orsillo, 2009). A meta-analysis on ACT found 13 controlled trials on different populations, and five trials were found significantly more beneficial, compared to different control conditions (Øst, 2008). These studies were conducted on stress, psychotic symptoms, diabetes self-management, epilepsy, and borderline personality disorder. The author found moderate effect (*d* .68) across the

different studies (Øst, 2008). Due to its distinctive features it is suggested that ACT is also a good treatment alternative for chronic pain patients (McCracken, Carson, Eccleston, & Keefe, 2004; McCracken & Vowles, 2008; Wicksell at al., 2009), and a recent study integrated ACT into a self-help program (M. Johnston, Foster, Shennan, Starkey, & A. Johnston, 2010).

Methods

Search for relevant studies

Relevant studies for the review were identified by searches in the following databases: Pubmed; ISI Web of Science & PsychInfo. All searches were carried out between February and October 11, 2010. The following terms were used in the search: “mindfulness based stress reduction”, “mindfulness based cognitive therapy”, “acceptance and commitment therapy”, “dialectical behaviour therapy”, “mindfulness”, “meditation”, “older”, “elderly”, “late-life”, “aging”. The protocol for citations and hits is presented in the Appendix.

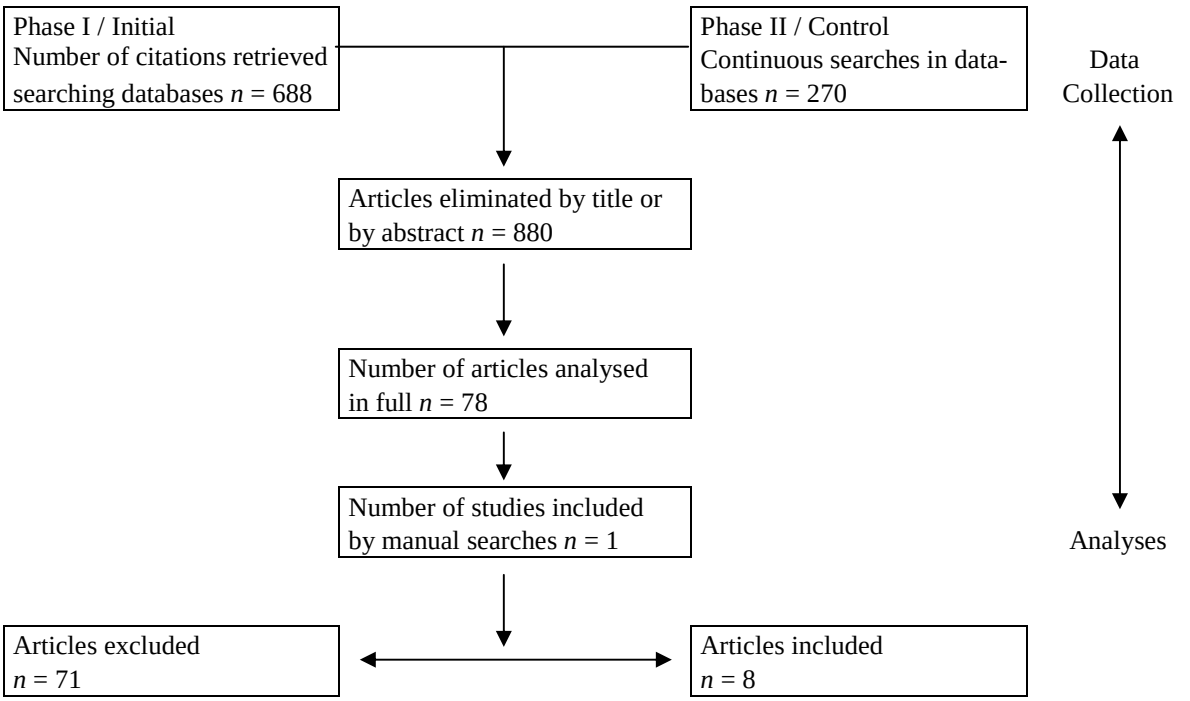
Computer searches in the initial phase, using different combinations of the terms, resulted in a pool of 688 articles. These articles were then analyzed by title or by abstract, resulting in 6 out of 8 included outcome studies. Additional computer searches were then conducted in the second phase, controlling for missing studies by general terms. This resulted in 270 articles for qualifying analysis, and one additional outcome study qualified for inclusion. A total of 78 articles were analyzed in-depth. Reference lists of relevant articles, books and reviews were then controlled for missing studies not covered by the database searches. This resulted in one last outcome study included in the review. The flow of studies being qualified or excluded is presented in a diagram in Figure 1.

Inclusion and exclusion criteria

To be qualified in the review a study had meet the following criteria for inclusion: (i) involve psychotherapy treatment using one of the four following interventions; mindfulness-based stress reduction (MBSR), mindfulness-based cognitive therapy (MBCT), acceptance-

and commitment therapy (ACT), dialectical behavior therapy (DBT); (ii) all participants in study being at least 55 years or older; (iii) report outcomes from a treatment trial, hereby including also qualitative reports, and; (iv) be written in English. Case-reports (N = 1) were excluded from the review. Studies providing only abstracts were not included.

Figure 1. Study flow diagram. Number of citations and hits from study searches.



phase I = citation hits (n = 688) relates to phase I study search protocol subsections level 1
phase II = citation hits (n = 270) relates to phase II study search protocol subsection level 2

Results

Descriptive characteristics and outcome results of the eight included studies are presented in Table 1. Of the included studies, four were randomized clinical trials and three non-randomized trials. The last included study (Morone, Greco, Tindle, & Weiner, 2008b) provided new data from the original controlled trial (Morone et al., 2008a), in the form of qualitative diary entries. Five studies addressed adapted or modified MBSR, two studies used standard or modified DBT, and one study utilized adapted MBCT. Five studies addressed chronic pain, all following MBSR treatment. Three MBCT or DBT studies targeted different conditions of late-life depression.

The number of participants ranged from 14 to 40 subjects. The age of the participants ranged from 55 to 98 years across all trials. The nursing-home residents represented the oldest (68 - 98 years), whereas the age range of outpatients was 55 - 88 years. The participants were mainly females (45. 7 % - 93 %) and Caucasians (data from five trials: 87 – 93 %).

Table 1 Main characteristics and findings of included studies

Study	Condition	Participants	Age (SD)	Design	Measures	Results
MBSR						
Study 1						
Morone et al., 2008a	Older adults with chronic low-back pain / moderate intensity	37 community-dwelling older adults	75 (n/a) range 65-84	Randomized clinical trial featuring wait-list control & 8-week adapted MBSR / no between-group follow-up due to wait-list crossed over at 8-weeks	**Quality of life (SF-36)** SF-36 Health Status Inventory / reporting Physical Function- & Pain subscales **Pain experience (SF-36)** SF-36 Pain Scale **Pain intensity (MPQ-SF)** McGill Pain Questionnaire -Short Form **Pain acceptance (CPAQ)** Chronic Pain Acceptance Questionnaire **Physical function (SF-36; RMDQ)** SF-36 Physical Function Scale Roland & Morris Disability Questionnaire	Significant improvements for MBSR group at 8-weeks compared to control for physical function (SF-36) & pain-acceptance (CPAQ) / no further improvement by within-subjects comparisons at 3-months (no control group) Control-group subjects crossing over to MBSR condition had a significant decline in pain-intensity (MPQ-SF) at follow-up, but only a trend for improvement in pre-post scores of pain-scales
Study 2						
Morone et al., 2008b	Similar to study 1	27 diary entries available from 37 completers	74.3 (5.3)	Qualitative study using thematic narrative analysis based on grounded theory / analysis of diary entries from original trial (study 1)	**Attention skills** **Well-being** **Pain** **Sleep**	27 out of 37 included participants hended in diary reports, hence 18 reported every week From in total 742 lines of comments 4 out of 6 themes were given interest describing the participants` treatment-effects at follow-up: (i) attention skills; attention capacity, being more consentrated and staying focused (ii) increased well being; -and quality of life, better coping with stressors, physical and mental stress-reduction, more positive affect (iii) improved sleep; -both quality & latency (iv) pain reduction; being on purpose aware of pain-stimuli -similar to rationale in MBSR

Table 1 Main characteristics and findings of included studies

Study	Condition	Participants	Age (SD)	Design	Measures	Results
Study 3						
Morone et al., 2009	Older adults with chronic low-back pain / moderate intensity	40 community-dwelling older adults	TRG 78 (7) CCG 73 (6)	Randomized clinical trial with educational control & 8-week adapted MBSR / 4-months follow-up	**Quality of life (SF-36)** SF-36 Health Status Inventory / reporting Role Limitations Due to Emotional Problems- & Pain subscales **Pain (MPQ-SF; SF-36)** McGill Pain Questionnaire -Short Form SF-36 Pain Scale **Pain self-efficacy (PSE)** Chronic Pain Self-Efficacy Scale **Disability (RMDQ)** Roland & Morris Disability Questionaire **Mindulness (MAAS; FFMQ)** Mindful Attention Awareness Scale Five Facet Mindfulness Questionnaire	MBSR group significantly improved in the quality of life (SF-36) scale Role Limitations Due to Emotional Problems at 8-weeks, compared to educational control group Both MBSR- & educational control group improved at both 8-weeks and 4-months / only a trend in pain self-efficacy (PSE) for beneficial MBSR effects at 4-months Although beneficial effects are reported in favor MBSR-group at follow-up, no further significance is found between the groups
Study 4						
McBee et al., 2004	Nursing-home residents with chronic pain of multiple conditions	14 nursing-home residents	85 (n/a) range 68-92	Open clinical trial with a 10-week pre-post modified MBSR design / no follow-up	**COOP inventory (VAS)** / reporting the following two subscales **General life satiscation (VAS)** Feelings of sadness **Pain-scales (VAS)** Feelings of pain	A statistical significant improvement at 10-weeks for VAS Feelings of sadness (COOP) Only a trend is reported for beneficial MBSR effects on VAS Feelings of pain (COOP)

Table 1 Main characteristics and findings of included studies

Study	Condition	Participants	Age (SD)	Design	Measures	Results
Study 5						
Ernst et al., 2008	Nursing-home residents in Germany with a minimum of cognitive health	22 nursing-home residents / self-selection to groups	83.5 (n/a) range 72-98	Non-randomized open clinical trial with untreated control group and 8-week adapted MBSR / no follow-up	**Qualify of life (SF-12)** SF-12 Short-Form General Health Survey / reporting both summary subscales **Physical & mental health (SF-12)** SF-12 Physical Health Score SF-12 Mental Health Score **Depression (GDS-12R)** Geriatric Depression Scale, GDS-12R **Cognitive impairment (MMST)** Mini Mental State Score **Activity of daily living (ADL)** Barthel Index ADL-Score **Visual analogue scales (VAS)** Pain intensity; degree of life satisfaction; degree of major complaints	MBSR group improved significantly on quality of life subscale physical health (SF-12) compared to comparison group Comparison group significantly reduced major complaints (VAS), MBSR-group showing a slightly increase (worsening) A significant decline found for MBSR group in depression scores (GDS-12R) compared to comparison group
DBT						
Study 6						
Lynch et al., 2003	Older adults with major depressive disorder (unipolar)	34 out-patients with current depression	66 (5) range 60-80	Randomized clinical trial featuring medication control and 28-week modified DBT+MED / 6-months follow-up	**Depression (Ham-D; BDI)** Hamilton Rating Scale for Depression Beck Depression Inventory **Hopelessness (BHS)** Beck Hoplessness Scale **Thought supression (WBSI)** White Bear Supression Inventory **Emotional ambivalence (AEQ)** Ambivalence over Emotional Expressiveness Questionnaire **Coping styles (CSQ)** Coping styles Questionnaire **Sociotrophy & Autonomy (PSI)** Personality style inventory	At 6-months DBT+MED group showed a statistically higher remission rate (75 %) than medication control (31 %) following Ham-D criterion (<7), a predominance found also at 28-week (DBT+MED: 71%; MED: 47 %), though not significant. Only DBT+MED group showed reduction in self-reported depression (BDI) at 28-weeks Both groups showed a statistically decline in 28-week Ham-D depression ratings / results maintained at 6-months Only DBT+MED group showed significant improvements on scales for coping (CSQ) and sociotropy (PSI) at 28-weeks

Table 1 Main characteristics and findings of included studies

Study	Condition	Participants	Age (SD)	Design	Measures	Results
Study 7						
Lynch et al., 2007	Older adults depressed with co-morbidity of personality disorder /-s	37 out-patients with at least one co-morbid personality disorder	61 (5) range 55-75	Randomized clinical trial with medication control & 24-week standard DBT+ MED (phase II) / eligibility only for non-responders of SSRIs in 8-week open medicational trial / last follow-up 6-months post individual treatment	**Depression (Ham-D)** Hamilton Rating Scale for Depression **Personality disorders (SCID-II; IIP-PD)** Structured Clinical Interview for DSM-IV Personality Disorders (pre-post) Inventory of Interpersonal Problems - Personality Disorders (all assessments) / reporting: Interpersonal Sensitivity Interpersonal Aggression	Only 14 % responded to phase I medication treatment, hence 12 % in remission, and 7 not increasing Ham-D scores at 8-week DBT+MED group scored significantly lower than MED on interpersonal sensitivity and interpersonal aggression at post-treatment maintained at follow-up On average only MED+DBT group achieved sustained remission from depression at post- group assessment (Ham-D<10), leveling off at follow-up
MBCT						
Study 8						
Smith et al., 2007	Older adults with at least three previous cases of major depression	38 out-patients at most mildly depressed	70.5 (n/a) range 65-88	Non-randomized clinical trial / qualitative pilot study featuring 8-week adapted MBCT / 1-year follow-up	**Depression (BDI)** Beck Depression Inventory **Qualitative & quantitative reports** Thematic analysis of semi-structured interviews featuring quantitative data of feasibility recordings	Only 2 out of 25 participants had diagnosed episodes of major depression at follow-up 23 participants either remained- or improved from mildly (BDI<19) depression at 1-year Qualitative reports identified 17 main themes reporting less rumination, improved sleep & interpersonal functioning, increased coping of difficult thoughts & depressive symptoms At 1-year follow-up 61. 5 % of participants report course being "extremely helpful" or have contributed to a "major benefit in life"

M; mean, SD; standard deviation, n/a; not available, SSRIs; Selective Seretonin Reuptake Inhibitors (anti-depressants)
MED; medication control (SSRIs); TRG; treatment group, CCG; Comparison Control Group (illustrated due to significant age effects in sample)
DBT; Dialectical Behavor Therapy, MBSR; Mindfulness-Based Stress Reduction, MBCT; Mindfulness-Based Cognitive Therapy
Mean age of samples represent availability of participants at different times of assessments

MBSR treatment for chronic pain

A total of five MBSR studies targeted chronic pain. Three out of these represent successive studies carried out by Morone and Colleagues (2008a; 2008b; 2009), all hereby focusing on community-dwelling older adults with chronic lower-back pain (CLBP). The other MBSR studies were non-randomized open trials, with inpatient samples from nursing homes (Ernst et al., 2008; McBee, Westreich & Likourezos, 2004).

Study 1. The first study conducted by Morone et al. (2008a) included a wait-list control, and aimed at both estimating the effects of MBSR treatment, and assessing the feasibility of the program. Patients with previous participation in mindfulness meditation group, or with pain caused by a serious underlying illness, were excluded from the trial. Thirty-seven cognitively healthy patients, with current CLBP of moderate intensity, were assigned to MBSR groups. All patients were 65 years or older. Times for assessment included pre-treatment, post-treatment (8-weeks), and a 3-month follow-up. Outcome ratings included self-reports for quality of life, physical function, and pain-ratings for intensity-, experience- and acceptance of pain (Table 1). The wait-list subjects were introduced to MBSR at 8-weeks, and therefore between-group comparisons were available only at post-treatment.

The standard MBSR protocol was adjusted by limiting the duration of group sessions to 90 minutes, and exclusion of the yoga-component and the full-day retreat. In addition to the quantitative outcome measures, the participants were asked to fill out and hand in weekly meditation diaries (one page), and to dedicate five minutes per day (6 days/ week) to writing a log, after individual homework assignments.

Thirty out of the 37 included patients completed the MBSR intervention. Patients who dropped out during the intervention had a higher level of education, but did not otherwise differ from completers. The patients had significant improvements in a quality of life physical function component ($p = 0.03$; d .46) at post-treatment, compared to the wait-list group.

Further, at the same time of assessment, large effects were found for pain acceptance total score (p = 0.008; *d* .83) and a subscale (p = 0.004; *d* .95), compared to the wait-list group. There were no further improvements during the follow-up. The wait-list subjects crossing over to MBSR condition, showed a significant improvement in pain intensity at follow-up (p = 0.03), but only trends were found for pain intensity (p = 0.098) and pain acceptance (p = 0.07) at post-treatment. Authors refer to effect-sizes ranging from small to large by 8-weeks (*d* .13 - *d* .95). At follow-up, completer reports of twenty-five patients from both latter groups show that 76 % continued to meditate, 72 % recommended class to others, 64 % reported better concentration, and finally, 48 % reported having reduced medication for sleep or pain. At 8-weeks 68 % completed, and 31 min were spent daily for individual meditation. Class-attendance averaged 6. 7 out of 8 sessions.

Study 2. The second study (Morone et al., 2008b) reports the findings based on the qualitative data from the diary entries of Study 1. The aim of the study was to identify qualitative statements and themes, which could explain the beneficial effects reported by the participants. In this process, two experienced coders independently identified main themes by categorizing words, phrases, and concepts, similar in meaning. The participants had to fill out and hand in a one page diary report on a weekly basis. The diary included both closed and open-ended categories, meant to capture the experiences following daily meditation practice.

In total, twenty-seven out of the 37 included participants completed the meditation program and handed in the diaries. Eighteen participants handed in diary reports every week. These reports only address beneficial effects (not strains) following meditation practice. In total 742 lines of comments were available for analysis at 3-months follow-up. Four main themes were extracted in the data analysis: (i) Achieved well-being; (ii) Improved sleep; (iii) Attention-skills improvement, and; (iv) Pain-reduction, all herein following beneficial experiences of mindfulness meditation. The main themes and results are presented in Table 1.

With regard to the theme of; (i) achieved well-being, the participants reported to experience mental and physical stress-reduction, including better coping for stressors, increased life-quality and positive affect in everyday life. The experiences of; (ii) improved sleep, involved reduced latency before sleep-onset and after awakenings. Other stated to experience increased sleep-quality and feelings of being more restored. The category of; (iii) improved attention- skills involved experiencing improved attention capacity, being more concentrated and staying focused. Authors devote a special interest to the fourth and final main theme, concerning; (iv) pain-reduction statements. Hereby the participants stated better coping with pain, and that this was due to having become more purposefully aware of pain sensations. Authors report this is the quite opposite strategy that people usually employ for coping with pain. Authors suggest that increased coping with pain followed beneficial effects of meditation, and that this might relate to increased attention regulation skills. Furthermore, the participants stated to experience distraction from pain, and an increased awareness of pain sensations in their body, all following practice of mindfulness meditation. Considering the latter participants stated that this had given resources, making them able to recognize pain earlier than usual, which in turn had improved their coping with pain. Authors mention this to be in accordance with the rationale of the techniques teached in class.

Authors report the participants had become more introspective, and more aware of their maladaptive coping skills and body neglect of symptoms. Authors report moreover that some of the participants had stated to experience positive changes in self-views, in views of their own limitations due to pain symptoms, and that they experienced to cope better in everyday-life. Authors suggest the positive changes in the participants might be due to changes in cognitive restructuring. Finally, becoming more skilled practicing meditation, some participants reported being fully relieved from pain during exercise.

Study 3. In this successive trial, Morone et al. (2009) compared the MBSR program to a health-educational control group. The aim of the consecutive trial was to detect feasibility of introducing a more rigorous educational control on the target group. By adopting the original study design, the authors wanted further to examine whether previous findings were a consequence of meditation, rather than learning effects. The inclusion criteria were similar to those of the previous trial, and 40 patients were included. The follow-up procedures were improved by including between-group comparisons at 4-months. Similar ratings as the initial trial were included measuring pain, physical function and quality of life, but additional scales of mindfulness and pain-related self-efficacy were also included (Table 1).

Thirty-five out of 40 included patients completed assessments at 8-weeks. The drop-outs were older compared to the completers ($p = 0.003$), which was also the case for the meditation group compared to educational control group ($p = 0.003$). Therefore, age was controlled for in the analyses. Compared to the educational group, the meditation group improved significantly on a quality of life subscale at 8-weeks ($p< .05$). The authors report a possible trend in self-efficacy for meditation group at 4-month follow-up. The differences between the groups did nevertheless not reach statistical significance, which also the case for all other findings. At follow-up, at least minimal improvement in symptoms was reported by 81 % from meditation group, in contrast to 67 % in education control, and 88 % of the meditation group continued to practice formal meditation. At 8-weeks 80 % of MBSR group completed, and 31 min was spent for meditation on overall. Class-attendance averaged 7. 5 out of 8 sessions, compared to 7. 1 in education control program.

Study 4. McBee et al. (2004) conducted a 10 week pre-post modified MBSR design on 14 nursing-home residents with chronic pain. The aim of the study was to detect whether MBSR treatment could reduce pain and increase positive feelings. Inclusion criteria were being able to follow instructions from staff, and being willing to try out new techniques.

Outcome ratings included interviews, before and after each of the 10 weekly sessions, with two questions for life satisfaction and pain (Table 1). No follow-up ratings were included. The MBSR treatment was described as a 10-week Relaxation Group, modified from the early work of Kabat-Zinn (1982). The intervention comprised only ongoing group therapy sessions, due to time-constraints in the setting, and functional limitations of the residents. Each of the 10 group-sessions was limited to 60 min on a weekly basis, including modified meditation, relaxation, guided imagery, and body awareness techniques. No full-day retreat was included.

According to the authors, most of the 14 included residents followed group sessions at least once, resulting in a total of 71 resident encounters. Outcome reports show that the residents reported feeling significantly less sad ($p < .001$) on scales for life satisfaction. Although scores on the pain-scales did not reach statistical significance, a trend is reported towards feeling less pain ($p = 0.094$). Authors report the residents continued to beneficially use meditation techniques outside the Relaxation Group. Class-attendance at 10-weeks averaged 5 out of 10 sessions.

Study 5. The more recent open trial by Ernst et al. (2008) initiated adapted MBSR on 15 nursing-home residents, compared to seven untreated residents in a non-randomized comparison group. The aim of the trial was to detect both feasibility and possible effects on nursing home residents in Germany. To be qualified for the study all residents had to show a minimum cognitive functioning, an ability to follow instructions from health personnel, and signing informed consent. Assessments included pre- and post 8-week ratings for both groups on outcomes for depression, feelings of sadness and pain, activity of daily living, cognitive functioning, and quality of life for both mental and physical health (Table 1). Semi-structured 8-week interviews measured study feasibility. No follow-up was included. Adjustments of the MBSR protocol meant reducing individual homework assignments with no time-constraints.

The group sessions were time-limited to 90 minutes, and formal mindfulness practice included less strenuous physical exercises. The full-day retreat was excluded.

Nine out of 15 meditators completed MBSR treatment at 8-weeks. The drop-out residents did not differ significantly from the completers, otherwise than being older ($p = 0.008$). The latter was also the case for the untreated ($p = 0.004$) subjects, additionally having more major complaints ($p = 0.042$), as compared to MBSR group completers. Meditation group improved significantly in quality of life subscale physical health ($p = 0.017$), compared to a worsening found in the comparison group. Following depression scores, meditation group had a significantly decrease in symptoms both within group ($p = 0.04$), and as compared to comparison group ($p = 0.011$) at 8-weeks. Both groups improved in a quality of life subscale mental health, reaching nearly significance for the comparison group ($p = 0.063$). The control group showed a significant decrease in major complaints ($p = 0.011$), whereas the meditators showed a slight worsening. No other outcome ratings for any other scale reached significance. The structured interviews showed that 53. 3 % completers in MBSR condition were satisfied with the course. None of the meditators took part in the individual assignments, stating these to be a challenge. The group sessions was reported most beneficial, the least when the teacher talked. At 8-weeks, 87. 5 % of completers had attended all classes.

DBT treatment for depression co-morbid with personality disorders

Two consecutive controlled DBT trials were found targeting older adults with depression. The initial trial addressed chronically depressed older adults, using modified DBT group therapy (Lynch et al., 2003). The more recent trial conducted standard DBT treatment on depressed with co-morbid personality disorders (Lynch et al., 2007a).

Study 6. The first controlled trial compared modified DBT group therapy with a medication control on 36 eligible subjects, 60 years or older, with (unipolar) major depressive disorder (MDD; Lynch et al., 2003). 28 weeks of medication and clinical management (MED)

were administered either alone, or added with 2 hrs weekly DBT skills-training group therapy plus half-hour scheduled sessions of telephone coaching (MED+DBT). Authors mention this is the first controlled trial on older adults aiming to detect feasibility and effects of anti-depressant medication with group psychotherapy. The subjects had to be at least 60 years, showing more than mild depressive symptoms on both Beck Depression Inventory (BDI; ≥18) and Hamilton Rating Scale for Depression (Ham-D; ≥19), and satisfy diagnostic criteria for a current episode of MDD. Exclusion criteria meant currently following ECT treatment, having diagnostic bipolar disorder, psychotic symptoms or signs of cognitive impairment.

Outcome assessments included self-reported depression (BDI), hopelessness, thought-suppression, emotional ambivalence, and ratings of personality- and coping style. Symptoms of depression were also rated in interviews (Ham-D). All rating scales are presented in Table 1. Remission rates included both BDI (≤9) - and Ham-D (≤7) criteria. Times for assessment included pre and post 28-weeks, with additional 6-months follow-up.

At 28-weeks, thirty-four out of 36 patients had completed the intervention, one had dropped out and one was excluded for bipolar disorder. No group x time interactions was found significant for depressive symptoms, and the effect-sizes were small at 28-weeks (BDI: *d* .14; Ham-D: *d* .39). Not reporting statistical reliability of change scores, only DBT group significantly improved in self-reported depression at 28-weeks, with maintained effects at follow-up. Within-subjects comparisons for the interviews (Ham-D) showed that both groups significantly decreased depression scores at 28-week, with maintained effects at follow-up. There were no significant between-group differences in depressive symptoms at follow-up.

Analysing remission rates by the Ham-D criterion (≤7), 71 % of the DBT group were in remission from depression at 28-weeks, as compared to 47 % of MED group. On the BDI-criterion (≤9) the difference was less predominant (MED+DBT: 50 %; MED: 42 %).

At follow-up, the groups showed a significant difference ($p < 0.05$) in remission rates, according to the Ham-D criterion, and 75 % of the DBT group had remitted, as compared to only 31 % in MED group. Although not significant, the DBT group had also higher remission rates using the BDI- criterion (MED+DBT: 42 %; MED: 31 %). Only DBT group improved significantly in within-subject comparisons for total coping and sociotropy, but no significant group x time interactions was found. The latter rating scales are reported to predict relative vulnerability to depression (Lynch et al., 2003).

Study 7. The subsequent controlled trial included a standard DBT format with 37 eligible subjects 55 years or older (Lynch et al., 2007a). Authors report that this is the first controlled trial, with the aim to detect feasibility and treatment effects, using depressed older adults with co-morbid personality disorders (PD). Additional targets were to modify standard DBT design, and to develop a new DBT treatment manual for the population, utilizing clinical experience. Similar to the first study, a medication control (MED) was included to detect specific DBT treatment effects in the meditation group (MED+DBT). Additions for this study included an 8-week open standard medication trial (phase I) handing SSRIs to 65 subjects.

Only subjects not responding to SSRIs by remission criterion (Ham-D≤10), were assigned to groups (MED; MED+DBT) and the second phase. The second phase included standard 24-week DBT treatment, individual sessions and additional times for assessment, as compared to the former trial. The structured skills-coaching on the telephone was excluded according to standard DBT protocol. Medication control included clinical management and monthly monitoring, with assessment and adjustment of treatment response, side-effects and medication dosage. Ham-D was rated for both depressive symptoms and remission rates.

Times for assessment included a total of five different times**.** Different from the former study, depressive symptoms included only Ham-D ratings, similar to remission criterion (Ham-≤10). Additional PD scales were also included, using both self-reports and diagnostic

interviews (Table 1). Diagnostic interviews included screening at intake and 24-weeks (post-group). Depression and PD self-reports were rated at all times, including pre- and post 8-week (phase I) and 24-weeks post-group (phase II). Additional ratings included post-treatment (3-months) and 6-months follow-up of post-treatment assessment. Individual DBT sessions was ended at 30-weeks, but medication treatment was uncontrolled at post-group.

Participants had to be at least 55 years, showing elevated depressive symptoms (Ham-D≥14), and at least one personality diagnosed disorder. Only non-responders to SSRIs in the open medication trial were included. Exclusion criteria were similar to the first trial.

All thirty-seven participants completed the 24-week trial. In the open trial, 14 % of sixty-five subjects responded to SSRI treatment (Ham-D≥50 % decrease), 12 % were in remission, and seven subjects (10. 8 %) did not change in depression scores at 8-weeks. In the second phase, no significant difference in depression scores were found between the groups (MED; MED+DBT). Effect-sizes for depression scores showed at best moderate at 24-week post-group (d .049) in favour DBT group, levelling off at follow-up.

Considering remission from depression, both groups showed similar rates, and there were no significant group differences. Although not significant, a trend is reported for quicker DBT group remission at 24-weeks, with no lasting effects at follow-up. Regarding self-reports on PD, DBT group significantly improved on both Interpersonal Sensitivity and Interpersonal Aggression at post-treatment, which was maintained at follow-up. Following diagnostic scales and remission from PD, 16 participants had recovered at post-group, herein seven from MED- and nine subjects from MED+DBT.

Controlling for moderators of treatment responses in the first phase Ham-D scores were found to be affected by relationship status ($p = 0.025$), showing a greater change for the married and the cohabiting. In the second phase, number of medication dosage changes interacted significantly ($p = 0.004$) with Ham-D ratings at 24-weeks.

MBCT treatment for depression relapse prevention

The MBCT trial targeted depression relapse on mildly depressed older adults, and reported qualitative data and pre-post BDI- ratings (Smith, Graham, & Senthinathan, 2007).

Study 8. 38 participants enrolled MBCT courses for depression relapse prevention. The authors aimed to find out if the treatment was suitable for subjects 65 years or older, and to identify adaptation requirements. In accordance with the depression relapse prevention rationale of MBCT, only subjects with at least three previous episodes were admitted. By similar means only subjects at most mildly depressed (BDI≤19) were included, presenting symptoms between episodes. Only non-demented individuals, with no psychotic symptoms were qualified. Medicated (anti-depressants) patients with anxiety co-morbidity and physical pain were included, for the purpose of study realism. Assessments included semi-structured interviews and depression (BDI) self-reports pre- and post treatment (8-weeks), with one year follow-up (Table 1). Both expectations and actual experiences were rated in the interviews. Adaptations from standard MBCT were minimal, following advice from a physiotherapist.

In total thirty out of 38 participants completed MBCT courses at 8-weeks. Half of the 8 drop-outs was due to physical illness, and the rest was not considered to be due to serious adverse effects. No significant characteristics were presented for either completers or drop-outs. Fifteen out of 16 participants reported to continue weekly meditation at follow-up, spending 43 min each day on overall, and being confident to continue further practice. At follow-up, twenty-three out of 25 participants remained mildly depressed, or had improved for symptoms (BDI≤19). Depression mean scores dropped slightly at 8-weeks, declining further at follow-up, suggesting a successive decrease in depressive symptoms, and sustained MBCT effects. At completion, 89. 7 % report MBCT courses to be either “definitely” or “extremely helpful”, hence 48. 3 % report a “major benefit to life”, and additional 41. 4 % reporting “significant improvement” (Smith et al., 2007, p. 349). At follow-up, course

satisfaction had increased to a total of 61. 5 % reporting that the MBCT program had been "extremely helpful" and was "contributing with a major benefit to life"

After identifying meaningful categories from the interviews, themes were extracted out in analysis. The participants stated to improve at post-course and follow-up. Several main themes were found describing the participants' beneficial experiences post-treatment. 6 key-categories concerned: (i) improved awareness, –feeling better and more vividly alive than on "automatic pilot"; (ii) acceptance, –of both self and things that cannot be changed; (iii) more control –over which stimuli attending to, -as well as to one's own emotional reactions, and experiences of; (iv) helpfulness in mindfulness course, -finding group format and provided course material especially helpful practicing skills; (v) better coping, -meaning letting more go of attachments, and attachment to thinking about problems, and finally; (vi) increased breath awareness, – coping better with acute threats or stressors, herein experiencing to have increased reflection before responding.

Additional statements concerned themes of pain experience, relaxation, & calmness – hereby stating to spend less time ruminating, taking things more lightly, getting better along with others, and feeling more energetic. Other statements included better coping of depressive symptoms by handling precursors to depression. The participants stated further to experience reduction of stigma, and more enjoyment of oneself, others and everyday things. Moreover, statements also involved identity change, –including changes in lifestyle and experiencing to relate differently to one self. Authors detail that participants claim this to be validated through feedback from peers. Authors report further that the participants became more assertive, slept better, and some also lost weight. Authors suggest that the participants, following the courses, changed in fundamental ways. The participants stated relating differently to both external and internal stimuli, and that they self believed this followed more awareness in own reactions and changes, attributing changes also to having become more calm, relaxed and accepting.

Discussion

At a general level it is concluded that no review was identified addressing older adults exclusively, and at the same time targeting one or more of the four MBI approaches (MBSR; MBCT; ACT; DBT). Studies focusing exclusively on older adults and psychotherapy effects were generally found to be limited, and were especially the case for MBI studies. Several effect studies were excluded having a sample of both older and younger adults, thus not making any systematically analyses concerning age attainable. MBSR and MBCT trials were identified targeting explicitly older adults, but also including subjects younger than 55 years. Some trials of MBSR effects on older adults were excluded due to the fact that they added other treatment components. The studies that qualified for analyses addressed chronic pain or depression, five MBSR studies for the first and 3 on the latter studying effects of DBT or MBCT treatment. All studies, however, had small samples primarily aiming to pilot feasibility and initial MBI effects. The small sample sizes limit statistical power to detect treatment effects. However, important elements of both feasibility and treatment effects could be detected for older adults.

Effect of MBSR for older adults with chronic pain

There are no previous reviews of MBSR treatment for older adults. However, two meta-analysis' of MBSR studies, among adults in general, report medium effect-sizes, although findings are questioned due to small sample sizes and lack of stringent control procedures (Baer, 2003; Grossman et al., 2004). A meta-analysis of older adults with chronic pain reports medium effects, at post-treatment (*d* .47) and follow-up (*d*. 56), across treatment approaches for self-reported pain-experience (Lunde et al., 2009a). Lunde et al. (2009a) suggest these effect-sizes are similar to the effects on younger adult populations, and thus that older adults with chronic pain may benefit just as much from psychotherapeutic treatment. An abstract report of an MBSR trial, suggest significant effects on the age group using measures

of emotional distress (Baime & Young, *in press*). Furthermore, Lunde and Nordhus (2009b) report clinically significant findings, for pain-acceptance and pain-intensity, following ACT and CBT combination treatment, in a case description of a 70 year old patient.

Of the four MBSR trials covered in this review, only the study by Morone et al. (2008a) reported effect-sizes, which ranged from small to large at 8-weeks. The largest effect-sizes were found to range from nearly moderate for physical functioning to large for pain-acceptance, suggesting beneficial effects from MBSR treatment. However, compared to the findings of the above mentioned meta-analysis on the age group (Lunde et al., 2009a), effect-sizes for pain experience were relatively small in the study. Pain-acceptance scales were not included in the meta-analysis with younger adults, thus making comparisons with the findings of Morone et al. (2008a) not attainable.

Measures of pain-acceptance may predict better coping with pain, through increased acceptance of pain and engagement in daily activities (Karp, Shega, Morone, & Weiner, 2008). Pain-acceptance ratings have also been found to predict quality of life and emotional functioning among older adults (Butler & Ciarocchi, 2007), and to reliably predict physical, social, and emotional functioning among chronic pain patients, in heterogeneous populations (McCracken & Vowles, 2008). The findings in pain-acceptance might reflect that, compared to other psychotherapeutic treatments, mindfulness- and acceptance-based interventions have different targets and/or mediating effects for chronic pain patients. Pain-acceptance scales might to a larger extent detect acceptance-based effects, emphasized in the treatment rational, as opposed to pain-experience scales. The role of pain acceptance in chronic pain treatment has similarly been addressed elsewhere, referring to possible MBI specific effects (Gardner-Nix, 2009, p. 378; McCracken & Eccleston, 2005; McCracken & Vowles, 2008). It has been suggested that older adults benefit more from pain-acceptance (Butler & Ciarocchi, 2007).

The qualitative reports from the same trial reveal improvements in sleep, attention-regulation and skills, well-being, and better coping of pain, and hence the authors suggest findings to be consistent with the rationale in MBSR treatment (Morone et al., 2008b).

In the second trial by Morone et al. (2009), MBSR treatment proved superior to educational control only on quality of life. The findings show that both groups had beneficial effects on the other measures, which suggests that simply educating older adults in health-related successful aging may be equally effective as MBSR treatment. The authors report that the educational program had in-consistent findings, and that unsystematically effects of a possible biased control condition could explain the poor MBSR effects. However, it might just as well be plausible to assume that the educational program actually proved to have effect, as the program was based on similar procedures and structure as the MBSR treatment, with a relevant curriculum on successful aging. The meditators in both trials by Morone et al. report more or less similar beneficial effects at follow-up, including symptom relief and continued individual practice, suggesting that in the second trial only the control condition had changed.

While the two trials by Morone et al. included community-dwelling older adults, the other two trials of MBSR were conducted with nursing home residents (Ernst et al., 2008; McBee et al., 2004). In the study by Ernst et al. (2008), beneficial effects were found for MBSR group on depressive symptoms, and the physical health component of the quality of life measure. Although the trials with community-dwelling older adults presented significant findings for quality of life, physical health was not among these. In the other trial with nursing home residents, McBee et al. (2004) did not either find significant improvement in pain-scales, but the residents reported significantly reduced feelings of sadness. MBSR group was thus in both trials on nursing-home residents associated with findings in mood-related scales. However, the comparison group in the more recent trial did not compare on client variables.

Moreover, the untreated subjects control improved significantly in other scales, compared to MBSR group, suggesting probably interference of unsystematically effects and in-conclusive findings. However, within-subjects comparisons of meditation group reveal depression scores declined significantly at 8-weeks. No other ratings proved significantly beneficial MBSR effects. These results do not suggest specific MBSR effects on pain-scales for older adults in nursing homes. Some evidence however suggest that residents might improve in mood-scales, which is mentioned to have a role in chronic pain functioning (Lunde et al., 2009a).

Feasibility of MBSR for older adults

Reports of class-attendance, completion rates and individual practice were considered detecting feasibility of the 4 included MBSR trials. The interest for being recruited to this kind of treatment was high for all trials. Findings from different MBSR studies will be presented first, to provide a background for discussing the reviewed studies.

Kabat-Zinn (1988) addressed feasibility of MBSR, finding average completion rates of 76 %, with additional 15 % drop-outs in heterogeneous populations (as cited in Baer, 2003). These completion rates are reported to be consistent with findings in a recent MBSR trial (Rosenzweig et al., 2010). Interestingly, Kabat-Zinn (1988) found that chronic pain patients, such as patients with chronic lower-back pain, had the lowest completion (Baer, 2003). Morone and Greco (2007) did a review on older adults above 65 years with CLBP, finding 0 - 43 % drop-outs across 16 different mind-body approaches, suggesting this range to be typical for class-room exercise programs. Baime and Young (*in press*) suggest feasibility completing MBSR treatment on older adults, finding the oldest in sample had highest retention levels. Following 13 MBSR trials Baer (2003) found that patients from an inner city health clinic had lowest completion (60 %), and that pre- medical and medical health students had the highest.

Considering the four included MBSR trials, Morone et al. (2009) had the highest rates of completion and class-attendance. The initial trial by Morone et al. (2008a) also showed

better completion rates compared to the two other trials. However, the latter mentioned trial had a lower mean average class attendance than the completers in the nursing-home in Germany (Ernst et al., 2008). The nursing-home residents in the former trial had a poor 50 % class attendance (McBee et al., 2004), and the authors did not report data for completion rates.

The nursing-home residents in Germany (study 5) did not follow up on homework meditation assignments, claiming these to be a challenge (Ernst et al., 2008). By contrast, the CLBP meditators in the trials by Morone et al. (2008a; 2009), spent on average 31 min for daily meditation. This latter finding is consistent with highly functioning college students in a study by Astin (1997), and nearly double the amount of practice reported in mixed medical samples (Riebel, 2001; as cited in Baer, 2003). Follow-up reports of the CLBP patients suggest high sustained compliance of individual practice, showing nearly eight out of ten continued meditating in both trials at 3- and 4-months (Morone et al., 2008a; 2009).

MBSR treatment was thus found feasible in both trials for CLBP patients, which is consistent with previous MBSR studies of heterogeneous populations. However, the mentioned findings from Baer (2003) suggest that adherence may vary across the setting and population in study. McBee et al. (2003; 2009) similarly suggest that nursing-homes represent poor conditions for routine treatment. Correcting for drop-outs by reports of reasons not due to intervention, the residents in study 5 had the highest completion rates (87 %), thus suggesting feasibility for MBSR completion.

Effect of DBT and MBCT for depression in older adults

No previous review was found targeting exclusively older adults in DBT or MBCT treatment. No other DBT study was found using medication control or including Axis II disorders. No DBT study was either found targeting neither exclusively older adults nor major depression, regardless of age. These findings limit the ability to interprete findings on specific elements of age, comparison condition, and target condition using DBT treatment.

The reviewed DBT trials suggest small to moderate effect sizes immediately after ended treatment, for depressed older adults with or without co-morbid PD (Lynch et al., 2003; Lynch et al., 2007a). One review of DBT treatment found on overall moderate effects of 13 trials, using different control conditions and populations (Øst, 2008), suggesting more or less consistent findings in the trials by Lynch et al. The findings also suggest that combined DBT and SSRI treatment was at least as effective as SSRIs alone, treating major depression on older adults. Interestingly, in the first trial significantly more patients were recovering from depression in the DBT group, compared to SSRIs alone. In contrast, a review on older adults found that psychotherapy did neither influence symptoms nor remission differently from SSRIs on major depression (Pinquart et al., 2006). A different meta-analysis found SSRIs only slightly beneficial on adults, and that psychotherapy is a good alternative, due to adverse side-effects of medication and less drop-out from treatment. Lynch et al. (2003) refer to studies showing that 10 - 30 % of depressed adults do not respond to anti-depressants or psychotherapy, alone, and that combination treatment is more effective.

Mentioned results suggest clinically significant findings for the DBT group, and that patients with major depression receiving SSRIs might benefit more from additional DBT group therapy. A trend for quicker remission (post-group) might suggest that the depressed older adults with co-morbid PD (Lynch et al., 2007a) also had immediate beneficial effects of SSRIs added with DBT. The findings in both trials seem to indicate potential beneficial effects of DBT, which should be tested in larger trials. Lynch et al. (2003) stress that the majority of the MDD patients had experienced at least 8 previous episodes, and had an early onset before 30 years. All patients had co-morbid medical conditions. This strengthens the ability to generalize results to older adults with chronic depression, with somatic and psychological co-morbidities.

Findings in the initial trial included beneficial effects for DBT group also for coping and personality style. Authors mention that low levels of sociotropy predict increase in depressive symptoms and relapse of depression, and that high levels show less vulnerability in inter-personal relations (Lynch et al., 2003). The findings in total coping are mentioned to be consistent with the rationale of DBT skills. Diagnostic ratings in the last trial (Lynch et al., 2007a) show that 16 out 45 patients recovered from PD by more or less similar rates in both treatment conditions. However, only DBT group decreased personality disorder subscales significantly, which suggest some additional benefits of DBT in areas of PD.

In contrast with the DBT trials, the MBCT study addressed older adults between episodes of major depression (Smith et al., 2007). Only three patients experienced depressive episodes during the year at follow-up, which suggests that older adults could have beneficial effects following the 8-week program. These findings suggest older adults might benefit just as much from MBCT treatment as other age groups, with only minimal adaptations (Smith et al., 2007). The MBCT trial was primarily a feasibility study, targeting to detect adaptation requirements for future research. However, the findings also indicate clinical relevance and utility for older adults. In fact, compared to a previous trial of MBCT with adults (Ma & Teasdale, 2004), the benefits of MBCT seemed to be even larger for older adults. Thus these results show promise, which should be examined further in larger controlled trials. A recent MBCT trial support beneficial effects on older adults, showing significant reductions in both mood-related and mindfulness scales (Splevins et al., 2009). However, the latter trial was not included among the reviewed trials, not exclusively targeting people at least 55 years.

Feasibility of DBT and MBCT for older adults

Both DBT and MBCT studies targeted older adults with depression. Authors suggest feasibility of both modified DBT group therapy (Lynch et al., 2003) and standard DBT format (Lynch et al., 2007a), similarly to reports using adapted MBCT treatment (Smith et al., 2007).

Only one patient dropped out from the DBT groups in both trials. By contrast, nearly one fourth of the 65 patients dropped out from the open medication phase (study 7). Both DBT trials were found to have the lowest drop-outs across 13 controlled trials, using DBT treatment on heterogeneous populations (Øst, 2008). No other DBT study was found targeting older adults. The latter findings suggest compliance and feasibility of study on older adults.

Following 38 patients in three MBCT courses, eight dropped out at post-group giving retention of 79 %. Smith (2004) report that drop-out rates typically average 25 % in MBCT courses on older adults. Two MBCT trials on heterogeneous samples show remarkably high completion (Ma & Teasdale, 2004; Teasdale et al., 2000), suggesting that the older adults in the reviewed trial had a poor retention. However, four drop-outs reported that this was due to physical illness, which may allow for corrections to 89. 5 %, and this rate are considered acceptable. Individual meditation practice showed high compliance on overall, higher than the MBSR trials on older adults (study 1 and 3). In contrast to the shorter sessions in the reviewed MBSR trials, the MBCT trial was conducted with standard 2 hrs sessions, nevertheless showing higher completion at 8-weeks. Mentioned results suggest feasibility for older adults, using minimal adjustments to standard MBCT protocol.

No class-attendance rates were recorded in the reviewed MBCT trial. A different MBCT study on older adults showed a high rate of class-attendance (Splevins et al., 2009). This is consistent with adherence in the included MBSR trials (study 1 and 3), although the trial was excluded from the review due to inclusion of subjects younger than 55 years. Mentioned findings suggest that both DBT and MBCT treatment are feasible for older adults.

Design and methodological limitations

All the included MBI studies had small samples, which reduces statistical power, and the ability to detect specific treatment effects. According to Cohen (1977), each sample need to include at least 33 participants, in order to have an 80 % chance in detecting medium-to-

large effects (as cited in Baer, 2003, p. 138). This means that all included studies had limited capacity to capture potential treatment-effects, thus reducing the reliability of the findings.

The participants across all trials were mostly white and females, which limits the ability to generalize findings across race and gender. Nearly all studies involved self-recrution, which limits the control over unspecific client variables (*e.g.* social desirability bias) in the samples. Moreover, one open trial was limited by self-selection to groups, which potentially biases the validity of study results. Only Study 4 did not include standardized screening for cognitive impairment, though reported to rate pre-post outcomes from each of the sessions to preclude this from influencing data. McBee (2009) notes that 1 out of 5 older adults above 80 suffer from dementia worldwide. McBee et al.(2004) included the oldest participants in all eight trials, with a sample mean of 85 years. Not including standardized screening for cognitive impairment limits control for unspecific client variables, and might limit ability to generalize findings. No stringent inclusion criteria might conversely increase the ecological validity of findings, if the sample represent nursing-home residents in general.

Other possible limitations concern lack of control for attention- and educational effects, and non-specific elements of facilitator-effects and group-support. Only the DBT trials controlled for medication effects, and only an MBSR trial included an attention and educational control. Two MBSR or MBCT studies addressed expectancy effects. The trial by Morone et al. (2009) balanced time and amount of therapist contact between the treatment and control groups, by implementing an educational control, and stressed additional learning effects. Similar expectancy effects were found in both groups. Groups in the controlled MBSR trials were quite balanced by medication type. However, medication was not controlled for, neither for usage nor interaction effects with MBSR treatment, which was a focus in DBT trials, and strengthens the latter designs. The open MBSR trials did not include follow-ups. The first controlled trial crossed over the control subjects to MBSR condition at

8-weeks, being thus unable to detect between-group differences at follow-up. The latter issues limit the ability to detect long-term effects and possible regression to the mean.

MBSR trials. Study adaptations were made mainly referring to standard MBSR and curriculum by Kabat-Zinn (1990; as cited in Ernst et al., 2008; Morone et al., 2008a; 2008b; 2009). Similar adjustments were made including 90 min group sessions, exclusion of the yoga-component and the full-day retreat. McBee et al. (2004) modified a time-limited and short-term design by Kabat-Zinn (1982), excluding individual practice, using less strenuous group-skills and time-constraints also for the yoga-component. Ernst et al. (2008) adjusted individual practice without time-constraints. The residents in the latter trials did not practice individual meditation, which is suggested to be an important MBSR element (Rosenzweig, et al., 2009). Problematic issues for MBSR protocol adaptations in particular concern the latter trials, in which important components were left out or modified. This may reduce the ability to detect standard MBSR effects, questioning both validity and reliability of findings.

All MBSR trials presented with different control conditions (Table 1). The wait-list in the initial controlled trial cannot account for attention- and facilitator group-effects, but this concern was improved with an active control in the subsequent trial. The open trials did not include a randomized sample which cannot address specific MBSR interaction effects. The open trials included participants from the oldest segment, qualifying by minimal criteria. This age group is mentioned to have a higher risk for cognitive impairment and physical disability (Lunde et al., 2009a; McBee, 2009). Limited control over participant demographics may reduce ability to interprete specific MBSR effects, but this does not preclude results from having possible clinical relevance. As previously mentioned, Woods and Lamers (2010) suggest severe functioning is often age-related but not age-specific, and that different levels of functioning, regardless of age, do not preclude potential effects of psychotherapy treatment.

McBee et al. (2004) followed a probably homogenous group (N = 14) of mainly white (n = 13) Jewish (n = 12) female (n = 13) nursing-home residents, thus reducing ability to generalise results to non-Jewish residents across gender and race. However, the residents served as their own control, which may bee a good option of design, considering the inclusion of a small sample and limited control over client variables. In the study by Ernst et al. (2008) the comparison group had a higher need for nursing, scored significantly higher on major complaints, and was significantly older than the MBSR group at intake. The drop-outs were also older than MBSR group. Thus groups were probably not comparable.

The findings in the initial controlled MBSR trial may not generalize across race, relational status and educational level, including mainly married well-educated whites. The drop-outs were more educated, potentially limiting the validity of results. In the consecutive MBSR trial, the sample consisted of high-educated religious females, which raises questions about the reliability, as in the former trial. The drop-outs were significantly older than the completers, also being the case for the latter group as compared to educational control. Thus age-effects might bias validity of results.

All MBSR trials preclude to measure levels of chronic pain functioning. Findings from diary entries (Morone et al., 2008b) did not result in additional ratings on depression and sleep, in the more recent trial on CLBP (Morone et al., 2009). The study by Ernst et al. (2008) addressed geriatric depression and proper quality of life scales, but the study by McBee et al. (2004) missed out to assess several important areas of chronic pain functioning.

In the controlled trials, pain-acceptance (Morone et al., 2008a) and mindfulness scales (Morone et al., 2009) were among others included. The latter scales remained high at intake, and throughout assessments. The authors question if older adults might be more mindful. These scales are not validated on older adults, which may limit ability to interprete possible age-related effects, being also the case for pain-acceptance in the initial trial. Possible ceiling-

effects are reported on the disability-scales, which may show limited in sensitivity. On the contrary the quality of life scales are validated on the age-group, and possible clinically important differences are reported for physical function in the first controlled trial. However, similar to the pain-acceptance scales, this measure was not reported in the consecutive trial, being unable to detect replicated findings. Nevertheless, the pain self-efficacy scales had a statistical trend in the last controlled trial, measuring pain-acceptance issues.

Considerations in the last section may illustrate the pilot nature and rationale for implementing different scales across the controlled trials. However, implementing different control conditions and rating scales across the controlled trials makes interpretation difficult. It remains unclear whether large pain-acceptance effects in the first trial could be replicated in an educational control, and whether poor effects in the last trial were due to a more rigid active control. The mentioned issues regard methodological shortcomings, and thus make the interpretation of findings difficult.

Future MBSR trials on older adults should include larger samples to prevent risk for false negatives (Type II error). A cut-off should be considered on ratings showing ceiling effects on older adults based on normative data. Alternative mindfulness scales such as The Kentucky Inventory of Mindfulness Scales (KIMS) might be beneficially implemented on older adults, as the scale has been suggested to be proper for rating areas of the construct mindfulness and mindfulness-based changes (Splevins et al., 2009). Successive trials should consider not including different control conditions and ratings at the same time.

Different levels of functioning should be addressed when measuring chronic pain conditions, and mood-ratings should also be included. Different findings across MBSR trials on chronic pain could reflect different areas on the construct mindfulness, and similar ratings should be considered. Mood-ratings such as The Depression, Anxiety and Stress Scales (DASS-21) and Profile of Mood Scales (POMS-SF) have been beneficially implemented on

older adults in mindfulness studies (Splevins et al., 2009; Baime & Young, *in press*), and the latter scales have been used on chronic pain conditions (Kabat-Zinn et al., 1985).

DBT and MBCT trials. The MBCT trial adopted the original format from Segal and Colleagues (2002), with minimal adaptations advised by physiotherapist. Study adaptations from standard DBT protocol involved the initial trial, referring to manualized curriculum from Linehan (1993; as cited in Lynch et al., 2003). Based on previous modifications to late-life depression (Lynch et al., 2000), authors report including a different format of 28-week group therapy and structured telephone coaching. No individual sessions were included. Adaptations from standard DBT mainly included extensions of group sessions (24-week) and regular skills-coaching on the telephone. All four modules were addressed covering each twice at 14-weeks, following similar structure. Standard DBT treatment targets BPD patients, with a rationale from the biosocial theory (Lynch et al., 2000). It is not clear whether standard DBT treatment is appropriate for depressed older adults, and it is difficult to address standard DBT effects in a modified group format (Lynch et al., 2003). Although the last trial adopted a standard format, it is difficult to conclude that effects were due to DBT elements, targeting PD patients not only from Cluster B, and co-morbid depression. This has been debated elsewhere (Cheavens, Lynch, Smoski, 2007; Van Alphen, Tummers, & Derksen, 2007).

Both DBT trials included medication control, but did not address asymmetric therapist contact, or possible effects of attention and group-support in DBT group. In contrast Ernst el al. (2008) mention isolated older adults may benefit solely from safety and belongingness in a group. Mentioned concerns increase risk for false positives, making the Type I error, thus in this case interpreting findings due to specific treatment effects. The last DBT trial included only non-responders to SSRIs. This reduces ability to generalize DBT effects to account for SSRI responders in the population with co-morbid PD. Expectancy effects were only recorded

in the MBCT trial, but no interaction effects of these were addressed in the pre-post design. No randomization to groups reduces ability to generalise findings to the population in study.

In the initial DBT trial the sample consisted of mainly white females. The other trial was limited by including Whites with high incomes and education. Thus it is difficult to interprete and generalise findings across race, gender and socio-economical status. In the MBCT trial only patients with proper depression levels and a minimum cognitive functioning were included. Even though co-morbid patients might increase ecological validity, only minimal participant demographics were presented and mainly females were included. Depression chronicity was neither addressed, as emphasized in the former MBCT trials (Ma & Teasdale, 2004; Teasdale et al., 2000). No reports were given concerning age at initial onset, number of previous episodes or significant life events. This was a focus in the latter trials, finding MBCT in particular effective for 4 previous depressive episodes, and less effective for episodes following significant life events. Grace (2003) suggests that early onset in old age increase risk for depression relapse, suggesting differences in aetiology and symptoms (as cited in Smith et al., 2007). Lynch et al. (2003) mention that number of episodes might relate to late-life depression chronicity. Although the MBCT trial was a qualitative feasibility study, important areas of late-life depression were left out. Lynch et al. (2003) mention 60 % experience relapse the first year without anti-depressant medication. Future MBCT trials on this population should also consider implementing a medication control, to differentiate anti-depressants effects.

DBT group had superior clinician rated remission rates in the first study, differently targeting current states of major depression. Thus DBT might prove to be a good alternative within episodes. DBT group also had more self-reported symptom reduction, but significant group differences were not found in the analyses. It is also difficult to separate DBT elements

from other psychological factors, not including an active control, thus results might not show to be replicated in large controlled trials.

A range of problematic issues arise assessing depressed older adults with PD co-morbidity. Gum and Cheavens (2008) suggest that depression might both mask and trigger PD responses, stressing differential diagnostic concerns. Diagnostic scales for depression were not recorded, and no measure scales were validated on older adults. It is thus not clear whether the last DBT trial treated depression or Axis II disorders, providing diagnostic reports only for PD. Gum and Cheavans (2008) stress that differential diagnosis is especially difficult for chronically depressed, and depression within episodes. The last DBT trial did not address these issues, and the initial trial may conversely have treated depressed with co-morbid PD not reporting to exclude this group from treatment. Older adults respond differently on PD symptoms compared to younger depressed with co-morbid PD, regardless of Axis-II severity (Gum & Cheavens, 2008). The included diagnostic PD scales has not been validated on older adults, which might also question the diagnostic validity of participants in the last DBT trial. Mentioned limitations also address outcome ratings assessed in PD areas. Qualitative reports were also missing, considering the descriptive pilot nature of these small trials.

Both the MBCT and the DBT trials aimed to detect feasibility of pioneering different targets on older adults, and findings may be regarded more descriptive. However, preliminary findings from these trials suggest promising treatment effects. Findings from the MBCT trial should be replicated in larger trials. Similarly, it is yet to be seen whether the high remission rates in the initial DBT trial could be replicated in a larger trial, and moreover if the chronically depressed could benefit from a standard DBT format using similar ratings. These issues could not be addressed in the subsequent trial, targeting a different population. Linehan (1993) presumably mention individual sessions as a necessary supplement (as cited in Lynch et al., 2003), which has not yet been tested with on chronically depressed older adults.

Conclusion

So far, mindfulness- and acceptance based interventions have been mainly applied to treating chronic pain and depression in older adults. The reviewed studies suggest that MBI may be suitable and a beneficial treatment approach for the patient groups. All MBSR, DBT, and MBCT trials showed beneficial effects for older adults, with depressive- or chronic pain conditions. MBSR treatment seems to improve pain acceptance, quality of life, and physical functioning, and reduce depression. These findings are consistent with different levels of chronic pain functioning. Qualitative participant reports reveal possible additional effects for sleep and attention. DBT in combination with SSRIs may have beneficial effects on depression remission rates for chronically depressed older adults. For preventing depression relapse, MBCT may be at least equally effective for older adults as for younger adults.

All included MBI approaches were also found feasible for older adults. In fact, the age group showed high interest, retention, and compliance to all programs, showing on overall similar levels as younger patients in other trials. No comprehensive adaptations were found necessary, but some evidence suggests that further adjustments might be required for nursing-home residents.

MBI have been suggested to differ in targets and strategies from traditional psychotherapy, emphasizing acceptance, mindfulness and dialectical change issues. It is not clear how, exactly, MBI provide beneficial effects, and if these effects differ from those in traditional psychotherapy. Mindfulness as a construct, including its targets and effects, has not been sufficiently defined and operationalized in research literature, which complicates the measurement of effects and implications of treatment (Baer, 2003; Bishop, 2002). This might also partly explain the inconclusive findings in mindfulness scales, in one of the reviewed MBSR studies. It is neither clear how MBSR improves pain, with reference to large effects in pain-acceptance scales, but only small effects in additional pain ratings.

Overall, the findings thus suggest beneficial effects of MBI for older adults. The reviewed trials were, however, limited by design and methodological issues. Well-designed, larger trials are needed to replicate the findings, across different settings, conditions, and participant demographics. Future research should also strive to operationalize important elements in the mindfulness- and acceptance-based approaches, to make it easier to interprete and replicate the effects in research and in clinical practice. Until then, MBI studies in this review suggest promising effects and clinical relevance for older adults.

References

Allen, M., Bromley, A., Kuyken, W., & Sonnenberg, S. J. (2009). Participants` Experiences of Mindfulness-Based Cognitive Therapy: "It Changed Me in Just about Every Way Possible". *Behavioral and Cognitive Psychotherapy, 37*, 413-430.

Angeli, E., Wagner, J., Lawrick, E., Moore, K., Anderson, M., Soderland, L., & Brizee, A. (2010, Oct 10). *General Format.*, from http://owl.english.purdue.edu/owl/resource/560/01/

Astin, J. A. (2004). Mind-Body Therapies for the Management of Pain. *Clinical Journal of Pain, 20*(1), 27-32.

Baer, R. A. (2003). Mindfulness Training as a Clinical Intervention: A Conceptual and Empricial Review. *Clinical Psychology: Science and Practice, 10*(2), 125-143.

Baer, R. A. (Ed.). (2006). *Mindfulness-Based Treatment Approaches: Clinician`s Guide to Evidence Base and Applications*. San Diego, California: Elsevier/Academic Press publications.

Baime, M., & Young, L. (in press). Mindfulness-Based Stress Reduction Decreases Psychological Distress in Older Adults [Abstract]. *Annals of Behavioral Medicine, 2008 Annual Meeting Supplement, 35*, pp 103.

Bishop, S. R. (2002). What Do We Really Know About Mindfulness-Based Stress Reduction? *Psychosomatic Medicine, 64*, 71-84.

Butler, J., & Ciarocchi, J. (2007). Psychological Acceptance and Quality of Life in the Elderly. *Qual Life Res, 16*, 607-615.

Carr, A., & McNulty, M. (Ed.). (2010). *The Handbook of Adult Clinical Psychology: An Evidence-Based Practice Approach*. New York, NY: Routledge: Taylor & Francis Group.

Cheavens, J. S., Lynch, T. R., & Smoski, M. J. (2007). Response to the van Alphen *et al*. `Reaction to "Treatment of Older Adults With Co-morbid Personality Disorder and Depression: A Dialectical Behavior Therapy Approach". *Int J Geriatr Psychiatry, 22*, 701-703. Retrieved from www.interscience.wiley.com doi:10.002/gps.1843

Coelho, H. F., Canter, P. H., & Ernst, E. (2007). Mindfulness-Based Cognitive Therapy: Evaluating Current Evidence and Informing Future Research. *Journal of Consulting and Clinical Psychology, 75*(6), 1000-1005.

Cuijpers, P., van Straten, A., Smit, F., & Andersson, G. (2009). Is Psychotherapy for Depression Equally Effective in Younger and Older Adults? A Meta-Regression Analysis. *International Psychogeriatrics, 21*(1), 16-24.

Cuijpers, P., van Straten, A., van Oppen, P., & Andersson, G. (2008). Are Psychological and Pharmacologic Interventions Equally Effective in the Treatment of Adult Depressive Disorders? A Meta-Analysis of Comparative Studies. *Journal of Clinical Psychology, 69*, 1675-1685.

Ernst, S., Welke, J., Heintze, C., Gabriel, R., Zöllner, A., Kiehne, S.,...Esch, T. (2008). Effects of Mindfulness-Based Stress Reduction on Quality of Life in Nursing Home Residents: A Feasibility Study. *Forschende Komplementärmedizin, 15*, 74-81.

Gardner-Nix, J. (2009). Mindfulness-Based Stress-Reduction for Chronic Pain Management. In F. Didonna (Ed.), *Clinical Handbook of Mindfulness* (pp. 369-381). New York, NY: Springer.

Germer, C. K. (2005). Mindfulness: What is it? What Does It Matter? In C. K. Germer, Siegel, R. D., & Fulton, P. R. (Ed.), *Mindfulness and Psychotherapy*. New York: The Guilford Press.

Grossman, P., Niewmann, L., Schmidt, S., & Walach, H. (2004). Mindfulness-Based Stress Reduction and Health Benefits: A Meta-Analysis. *Journal of Psychosomatic Research, 57,* 35-43.

Gum, A. M., & Cheavens, J. A. (2008). Psychiatric Comorbidity and Depression in Older Adults. *Current Psychiatry Reports, 10,* 23-29.

Hayes, S. C. (2004). Acceptance and Commitment Therapy and the New Behavior Therapies: Mindfulness, Acceptance and Relationship. In S. C. Hayes, Folette, V. M., & Linehan, M. M. (Ed.), *Mindfulness and Acceptance: Expanding the Cognitive-Behavioral Tradition* (pp. 1-29). New York, NY: Guilford Publications.

Hofmann, S. G. (2008). Acceptance and Commitment Therapy: New Wave or Morita Therapy? *Clin Psychol Sci Prac, 15,* 280-285.

Hofmann, S. G., & Asmundson, G. J. G. (2008). Acceptance and Mindfulness-Based Therapy: New Wave or old hat? *Clinical Psychology Review, 28,* 1-16.

Hunot, V., Moore, T. H. M., Caldwell, D., Davies, P., Jones, H., Lewis, G., & Churchill, R. (2010). Mindfulness-Based "Third Wave" Cognitive and Behavioural Therapies Versus Other Psychological Therapies for Depression. *The Cochrane Library: Cochrane Database for Systematic Reviews,* (9), 1-17. Retrieved from www.thecochranelibrary.com doi:10.1002/14651858.CD008704

Hunt, M. (2007). Borderline Personality Disorder Across Life Span. *Journal of Women & Aging, 19*(1), 173-191.

Johnston, M., Foster, M., Shennan, J., & Johnson, A. (2010). The Effectiveness of an Acceptance and Commitment Therapy Self-help Intervention for Chronic Pain. *Clinical Journal of Pain, 26*(5), 393-402.

Kabat-Zinn, J. (2003). Mindfulness-Based Stress Reduction (MBSR). *Constructivism in the Human Sciences, 8*(2), 73-107.

Kabat-Zinn, J. (2004). *Full Catastrophe Living: How to Cope With Stress, Pain and Ilness Using Mindfulness Meditation* (2 ed.). London: Piatkus.

Kabat-Zinn, J. (2008). *Wherever You Go, There You Are: Mindfulness Meditation for Everyday Life*. London: Piatkus Books.

Kabat-Zinn, J., Lipworth, L., & Burney, R. (1985). The Clinical Use of Mindfulness Meditation for the Self-Regulation of Chronic Pain. *Journal of Behavioral Medicine, 8*(2), 163-190.

Karp, J. F., Shega, J. W., Morone, N. E., & Weiner, D. K. (2008). Advances in Understanding the Mechanisms and Management of Persistent Pain in Older Adults. *British Journal of Anaesthesia, 101*(1), 111-120.

Laidlaw, K., Davidson, K., Toner, H., Jackson, G., Clark, S., Law, K.,...Cross, S. (2008). A Randomized Controlled Trial of Cognitive Behaviour Therapy vs Treatment as Usual in the Treatment of Mild to Moderate Late-Life Depression. *Int J Geriatr Psychiatry, 23*, 843-850.

Lau, M. A., & McMain, S. F. (2005). Integrating Mindfulness Meditation With Cognitive and Behavioural Therapies: The Challenge of Combining Acceptance and Change-Based Strategies. *Canadian Journal of Psychiatry, 50*(13).

Lindberg, D. (2005). Integrative Review of Research Related to Meditation, Spirituality and the Elderly. *Geriatric Nursing, 26*(6), 372-377.

Longmore, R. J., & Worell, M. (2007). Do we Need to Challenge Thoughts in Cognitive Behavior Therapy? *Clinical Psychology Review, 27*, 173-187.

Lunde, L.-H., Nordhus, I. H., & Pallesen, S. (2009a). The Effectiveness of Cognitive and Behavioural Treatment of Chronic Pain in the Elderly: A Quantitative Review. *Journal of Clinical Psychology in Medical Settings, 16*, 254-262.

Lunde, L. H., & Nordhus, I. H. (2009b). Combining Acceptance and Commitment Therapy and Cognitive Behavioral Therapy for the Treatment of Chronic Pain in Older Adults. *Clinical Case Studies, 8,* 296-308.

Lynch, T. (2000). Treatment of Elderly Depression With Personality Disorder Comorbidity Using Dialectical Behavior Therapy. *Cognitive and Behavioral Practice, 7*, 468-177.

Lynch, T. R., Cheavens, J. S., Cukrowicz, K. C., Thorp. S. R., Bronner, L., & Beyer, J. (2007a). Treatment of older adults with co-morbid personality disorder and depression: a dialectical behavior therapy approach. *Int J Geriatr Psychiatry, 22*, 131-143.

Lynch, T. R., Morse, J. Q., Mendelson, T., & Robins, C. J. (2003). Dialectical Behavior Therapy for Depressed Older Adults. *Am J Geriatr Psychiatry, 11*, 33-45.

Lynch, T. R., Trost, W. T., Salsman, N., & Linehan, M. M. (2007b). Dialectical Behavioral Therapy for Borderline Personality Disorder. *Annual Review of Clinical Psychology, 3*, 181-205.

Ma, S. H., & Teasdale, J. H. (2004). Mindfulness-Based Cognitive Therapy for Depression: Replication and Exploration of Differential Relapse Prevention Effects. *Journal of Consulting and Clinical Psychology, 72*(1), 34-40.

McBee, L. (2003). Mindfulness Paractice With the Frail Elderly and Their Caregivers. *Topics in Geriatric Rehabilitation, 19*(4), 257-264.

McBee, L. (2008). *Mindfulness-Based Elder Care: Communicating and Embodying Mindfulness for Frail Elders and Their Caregivers*. New York, NY: Springer.

McBee, L. (2009). Mindfulness-Based Elder Care: Communicating Mindfulness to Frail Elders and Their Caregivers. In F. Didonna (Ed.), *Clinical Handbook of Mindfulness* (pp. 431-445). New York, NY: Sprinter.

McBee, L., Westreich, L., & Likourezos, A. (2004). A Psychoeducational Relaxation Group for Pain and Stress Management in the Nursing Home. *Journal of Social Work in Long-Term Care, 3*(1), 15-28.

McCracken, L. M., & Eccleston, C. (2005). A Prospective Study of Acceptance of Pain and Patient Functioning with Chronic Pain. *Pain, 118,* 164-169.

McCracken, L. M., & Vowles, K. E. (2008). A Prospective Analysis of Acceptance of Pain and Values-Based Action in Patients With Chronic Pain. *Health Psychology, 27*(2), 215-220.

McCracken, L. M., Carson, J. W., Eccleston, C., & Keefe, F. J. (2004). Acceptance and Change in the Context of Chronic Pain. *Pain, 109,* 4-7.

McHugh, L., Simpson, A., & Reed, P. (2010). Mindfulness as a Potential Intervention for Stimulus Over-Selectivity in Older Adults. *Research in Developmental Disibilities, 31,* 178-184.

MHA. (2010). Prevalence and Incidents of Depression. *Mental Health America (MHA)* Retrieved 19.09, 2010, from http://www.mentalhealthamerica.net/index.cfm?objectid=C7DF94FF-1372-4D20-C8E34FC0813A5FF9

Morone, N. E., & Greco, C. M. (2007). Mind-Body Interventions for Chronic Pain in Older Adults: A Structured Review. *Pain Medicine, 8*(4), 359-375.

Morone, N. E., Greco, C. M., & Weiner, D. K. (2008a). Mindfulness meditation for the treatment of chronic low back pain in older adults: A randomized controlled pilot study. *Pain, 134,* 310-319.

Morone, N. E., Lynch, C. S., Greco, C. M., Tindle, H. A., & Weiner, D. K. (2008b). "I Felt Like a New Person." The Effects of Mindfulness Meditation on Older Adults With

Chronic Pain: Qualitative Narrative Analysis of Diary Entries. *The Journal of Pain, 9*(9), 841-848.

Morone, N. E., Rollman, B. L., Moore, C. G., Qin, L., & Weiner, D. K. (2009). A Mind-Body Program for Older Adults with Chronic Low Back Pain: Results of a Pilot Study. *Pain Medicine, 10*(8), 1395-1407.

Neacsiu, A. D., Rizvi, S. L., Vitaliano, P. P., Lynch, T. R., & Linehan, M. M. (2010). The Dialectical Behavior Therapy Ways of Coping Checklist: Development and Psychometric Properties. *Journal of Clinical Psychology, 66*(6), 563-582.

NICE. (2010a). Depression: The Treatment and Management of Depression in Adults. *Partial Update of Nice Clinical Guideline 23,* (October 2009). Retrieved from www.nice.org.uk/CG90

NICE. (2010b). Anxiety: Management of Anxiety (Panic Disorder With or Without Agoraphobia and Generalised Anxiety Disorder) in Adults in Primary, Secondary, and Community Care. *Nice Clinical Guideline 22 (Amended),* (April 2007). Retrieved from www.nice.org.uk/CG022NICEguideline

NIMH. (2010). Older Adults: Depression and Suicide Facts (Fact Sheet). *National Institute for Mental Health (NIMH)* Retrieved 19.09, 2010, from http://www.nimh.nih.gov/health/publications/older-adults-depression-and-suicide-facts-fact-sheet/index.shtml

Nordhus, I. H., & Pallesen, S. (2003). Psychological Treatment of Late-Life Anxiety: An Empirical Review. *Journal of Consulting and Clinical Psychology, 71*(4), 643-651.

Pinquart, M., Duberstein, P. R., & Lyness, J. M. (2006). Treatment for Later-Life Depressive Conditions: A Meta-Analytic Comparison of Pharmacotherapy and Psychotherapy. *Am J Geriatr Psychiatry, 163*, 1493-1501.

Rejeski, W. J. (2008). Mindfulness: Reconnecting the Body and Mind in Geriatric Medicine and Gerontology. *The Gerontologist, 48*(2), 135-141.

Rizvi, S. L., & Linehan, M. M. (2001). Dialectical Behavior Therapy for Personality Disorders. *Current Psychiatry Reports, 3*, 64-69.

Roemer, L., & Orsillo, S. M. (2009). *Mindfulness- and Acceptance-Based Behavioral Therapies in Practice*. New York: The Guilford Press.

Rosenzweig, S., Greeson, J. M., Reibel, D. K., Green, J. S., Jasser, S. A., & Beasley, D. (2010). Mindfulness-Based Stress Reduction for Chronic Pain Conditions: Variations in Treatment Outcomes and Role of Home Meditation Practice. *Journal of Psychosomatic Research, 68*, 29-36.

Samuelson, M., Carmody, J., Kabat-Zinn, J., & Bratt, M. A (2007). Mindfulness-Based Stress Reduction in Massachusetts Correctional Facilities. *The Prison Journal, 87*(2), 253-268.

Segal, Z. V., Teasdale, J. D., & Williams, M. G. (2004). Mindfulness-Based Cognitive Therapy. In S. C. Hayes, Follette, V. M., & Linehan, M. M. (Ed.), *Mindfulness and Acceptance* (pp. 45-65). New York, NY: The Guilford Press.

Shapiro, S. L., & Carlson, L. E. (2009). *The Art and Science of Mindfulness: Integrating Mindfulness Into Psychology and the Helping Professions*. Washington, DC: American Psychological Association.

Siegel, D. J. (2007). *The Mindful Brain*. New York, NY: W. W. Norton & Company.

Siegel, R. D., Germer, C. K., & Olendzki, A. (2009). Mindfulness: What is it? Where did it come from? In F. Didonna (Ed.), *Clinical Handbook of Mindfulness* (pp. 17-37). New York, NY: Springer.

Smith, A. (2004). Clinical Uses of Mindfulness Training for Older People. *Behavioral and Cognitive Psychotherapy, 32*, 423-430.

Smith, A. (2006). Mindfulness Training for Older People. In R. A. Baer (Ed.), *Mindfulness-Based Treatment Approaches: Clinicians Guide to Evidence Base and Applications*. San Diego, California: Elsevier /Academic Press.

Smith, A., Graham, L., & Senthinathan, S. (2007). Mindfulness-Based Cognitive Therapy for Recurring Depression in Older Adults: A Qualitative Study. *Aging & Mental Health, 11*(3), 346-357.

Splevins, K., Smith, A., & Simpson, J. (2009). Do Improvements in Emotional Distress Correlate With Becoming More Mindful?: A Study of Older Adults. *Aging & Mental Health, 13*(3), 328-335.

SSB. (2010). Fortsatt høy Befolkningsvekst. Retrieved 20.09.2010, from Statistisk Sentral Byrå http://www.ssb.no/emner/02/03/folkfram/

Stanley, M. A., & Novy, D. M. (2000). Cognitive-Behavior Therapy for Generalized Anxiety in Late-Life: An Evaluative Overview. *Journal of Anxiety Disorders, 14*(2), 191-207.

Stanley, M. A., Wilson, N. L., & Novy, D. M. (2009). Cognitive Behavior Therapy for Generalized Anxiety Disorder Among Older Adults in Primary Care: A Randomized Trial. *301*(14), 1460-1467. Retrieved from http://jama.ama-assn.org/cgi/content/full/301/14/1460 doi:10.1001/jama.2009.458

Teasdale, J. D., Segal, Z. V., Williams, J. M. G., Ridgeway, V. A., Soulsby, J. M., & Lau, M. A. (2000). Prevention of Relapse/Recurrence in Major Depression by Mindfulness-Based Cognitive Therapy. *Journal of Consulting and Clinical Psychology, 68*(4), 615-623.

Thorp, S. R., Ayers, C. R., Nuevo, R., Stoddard, J. A., Sorrell, J. A., & Wetherell, J. A. (2009). Meta-Analysis Comparing Different Behavioral Treatments of Late-Life Anxiety. *American Journal of Geriatric Psychiatry, 17*, 105-115.

Toneatto, T., & Nguyen, L. (2007). Does Mindfulness Meditation Improve Anxiety and Mood Symptoms? A Review of the Controlled Research. *Canadian Journal of Psychiatry*, *52*(4), 260-266.

UCB. (2010). International Data Base. Retrieved 20.09.2010, from U. S. Cencus Bureau http://www.census.gov/ipc/www/idb/groups.php

Van Alphen, S. P. J., Tummers, J. H. A., & Derksen, J. J. L. (2007). Reaction to "Treatment of Older Adults With Co-morbid Personality-Disorder and Depression: A Dialectical Behavior Therapy Approach" *Int J Geriatr Psychiatry*, *22*, 701-703. Retrieved from www.interscience.wiley.com doi:10.002/gps.1844

WD. (2010). Prevalence and Incidence of Depression. *WrongDiagnosis.com (WD)* Retrieved 19.09, 2010, from http://www.wrongdiagnosis.com/d/depression/prevalence.htm?&page=2&total=4

WHO. (2010). Our Ageing World. *World Health Organization* Retrieved 01.10, 2010, from http://www.who.int/ageing/en/

Wicksell, R. K., Melin, L., Lekander, M., & Olsson, G. L. (2009). Evaluating the Effectiveness of Exposure and Acceptance Strategies to Improve Functioning and Quality of Life in Longstanding Pediatric Pain - A Randomized Controlled Trial. *Pain*, *141*, 248-257.

Williams, J. M. G., Russel, I., & Russel, D. (2008). Mindfulness-Based Cognitive Therapy: Future Issues in Current Evidence and Future Research. *Journal of Consulting and Clinical Psychology*, *76*(3), 524-529.

Wilson, K., Mottram, P. G., & Vassilas, C. (2009). Psychotherapeutic Treatments for Older Depressed People (Review) *The Cochrane Library*: The Cochrane Collaboration. John Wiley and Sons.

Woods, B., & Lamers, C. (2010). Psychological Problems of Older People. In A. Carr, & McNulty, M. (Ed.), *The Handbook of Adult Clinical Psychology* (pp. 941-977). London: Routledge: Taylor & Francis Group.

Øst, L. G. (2008). Efficacy of the Third Wave of Behavioral Therapies: A Systematic Review and Meta-Analysis. *Behavior Research and Therapy, 46*, 296-321.

Appendix

Underneath, the study searches are presented for relevant citations and hits for articles. The terms in the sub-sections relates to the terms described in the sections (*e.g.* “mindfulness based stress reduction”; + “older”, “elderly”, “late-life”, “aging”), with related hits in parenthesis (*e.g.* $n = 110$). The total number of articles in phase I ($n = 688$) and phase II ($n = 270$) corresponds to the numbers presented in phase I ($n = 688$) and phase II ($n = 270$) in the study flow diagram in method section (Figure 1). The number of included studies ($n = 7$) from databases searches, are presented in subsection level 2 (phase I) and subsection level 3 (phase II) in the protocol.

Study search protocol

Pubmed/ ISI Web of Science / Psychinfo database citations featuring number of hits

Phase I

1. Mindfulness based stress reduction

    1.1. Older, aging, late life, elderly (*n* = 110)

        1.1.1. Older (*n* = 1), elderly (*n* = 2)

2. Mindfulness based cognitive therapy

    2.1 Older, aging, late life, elderly (*n* = 358)

        2.1.1. Older (*n* = 1)

3. Dialectical Behaviour Therapy

    3.1 Older, aging, late life, elderly (*n* = 109)

        3.1.1. Older (*n* = 2)

4. Acceptance and Commitment Therapy

    4.1 Older, aging, late life, elderly (*n* = 111)

        4.1.1. Older

Phase II

5. Mindfulness

    5.1. Meditation

        5.1.1 Older, aging, late life, elderly (*n* = 270)

            5.1.1.1. Older (*n* = 1)

Phase I: sub-sections level 1 for relevant citation hits (*n* = 688) and level 2 for hits of included studies (*n* = 6)
Phase II: sub-sections level 2 for relevant citation hits (*n* = 270) and level 3 for hits of included studies (*n* = 1)

Last review and update at October, 11, 2010 23: 12 hrs