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A systematic review and narrative synthesis of occupational therapy-led interventions for individuals with anxiety and stress-related disorders

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ABSTRACT

Anxiety and stress-related disorders are highly prevalent and impede participation in life activities. Occupational therapists work extensively with people diagnosed with these disorders but the effectiveness of their interventions is unclear. A systematic search strategy identified 19 papers describing 13 studies. Studies varied in methodology, intervention type and theory-base. The results show the potential for lifestyle approaches, occupational science-based programs and skill-building to improve mental health. The variety of interventions and methodologies of many studies means that the effectiveness of occupational therapy interventions for this population is not yet determined. High quality research is required to replicate interventions with emerging potential for effectiveness.

KEYWORDS

Occupational therapy, anxiety disorders, psychological stress, psychosocial rehabilitation, systematic review

Introduction

Anxiety and stress-related disorders such as post-traumatic stress disorder are the ninth highest cause of disability globally, as measured in years lived with a disability in the Global Burden of Disease Study 2013 (Vos et al., 2015). Some authors suggest this may be an underestimate (Vigo, Thornicroft, & Atun, 2016). These disorders are highly persistent over the lifetime (Kessler et al., 2007) and are associated with significant levels of disability, poor functioning and reduced quality of life. Many domains of daily life functioning are affected in those with anxiety and trauma-related stress, including work and household functioning (Iancu et al., 2014), social functioning (Rodriguez, Bruce, Pagano, & Keller, 2005) and community participation (Buist-Bouwman et al., 2006).

Interventions for anxiety and stress-related disorders have been the focus of several systematic reviews in the fields of pharmacology, psychology and alternative therapies. Evidence for effectiveness of cognitive-behavioral therapy (CBT) has been demonstrated against wait-list control conditions (Hunot, Churchill, Teixeira & Silva de Lima, 2007), as have mindfulness and acceptance-based therapies (Vollestad, Nielsen, & Nielsen, 2012) and exercise (Jayakody, Gunadasa, & Hosker, 2014). A recent meta-analysis showed that medication may be more effective for the treatment of anxiety than psychotherapy (Bandelow et al., 2015). Trauma-focused CBT has some emerging evidence for the specific treatment of PTSD symptoms (Roberts, Kitchiner, Kenardy & Bisson, 2010). Despite their long history of working in mental health settings however, the effectiveness of the work of occupational therapists with this population has not been reviewed systematically.

It is apparent that anxiety and stress-related disorders have a profound influence on individuals' ability to participate to their satisfaction in many activities in daily life and that

routines and time use are also affected. Stress reduces energy and motivation to complete daily activities (Johansson, Eklund, & Erlandsson, 2012) and is related to resilience and adaptive capacity (Lopez, 2011). Therefore, interventions that focus solely on the biochemical or cognitive aspects of anxiety may not improve an individual's participation in life activities. There is some evidence that unsatisfactory participation in activities may be a *predictor* of anxiety and depression. Losing pleasure in activities is a risk factor for future anxiety disorders and the presence of anhedonia in people with anxiety is a risk factor for future co-morbid depression (Winer et al., 2017). In addition, functioning in daily life appears to be independent of symptoms of anxiety (i.e. poor functioning can continue after the recovery of symptoms) (Rodriguez et al., 2005). It is also known that functioning is a greater predictor of health care usage and cost than severity of depressive or anxious symptoms (Twomey, Cieza & Baldwin, 2017). These findings point to a need to develop and evaluate interventions that focus on how individuals participate in daily activities and that address the maintenance and improvement of functioning, as this may protect against relapse for those with anxiety and stress-related disorders and may potentially be more cost-effective.

Enabling satisfying participation in activities of daily life is the core domain of concern of occupational therapists. However, there are few high quality trials and systematic reviews of the effectiveness of occupational therapy interventions in mental health, and there has been a call for an urgent increase in rigorous mental health occupational therapy research to improve the evidence base for the profession (Bannigan & Spring, 2012). Where systematic reviews of the effectiveness of occupational therapy in mental health have been conducted, they have included populations with varying diagnoses. Ikiugu, Nissen, Bellar, Maassen, and Van Peurse (2017) carried out a meta-analysis of randomized-controlled trials of occupational therapy interventions based on the profession's conceptual models for people with mental health diagnoses. This review found a medium effect size for

occupational therapy intervention in improving occupational performance and a small effect on wellbeing. The reviewed studies included populations as heterogeneous as inpatients with schizophrenia, caregivers and patients with dementia and primary care patients with panic disorder. Spencer, Sherman, Nielsen, and Thormodson (2017) reviewed occupational therapy interventions for students with different types of mental illnesses transitioning to higher education, but the quality of the studies found in this review meant that conclusions about effectiveness could not be reached. These reviews add to the evidence-base for mental health occupational therapy practice, but they do not provide evidence for the effectiveness of occupational therapy interventions for people specifically with anxiety and stress-related diagnoses. Given the different etiologies, symptoms and perpetuating factors of mental health conditions (Geddes, Price, & McKnight, 2012), comparing heterogeneous populations may not accurately determine the most effective interventions for each population.

Where occupational therapy-led interventions for individuals with anxiety and stress-related disorders have been researched, they have shown positive results, albeit in small-scale studies, e.g. The Redesigning Daily Occupations program (Eklund & Erlandsson, 2011) and the LAMP intervention for panic disorder (Lambert, Harvey, & Poland, 2007). Given the differing theoretical frameworks underpinning these interventions however, they cannot be meaningfully compared to each other in terms of effectiveness. This review aims to systematically search the literature, evaluate the quality of the research evidence and synthesize this evidence to provide guidance for occupational therapy practice for those with anxiety and stress-related disorders.

Objectives

The first objective of this systematic review was to address the question; “What is the evidence for the effectiveness of occupational therapy interventions in improving functioning and mental health outcomes for individuals with anxiety and stress-related disorders?” Initial literature searches showed that there was likely to be a high degree of heterogeneity between the studies and interventions found, so a second objective was made: “To determine the characteristics of the occupational therapy interventions that have been evaluated as effective in improving outcomes”. A systematic review protocol was prepared (Centre for Reviews and Dissemination, 2009), peer-reviewed and published on the PROSPERO International Prospective Register of Systematic Reviews (Fox, Erlandsson & Shiel, 2015).

Methods

Inclusion/exclusion criteria

The included studies: (a) had individuals over 18 years of age with anxiety and stress-related disorders as defined by categories F40 (Phobic anxiety disorders), F41 (Other anxiety disorders including generalized anxiety disorder and mixed anxiety and depression disorder), F42 (Obsessive-compulsive disorder) and F43 (Reaction to extreme stress and adjustment disorders, including post-traumatic stress disorder) in the ICD-10 (World Health Organization, 1992), (b) measured outcomes relating to functioning in daily activities and/or mental health, and (c) had an intervention defined as occupational therapy, or led/designed/facilitated by an occupational therapist. Quantitative studies of any type published between 1994 and December 2017 were considered.

The studies found required some flexibility in the inclusion/exclusion criteria. First, studies where individuals had a co-morbid diagnosis were included, since anxiety commonly

co-occurs with other conditions (Alonso et al., 2004). Second, a number of studies involved individuals with a variety of mental health diagnoses. These were included if: (a) over 50% of individuals had anxiety disorders, (b) the other diagnoses were mood and/or anxiety disorders, and (c) anxiety or functioning was explicitly measured. The Centre for Reviews and Dissemination (CRD) guidance for undertaking reviews in health care states that in the absence of individual patient data, “it is unlikely that inclusion can be restricted to particular types of participants” (CRD, 2009, p. 8). The Cochrane Handbook states that deciding on inclusion of studies that only “partially address the population of interest can be challenging”. It is recommended that a common-sense strategy is used so that studies can be included that “keep faith with the objectives of the review” (O’Connor, Green & Higgins, 2011, section 5.2).

Search Strategy

The following databases were searched: PUBMED, MEDLINE, EMBASE, Cochrane Library, CINAHL, SCOPUS, OTSeeker, RIAN, ETHOS, and ProQuest Dissertations and Theses. Reference lists of key studies were searched, and authors were contacted for clarification. An example of the search strategy is that used in MEDLINE, using the appropriate MeSH terms: (“adjustment disorders” OR anxiety OR “anxiety disorders” OR “obsessive compulsive disorder” OR phobia OR “phobic disorder” OR “stress disorders, post-traumatic” OR “stress disorders, traumatic” OR “stress disorders, traumatic, acute”) AND “occupational therapy”.

Data Extraction

Search results were imported into Endnote™ software and the initial screening was completed by the first author. Duplicates and records earlier than 1994 were removed. Studies meeting the inclusion criteria were included by the first author and checked by the other authors. Where there was doubt over inclusion, the paper was reviewed independently by at least two authors and in some cases, three authors. This decision-making process was guided by two principles: whether the intervention was led/facilitated/designed by an occupational therapist and whether the population included a sufficient number of individuals with an anxiety or stress-related diagnosis. A data extraction form was developed and used by all authors (CRD, 2009). Data extracted related to participants, treatment, control group (if used), outcomes measured and results. Papers were critically appraised using the tools designed by Law and MacDermid (2014) and Tate et al. (2008), the methodological quality of studies was assessed and each critical appraisal included a comprehensive evaluation of bias within individual studies.

Figure 1. Search strategy

Results

The database searches identified 2968 records and 19 articles met the inclusion criteria. Reasons for study exclusion can be seen in Figure 1. The 19 articles describe 13 individual studies representing a variety of research designs. Four used some form of controlled design (two randomized controlled trials, one non-randomized controlled trial and one cross-over study). The remaining nine used non-controlled designs (before-and-after comparisons or case studies). The included studies evaluated interventions as diverse as driving rehabilitation, nutritional advice and cognitive-behavioral strategies using both standardized and non-standardized assessments.

To meet the research objectives, the results of this systematic review take the form of a realist, narrative synthesis. A realist synthesis attempts to analyze how and why complex interventions work in particular contexts, or with particular populations (Shepperd et al., 2009). The studies were grouped according to the theoretical underpinning of the intervention being studied, as the expected mechanism of change is likely to be similar for interventions with similar theoretical bases (Popay et al., 2006). The effectiveness of occupational therapy interventions for people with anxiety and stress-related disorders will be discussed under five distinct theoretical categories: cognitive-behavioral interventions, health behavior change interventions, skill-building interventions, occupational science-based interventions, and neurological and/or sensory-based interventions.

Table 1. Included studies

Occupational therapy interventions using cognitive-behavioral theory

Three studies evaluated occupational therapy interventions using cognitive-behavioral theory. Kitchiner et al. (2009) reported on a randomized-controlled trial with two treatment conditions: an occupational therapy-led anxiety management group using cognitive-behavioral strategies, relaxation training and goal-setting (n = 24); and a nurse-led “stress control” group which had a psychoeducational approach (n = 25). They also included a waiting list control group (n = 24). The participants all met the DSM-IV criteria for a diagnosis of an anxiety disorder (American Psychological Association, 1994). Two papers evaluated a six-week group intervention using a cross-over design for people with anxiety (Prior, 1998a, 1998b). The group used cognitive strategies, relaxation, psychoeducation and systematic desensitization (n = 37). Finally, Kohn, Hitch, and Stagnitti (2012) collected retrospective pre- and post- intervention data of 31 individuals from a single occupational

therapy practice. Of the 31 participants, 21 had an anxiety disorder, adjustment disorder or diagnoses of anxiety and depression. The intervention was highly individualized, with a differing number of sessions per person and used strategies including “motivational interviewing, cognitive behavioral therapy, relaxation strategies, skills training and interpersonal therapy” (Kohn et al., 2012, p. 439).

These three studies used reliable and valid tools to measure improvements in anxiety and general mental health. Functioning, or participation in daily activities, was not measured in any of the papers. Kitchiner et al. (2009) measured outcomes pre and post intervention and at three follow-up points (1, 3 and 6 months) and found no significant differences between the occupational therapy-led intervention, the “stress control” intervention or the waiting list control group on the Anxiety subscale of the General Health Questionnaire (GHQ-28). Both treatment conditions showed a statistically significant improvement on the Fear Questionnaire after one month compared to the control group, but this was not sustained. The participants in Prior’s cross-over trial (1998a) showed statistically significant improvements on the Hospital Anxiety and Depression Scale (HADS) ($p = 0.007$), but not on the Spielberger Questionnaire or the Fear Questionnaire and this was maintained after one year. Kohn et al. (2012) found a statistically significant improvement ($p = 0.001$) between the pre-intervention score (mean = 25.68, SD = 9.94) and the post-intervention score (mean = 21.00, SD = 9.21) on the Kessler Psychological Distress Scale.

Two of the three papers in this category reported statistically significant improvements for people with anxiety disorders following occupational therapy interventions using cognitive-behavioral theory (Kohn et al., 2012; Prior, 1998a, 1998b). However, methodological limitations mean that the results should be interpreted with caution. The treatment, assessment, data analysis and reporting all were completed by the author in the case of Prior’s study (1998a, 1998b), introducing possible reporting bias. As a retrospective

study, the outcomes reported by Kohn et al. (2012) are only based on individuals who completed treatment, the level of drop-out is unknown and the treatment received is likely to have been highly individualized. Kitchiner et al.'s (2009) high quality randomized-controlled trial reported the randomization process and treatment fidelity procedures clearly. It is possible that the lack of statistical difference between the treatment conditions in this study is due to the similarity of the interventions – the main difference being the higher emphasis on group process in the occupational therapy intervention.

Occupational Therapy interventions using health behavior change theory

Of the 13 studies reviewed, only one used theory relating to health behavior change to improve anxiety symptoms and so it is discussed separately here. Rodney Lambert and colleagues reported on an intervention delivered over 10 individual sessions by occupational therapists in primary care focused on lifestyle review and goal-setting to improve diet, reduce caffeine and alcohol intake and increase exercise (Lambert, Caan, & McVicar, 2008; Lambert, Harvey, & Poland, 2007). This high-quality randomized-controlled trial compared this intervention (n = 54) to general practitioner (GP) care-as-usual for people with panic disorder (n = 59). This intervention draws on studies showing possible links between unhealthy lifestyles and anxiety symptoms (Breslau & Klein, 1999; Otto et al., 2007). The therapists used health behavior change strategies like lifestyle diaries, education, goal-setting and monitoring.

This paper shows the emerging potential of occupational therapy interventions using health behavior change techniques to improve anxiety and stress symptoms. Lambert et al. (2007) found that anxiety symptoms for the treatment group were significantly lower at 20 weeks ($p < 0.001$, $md -9.8$; 95% CI -15.0 to -4.6), measured on the Beck Anxiety Inventory.

However, this difference was non-significant at 10 months. There were statistically significant changes in physical exercise, diet, general fluid intake and the overall scores on the Lifestyle Behavior Index at both 20 weeks and 10 months but no significant changes for smoking or alcohol use. There were no significant changes on any lifestyle variable for the GP care-as-usual group (Lambert et al. (2007). Scores on the BAI at 10 months suggested that the occupational therapy-led intervention had lower relapse rates than care-as-usual. This trial clearly reported the stratified randomization process and the data collection and analysis were completed by researchers not involved in intervention-delivery (Lambert et al. 2007). The study did not recruit sufficient participants required to achieve 90% power, but they did use appropriate statistical analysis to account for this discrepancy. The trial lost 43% of participants to follow-up and there were considerable differences in the number of sessions attended (0-10).

Occupational Therapy interventions using skill-building theory

Of the 13 studies identified, five used a skill-building approach to target the difficulties of particular populations in completing daily activities. The populations of these studies predominantly had stress-related conditions such as post-traumatic stress disorder (PTSD). The largest study was that by Helfrich, Peters and Chan (2011) who studied people in transition from homelessness (n = 72). While diagnoses were not specified, the mean score for participants on a PTSD screening tool (The Impact of Event Scale Revised (Weiss, 2004)) was higher than the cut-off score for a diagnosis of the condition. This occupational therapy-led intervention consisted of 4 modules, each consisting of six group and six individual sessions. These focused on developing skills in managing food, money and the living space as well as safe community participation. Three studies identified the particular impact of

combat trauma on military veterans which can lead to increased risk-taking and aggressive behavior. Classen, Monahan, Canonizado & Winter (2014b) described a case study and Classen et al., (2014a) did a further pre-test post-test study (n = 8) of a specialist occupational therapy intervention to improve driving skills for veterans with PTSD and associated battlefield injuries such as orthopedic conditions. The intervention in both cases consisted of three standardized sessions identifying risky driving behavior and learning strategies to overcome it. Pre and post testing took place in a driving simulator. Rogers, Mallinson and Peppers (2014) also identified the need to redirect this risk-taking behavior of former veterans and used surfing as an occupation to build skills in more socially acceptable adrenaline-seeking behavior. They carried out five standardized sessions of surfing followed by group discussion on topics such as role identity, leadership and transition with 14 veterans with PTSD. Finally, a single case-study described the rehabilitation of an individual with PTSD in job-related skills including walking on elevated surfaces (Phillips, Bruehl & Harden, 1997).

These studies were mainly concerned with improving trauma symptoms, but some also measured improvements in daily living activities. Helfrich et al., (2011) showed a significant decrease in trauma symptoms post-intervention ($p = 0.019$) and from baseline to 6-months ($p = 0.001$). Of those who completed the program described in Rogers et al. (2014), 1/11 participants had clinically sub-threshold levels of PTSD symptoms pre-intervention, and post-intervention 8/11 participants were clinically sub-threshold. Classen et al. (2014a, 2014b) both reported a reduction in driving errors following their intervention, which was statistically significant in the larger study, albeit only with 8 participants. Phillips et al. (1997) reported an improvement in performance and satisfaction in daily activities for the participant described in their study using the validated self-rating tool, the Canadian Occupational Performance Measure (Law et al., 1998).

The studies in this category show the potential for occupational therapy interventions using skill-building to improve outcomes for individuals with anxiety and stress-related conditions. However, the small number of participants in many of the studies using this approach and the lack of control conditions means that all these results must be interpreted with caution. Lack of randomization may have led to participant selection bias in some cases, particularly in Rogers et al. (2014), where it is likely that only those with an interest in surfing would have volunteered. The intervention described in Phillips et al. (1997) was in addition to other treatments being received by the individual and collection of follow-up outcomes by telephone may have led to reporting bias. However, many of the interventions are either clearly described in the published papers (Classen et al., 2014a, 2014b; Rogers et al., 2014) or are available as manuals from the author (Helfrich et al., 2011), which adds to both treatment fidelity and replicability.

Occupational Therapy interventions using Occupational Science theory

One study described over five papers was underpinned by theories unique to occupational science and occupational therapy (Eklund, 2013; Eklund & Erlandsson, 2011, 2013, 2014; Eklund, Wästberg & Erlandsson, 2013). The Redesigning Daily Occupations program was underpinned by theory about how patterns of daily occupation affect stress, specifically the Value and Meaning in Occupations Model (Erlandsson, 2013; Persson, Erlandsson, Eklund & Iwarsson, 2001). It consisted of a 16 week, twice-weekly group with a focus on returning to work after stress-related sick leave. Forty-two women with stress-related diagnoses defined by F43 in the ICD-10 (World Health Organization, 1992) and 42 matched controls took part in this Swedish quasi-experimental study. The intervention consisted of reflecting on one's occupational history, identifying interests, stresses and rewards, identifying how time is used

and becoming aware of the value and meaning that may be found in everyday occupations (Erlandsson, 2013). The control group received standard work rehabilitation which was highly individualized.

Participants in Eklund and Erlandsson (2011) showed a statistically significant reduction in numbers of identified cases of anxiety up to a year following the intervention. The return-to-work rate was 59% in the treatment group compared to 37% in the control group and satisfaction with and participation in daily occupations improved significantly in both treatment and control groups. Apart from the lack of random allocation, the Redesigning Daily Occupations study used good methodological rigor (Eklund & Erlandsson, 2011). There was a high degree of treatment fidelity with a manualized intervention and transparency in the reporting of drop-outs and missing data. Nevertheless, the lack of random allocation should be considered as it is possible that this led to overly pessimistic results. For example, the control group were significantly better in terms of mental health, self-esteem and other important factors at baseline, so some of the non-significant differences between the groups at follow-up could be due to this. The study also took place during a period of change in the Swedish social insurance system which may have led to the control group being forced back to work at an earlier stage than those in the treatment group (Eklund & Erlandsson, 2011).

Occupational Therapy interventions using neurological and sensory theories

Three case studies described occupational therapy-led interventions for individuals with anxiety that were designed to act on a neural or sensory level to improve symptoms. Bracciano et al. (2012) used cranial electrotherapy stimulation with two individuals with PTSD. This highly specialized therapy is described as clinically legitimate for occupational

therapists to consider as an adjunctive method to occupation-focused interventions (Bracciano, 2008). It consisted of a device administering micro currents to alter electrical currents in the brain self-administered by the participants under the direction of an occupational therapist. Moore & Henry (2002) and Champagne (2011) reported on interventions based on the theory that traumatic experiences can lead to sensory distortion and sensory defensiveness (Kolb, 1987). They carried out single case studies with individuals with PTSD and the intervention mainly consisted of the prescription of a sensory diet of “sensory rich” activities, augmented in the case of Moore and Henry (2002) with deep pressure brushing of the skin.

The two participants in Bracciano et al. (2008) showed a decrease in severity of PTSD symptoms on the PTSD Symptom Scale-Interview (Foa, Riggs, Dancu & Rothbaum, 1993) following four weeks of the intervention. They also self-reported some improvements in performance of activities of daily living such as shopping on the Canadian Occupational Performance Measure (Law et al., 1998). Moore and Henry (2002) used an unpublished questionnaire developed for the study called the Sensory Defensiveness Screening for Adults and reported that participants identified with fewer symptoms of sensory defensiveness following the treatment. Champagne (2011) reported that several baseline measures were carried out with the single participant with PTSD but no results are reported. Some personal goals are measured on a scale of 1-10 e.g. “paying bills on time”. Both Champagne (2011) and Moore and Henry (2002) gathered outcome data in an informal way, sometimes over the phone and directly by the clinician delivering the intervention, introducing risk of reporting bias. These two interventions included scheduling many pleasant activities such as yoga and swimming so any positive results seen could have been due to increased participation in these health-promoting activities, rather than the sensory aspect of the intervention.

Discussion

Because of the breadth and scope of interventions that occupational therapists use with people with anxiety and stress-related diagnoses, an overall conclusion about effectiveness cannot be reached. However, clustering interventions according to theory provides a clearer picture of what kind of occupational therapy intervention might work for whom, and how (Popay et al., 2006).

The use of psychological theoretical perspectives such as cognitive-behavioral theory is common among occupational therapists working with people with anxiety and stress-related disorders possibly due to the dominance of this perspective in research and practice in psychiatry (Ashby, 2015). Both Prior (1998a, 1998b) and Kitchiner et al. (2009) studied groups that included separate sessions on relaxation, cognitive-behavioral strategies and overcoming avoidance: a “three systems” approach to anxiety management that has a long history in practice (Lang, 1968). Kitchiner et al. (2009) found no differences between the occupational therapy-led group, a nurse-led stress control group, and a waiting list control group, but Prior (1998a, 1998b) found significant improvements in her smaller cross-over study. These studies should be considered alongside other research indicating that brief group-delivered interventions including cognitive restructuring and relaxation strategies are effective in treating individuals with anxiety (Erickson, Janeck, & Tallman 2007; Petrocelli, 2002) and that non-psychologists can deliver CBT-based interventions effectively in primary care (Craske et al., 2009).

The high quality RCT described by Lambert et al. (2007) was the only study found where occupational therapists were directly targeting healthy lifestyle changes to improve symptoms of anxiety. The focus of the occupational therapist in interventions like this is on health promotion – maintaining one’s health is a crucial daily living activity (Brownson,

2008) and this intervention showed potential for occupational therapists in providing education on how to improve participation in this activity. The study resulted in significant improvements in panic symptoms and in healthy lifestyle behaviors when compared with GP care-as-usual (Lambert et al. 2007). This study contributes to a body of literature indicating that lifestyle changes may decrease anxiety symptoms (Forsyth, Deane, & Williams, 2017; Hiles, Lamers, Milaneschi, & Penninx, 2017) and demonstrates that occupational therapists have the skills to deliver these interventions.

A number of reviewed studies were designed for the specific needs of individuals with stress-related conditions such as PTSD. These studies took a top-down approach to the functional difficulties of participants. Rather than changing the underlying cognitive appraisals about the trauma, which also shows potential for effectiveness with veterans (Sacks, Schwartz, & Mueser, 2017) the occupational therapists used structured practice in meaningful activities to teach people how to manage life differently following traumatic events. Several studies used the theory of “battlemind” either explicitly or implicitly (Rogers et al., 2014; Classen et al., 2014a, 2014b). This phenomenon can be experienced by military veterans when they return to civilian life and find that behaviors appropriate to the battlefield e.g. targeted aggression or combat driving, cause difficulty with community reintegration (Castro, Hoge & Cox, 2006). Rogers et al. (2014) and Classen et al. (2014a, 2014b) used participation in valued occupations (surfing and driving respectively) alongside discussion and education on adjusting behaviors to civilian life. Helfrich et al. (2011) showed the potential of teaching life skills to individuals who were traumatized due to homelessness and domestic abuse. Again, the focus was on learning skills in important activities to re-enter the community. These small studies were uncontrolled, but they demonstrated some promising results both in terms of reducing PTSD symptoms (Rogers et al. 2014; Helfrich et al. 2011) and altering behaviors (Classen et al., 2014a, 2014b). They may also demonstrate an effective

alternative to the trauma-focused approaches that are commonly used for those with PTSD (Roberts et al., 2010).

Only one of the studies was based explicitly on an occupational therapy theoretical model, in this case the Value and Meanings in Occupations (ValMO) Model (Persson et al., 2001). Other studies draw on occupational therapy theories, for example Rogers et al. (2014) cites the Model of Human Occupation (Kielhofner, 2008). The Redesigning Daily Occupations intervention can be seen as contributing to ongoing theory development of the ValMO model, by studying whether the theoretical constructs result in improvements in daily living as hypothesized (Eklund & Erlandsson, 2011). The participants in the program showed good return-to-work outcomes as compared with standard work rehabilitation, but differences between the groups at baseline are likely to have contributed to the non-significance of the results.

The Redesigning Daily Occupations program is one of several identified in this review that emphasize self-mastery - the premise being that helping individuals to take control over aspects of their own lives and health will have an impact on their wellbeing (Erlandsson, 2013; Helfrich et al., 2011; Lambert et al., 2007). These studies suggest that improvement in anxiety symptoms and participation in daily living activities may follow different courses of recovery. While the participants in Eklund and Erlandsson (2011) and Helfrich et al., (2011) showed improvements in daily functioning such as returning to work, mental health symptom improvement was more modest. As noted by the authors, it is likely that increased participation in daily occupations e.g. by moving into independent living, may lead to an understandable increase in anxiety symptoms, at least in the short term (Eklund, 2013). The participants in Helfrich et al. (2011) showed an increase in anxiety post-intervention while transitioning out of homelessness, but 6 months post-intervention, their mental health was significantly better than at baseline. These results suggest that occupational

therapy interventions focusing on self-mastery and developing individuals' ability to have agency over daily life have potential to improve symptoms of anxiety when measured over the longer term. They also support the idea that anxiety is a natural aspect of living (Horwitz & Wakefield, 2012), particularly when adjusting to challenging life circumstances and that clinicians can help individuals to cope with these times of transition (Besse, Poremski, Laliberté, & Latimer, 2017).

The final three studies used theories relating to sensory processing or neurological sensitivity (Bracciano et al., 2012; Champagne, 2011; Moore & Henry, 2002). These were small-scale case studies with methodological short-comings meaning that the evidence-base for these interventions for people with anxiety disorders is not strong. A recent systematic review concluded that sensory integration therapy with children with autism is not supported by research evidence (Lang et al., 2012) and the American Academy of Pediatrics has described evidence for the effectiveness of sensory-based therapies as limited and inconclusive (Zimmer & Desch, 2012). Urgent high-quality research is required to evaluate this type of intervention as it begins to be used with adults with a range of disorders, including anxiety. Cranial electrotherapy stimulation, although implemented by an occupational therapist in the case of Bracciano et al. (2012), is an intervention outside the usual skill-set of a qualified occupational therapist. It is a highly mechanistic intervention, falling far down the continuum suggested by Fisher (1998) away from practice focusing on authentic client-chosen occupations in a naturalistic context. Other interventions in this review are based on higher quality studies with the same population, and should be given greater consideration in practice (Classen et al., 2014b; Helfrich et al. 2011; Rogers et al., 2014).

Limitations

A limitation of this systematic review is the small team of reviewers involved. However, a standardized data extraction form was used and included/excluded studies were reviewed by authors independently in a transparent process. Only English language search terms were used in the search so studies published in other languages may have been missed. The review took place over two years, but the searches were repeated to include newly published material. The heterogeneity of the interventions found meant that meta-analysis or pooling of results was not possible and so a realist review approach was taken (Shepperd et al. 2009) by clustering studies based on their underlying theory of change (Popay et al., 2006).

Given the strictness of the inclusion criteria for this review, it is acknowledged that this paper may not accurately represent the reality of occupational therapy in the treatment of those with anxiety disorders. Studies including populations with varying mental health diagnoses were excluded where the particular impact of the intervention on the subgroup with an anxiety diagnosis was difficult to determine (Bonsaksen, 2011; Chesworth, Duffy, Hodnett, & Knight, 2002; Gutman et al., 2004). Multidisciplinary studies where the particular contribution of the occupational therapy practitioner couldn't be determined were also excluded (Reagon, 2011; Speicher, Walter, & Chard, 2014; Van de Vliet et al., 2003). Occupational therapy interventions show some potential to reduce anxiety in populations under stress or with other medical conditions, for example with veterans (Beck et al., 2012; Eakman, Rolle, & Henry, 2017; Stoller, Greuel, Cimini, Fowler, & Koomar, 2012), impoverished populations (Crouch, 2008), individuals with depression (Chen, Pan, Hsiung, & Chung, 2015), patients with multiple morbidities (Garvey, Connolly, Boland, & Smith, 2015) or caregivers (Martin-Martin et al., 2014), but the lack of an anxiety diagnosis for the participants in these studies meant they were excluded. Finally, this review excluded studies

involving children and did not find any studies specifically involving occupational therapy interventions for older adults with anxiety.

Conclusion

This systematic review aimed to determine the effectiveness of occupational therapy interventions for people with anxiety and stress-related disorders. Given the nature of the studies found, it is not possible to make a judgement about overall effectiveness, but individual good quality studies point to the potential for certain replicable interventions to improve mental health and functioning (Eklund & Erlandsson, 2011; Helfrich et al., 2011; Lambert et al., 2007; Prior, 1998a; Rogers et al., 2014.). The review shows that occupational therapy interventions using cognitive-behavioral theory, behavior change theory, the ValMO model (Persson et al., 2001) and skill-building have emerging evidence for effectiveness, albeit in small-scale trials, but that neurological and sensory-based approaches do not have a strong evidence-base as yet. Each of these kinds of intervention are usually only represented once in the literature however, and it is possible that this breadth of diversity comes at the expense of replicating and consolidating the evidence for clearly-described interventions in high-quality studies.

Future research should report on the impact of occupational therapy interventions on functioning or participation in activity as a key outcome of interest. Functioning was not reported as an outcome in five studies reviewed for this paper, including in two of the randomized-controlled trials (Kitchiner et al., 2009; Lambert et al., 2007). It is recommended that physical functioning and participation in work and social occupations are measured as core outcomes of anxiety interventions in clinical trials according to mental health consumers and experts in the field (ICHOM, 2017). With recent research showing that a decline in

satisfactory participation in life activities may actually precede an anxiety diagnosis (Winer et al., 2017), interventions targeting self-mastery, lifestyle changes and life skills are indicated as preventative treatments for the condition.

This review suggests that occupational therapy interventions that focus on self-mastery and assist individuals to participate effectively in daily life have potential to improve symptoms of anxiety when measured over the longer term and should be considered by occupational therapists in practice when working with individuals with anxiety and stress-related disorders. The professional role of the occupational therapist is to enable people to participate in the activities of everyday life (World Federation of Occupational Therapists, 2011) and there is growing urgency for high quality research into occupation-based or occupation-focused interventions in all areas of health care (Mackenzie et al., 2017) and for those with anxiety and stress-related disorders particularly.

Declaration

An early version of these results was presented as an academic poster presentation at the International Society for Affective Disorders conference in London in 2017 and a published abstract is available (Fox, Erlandsson & Shiel, 2017). This written paper presents the most up-to-date version of this systematic review.

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