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Systematic review of the clinical application of exposure techniques to community-dwelling older adults with anxiety

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Abstract

Although exposure techniques are a first-line intervention for anxiety, clear evidence is lacking for their efficacy in treating the prevalent and debilitating condition of late life anxiety. This study sought to review the current literature on use of exposure with community-dwelling older patients. Searches of electronic databases were conducted to identify articles published through December 7, 2016. Inclusion criteria were: 1) sample age ≥ 55, 2) therapy that included exposure, 3) anxiety as a target of the treatment. Exclusion criteria were: 1) not available in English, 2) no quantitative data, 3) inpatient setting. Methodological data and findings were extracted from the articles chosen for review. The 54 eligible articles presented a total of 15 case studies, 10 uncontrolled trials, 24 controlled trials, and 6 secondary studies. A majority of the studies were conducted in the U.S.A with participants who received individual treatment. In vivo and imaginal exposure were the most frequently delivered techniques, and most treatments were multicomponent. Most studies found a reduction in anxiety symptoms. While the surveyed research provides a preliminary foundation of evidence for mental health practitioners who wish to incorporate exposure into treatment plans, the review highlights important gaps that need to be addressed.

Keywords

older adults; anxiety; cognitive-behavioral therapy; exposure therapy

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Ethical Principles: The authors affirm having followed professional ethical guidelines in preparing this work. These guidelines include obtaining informed consent from human participants, maintaining ethical treatment and respect for the rights of human or animal participants, and ensuring the privacy of participants and their data, including ensuring that individual participants cannot be identified in reported results or from publicly available original or archival data.

Introduction

This review addresses the absence of any systematic overview of the literature on exposure therapy in anxiety treatments for older adults, which overwhelmingly concerns older adults living in a community setting. Given that the number of Americans above the age of 65 is projected to reach 83 million by 2050 (Ortman, Velkoff & Hogan, 2014), it is essential that mental health practitioners have good information about the best available approaches to treating the aging population. Anxiety disorders, which are some of the most prevalent (Byers, Yaffe, Covinsky, Friedman & Bruce, 2010) and disabling (Poretsky et al., 2009) conditions of later life, are an important focus of clinical work with older adults. Exposure techniques, a class of Cognitive-Behavioral Therapy (CBT) approaches, are considered first-line, well-established treatments for fears and anxiety in the young- and middle-aged adult population (Abramowitz, Deacon & Whiteside, 2011; Olatunji, Cisler & Deacon, 2010). Although a number of reviews have examined the application of CBT treatments to late life anxiety (e.g., Gorenstein, 1999; Gould, Coulson, & Howard, 2012; Hall, Kellet, Berrios, Bains, & Scott, 2016; Thorp et al., 2009; Wetherell, Sorrell, Thorp, & Patterson, 2005; Wetherell, Ayers, Sorrel, Thorp & Wetherell, 2007), there exists neither an overarching synthesis of quantitative data specifically on exposure with older research participants nor a set of established practice guidelines for the utilization of exposure techniques with older patients.

Diverse factors may explain the lack of synthesis in the literature. For many years, most researchers viewed late-life anxiety as a low prevalence condition and considered data gathered from younger adults to be generalizable across age groups (Schuurmans & van Balkom, 2011). Equally important is fragmentation of the information generated across studies, which occurs because the fear-eliciting stimulus can vary from object thought to situation thought or physiological state across anxiety conditions (Abramowitz, Deacon, & Whiteside, 2011). This variability means that a broad range of exposure techniques (imaginal, in vivo, interoceptive, virtual reality exposure, exposure with response prevention, and prolonged exposure) can be used either alone or in combination toward the treatment goal of extinction or inhibition of the fear response (Abramowitz, 2009). Further preventing the synthesis of evidence across studies, exposure techniques are frequently delivered to a greater or lesser degree in conjunction with other CBT techniques. Cognitive techniques, for example, may be used to decrease the patient's prediction of the likelihood and extent of harm from the feared stimulus, while relaxation, behavioral activation, and problem-solving may be used to address other aspects of anxiety. Consequently, it is difficult to determine the dosage of exposure that is considered efficacious for a given condition and to compare effects across protocols. Although some have argued that treatments effective for younger patients should also be utilized with older adults (Schuurmans & van Balkom, 2011), researcher- and participant-level barriers create further challenges for conducting the intervention studies with older adults (Kenchel, 2013) that might support such efforts.

Despite the difficulty of synthesis, a review of studies specifically enrolling older participants is justified by the fact that there are many potential challenges to implementing exposure techniques with older adults. First, this age cohort may be less willing than young- and middle-aged adults to tolerate the uncertainty and discomfort associated with

confrontation with feared stimuli because they place a greater value on positive affect and certainty than on negative affect and risk, even in circumstances where they stand to gain a greater reward (Lockenhoff, Reed, & Maresca, 2012). Second, age-related neurobiological changes may reduce the success of extinction approaches in older adults by attenuating the emotional engagement with the feared stimulus that is considered important for corrective emotional learning (Abramowitz, 2011). This possibility is raised by animal studies showing attenuation of extinction in “older” animals (Psotta, Lessman, & Endres, 2013). Other age-related impediments to extinction may include medical conditions, medications, and reductions in capacity to self-generate imagery (Di Nuovo, De La Cruz, Conti, Buoni & Di Nuovo, 2014). Third, because exposure treatment is optimized by sustained and repeated confrontation with the feared stimulus, working with an array of triggers, and eliminating all safety behaviors, older adults’ ability to adhere to the treatment may be reduced (Abramowitz, 2011) by age-related losses in sensory functioning (Dagnelie, 2013; Tun, Williams, Small & Hafter, 2012), cognitive functioning (Beaudreau, Mackay-Brandt & Reynolds, 2014; Deary et al., 2009), motor functioning (Desrosiers, Hebert, Bravo & Rochette, 1999), and shrinking of the life-space (Saajanahao et al., 2015). All of these factors may also put older adults at risk for relapse after treatment’s end if negative associations remain ready to be primed by subsequent negative experiences (Craske, Treanor, Conway, Zbozinek, & Vervliet, 2014). Fourth, clinicians may be reluctant to use exposure techniques with older patients either because they have concerns about the medical impact of physiological activation or because they assume consider exposure to be inappropriate for patients with cognitive deficits (Clapp & Beck, 2012).

The aim of this review is to survey systematically and evaluate critically the existing peer-reviewed literature concerning community-dwelling older adults in order to generate more specialized recommendations for future clinical research and practice. Questions to be addressed in the review are: (1) How often, in what geographical locations, and with which participant groups have exposure treatments for anxiety in older adults been studied? (2) What are the characteristics of the exposure treatments used in these studies? (3) Does the existing literature support the acceptability and feasibility of conducting exposure with older patients? (4) Across studies, what level of support is there for the efficacy of exposure therapy with older patients?

Methods of the Review

This review was conducted in accordance with established guidelines (Moher, Liberati, Tetzlaff, & Altman, 2009). We elected to examine a wide range of studies (including case studies, uncontrolled trials, and controlled trials) and to conduct qualitative interpretation and synthesis rather than use quantitative methods (meta-analysis) because of the variability of exposure techniques and their frequent combination with other strategies. Due to our focus on quantifiable measures of feasibility, acceptability, and efficacy, none of the following were included: systematic reviews, meta-analyses, case studies that were purely descriptive, or expert opinion pieces.

Eligibility Criteria

Because CBT research on older adults is relatively new, and because some chronologically younger patients display clinical traits consistent with an older age group, the cut-off age for the review was set at a lenient level (≥ 55 years of age). In order to maintain comparability, the decision was also made to restrict the review to studies of patients in the community setting, excluding the small number of studies that have been conducted with inpatients. Thus, to be included in this review, studies had to meet the following criteria: (1) include a sample of adults ≥ 55 years of age; (2) include a psychotherapeutic treatment incorporating at least one type of exposure as a required technique; and (3) target a diagnosable anxiety disorder or anxiety symptoms. Exclusion criteria were: (1) not available in the English language; (2) no quantitative anxiety data; or (3) conducted in the inpatient setting.

Sources of Information

Searches covered publications up to December 7, 2016 in three electronic databases: PubMed, PsycINFO, and AGELINE. Recent systematic reviews, “in press” sections of key journals, and the reference sections of articles identified from database searches were also scanned for additional studies.

Systematic Search Strategy

The first phase of the review involved database searches using the following key terms: *Prolonged Exposure Therapy*, *Imaginal Exposure*, *Graded Exposure*, *In Vivo Exposure*, *Virtual Reality Exposure*, *Interoceptive Exposure*, and *Exposure* together with “*Response Prevention*.” Because the AGELINE database is limited to publications relating to older adults, no age terms were added for these searches. In contrast, because PubMed and PsycINFO databases encompass the entire lifespan, the above technique-related terms were combined with each of the following: *Older Adults*, *Late Life*, and *Elderly*. Since exposure approaches are by and large used to address anxiety conditions, *Anxiety* was not entered as a term in any of these searches. The second phase of the review involved a broader search using the combined key terms *Cognitive-Behavior Therapy* and *Anxiety*. This pair of terms was entered without age terms into AGELINE, but in combination with age terms into PubMed and PsycINFO.

Selection of Studies for Review

Two authors (L.F-F and N.J) conducted the searches of electronic databases. Articles that appeared to meet the review criteria based on titles and abstracts were selected for full-text review. The final selection of articles was made by the same authors, in conference (L.F-F & N.J.). A third author (L.S-G) helped with decisions regarding any discrepancies in opinion.

Data Extraction

Details were extracted from the selected articles in response to the questions addressed in the present review: (1) year of publication and country in which the study was conducted; sample size, demographic and background characteristics of participants; (2) amount of exposure, target anxiety condition, types of exposure techniques, intervention format (individual or group, in person, phone, or online), number and duration of sessions, level of clinician

experience; (3) study type (RCT, etc.), level of attrition from randomization to post-treatment, clinician fidelity to the protocol, patient adherence, perceived credibility of the treatment, satisfaction with the treatment; (4) evidence for pre-post improvements in anxiety, intensity of the control treatment when present, evidence for improvement relative to a control condition, and evidence for maintenance of improvement at a follow-up time point.

To facilitate comparison between studies, specific coding schemes were applied to three variables of interest: (1) amount of exposure (high, medium, or low, based on the number of sessions and inclusion of non-exposure components in treatment); (2) duration of session (brief [< 45 minutes], standard [45-60 minutes], or extended [> 75 minutes]); (3) level of clinician training (high, medium, or low based on clinician's experience with CBT); and (4) intensity of the control treatment (depending on whether wait-list, non-specific intervention, or anxiety-focused intervention was provided). Qualitative comparisons were made between similar studies, based on the level of exposure included in the treatment protocol.

Assessing the Quality of the Trials

The quality of RCTs was assessed by the application of six of the seven categories from the Cochrane Risk of Bias Tool (Higgins et al., 2011). These were: random sequence generation, allocation concealment, blinding of outcome assessment, incomplete outcome data, selective reporting, and other biases. Because exposure therapy cannot be delivered with blinding of participants or personnel, studies were not rated for reporting of therapist and participant blinding procedures. Ratings for each of the six categories addressed ranged from low, to unclear, to high risk of bias. Two authors (L.F.F. & N.J.) rated the studies independently and resolved any discrepancies in ratings via discussion.

Results

Literature Search

Details of each stage of the search are provided in Figure 1. Electronic database searches and other sources yielded a combined total of 6,354 articles, reduced to 6,008 after the removal of duplicates. After screening titles and abstracts, 5,770 articles were excluded on the basis of eligibility criteria, leaving 238 articles for full text review. The full text review excluded a further 184 articles, leaving 54 articles for qualitative synthesis.

How Often and in What Geographical Locations Have Exposure Techniques Been Studied, and How Can Participants be Characterized?

Among the 54 articles selected, 2 articles were published in the period prior to 1995, 16 in the period 1996-2005, 30 in the period 2006-2015, and 6 in 2016 alone. Most of the articles originated in the U.S. ($N=35$). The remaining 19 articles were from other industrialized countries: Australia ($N=6$), The Netherlands ($N=5$), Canada ($N=3$), United Kingdom ($N=2$), France ($N=1$), Portugal ($N=1$), and China ($N=1$). The 54 articles yielded 49 studies that directly examined the impact of an intervention on symptoms, while the remaining six were extensions of these studies that examined long-term effects or predictors of outcome.¹ The 49 intervention studies involved 2,437 participants and included 1,230 older adults with a mean age of 70.74 years. The percentage of females was estimated to be 64.96%. In the 24

studies for which data was available, 27.39% of older participants were from minority race/ethnic groups. Only five studies included any participants with marked cognitive impairment. The 49 intervention studies reported on background characteristics of potential importance to outcomes as follows: depression ($N=41$), medical comorbidities ($N=26$, 50.00%), psychotropic medications ($N=28$), and duration of illness ($N=26$). However, it was not possible to characterize participants on these variables due to the wide variability in measurement.

What are the Characteristics of the Exposure Treatments Used in These Studies?

Of the 49 intervention studies, 15 delivered high intensity exposure treatments (received by 113 older participants), 17 delivered moderate intensity exposure treatments (received by 511 older participants), and another 17 delivered low intensity exposure treatments (received by 606 older participants). Table 1 presents additional characteristics of the exposure treatments.

High intensity treatments—Among the 15 intervention studies in this group, the most frequent targets of treatment were posttraumatic stress disorder (PTSD; $N=7$) and obsessive-compulsive disorder (OCD; $N=5$); specific phobia, hoarding, and social phobia were also represented. The participants in this group of studies were disproportionately male (82.90%) relative to the moderate and low intensity groups (28.69 vs. 28.79%) due to a focus on military veterans with PTSD. Most studies involved individual treatments ($N=13$), with one study (7.14%) involving group treatment alone, and one using a combination of individual and group formats. Three of the studies included some home-based sessions. The number of intervention sessions in studies ranged from 1-32 with a mean of 14.56, and most studies employed sessions of extended duration ($N=10$). The types of exposure incorporated into treatment were: in vivo ($N=12$), imaginal exposure ($N=9$), exposure with response prevention ($N=5$), virtual reality ($N=1$), and unspecified ($N=1$).² Studies involving other forms of treatment break down as follows: education about anxiety or treatment ($N=9$), relaxation ($N=4$), other CBT components ($N=2$, 21.43%), and other techniques ($N=2$, i.e., cognitive rehabilitation and socialization). For 6 studies it was not possible to determine the treating clinician's experience. In the reports where data was available, treatment providers had high ($N=6$) or moderate ($N=3$) level of training; in only one study did clinicians have a low level of training.

Moderate intensity treatments—Among the 17 intervention studies in this group, the most frequent targets of treatment were generalized anxiety disorder ($N=6$) and panic disorder ($N=3$); specific phobia (including fear of falling) and hoarding were also represented. Transdiagnostic studies additionally included subjects with panic disorder, social phobia, and anxiety disorders not otherwise specified. Most studies involved individual treatments ($N=13$), while a few used group formats ($N=4$). Five studies included some home-based sessions. The number of treatment sessions in studies ranged from 8 to 35 with a mean of 14.24, and most employed sessions of standard duration ($N=9$)

¹Mohlman et al (2003) included two studies which were analyzed separately for the review; conversely, for the purposes of the review Schuurmans et al. (2006) and Schurmanns et al. (2009) were discussed as one study with extended follow-up.

²Numbers may exceed the total number of studies due to multiple entries for individual studies.

or extended duration ($N=8$). The types of exposure incorporated into treatment were: in vivo ($N=16$), imaginal ($N=9$), interoceptive ($N=4$), and unspecified ($N=1$).² Studies involving other forms of treatment break down into: education about anxiety or treatment ($N=14$), relaxation ($N=12$), other CBT components ($N=17$), and other techniques ($N=4$; i.e., organizational skills training, adaptations aimed at enhancing learning of skills and adherence to homework, and exercise, $N=3$, 7.14%). In two studies it was not possible to determine the treating clinician's level of experience. In the remaining studies treatment providers had a high level ($N=12$) or moderate level ($N=3$) of training; in only three studies did clinicians with a low level of training participate (these clinicians were a bachelor's level counselor, healthcare assistants, and a physical therapist).

Low intensity treatments—Among the 17 intervention studies in this group, the most frequent target of treatment was generalized anxiety disorder ($N=11$); specific phobia and self-reported anxiety problems were also represented. Transdiagnostic studies additionally included participants with panic disorder and/or a range of other anxiety conditions. Most studies involved individual treatments ($N=14$), while a few used group formats ($N=3$). In some studies the interventions involved phone sessions ($N=3$), online sessions ($N=3$), and home-based sessions ($N=1$). The number of treatment sessions in the studies ranged from 5 to 15 with a mean of 9.65. In eight studies the duration of sessions was not available; the remaining studies spanned sessions of extended ($N=5$) or standard ($N=2$) or brief duration ($N=3$).² The types of exposure incorporated into treatment were: in vivo ($N=11$), imaginal ($N=4$), and unspecified ($N=5$). Other forms of treatment incorporated into these studies included education about anxiety or treatment ($N=16$), relaxation ($N=12$), other CBT components ($N=17$), and other techniques ($N=2$; i.e., attention training). In six studies, it was not possible to determine the treating clinician's experience. The remaining studies mostly involved treaters with a high level ($N=8$) or moderate level ($N=5$) of experience. Two studies used treaters with a low level of mental health training (i.e., community nurses and collaterals in the patient's social network).

What Level of Support is There for the Acceptability and Feasibility of Conducting Exposure with Older Patients?

The 49 intervention studies were of the following types: 16 case studies, 9 uncontrolled studies (including clinical trials and naturalistic studies), and 24 controlled trials (randomized and non-randomized). Table 2 presents details of feasibility and acceptability of these studies.

High intensity treatments—This group consists of 10 case studies, 3 uncontrolled studies, and 2 controlled trials. For the case studies attrition statistics are not relevant. In the remaining five studies, the degree of attrition ranged from 0% to 27%. In three studies attrition was below 10%, in one study between 10% and 20%, and in two studies 20% or above. None of the studies reported on reasons for drop-out. Only one presented clinician fidelity to the protocol, indicating it to be high. No data was made available on patient adherence to homework or on perceptions of the credibility or satisfaction with the treatment.

Moderate intensity treatments—This group consists of one case study, five uncontrolled studies, and 11 controlled trials. For the case study attrition statistics are not relevant. In the remaining 16 studies, attrition ranged from 0% to 46%. In three studies attrition was below 10%, in three studies between 10% and 20%, and in ten studies 20% or above. Four studies reported that one or more participants dropped out due to discomfort with the exposure component of treatment. Eight studies presented clinician adherence to the protocol, with high adherence indicated in all cases. Studies that reported aspects of acceptability were few in number, with only six providing statistics on homework adherence, four reporting on perceived credibility of the treatment, and three reporting on satisfaction with the treatment. However, detailed information on homework adherence and satisfaction was available for only one study of hoarding treatment, through a companion report (Ayers, Bratnott, Saxana, & Wetherell, 2012). In this study, therapist and participant reports indicated that homework adherence was greater for exposure components of the treatment than cognitive components, and was perceived as a particularly helpful aspect of treatment. Only one other study specifically documented the acceptability of the exposure component relative to other components (Jayasinghe et al., 2014).

Low intensity treatments—This group consists of five case studies, one uncontrolled studies, and 11 randomized controlled trials. Attrition statistics are not relevant for case studies. Among the remaining 12 studies, attrition ranged from 0% to 25%. Attrition was below 10% in seven studies, between 10% and 20% in one study, and 20% or above in four studies. Among the studies that documented reasons for drop-out, discomfort with exposure was not mentioned. Five studies presented clinician adherence to the protocol, all indicating it to be high. Studies reporting on acceptability were few, with only two studies providing statistics on homework adherence, four reporting on perceived credibility of the treatment, and five reporting on satisfaction with the treatment. None of these studies examined the exposure component specifically, although one study (Dorresteijn et al., 2016) stated anecdotally that 50% of participants did not complete the single exposure assignment that was part of the proposed treatment.

What Level of Support is There for the Efficacy of Exposure Therapy with Older Patients?

Table 3 presents details of the clinical outcomes documented by the studies selected for review. Table 4 presents details of bias among RCTs selected for review as well as details of the efficacy of interventions relative to control conditions.

High intensity treatments—Some studies in the high intensity group presented data pertinent to engagement in exposure and within- or between-session habituation (subjective units of distress $N = 3$). All nine case studies in this group provided evidence for pre-post reductions in symptom severity. Additionally, two of these studies indicated that patients met treatment responder status and one study documented improvements in end state, while four studies documented remission of diagnosis. All but one study involved follow-up assessments that documented maintenance of gains. The three UCTs also provided support for pre-post symptom reduction; two of these indicated high levels of remission, and one involved a follow-up assessment documenting maintenance of gains. The single RCT in the

high intensity treatment group appeared to be vulnerable to several sources of bias and did not yield significant pre-post effects.

Moderate intensity treatments—The case series in this group provided evidence for pre-post reductions in symptom severity, clinically significant reduction in symptoms, and remission; no follow-up was conducted. The five UCTs also provided evidence for pre-post symptom reduction, and two reported on the percentage of participants qualifying as treatment responders; three of these studies conducted follow-up to document maintenance of gains. The only study to compare outcomes with younger patients receiving a similar treatment was in this group; in this non-randomized trial, older participants receiving CBT showed greater levels of symptom relief than younger participants at post-treatment and follow-up time-points. The 11 controlled studies in this group had variable levels of vulnerability to bias. All provided evidence for reductions in symptom severity. Several studies examined treatment response rates (which ranged from 23%-75%), end-state functioning, and remission (which ranged from 45%-86%). The multicomponent treatments showed superiority in one of three studies involving active controls, in two of five studies with a nonspecific control, and in five of six studies with a wait-list. However, it is not possible to determine to what extent positive results can be accounted for by the exposure component versus other aspects of treatment.

Low intensity treatments—All five case studies in this group documented pre-post reductions in symptom severity; in one study the patient met criteria for treatment responder, while remission of diagnosis was documented in two studies. Follow-up was conducted to document maintenance of improvements in four of the case studies. The single UCT also provided evidence for pre-post symptom reduction, and which indicated that 72% of participants showed remission from diagnosis. The 11 RCTs in this group had low levels of vulnerability to bias. All provided evidence for reductions in symptom severity. Four studies examined treatment response rates (which ranged from 50% to 100%) and remission (which ranged from 40% to 78%). These multicomponent treatments showed inferiority in the single study that used an active control; by contrast, they showed superior on at least some measures in all six studies with non-specific controls and all three studies involving a wait-list comparison. However, as with the moderate intensity studies, it is not possible to determine the extent to which positive results can be accounted for by the exposure component versus other aspects of treatment.

Predictors of outcome—For high intensity treatments, no data was available on predictors of treatment outcome. For moderate intensity treatments, some data was available: younger age (Ayers et al., 2011), better perceived health (Schuurmans, 2009), lower neuroticism (Schuurmans et al., 2009), higher baseline symptoms (Wetherell et al., 2005b), presence of a comorbid diagnosis (Wetherell, Sorrell, Thorp & Patterson, 2005b), absence of subtle cognitive deficits or executive skill deficits (Caudle, 2007; Mohlman & Gorman, 2005), treatment credibility and homework adherence (Ayers et al., 2011, Gorenstein, et al, 2005, and Wetherell et al., 2005b). Likewise, for low intensity treatments, the following predictors of positive treatment outcome were identified: age > 60 years of age (Hui & Zhihui, 2016), shorter duration of illness (Hui & Zhihui, 2016), higher baseline levels of

avoidance (Hui & Zhihui, 2016), treatment credibility (Hundt, 2013, Jones et al., 2016), homework adherence (Hundt et al., 2013), reduction in anxiety symptoms early in treatment (Bradford et al., 2011), and improvement in executive functioning during the course of treatment (Mohlman et al., 2008).

Discussion

A considerable body of relevant literature has accumulated over the past three decades, and the amount of empirical data on exposure therapies for older adults with anxiety appears to be steadily increasing: our comprehensive search demonstrated that this topic continues to receive increasing attention, with 44% of the reviewed studies having been released in the past five years. The present review has four broad findings.

First, the heterogeneity of the studies with regard to intensity of exposure is striking. The majority of studies incorporated exposure within a broader multicomponent treatment, and in many trials the stringency for delivery of manualized exposure in research studies appears to have been low. Although there is a benefit to reporting on this type of integrative intervention because it most closely matches the way in which exposure is delivered in real-life settings at present, there was a notable dearth of research isolating the ways in which exposure techniques alone are helpful to older adults. We note also that while in vivo exposure and imaginal exposure were well represented in the studies reviewed, studies examining virtual reality exposure with older patients were few in number. Yet, data in younger populations indicate that these approaches may be effective for the several of the conditions discussed here (Diemer, Muhlberger, Pauli, & Zwanzger, 2014; Butler, Chapman, Forman, & Beck, 2006) and appropriate for patients—like some older adults—whose ability to self-generate imagery of feared situations is low (Gerardi, Cukor, Difede, Rizzo & Rothbaum, 2010). Among the studies reviewed, there was also a notable lack of data on anxiety conditions prevalent in the older population, e.g., Specific Phobia, Social Phobia, and PTSD (Byers, Yaffe, Kovinsky & Bruce, 2010), with the exception of one frequently studied diagnosis: generalized anxiety disorder.

Second, important gaps exist in the characterization of the participants for whom data is available. Evidence is principally available for young-old cohorts (i.e., older adults in the 65-74 age group), but because older adults are not a homogenous group (Laidlaw & McAlpine, 2008) it would be helpful to have studies that help us better understand responsiveness to and appropriateness of exposure across young-old, mid-old, and old-old age cohorts. Moreover, although the studies reviewed predominantly enrolled women, consistent with the higher proportion of women in the older general and clinical population, males were overrepresented in studies of intensive exposure treatments. More data is needed for the use of this type of approach with females. A further important lacuna was the limited information on racial and ethnic minority participants. Finally, more broadly there was limited information on the utility of exposure for older patients who have a range of severities of medical burden and cognitive functioning, or on the viability of *modifying* exposure therapy, as opposed to combining exposure with other treatment approaches, for older adults with high medical burden or cognitive decline or according to the presence of comorbid depression or duration of symptoms. Ideally, future studies would document these

factors in characterizing their subjects and use blocking or minimization designs to reduce potential confounds.

Third, the review found that several case studies offer moderate support for the feasibility of using exposure with older adults and for use of exposure for older adult populations using similar protocols to younger ones. Importantly, attrition rates in clinical studies were comparable with those noted in younger populations (Abramowitz, 2011), which suggests that treatments incorporating exposure may be acceptable to older adults in real-world practice. From a methodological standpoint, however, it should be noted that the multicomponent studies identified in this review rarely provided information on fidelity of treatment delivery by clinicians or adherence to session content and/or homework, which is important for understanding the extent to which older adults are able to comply with standard parameters of the treatment approach, and in no case provided data for the exposure component alone. A further consideration is that studies to date have relied on highly experienced treatment providers, which limits the ability of interventions to reach large numbers of potential patients.

The fourth finding is an absence of high quality data for the efficacy of exposure in treating older adults with anxiety. The case studies reviewed did provide promising evidence for the potential of exposure treatments to improve symptoms and lead to enduring clinical gains. However, clinical trials with high intensity exposure treatments were few in number, were focused on symptom reduction (which is less clinically meaningful than outcomes such as responder status, high end-state functioning, or remission from diagnosis), and lacked follow-up data to illuminate the degree to which gains were maintained. For older patients who received multicomponent treatments with lower exposure intensity, clinical trials demonstrated promising reductions in anxiety symptoms. And, as a group these latter studies more fully assessed the range of possible outcomes and provided more extensive follow-up. However, none of them isolated the contribution of the exposure component to outcomes. Moreover, the present review reveals that most of these studies of multicomponent treatments utilized a wait-list or usual-care control condition, limiting their usefulness to clinicians who may be called upon to choose between exposure and another treatment modality for a particular patient. Finally, the review also reveals a deficit of studies examining the effectiveness of exposure-based therapies for older adults in the community setting. Although community-dwelling older adults receive services in a variety of settings, including primary care, assisted living facilities, and community centers, the majority of studies included in this review were conducted in an office or clinic setting. Many older adults do not have access to specialized treatment providers and receive care primarily from another type of provider.

The review has several limitations. We cannot claim to have identified all pertinent research studies. Limiting searches to three databases and not employing reverse citations methodology may have contributed to gaps; these constraints were appropriate, however, in our view given the wide scope of our search terms and the relevance of the databases selected to our research questions. The broad eligibility criteria that we set in response to the absence of prior reviews in this area produced a very heterogenous pool of studies, making comparison challenging and precluding quantitative synthesis. Finally, given the review's

focus on published studies, we recognize that it is not possible to determine the extent to which dissemination bias due to unpublished negative results or selective reporting has skewed its findings (Moreno et al., 2009). Searches of trial registries for studies of exposure-based interventions which are completed but have not reported results could clarify the extent to which this is an issue.

Three main recommendations for further studies flow from the review's findings:

1. **Clinicians should provide more data in the form of case reports.** Although the case studies examined in this review have taken important steps to highlight the use of exposure therapy with older patients, the reports often lacked details of pertinent factors (e.g., medical burden, medications affecting autonomic arousal, cognitive factors that affect new learning, and social context) that might influence the delivery of exposure. Moreover, only a few of the selected studies provided the level of within-person detail that would illuminate the progress of exposure therapy, such as session-by-session observations of Subjective Units of Distress (SUDS) in order to evaluate engagement and habituation and target behaviors, and to report symptom variation over smaller time intervals than are typically utilized in larger trials. Incorporation of physiological indices of distress, such as heart rate or galvanic skin response, could also provide valuable insight on creating person-specific modifications to address unique differences among patients. In a context of integrative care, case reports that clarify the ways in which mental health professionals coordinate their efforts with allied professionals would be particularly helpful.
2. **Clinician-researchers should contribute secondary analyses of existing study data to further detail the acceptability and impact of the exposure component in multicomponent treatments.** Data from studies involving the delivery of multicomponent treatments to older adults could be re-examined in order to delineate the delivery and impact of the exposure component of the treatment: what proportion of time was allotted to exposure, what was the level of adherence to in-session exposure and to exposure homework assignments, and what was the level of satisfaction with the exposure component? In clinical trials that involved younger patients but set age cut-offs above 55 years, case reports or subgroup analysis could be provided for those participants who were older.
3. **Clinician-researchers should conduct studies that dismantle the components of multi-component treatments that include exposure.** The number of studies involving older adults is still small in comparison to those conducted with younger adults (Olatunji, Cisler & Deacon, 2010). Additional research would clarify the utility of exposure techniques vis-à-vis others such as cognitive restructuring or relaxation, as has been proposed for younger patient groups (Kaczurkin & Foa, 2015). This approach would also make it possible to examine the patient-level characteristics that predict the response of older adults to exposure techniques. It should be possible to develop a standardized set of outcomes (and associated measures) that cross-cut diagnoses, permitting the accrual of comparable data across studies. In a different vein, clinician-

researchers should also conduct studies that document an older-adult perspective on credibility of and satisfaction with exposure. Similarly useful would be studies of the attitude of psychotherapists treating older adults toward the use of exposure in their independent practices; psychotherapists in community settings have been found to underutilize exposure approaches regardless of the age of the patient (Farrell, Deacon, Kemp, Dixon & Sy, 2013; Meyer, Farrell, Kemp, Blakey & Deacon, 2014).

Other, secondary recommendations could also be made. With a view to the dissemination of exposure-based treatments, it would be helpful to have better data on the extent to which exposure-based treatments can be employed effectively within the current structures of service provision and reimbursement. In a related vein, there is a need for data on the safety and feasibility of delivering exposure based approaches by videoconferencing or mobile apps, which have the potential to increase the availability of the approach to older adults who experience barriers to accessing traditional individual in-person psychotherapy.

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Clinical Implications

- Evidence modestly supports incorporation of exposure into treatment plans for older patients with anxiety.
- Gaps in knowledge remain to be addressed concerning how clinicians can best tailor exposure for older patients with anxiety and identify which patients will most benefit.

Figure 1.

Summary of the process by which published articles were identified and selected for review (following Moher, Liberati, Tetzlaff, & Altman, 2009).

Table 1

Key aspects of the treatment in the selected intervention studies (N=49) grouped by intensity of exposure in the treatment

First Author	Year	Target Diagnosis	Format	Sessions		Type Exposure	Other Components			Provider
				#	Min.		E	R	CB	O
*** Ayers	2014	Hoarding	I	24	60	IE+IV	✓	✓	✓	H
*** Berle	2007	SP PHB	I	7	?	IV	✓	✓	✓	?
*** Calamari	1994	OCD	I	20	?	IV (ERP)	✓	✓	✓	?
*** Colvin	1997	OCD	I	1	480	IV (ERP)	✓	✓	✓	?
*** Duax	2013	PTSD	I	14	60-90	IE+IV (PE)	✓	✓	✓	H
*** Gamito	2010	PTSD	I	12	?	IE or VR (PE)	✓	✓	✓	?
*** Heinrichs	2001	SOC PHB	G	11	120	IV	✓	✓	✓	H+M
*** Jones	2012	OCD	I	14	50	NS (ERP)_	✓	✓	✓	H
*** Price	2010	OCD	I	20	120	IE+IV (ERP)	✓	✓	✓	M
*** Ready	2012	PTSD	G+I	24	?-120	IE+IV (PE)	✓	✓	✓	?
*** Rowan	1984	OCD	I	8	120	IV	✓	✓	✓	L
*** Russo	2001	PTSD	I	32	60-90	IE (PE)	✓	✓	✓	M
*** Thorp	2012	PTSD	I	12	90	IE+IV (PE)	✓	✓	✓	H
*** Yoder	2010	PTSD	I	8	75-90	IE+IV (PE)	✓	✓	✓	?
*** Yoder	2013	PTSD	I	12	90	IE+IV (PE)	✓	✓	✓	H
** Ayers	2011	Hoarding	I	26	60-90	IE+IV (PE)	✓	✓	✓	H
** Clapp	2012	PTSD	G	14	120	IE+IV	✓	✓	✓	?
** Gorenstein	2005	Varies	I	13	50	IV+IC	✓	✓	✓	H
** Hendriks	2010	Panic D/O	I	14	50	IV+IC	✓	✓	✓	H
** Hendriks	2014	Panic D/O	I	14	50	IV+IC	✓	✓	✓	H
** Jayasinghe	2014	PTSD, FoF	I	8	75	IE+IV	✓	✓	✓	H
** Mohlman	2003i	GAD	I	13	50	IE+IV	✓	✓	✓	H
** Mohlman	2003ii	GAD	I	13	50	IE+IV	✓	✓	✓	H
** Mohlman	2005	GAD	I	8	90	IE+IV	✓	✓	✓	H
** Parry	2016	FoF	I	8	45	IV	✓	✓	✓	L
** Schuurmans	2006/9	Various	I	15	60	NS	✓	✓	✓	H
** Stanley	1996	GAD	G	14	90	IE+IV	✓	✓	✓	H+M

First Author	Year	Target Diagnosis	Format	Sessions		Type Exposure	Other Components				Provider
				#	Min.		E	R	CB	O	
** Stanley	2003a	GAD	G	15	90	IE+IV	✓	✓	✓	✓	H+M
** Swales	1996	Panic D/O	I	10	90	IV+IC	✓	✓	✓	✓	?
** Turner	2010	Hoarding	I	35	90-120	IV	✓	✓	✓	✓	L
** Wetherell	2003	GAD	G	12	90	IE+IV	✓	✓	✓	✓	M
** Wetherell	2016	FoF	I	10	60	IV	✓	✓	✓	✓	H+L
* Brenes	2012	Various	I	8	?	IV	✓	✓	✓	✓	H+M
* Brenes	2015	GAD	I	11	50	IV	✓	✓	✓	✓	H+M
* Dear	2015	Anxiety	I	5	?	NS	✓	✓	✓	✓	H
* Dorresteijn	2016	FoF	I	7	35-75	IV	✓	✓	✓	✓	L
* Hui	2016	GAD	G	12	120	IE	✓	✓	✓	✓	H
* Jones	2016	GAD	I	7	?	IE+IV	✓	✓	✓	✓	?
* Kraus	2008	GAD	I	9	30-40	IV	✓	✓	✓	✓	L+?
* Ladouceur	2004	GAD	I	14	?	IE+IV	✓	✓	✓	✓	H
* Mohlman	2008	GAD	I	8	90	IE+IV	✓	✓	✓	✓	M
* Mohlman	2010	GAD	I	10	90-120	IV	✓	✓	✓	✓	?
* Montel	2010	GAD	I	15	30-45	IV	✓	✓	✓	✓	H
* Stanley	2003b	GAD	I	8	?	NS	✓	✓	✓	✓	?
* Stanley	2009	GAD	I	10	?	IV	✓	✓	✓	✓	H
* Wetherell	2005a	SP PHB	I	12	?	IV	✓	✓	✓	✓	?
* Wuthrich	2013	Various	G	12	120	NS	✓	✓	✓	✓	M+?
* Wuthrich	2016	Various	G	11	120	NS	✓	✓	✓	✓	M
* Zou	2012	GAD	I	5	?	NS	✓	✓	✓	✓	H

KEY: Target Diagnosis: SP PHB = specific phobia; SOC PHB = social phobia; OCD = obsessive-compulsive disorder; PTSD = posttraumatic stress disorder; Panic D/O = panic disorder; FoF = fear of falling; GAD = generalized anxiety disorder; Format: I = individual; G = Group; FF = face-to-face; H = some home-based sessions; PH = Phone-based sessions; ONL = Online. Sessions: # number of sessions in the entire intervention; Min. = session length in minutes. Type Exposure: IE = imaginal exposure; IV = in vivo exposure; IC = interoceptive exposure; VR = virtual reality exposure; NS = not specified; ERP = exposure with response prevention; PE = prolonged exposure. Other Components: E = education about anxiety or treatment; R = relaxation training; CB = cognitive or behavioral techniques; O = techniques other than CBT; ✓ = Yes; ✗ = no; Provider: H = clinician experienced in CBT and/or doctoral level or higher; M = master's or predoctoral level; L = bachelor's level mental health or non-mental health specialist; ? = not specified.

Table 2

Aspects of feasibility and acceptability in the intervention studies (N = 49) grouped by intensity of exposure in the study treatment

First author	Year	Design	Sample		Attrition		Treatment		Treatment Credibility	Emotional		Homework		Participant Satisfaction
			N ¹	N ²			Fidelity			Engagement		Adherence		
***	Ayers	2014	UCT	11	0	0%	High	?	?	?	?	?	?	?
***	Berle	2007	Case ^M	1	0	–	?	?	?	✓	?	?	?	?
***	Calamari	1994	Case ^M	1	0	–	?	?	?	✓	?	?	?	?
***	Colvin	1997	Case	1	0	–	?	?	?	?	?	?	?	?
***	Duax	2013	Case ^M	1	0	–	?	?	?	✓	?	?	?	?
***	Gamito	2010	RCT	7	3	10%	?	?	?	?	?	?	?	?
***	Heinrichs	2001	Case ^M	1	0	–	?	?	?	?	?	?	?	?
***	Jones	2012	Case ^M	1	0	–	?	?	?	?	?	?	?	?
***	Price	2010	Case ^M	1	0	–	?	?	?	?	?	?	?	?
***	Ready	2012	UCT ^M	8	0	0%	?	?	?	?	?	?	?	?
***	Rowan	1984	Case	1	0	–	?	?	?	?	?	?	?	?
***	Russo	2001	Case	1	0	–	?	?	?	?	?	?	?	?
***	Thorp	2012	NCT ^M	11	53	27%	?	?	?	?	?	?	?	?
***	Yoder	2010	Case ^M	1	0	–	?	?	?	✓	?	?	?	?
***	Yoder	2013	UCSM	66	0	15%	?	?	?	?	?	?	?	?
**	Ayers	2011	UCT	12	0	0%	High	?	?	?	?	Variable	?	?
**	Clapp	2012	Case ^M	1	0	–	?	?	?	?	?	?	?	?
**	Gorenstein	2005	RCT	23	19	33%	High	?	?	?	?	?	?	?
**	Hendriks	2010	RCT	20	29	10%	?	?	?	?	?	?	?	?
**	Hendriks	2014	NRCT	31	141	18%	?	?	?	?	?	?	?	?
**	Jayasinghe	2014	UCT	14	0	9%	?	?	?	?	?	?	Mod-High	?
**	Mohlman	2003 ⁱ	RCT	14	13	22%	High	?	?	?	?	Moderate	?	?
**	Mohlman	2003 ⁱⁱⁱ	RCT	8	7	0%	High	?	?	?	?	Moderate	?	?
**	Mohlman	2005	RCT	22	10	19%	High	?	?	?	?	Variable	?	?
**	Parry	2016	RCT	210	205	34%	?	?	?	?	?	?	Low-High	?
**	Schuurmans	2006 ⁹	RCT	42	42	32%	?	?	?	?	?	?	?	?
**	Stanley	1996	RCT	26	22	33%	High	✓	?	?	?	?	?	?

First author	Year	Design	Sample		Attrition	Treatment		Treatment Credibility	Emotional Engagement	Homework Adherence	Participant Satisfaction
			N ¹	N ²		Fidelity					
** Stanley	2003a	RCT	39	46	16%	High	?	?	?	?	?
** Swales	1996	UCT	20	0	25%	?	?	?	?	?	?
** Turner	2010	UCT	11	0	45%	?	?	?	?	?	?
** Wetherell	2003	RCT	26	49	24%	High	✓	?	?	Moderate	?
** Wetherell	2016	UCT	10	0	20%	?	✓	?	?	High	High
* Brenes	2012	RCT	30	30	8%	?	?	?	?	?	High
* Brenes	2015	RCT	70	71	22%	High	✓	?	?	Moderate	> WL
* Dear	2015	RCT	35	37	6%	?	?	?	?	?	High
* Dorresteijn	2016	RCT	194	195	20%	?	?	?	?	?	?
* Hui	2016	RCT	32	31	0%	?	?	?	?	?	?
* Jones	2016	RCT	24	22	9%	?	✓	?	?	?	?
* Kraus	2008	Case ^M	1	0	—	?	?	?	?	?	?
* Ladouceur	2004	Case	8	0	0%	High	?	?	?	?	?
* Mohlman	2008	RCT	8	0	0%	High	?	?	?	?	?
* Mohlman	2010	Case ^M	1	0	—	?	?	?	?	Moderate	?
* Montel	2010	Case	1	0	—	?	?	?	?	?	?
* Stanley	2003b	RCT	6	6	25%	?	✓	?	?	?	High
* Stanley	2009	RCT	70	64	13%	High	✓	?	?	?	?
* Wetherell	2005a	Case ^M	1	0	—	?	?	?	?	?	?
* Wuthrich	2013	RCT	27	35	24%	?	?	?	?	?	?
* Wuthrich	2016	RCT	76	57	10%	High	?	?	?	?	?
* Zou	2012	UCT	22	0	0%	?	?	?	?	?	High

KEY: *** = high intensity of exposure in the study treatment; ** = moderate intensity of exposure in the study treatment; * = low intensity of exposure in the study treatment. *Design*: Case = case study; UCT = uncontrolled trial; UCS = uncontrolled study; NRCT = nonrandomized controlled trial; RCT = randomized controlled trial; *Sample*: N¹ = number of older participants receiving exposure intervention; N² = number of other participants in the study. *Attrition* = attrition from randomization to post-treatment assessment; *Treatment Fidelity* etc. ✓ = Yes; ? = not known.

Anxiety outcomes presented in the intervention studies (N = 49) grouped by intensity of exposure in the study treatment

Table 3

First Author	Year	Pre-post Improvement(s)				Length Follow -Up		Maintained Improvement				
		SYM	CL	RESP	END	REM	(months)	SYM	CL	RESP	END	REM
***	Ayers	✓	-	72%	-	-	-	-	-	-	-	-
***	Berle	✓	✓	-	-	-	5 M	✓	✓	-	-	-
***	Calamari	✓	✓	-	-	-	8 M	-	✓	-	-	✓
***	Colvin	✓	✓	-	-	-	2 M	✓	✓	-	-	-
***	Duax	✓	✓	-	-	-	6 M	✓	✓	-	-	-
***	Gamito	✗	-	-	-	-	-	-	-	-	-	-
***	Heinrichs	✓	✓	✓	✓	-	6 M	✓	✓	✓	-	✓
***	Jones	✓	✓	-	-	✓	7 M	✓	✓	-	-	✓
***	Price	✓	-	-	-	✓	12 M	✓	✓	-	-	-
***	Ready	✓	-	-	-	88%	6 M	✓	✓	-	-	✓
***	Rowan	✓	-	-	-	-	18 M	-	-	-	-	-
***	Russo	✓	✓	-	-	-	15 M	✓	✓	-	-	-
***	Thorp	✓	✓	-	-	87%	-	-	-	-	-	-
***	Yoder	✓	-	-	-	-	-	-	-	-	-	-
***	Yoder	✓	-	-	-	-	-	-	-	-	-	-
**	Ayers	✓	✓	25%	-	-	6 M	✓	-	-	-	-
**	Clapp	✓	✓	-	-	100%	-	-	-	-	-	-
**	Gorenstein	✓	-	39%	-	-	6 M	✓	-	✓	-	-
**	Hendriks	✓	50%	-	-	-	3 M	✓	-	-	-	-
**	Hendriks	✓	-	-	-	-	-	-	-	-	-	-
**	Jayasinghe	✓	-	-	-	-	3 M	✓	-	-	-	-
**	Mohlman	✗	-	40%	-	50%	6 M	✓	-	-	-	-
**	Mohlman	✓	-	75%	-	86%	6 M	-	-	-	-	✓
**	Mohlman	✓	-	0-67%	-	29-80%	18 M	✓	-	-	-	-
**	Parry	✓	-	-	-	-	10 M	✓	-	-	-	-
**	Schuurmans	✓	-	44%	48%	-	12 M	✓	-	✓	✓	-

First Author	Year	Pre-post Improvement(s)				Length Follow -Up		Maintained Improvement				
		SYM	CL	RESP	END	REM	(months)	SYM	CL	RESP	END	REM
** Stanley	1996	✓	-	28%	11%	-	6 M	✓	-	✓	✓	-
** Stanley	2003a	✓	-	45%	3%	45%	12 M	✓	-	✓	✓	✓
** Swales	1996	✓	-	-	-	-	3 M	✓	-	-	-	-
** Turner	2010	✓	-	-	-	-	-	-	-	-	-	-
** Wetherell	2003	✓	-	23%	15%	54%	6 M	✓	-	✓	✓	✓
** Wetherell	2016	✓	-	-	-	-	-	-	-	-	-	-
* Brenes	2012	✓	-	-	-	50%	6 M	✓	-	-	-	-
* Brenes	2015	✓	-	72%	-	-	-	-	-	-	-	-
* Dear	2015	✓	-	83%	-	78%	12 M	✓	-	✓	-	✓
* Dorresteijn	2016	✓	-	-	-	-	10 M	✓	✓	-	-	-
* Hui	2016	✓	-	-	-	-	6 M	✓	-	-	-	-
* Jones	2016	✓	50%	-	86%	-	1 M	✓	-	-	-	-
* Kraus	2008	✓	-	-	-	-	-	✓	-	-	-	-
* Ladouceur	2004	✓	-	-	-	88%	12 M	✓	-	-	-	✓
* Mohlman	2008	✓	-	50%	50%	-	6 M	✓	-	-	✓	-
* Mohlman	2010	✓	✓	✓	-	✓	3 M	-	-	-	-	-
* Montel	2010	✓	✓	-	-	-	-	-	-	-	-	-
* Stanley	2003b	✓	-	100%	-	40%	-	-	-	-	-	-
* Stanley	2009	✓	-	-	-	-	12 M	✓	-	✓	-	-
* Wetherell	2005a	✓	-	-	-	✗	-	-	-	-	-	-
* Wuthrich	2013	✓	74%	-	-	53%	-	✓	-	-	-	✓
* Wuthrich	2016	✓	-	-	-	-	6 M	✓	-	-	-	✓
* Zou	2012	✓	78%	-	-	72%	3 M	✓	-	-	-	✓

KEY: *** = high intensity of exposure in the study treatment; ** = moderate intensity of exposure in the study treatment; * = low intensity of exposure in the study treatment; Pre-post improvements: ✓ = Yes; ✗ = No; – = not available or not relevant; Sym = statistically significant reduction in symptom severity; CL = clinically meaningful reduction; RESP = responder status; END = high end-state functioning; REM = remission from clinical diagnosis.

Table 4

Key aspects of efficacy for controlled trials (N = 24) grouped by intensity of exposure in the study treatment

First author	Year	Potential Source(s) of Bias							Comparison Condition(s)	Exposure vs. Comparison(s)	
		1	2	3	4	5	6	7		Pre-Post outcome	Follow-Up outcome
*** Gamito	2010	?	?	-	?	?	✗	✓	Wait-list	E = AC, E = WL	-
*** Thorp ^{NCT}	2012	-	-	-	-	-	-	-	Treatment as usual	E > NC	-
** Gorenstein	2005	✗	?	-	✗	✓	✗	✗	Medication management	E = NC	-
** Hendriks	2010	✗	✗	-	✗	✗	✗	✓	Psychotropic medication, Wait-list	E = AC, E > WL	E = AC
** Hendriks ^{NCT}	2014	-	-	-	-	-	-	-	Younger adults	E AC	-
** Mohlman	2003i	?	✗	-	✗	✓	✗	✓	Wait-list	E = WL	E = WL
** Mohlman	2003ii	?	✗	-	✗	✗	✗	✓	Wait-list	E > WL	E > WL
** Mohlman	2005	?	✗	-	✗	✓	✗	✗	Wait-list	E WL	-
** Parry	2016	✗	✗	-	?	?	✗	✗	Usual care	E NC	E > NC
** Schuurmans	2006	?	✗	-	?	✓	✗	✗	Psychotropic medication	E ≤ AC, E WL	E < AC
Schuurmans	2009	?	✗	-	✗	✓	✗	✗		-	E < AC
** Stanley	1996	?	✗	-	✗	✓	✗	✗	Discussion group	E = NC	E = NC
Stanley	2003a	✗	✗	-	✗	✗	✗	?	Minimal contact	E > NC	-
** Wetherell	2003	?	✗	-	✗	✓	✗	✓	Discussion group, Wait-list	E = NC, E > WL	E = NC
* Brenes	2012	?	✗	-	✗	✗	✗	✗	Information	E > NC	E = NC
* Brenes	2015	✗	✗	-	✗	✗	✗	✓	Supportive therapy	E NC	-
* Dear	2015	✗	✗	-	✓	✗	✗	✓	Wait-list	E > WL	-
* Dorresteijn	2016	✗	✗	-	✗	✓	✗	✗	Usual care	E > NC	E > NC
* Hui	2016	?	✗	-	?	?	✗	✗	Usual care	E > NC	E > NC
* Jones	2016	✗	✗	-	✗	✗	✗	✗	Wait-list	E > WL	-
* Mohlman	2008	?	✗	-	✗	?	✗	✗	CBT + attention training	E < AC	E < AC
* Stanley	2003b	?	✗	-	?	✓	✗	✓	Usual care	E > NC	-
* Stanley	2009	✗	✗	-	✗	✗	✗	✗	Enhanced Usual Care	E NC	E NC
* Wuthrich	2013	✗	✗	-	✗	✗	✗	✓	Wait-list	E > WL	-
* Wuthrich	2016	✗	✗	-	✗	?	✗	✗	Discussion group	E > NC	E = NC

KEY: *** = high intensity of exposure in the study treatment; ** = moderate intensity of exposure in the study treatment; * = low intensity of exposure in the study treatment; *Potential source(s) of bias*: 1 = random sequence generation; 2 = allocation concealment; 3 = blinding of personnel; 4 = blinding of outcome assessment; 5 = incomplete outcome data; 6 = selective reporting; 7 = Other; ✓ = Yes; ? = unknown; ✗ = No. *Exposure vs. Comparison (s)*: E = exposure intervention; WL = Wait-list; NC = nonspecific control; AC = active control.