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Innovations in research for treatment of late-life anxiety

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Abstract

Objectives—While psychosocial interventions for late-life anxiety show positive outcomes, treatment effects are not as robust as in younger adults. To date, the reach of research has been limited to academic and primary care settings, with homogeneous samples. The current review examines recently funded and ongoing late-life anxiety research that uses innovative approaches to reach unique patient populations and tailor treatment content and delivery options to meet the unique needs of older adults.

Method—A systematic search was conducted using electronic databases of funded clinical trials to identify ongoing psychosocial intervention studies targeting older adults with anxiety. The principal investigators of the studies were contacted for study details and preliminary data, if available. In some cases, the principal investigators of identified studies acted as referral sources in identifying additional studies.

Results—Eleven studies met inclusion criteria and represented three areas of innovation: new patient groups, novel treatment procedures, and new treatment delivery options. Studies and their associated theoretical bases are discussed, along with preliminary results reported in published papers or conference presentations.

Conclusion—Psychosocial intervention trials currently in progress represent promising new strategies to facilitate engagement and improve outcomes among unique subsets of older adults with anxiety. Continued investigation of evidence-based treatments for geriatric anxiety will allow greater understanding of how best to tailor the interventions to fit the needs of older adults.

Keywords

psychosocial treatment; late life anxiety; generalized anxiety disorder; older adults; review

Introduction

Late-life anxiety is highly prevalent, with rates exceeding those of depression and other affective disorders (Bryant, Jackson, & Ames, 2008; Byers, Yaffe, Covinsky, Friedman, & Bruce, 2010). The negative personal and societal costs associated with late-life anxiety disorders, including increased morbidity and mortality (Martens et al., 2010; Porensky et al., 2009; Roest, Martens, de Jonge, & Denollet, 2010) coupled with the current demographic

shift, make further research in this area an important priority. When anxiety disorders co-occur with depression, this burden is further exacerbated by more pronounced consequences including lower rates of response to treatment (Lenze et al., 2001; Wolitzky-Taylor, Castriotta, Lenze, Stanley, & Craske, 2010), increased suicidal ideation (Lenze et al., 2001), and comorbid somatic symptoms (Lenze et al., 2000).

Generally, older adults seek mental health care from their primary care doctors, who often prescribe medication, in particular, benzodiazepines, as the first line of treatment for their anxiety (Klap, Unroe, & Unutzer, 2003). While pharmacologic treatment is effective for late-life anxiety (Pinquart & Duberstein, 2007), older adults are more susceptible than younger adults to side-effects (e.g., psychomotor retardation, memory problems, increased risk of falls) due to aging-related physiological changes and polypharmacy (Allain, Bentué-Ferrer, Polard, Akwa, & Patat, 2005; Mamdani, Rapoport, Shulman, Herrmann, & Rochon, 2005). Older adults' medication regimes are often burdensome, and research suggests they prefer psychosocial treatment (Gum et al., 2006; Wetherell et al., 2004). Although psychosocial interventions have positive effects for older adults with anxiety, effects are not as strong as they are for younger adults and attrition rates are higher (Wolitzky-Taylor et al., 2010). Thus, additional research is needed to determine how best to increase engagement and improve outcomes.

The primary aim of this review is to examine innovative approaches to the psychosocial treatment of late-life anxiety that are currently being developed and tested. This recent and ongoing research encompasses a potential expansion of treatment options for older adults through development of interventions to address unique constellations of symptoms, test new treatment modalities, and examine innovative methods of treatment delivery. Because previous research informs this ongoing work, the current status of evidence-based psychosocial treatments for late-life anxiety derived from meta-analyses and comprehensive reviews is briefly summarized.

Treatment Outcome Overview

Cognitive-behavioral therapy (CBT) has received the most empirical support as an evidence-based psychosocial treatment in geriatric mental health and the general population (Bartels et al., 2003; Hendriks, Oude Voshaar, Keijsers, Hoogduin, & van Balkom, 2008). According to cognitive-behavioral theory, anxiety disorders are initiated and sustained through interactions among maladaptive cognitions, behaviors and physiological response systems (Newman & Borkovec, 1995). CBT **uses** various techniques to replace maladaptive thoughts and behaviors with adaptive coping strategies, thereby breaking cycles of fear and worry. Adaptive coping strategies that target maladaptive cognitions include identifying and monitoring automatic thoughts and core beliefs, cognitive restructuring, and decatastrophizing. In the behavioral domain, exposure therapy is used to address maladaptive behaviors by gradually exposing individuals to anxiety-provoking situations that are typically avoided to alleviate anxiety. Additionally, relaxation training (e.g., progressive muscle relaxation, diaphragmatic breathing) is often included as a component of CBT for anxiety as it assists individuals in preventing or managing the physiological response associated with anxiety.

CBT has been tested in older adults with generalized anxiety disorder (GAD) and among heterogeneous groups of older adults with GAD, panic disorder, social phobia, and anxiety disorder not otherwise specified (ADNOS; Ayers, Sorrell, Thorp, & Wetherell, 2007; Wolitzky-Taylor et al., 2010). Because several recent reviews and meta-analyses have examined the efficacy of CBT for late-life anxiety, only a brief review is provided here.

In three recent reviews (Ayers et al., 2007; Hendriks et al., 2008; Wolitsky-Taylor et al., 2010), multi-component CBT for late-life GAD and mixed anxiety disorders emerges with the most consistent support, although some evidence also points to the efficacy of relaxation therapy and, although to a lesser extent, supportive (i.e., reflective listening and validation of feelings) and cognitive therapies. Wolitsky-Taylor et al. (2010) also summarize evidence for the use of antidepressants in the treatment of GAD and panic disorder. In most studies, post-treatment gains following psychosocial treatments were maintained at longer-term follow-up (Ayers et al., 2007; Hendriks et al., 2008).

Two recent meta-analytic reviews (Pinquart & Duberstein, 2007; Thorp et al., 2009) provide additional support for pharmacological treatments, CBT, and relaxation therapy. While higher average treatment effects were found for pharmacological interventions in a meta-analytic comparison of cognitive, behavioral, and pharmacological interventions (Pinquart & Duberstein, 2007), these effects may be the result of pill-placebo conditions that inflate effect sizes relative to the wait-list controls used in psychosocial trials. Differences between cognitive behavioral and pharmacological outcomes disappeared when effect sizes that controlled for non-specific change in the control group were calculated. In a second meta-analytic comparison of behavioral treatments for late-life anxiety (Thorp et al., 2009), relaxation therapy offered by itself demonstrated the strongest effects when compared to CBT and CBT augmented with relaxation therapy.

More recent trials of CBT for late-life anxiety have expanded delivery of care to primary care settings and tested modular treatments that allow individual tailoring. In one recent primary care study (Stanley et al., 2009), CBT significantly improved worry severity, depressive symptoms and general mental health compared to enhanced usual care, although improvements in GAD severity were not statistically significant. Another study of older primary care patients with GAD and ADOS (Wetherell et al., 2009) used a modular-treatment format tailored to the specific symptoms and needs of the participants. The modular approach deviates from the “one-size-fits-all” approach and allows flexibility to tailor the treatment components to meet the specific needs and circumstances of the research participants. While no treatment differences emerged relative to an enhanced community treatment condition, sample sizes were small; and community care included aggressive pharmacotherapy and various other services.

Despite these encouraging results, older adults with anxiety consistently experience fewer benefits than younger adults from the same treatments (Wolitsky-Taylor et al., 2010). Previously tested intervention protocols may not be adequately tailored to accommodate the unique needs of older adults, and greater innovation in psychosocial interventions may be needed. To raise awareness of these limitations and move late-life anxiety research forward, the rest of this review highlights innovative approaches to the treatment of late-life anxiety that are currently being developed and tested.

Innovative Treatment of Late-life Anxiety: Current Developments

The National Institute of Mental Health Strategic Plan (NIMH, 2008) and National Mental Health Council Workgroup report (NMHCW, 2010) outline the need to develop innovative interventions that incorporate diverse needs and contexts of people with mental illnesses. The goal is to move toward developing personalized treatments that take into account the unique resources and challenges facing the individual and to expand treatment-delivery methods to reach an increasingly broad group of people with mental health needs. Unfortunately, most clinical trials of anxiety in older adults have been confined to academic settings, and treatments do not take into account unique constellations of symptoms, individual variations in coping mechanisms, or physical/cognitive changes that accompany aging. Study samples are also non-representative of older people with regard to demographic

and clinical features. A large number of published studies focus on the treatment of GAD (Ayers et al., 2010) using racially and socioeconomically homogeneous samples. Even in initial forays of treatment research into primary care (Stanley et al., 2009; Wetherell et al., 2009), the use of stringent inclusion/exclusion criteria, lack of variability in treatment procedures to meet individual patient needs, and restrictions in treatment-delivery methods limit translational value.

Late-life anxiety researchers are answering the call for increased innovation and testing of more patient-tailored interventions and delivery strategies. Here, we review recent and ongoing efforts to increase the translational value of treatment for anxiety in the older population. We focus on funded studies because although ongoing, these have undergone at least one stage of peer review during the funding process.

Method

Three websites that list funded clinical trials were searched for ongoing studies targeting the psychosocial treatment of anxiety in individuals 60 years and older: National Institute of Health (<http://projectreporter.nih.gov/reporter.cfm>); VA-based Health Services, Research and Development (<http://www.hsrd.research.va.gov/research/default.cfm>); and Clinical Trials.gov (<http://www.clinicaltrials.gov>). The search terms *older adult* and *anxiety* were used, yielding a total of 135 unique studies.

Studies were included if they tested psychosocial interventions for anxiety symptoms or disorders among older adults and were supported by federal or institutional funding. Studies that targeted medical comorbidity, mixed age groups, or the sole testing of pharmacotherapy were excluded. Project descriptions of the 135 studies were reviewed. A total of seven studies met the inclusion and exclusion criteria. The principal investigators of identified studies were contacted to request information about the projects and any available preliminary results. In some cases, these contacts revealed other funded, ongoing work that was not identified through the search process. Four additional studies were identified through this process, resulting in 11 studies to be reviewed (see Table 1). These studies broadly capture advancement in three major areas, as follows: i) targeting new patient groups, ii) testing new treatment procedures, and iii) studying outcomes with more flexible delivery options.

New Patient Groups

Ongoing research designed to expand knowledge of late-life anxiety treatment to a broader array of patient groups includes work focused on the treatment of anxiety in people with dementia (PI: Stanley), fear of falling (PI: Wetherell), compulsive hoarding (PI: Ayers) and late-life post-traumatic stress disorder (PTSD; PI: Thorp).

Patients with cognitive limitations—Comorbidity of anxiety in people with dementia is common (Seignourel, Kunik, Snow, Wilson & Stanley, 2008), and anxiety is a risk factor for dementia (Gallacher et al., 2009). Anxiety in dementia is associated with increased behavior problems (Teri et al., 1999a), limitations in activities of daily living (Schultz, Hoth, & Buckwalter, 2004), nighttime awakenings (McCurry, Gibbons, Logsdon, & Teri, 2004), reduced quality of life (Hoe, Hancock, Livingston, & Orrell, 2006), and nursing-home placement (Gibbons, Teri, & Logsdon, 2002). Because anxiety creates considerable burden for dementia caregivers, developing and implementing new treatments for anxiety in dementia holds significant potential benefit.

Some components of traditional CBT might not be appropriate for people with cognitive difficulties (e.g., cognitive restructuring), and non-traditional delivery models are likely

necessary (e.g., engagement of a caregiver, in-home treatment, modified learning strategies). The benefit and feasibility of recruiting caregivers to assist in psychosocial interventions (McCurry, Gibbons, Logsdon, Vitiello, & Teri, 2003; Teri, 1999), conducting home-based intervention (Teri et al., 2003), and using modified behavioral strategies (Gitlin, Hodgson, Jutkowitz, & Pizzi, 2010) for persons with dementia are established but have not before been applied to late-life anxiety. An innovative model of treatment for anxiety in people with mild-to-moderate dementia was developed and tested in an open trial with nine participants (Paukert et al., 2010a). The home-based treatment was delivered in collaboration with a collateral/caregiver who assisted the person with dementia in learning and implementing coping strategies. The intervention diverged from traditional cognitive behavioral treatment to enhance learning of coping skills in people with dementia, with an increased focus on behavioral skills (breathing, calming statements, behavioral activation), greater use of repetition and practice, modified learning procedures (Bourgeois et al., 2003), and simplified instructions and practice exercises. Treatment involved an average of 10 skills-training sessions (range = 5 to 12) over 3 months and seven booster calls over the subsequent 3 months. Improvements in anxiety and depressive symptoms occurred at both time points, and satisfaction among patients and caregivers was high.

A follow-up randomized controlled trial (RCT) to compare CBT and usual care (UC) was recently completed (PI: Stanley). This study included 32 people with coexistent anxiety and dementia and their identified collaterals ($n = 16$ dyads in each condition) (Paukert et al., 2010b). Dementia severity, measured using the Clinical Dementia Rating (Morris, 1993), ranged from .5 (mild) to 2 (moderate). Dyads completed an average of nine in-home sessions and six follow-up calls over 6 months. At 3 months, after completion of skills-training sessions, collateral and independent clinician ratings showed significantly lower levels of anxiety and caregiver distress in CBT relative to UC. Collateral ratings of anxiety in persons with dementia were also significantly lower in the CBT group at 6 months.

Additional work exploring the utility of CBT among older adults with cognitive impairment has focused on the role of executive dysfunction in the treatment of anxiety, particularly among older adults with Parkinson's disease (PD), in whom executive dysfunction is common (Mohlman et al., 2010). An integrated treatment approach for this population was developed that included a cognitive rehabilitation component to address deficits in executive skills in addition to CBT for anxiety. Executive skills play an important role in performing cognitive activities such as self monitoring, cognitive restructuring, and hypothesis generation, which are integral to CBT. Inclusion of cognitive training may increase the efficacy of CBT for anxiety in people with cognitive impairment (Mohlman, 2008). In an ongoing primary care trial of CBT for late-life GAD, further work is being conducted to examine the potential moderating role of executive dysfunction (PI: Calleo). No data from this work are yet available.

Fear of falling—Fear of falling is common among older adults and is associated with decreased physical activity, which increases risk of disability (Bertera & Bertera, 2008). While many factors contribute to fear of falling (e.g., gait instability, impaired cognitive functioning, poor self-perception of health; Vellas, Wayne, Romero, Baumgartner, & Garry, 1997), high levels of anxiety related to walking and fear of falling essentially define and characterize the condition. Experiencing a fall may invoke anxiety; however, fear of falling also occurs among those who have never fallen (Niino, Tsuzuki, Ando, & Shimokata, 2000).

In a recently funded treatment-development grant (PI: Wetherell), Wetherell and colleagues are developing and testing an integrated intervention for fear of falling in older adults. The in-home, physical therapist-delivered intervention integrates elements of existing interventions for fear of falling (physical therapy, exercise, falls education), a home-safety

evaluation, a medical evaluation, and components of CBT to reduce fear (exposure and cognitive restructuring). The inclusion of exposure to fall-related fear stimuli sets the study apart from other treatments for fear of falling. Given the conceptual overlap between excessive fear of falling and other phobias (Wetherell & Stein, 2009), exposure exercises may offer an opportunity for older adults to learn that not all anxiety-provoking situations are dangerous and that they can learn to cope with anxiety. A feasibility study will compare the newly developed intervention with education only.

Compulsive hoarding—Compulsive hoarding is also a significant problem for older adults; prevalence is higher among this population than it is among younger adults (Samuels et al., 2008), and severity might increase with age (Ayers, personal communication, December 13, 2010). Hoarding at all ages is associated with serious physical, social and psychological impairment (Ayers, Saxena, Golshan, & Wetherell, 2010; Frost, Steketee, Williams, & Warren, 2000). While the condition has been described as a subtype of obsessive-compulsive disorder (OCD; Christensen & Greist, 2001), not all compulsive hoarders display other OCD symptoms; and efficacious treatments for other OCD subtypes have little or no impact on hoarding (Saxena et al., 2002). Although serotonergic medications are ineffective as a treatment for hoarding, treatments based on CBT principles adapted to address information-processing deficits (e.g., attention, memory, organization, decision-making) have led to successful outcomes among younger adults (Steketee, Frost, Tolin, Rasmussen, & Brown, 2010; Tolin, Frost, & Steketee, 2007).

Given cognitive changes associated with aging and information processing deficits inherent in hoarding (Grisham, Brown, Savage, Steketee, & Barlow, 2007), attention to cognitive processing in the implementation of treatment for late-life compulsive hoarding is particularly important. In an ongoing treatment-development project (PI: Ayers), Ayers and colleagues are conducting an RCT of CBT for hoarding in older adults. The modified intervention, cognitive rehabilitation and exposure therapy, teaches cognitive-remediation skills such as cognitive flexibility, problem solving and prospective memory before transition to concrete skills for managing hoarding (e.g., exposure to acquiring and discarding, cognitive restructuring, decision-making, building insight, and motivation). The unique aspect of the study is the integration of cognitive rehabilitation training to remedy limitations in executive functioning demonstrated by older hoarders. The project will also examine the relation between neurocognitive performance and compulsive hoarding to explore how executive functioning might impact treatment response in older adults.

Late-life PTSD—Literature on the prevalence rate of PTSD in older adults is scarce (Averill & Beck, 2000). A recent study in The Netherlands documented the 6-month prevalence of PTSD in older adults at 0.9% and a much higher rate for subthreshold PTSD at 13.1% (van Zelst, de Beurs, Beekman, Deeg, & Dyck, 2003). Even though the prevalence of late-life PTSD is lower than in younger adults, the high association of PTSD with suicidal attempts, physical and mental disability, and poor quality of life (Sareen et al., 2007) makes it urgent for researchers to examine whether established treatments are efficacious in older adults. An RCT to study treatment of PTSD in veterans who are 60 years and older is currently underway (PI: Thorp). The study aims to examine the efficacy of combined prolonged exposure and relaxation therapy. Prolonged exposure is effective in reducing PTSD symptoms in younger adults (Powers, Halpern, Ferenschak, Gillihan, & Foa 2010). The mechanism underlying prolonged exposure involves activation of the fear structure and incorporation of new cognitive and affective information (Foa & Kozak, 1985) as a result of decreasing emotional reactions and cognitive/behavioral avoidance. The study by Thorp and colleagues will be the first to examine the efficacy of prolonged exposure and relaxation therapy in treating PTSD in older adults. The study will also examine how executive functioning impacts treatment response. The expansion of anxiety treatment research to

include new patient populations will help tailor interventions to groups of older adults with specific needs due to co-morbidities as well as distinctive expressions of anxiety.

New treatment procedures

To improve outcomes for late-life anxiety, new theoretical conceptualizations of worry (Behar, DiMarco, Hekler, Mohlman, & Staples, 2009) and related treatment models (acceptance and commitment therapy [ACT; PI: Wetherell] and exposure therapy [PI: Brenes]) are being tested among older adults with anxiety. In addition, modified CBT that individualizes treatment with an opportunity to integrate religion and/or spirituality is being developed (PI: Stanley).

ACT—In a recently completed pilot study, the efficacy of ACT for GAD in older adults was compared to that of standard CBT (Wetherell et al., 2010a). ACT is considered one of the third-wave approaches in the behavioral/cognitive theoretical tradition (Hayes, Luoma, Bond, Masuda, & Lillis, 2006). It emphasizes psychological flexibility, acceptance of internal experiences, and commitment to value-driven action. The goal is to reduce struggle to control or eliminate aversive thoughts and feelings and enhance awareness of one's experience without judgment while working towards behavioral changes consistent with one's values. Physical and functional changes associated with advanced age might not be completely within one's control; hence ACT, which emphasizes acceptance of negative experiences, might be more compatible for GAD treatment in older adults than CBT, which is more control oriented. Outcomes of the pilot study showed that ACT and CBT were comparable, even though the two approaches emphasize different techniques to reduce negative emotions (Wetherell et al., 2010a).

Exposure therapy—Another study testing a new treatment approach for GAD used an open trial to examine the efficacy of exposure therapy for GAD (Brenes & Blumental, 2010). Exposure to anxiety-producing situations is a component of traditional CBT. However, no study to date has examined the efficacy of exposure alone for the treatment of GAD. Exposure may be considered an appropriate treatment for GAD as worry, a key component of GAD, has been conceptualized a cognitive avoidance (Borkovec & Roemer, 1995). Avoidance behaviors (procrastination and checking) are also common in GAD. The treatment developed for the open trial included interoceptive exposure to physical symptoms of anxiety, imaginal exposure to feared cognitions and outcomes, and in vivo exposure to anxiety-provoking situations. Eight participants in the open trial completed 8 to 12 sessions. Results showed reductions in worry, anxiety, and anxiety sensitivity. Participants also reported high satisfaction with the treatment (Brenes & Blumental, 2010).

Integration of religion and spirituality into CBT—Although some studies show that religion/spirituality might be related to increased anxiety symptoms, especially when individuals face spiritual struggles (McConnell, Pargament, Ellison, & Flannelly, 2006), there is also evidence to suggest that religion/spirituality improves physical and mental health and psychological well-being (Koenig, McCullough, & Larson, 2001) and that religious/spiritual coping can play an important role in psychotherapy (Pargament & Raiya, 2007). Recent reviews conclude that CBT with religious content is at least as efficacious, and in some cases more so, than traditional CBT in reducing anxiety and depressive symptoms (Paukert et al., 2009; Hodge, 2006; Smith, Bart, & Richards, 2007). Therefore, including religious and spiritual coping in CBT for anxiety may enhance the efficacy and acceptability of treatment. This type of individual tailoring of treatment may be of particular benefit for older adults who report a preference for the inclusion of religion and spirituality in therapy (Stanley et al., in press) and for minority groups (e.g., African Americans) among whom subjective religiosity and religious involvement are higher than among Caucasians

(Taylor, Chatters, Jayakody, & Levin, 1996). A recent case series of patients treated with a variation of CBT that includes the option for participants to integrate religious and spiritual beliefs and practices demonstrated high client satisfaction and decreased psychological distress (Barrera, Bush, Barber, & Stanley, 2009).

New Delivery Options—Ongoing research is also testing new delivery options to enhance engagement and outcomes for older adults, including sequencing of CBT and pharmacological treatment (PI: Wetherell; PI: Papp), telephone-based CBT (PI: Brenes), and treatment offered by paraprofessionals (PI: Stanley).

Sequencing of CBT and pharmacological treatments—Pharmacotherapy is efficacious in alleviating anxiety symptoms in older adults (Pinquart & Duberstein, 2007), but older adults tend to prefer psychosocial interventions (Wetherell et al., 2004). Because efficacy following CBT is lower than in younger adults (Wolitzky-Taylor et al., 2010), outcomes in this age group might be improved by combining medication and CBT. However, the best practices for integrating these two approaches have not been studied. Two ongoing projects are testing different sequences of delivery for integrated CBT and medication to treat late-life GAD.

In one of those projects, patients received 10 or 20 mg of escitalopram for 12 weeks, followed by 16 weeks of modular CBT and medication (Wetherell et al., 2010b). During the subsequent 8 weeks, medication was discontinued, and three additional CBT booster sessions were offered. CBT included education/awareness, relaxation training, problem solving, and cognitive skills offered in a modular format, which allowed clinicians and participants to decide which skills would likely benefit a particular individual and to tailor treatments accordingly. Results of an open trial with 10 older adults with GAD (Wetherell et al., 2010b) suggested that augmentation of selective serotonin reuptake inhibitor medication with CBT significantly reduced anxiety and worry. For some participants, treatment gains were maintained after discontinuation of medication.

In another ongoing project, the efficacy of multimodal CBT augmented with pharmacotherapy is being investigated with an open trial in a sample of older adults with GAD (PI: Papp). Participants receive 16 sessions of CBT over 12 weeks. CBT skills (relaxation, cognitive therapy, and behavioral skills including problem solving, worry behavior prevention, exposure, and increased social involvement) are administered in a flexible sequence to meet patients' needs. Patients complete one session of psychotherapy education during the first week of treatment and eight sessions of CBT in the initial 4 weeks. At the 4-week mark, patients are offered medication and information on the pros and cons of adding pharmacotherapy and continuing CBT based on the individual progress made up until that point. Participants are allowed to choose whether to continue with CBT with or without medication or discontinue CBT and initiate a medication regimen. Those who choose pharmacotherapy select one of two different medications. The study is currently in the data-collection phase.

Telephone delivery—Telephone delivery has been identified as an effective approach to treat anxiety (Newman, Erickson, Przeworski, & Dzus, 2003). Older adults, particularly those living in rural areas, face significant barriers to receiving care, including stigma, lack of available mental health professionals, and transportation. Therefore, the use of telephone-based treatment may be most beneficial in reaching rural residents. An RCT for late-life anxiety was recently completed comparing a telephone-assisted bibliotherapy intervention with an information-only intervention (Brenes et al, in press). The treatment group was provided with a CBT workbook written at the 8th-grade level, with eight chapters containing descriptions of CBT skills and examples relevant to the experiences of older adults.

Chapters (modules) of the workbook were reviewed during telephone sessions every 1 to 2 weeks. Results suggested significant group differences in worry, general self-rated anxiety, clinician-rated anxiety, anxiety sensitivity, and sleep at post-treatment. Group differences in worry severity were maintained at 6-month follow-up. Participant satisfaction with the treatment was high, and attrition was lower than in other clinical trials of anxiety treatment in older adults (Brenes et al., in press).

CBT by paraprofessionals—The use of paraprofessionals has been proposed as a potential strategy to increase the availability of psychological services for underserved older adults. Prior literature reviews have suggested that mental health outcomes generally are equivalent when services are provided by paraprofessionals and more experienced providers (Montgomery, Kunik, Wilson, Stanley, & Weiss, 2010). In an ongoing clinical trial of late-life GAD in primary care (PI: Stanley), the relative effects of CBT provided by Bachelor's-level counselors and Ph.D.-level providers are being compared. No data are yet available from this trial, but an associated pilot study (n = 22) demonstrated comparable treatment characteristics (e.g., number and duration of sessions, percent of sessions conducted in person versus by telephone), treatment expectancies and satisfaction, and 3-month outcomes for paraprofessional counselors and Ph.D.-level providers (Calleo et al., 2010). Data from the larger, ongoing trial will address more fully the viability of paraprofessionals to provide CBT for older adults.

Conclusion

Research in late-life anxiety is moving toward tailoring of psychosocial interventions to improve outcomes and expand the reach of services. With novel developments in targeting new patient populations, testing of novel treatment procedures, and incorporating innovative delivery modalities, researchers are moving towards the direction laid out by the NIMH strategic plan (NIMH, 2008) and National Mental Health Council Workgroup report (NMHCW, 2010). The innovative developments in late-life anxiety research reviewed in this article will advance the field by generating knowledge on how to treat unique constellations of anxiety symptoms among older adults (e.g., anxiety with cognitive impairment, fear of falling, compulsive hoarding, and PTSD). Furthermore, new treatment procedures, such as ACT, exposure therapy for GAD, and integration of religion and spirituality into CBT, will likely enhance outcomes of late-life anxiety treatment. Innovative delivery modalities (combination of medication and CBT, use of telephone and training paraprofessionals) will also enhance and increase the reach of existing treatments.

Even further developments in late-life anxiety treatment research will benefit from careful attention to additional factors, such as culture and neurobiological variables, personality factors and integration of non-CBT therapeutic approaches, preventive methodology, and use of modern technology. Understanding the impact of diversity in anxiety treatment and modifying treatment to enhance individual tailoring are paramount, as many sociocultural factors are risk factors for high levels of anxiety symptoms or diagnosis (Vink, Aartsen, & Schoevers, 2008). To this end, tailored CBT with broader attention to cultural variables (race/ethnicity, socioeconomic status, education level, and language and geographic barriers) is needed to enhance reach and efficacy among diverse communities within the United States and around the world. In addition, late-life anxiety research needs to pay close attention to neurobiological methodology to assist in understanding brain-behavior connections that may lead to novel treatment approaches (Lenze & Wetherell, 2009). In one related line of ongoing research, Mohlman and colleagues are using functional magnetic resonance imaging to identify patterns of neural activity and connectivity during naturalistic worrying relative to a neutral thinking task in older GAD patients compared to age-matched controls (Mohlman, personal communication, August 14, 2010).

Future treatment research also needs to explore several lines of inquiry examining personality factors and integration of alternative treatment approaches (e.g., interpersonal and reminiscence therapies). Personality traits like neuroticism and openness to experience show association with self report and observer-rated affective symptoms (Duberstein & Heisel, 2007), suggesting that personality characteristics might play an important role in late-life anxiety treatment. Further tailoring of treatment content might involve integrating interpersonal/emotional processing components into traditional CBT, an approach that has already demonstrated promising results in younger adults (Newman, Castonguay, Borkovec, Fisher, & Nordberg, 2008), and reminiscence therapy, which has been shown to improve anxiety in older adults (Rybarczyk & Auerbach, 1990; Scates, Randolph, Gutsch, & Knight, 1985).

Interventions for late-life anxiety need to address preventive approaches as well. About half of older adults with GAD have late onset (Chou, 2009), suggesting the potential utility of preventive approaches for individuals experiencing a subthreshold level of anxiety symptoms or other risk factors. A stepped-care program that integrated careful monitoring, CBT bibliotherapy, problem solving skills, and referral for medication showed promising results in the prevention of anxiety and depression in older adults (van't Veer-Tazelaar et al., 2009). Further work in this area is needed.

The use of advanced technology in treatment delivery holds much promise. Even though older adults lag behind their younger counterparts in the use of the internet and other technologies, there is a growing trend of older adults using online resources over the past decade (Pew Internet & American Life Project, 2009). Researchers have started to integrate internet (Andrews, Cuijpers, Craske, McEvoy, & Titov, 2010) and other hand-held devices (Percevic, Lambert, & Kordy, 2004) as new delivery modes for psychotherapy. Integrating these technologies might increase the availability of psychotherapy for anxious older adults, who experience physical impairment, and geographic or social barriers.

Overall, this review reveals a momentum among late-life anxiety researchers to develop tailored treatments for new patient populations, test novel treatment procedures, and examine innovative delivery approaches. The study methodology used here might not have captured all ongoing and recently funded work on late-life anxiety. For example, studies that focused on treatment of comorbid anxiety and depressive symptoms and on patients with medical comorbidities were not included to allow a more targeted look at innovative treatments for late-life anxiety. Although this strategy also limits the scope of the review, the studies reviewed here show promise in moving late-life anxiety research toward improved outcomes and expanded reach of services.

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Table 1
Ongoing and currently funded research on late-life anxiety

Study PI	Funding source	Focus of treatment
Stanley [†]	NIMH R34-MH078925	Treatment of anxiety in people with dementia
Calleo	NIMH Diversity Supplement; R01MH053932-12S1	Examination of the role of executive functioning in the cognitive behavioral treatment of GAD
Wetherell	NIMH R34MH0866	Treatment of fear of falling
Ayers	VA Career Development Award	Treatment of compulsive hoarding
Thorp [†]	VA Career Development Award	Treatment of PTSD
Wetherell [†]	NIMH R34 MH80151 (Wetherell) Forest Laboratories (Wetherell & Lenze)	Combination of CBT and medication for treatment of GAD
Brenes	Intramural grant from Wake Forest	Exposure treatment for GAD
Stanley [†]	VA Mental Illness Research Education and Clinical Center Pilot Grant	Incorporating religion and spirituality into cognitive-behavioral interventions for anxious and depressed older adults
Papps [†]	5R34MH077156-03	Development of multimodal treatment for late life Generalized Anxiety Disorder
Brenes [†]	NIMH R01MH083664-01A2	Telephone and bibliotherapy for late-life anxiety
Stanley [†]	NIMH MH53932	Primary-care based modular approach to GAD

Note: PI = principal investigator

[†] Studies identified through database search