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Psychological Interventions with Older Adults During Inpatient Post-Acute Rehabilitation: A Systematic Review

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Abstract

Purpose/Objective: Older adults in inpatient post-acute care settings report high rates of depression and anxiety. Psychological interventions address these symptoms through educational, cognitive, behavioral, relaxation, and/or psychosocial approaches. The purpose of this study was to systematically evaluate the quality of existing literature on psychological interventions for depression and/or anxiety among older adults during an inpatient post-acute care stay.

Research Method/Design: Medline, Embase, Cochrane Library, CINAHL, PsycINFO, and Google Scholar were searched for key concepts. Studies were included that: (a) sampled skilled nursing facility or inpatient rehabilitation facility patients; (b) evaluated a psychological intervention; (c) measured depression and/or anxiety symptoms before and after interventions; and (d) had a mean or median age of 65+. Two raters assessed articles for inclusion and risk of bias.

Results: Search strategies identified 7,506 articles for screening; nine met inclusion criteria. Included studies varied by study design, intervention type, and methodological quality. Only one study had low overall risk of bias. Four studies demonstrated preliminary treatment benefits for depression symptoms, none reported benefits for anxiety symptoms.

Conclusions/Implications: Most of the included studies were limited by small sample size and high risk of bias. Thus, currently, there is insufficient evidence to support the effectiveness of

psychological interventions for depression or anxiety among older adults during an inpatient post-acute care stay. The authors offer a detailed discussion of methodological limitations, empirical gaps, and future directions to develop this body of literature.

Keywords

post-acute care; subacute care; psychotherapy; depression; older adults

Each year, over two million older Americans utilize inpatient post-acute care (PAC) services in skilled nursing facilities (SNFs) or inpatient rehabilitation facilities (IRFs; MedPAC, 2019a; 2020). Inpatient PAC services account for over \$35 billion in annual Medicare spending (MedPAC, 2019b). Since the late 1990s, hospital stays have decreased in length, while the number of inpatient PAC admissions has risen (Burke et al., 2015). Partly related to these growing demands, SNFs and IRFs settings are providing care to an increasingly complex older adult patient population, who often require specialized services like psychological care (Ackerly & Grabowski, 2014; Grabowski et al., 2015; White, 2019). Many of these challenges, including navigating fragmented specialty care and accommodating the unique needs of an aging population, are noted across countries and healthcare systems (WHO, 2015).

SNFs and IRFs both provide rehabilitation services following an acute medical event for, primarily, older adult patients: approximately 70% of inpatient PAC patients are age 65 or older (Tian, 2016; White, 2019). However, SNFs and IRFs have some key distinctions in healthcare teams, environments, patient needs, and payment structures. SNFs follow a nurse-driven model, with rehabilitation and medical provider services on-site during select hours, and are commonly co-located with residential long-term care (Tian, 2016). SNFs often provide PAC services following an infection, musculoskeletal injury, or exacerbation of chronic illness (MedPAC, 2020), and require a qualifying hospitalization of at least three days for Medicare coverage (CMS, 2020). In contrast, IRFs have on-site physicians and are commonly located within acute care settings (Tian, 2016). IRFs often provide PAC services following a major medical event that requires specialized rehabilitation services (e.g., stroke or spinal cord injury). To qualify for Medicare coverage, IRF patients must be able to participate in at least three hours of direct rehabilitation per day (MedPAC, 2019a). Despite these differences, previous studies group SNF and IRF patients together because of their similar demographics, functional abilities, and comorbidities (Alcusky et al., 2018; Simning et al., 2019; Tian, 2016). It should be noted that, globally, inpatient PAC can differ in models of care, payment structures, and priority among other healthcare costs (see Kilgore, 2018; Wang et al., 2019).

In the United States, older adults in SNFs and IRFs report higher rates of depression and anxiety compared with other PAC settings (e.g., home care; Simning et al., 2019). Previous estimates suggest that about 40% of older patients report depression and about 25% report anxiety in inpatient PAC settings (Harris-Kojetin et al., 2019; Simning et al., 2019). Multiple studies suggest that depression symptoms are associated with poorer rehabilitation participation and efficacy, as well as longer length of stay in inpatient PAC settings (Allen et al., 2004; Gustavson, Falvey, et al., 2019; Kringle et al., 2018; Lequerica et al., 2009;

Yohannes et al., 2008). After discharge from inpatient PAC, depression symptoms relate with losses in functional ability and greater healthcare spending, as well as increased risk of re-hospitalization (Dossa et al., 2011; Galloway et al., 2016; Webber et al., 2005). In addition, previous studies suggest that anxiety symptoms relate with higher rates of depression during an inpatient PAC stay, as well as greater risk of re-hospitalization and mortality after discharge from inpatient PAC settings (Dossa et al., 2011; Yohannes et al., 2008).

Pharmacological approaches remain the preferred method of treatment for depression and anxiety in inpatient PAC settings, even though older adults in these settings are at high risk for side effects due to polypharmacy (Bachmann et al., 2018; Fullerton et al., 2009). Psychological interventions are non-pharmacological approaches to care that use educational, cognitive, behavioral, relaxation, or psychosocial supportive methods to treat symptoms (Welton et al., 2009). Previous studies suggest that psychological interventions are effective for reducing depression and anxiety among older adults in outpatient PAC settings (Alexopoulos et al., 2006; Hummel et al., 2017). Yet, psychological interventions during an inpatient PAC stay receive less attention in the literature.

To our knowledge, the literature on psychological interventions for depression and anxiety among older adults in inpatient PAC settings has yet to be systematically reviewed. Previous reviews have targeted psychological interventions for specific medical diagnoses common to inpatient PAC settings, such as stroke, traumatic brain injury, or spinal cord injury (Allida et al., 2020; Knapp et al., 2017; Li et al., 2017; Mehta et al., 2011). Even though older adults represent the majority of inpatient PAC patients (Tian, 2016), most of studies included in the aforementioned reviews sampled younger or middle-aged adults. In general, older adults report lower rates of mental health diagnoses compared to younger and middle-aged adults (Karlin et al., 2013). However, older adults may also experience different stressors (e.g., negative views of aging and illness), mental health knowledge, and symptom expression (e.g., somatic and cognitive symptoms) that may impact responses to psychological interventions in inpatient PAC (Bessey et al., 2018; Davies et al., 2004; Farrer et al., 2008). In addition, the inpatient context presents with unique opportunities (e.g., access to care) and challenges (e.g., transitional care and medical rehabilitation priority) to psychological research and care (Quinn et al., 2008; Strong et al., 2020). Therefore, to best inform geropsychological research and practice, the current review groups studies by participant age and care setting (i.e. SNF and IRF), rather than by medical diagnosis (e.g. stroke or spinal cord injury).

Purpose

The purpose of this review was to systematically evaluate the quality of the existing literature on psychological interventions that address depression and/or anxiety among older adults during an inpatient PAC stay. Our overarching research question was: among older adults in inpatient PAC settings, what is the quality of evidence for psychological interventions to improve depression and anxiety symptoms? In addressing this research question, the current review was also interested in commenting on intervention characteristics and considerations for feasibility.

Method

The current review followed guidelines set by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA; Moher et al., 2009) This protocol was pre-registered with the International Prospective Register of Systematic Reviews (#CRD42019137419).

Eligibility Criteria

Inclusion and exclusion criteria were determined a-priori (see Plys et al., 2019).

Study Design and Language—In order to evaluate psychological interventions, we included the following study designs: experimental, quasi-experimental, and single-case design. Observational studies, commentaries, methodological papers, and theoretical papers were excluded. Due to limited resources for translation, articles published in languages other than English were excluded. To address possible bias, we conducted additional follow-up searches and contacted authors of non-English studies, conference proceedings, study protocols, clinical trials, and dissertations for full or translated texts.

Intervention—Consistent with previous reviews, we defined a psychological intervention as a therapist-driven non-pharmacological approach to care that utilizes educational, cognitive, behavioral, relaxation, and/or psychosocial techniques (see Welton et al., 2009). Physical activity, complementary and alternative medicines (CAM; e.g., Reiki, aromatherapy, or herbal supplements), and pharmacotherapy interventions were excluded. These exclusions were imposed because physical activity interventions are already common in inpatient PAC setting (DeJong et al., 2009), and CAM and pharmacotherapy interventions likely impact depression and anxiety through different mechanisms as psychological interventions (see Efthimiou & Kukar, 2010). To ensure that the current review commented only on the impact of psychological interventions, studies that combined approaches were excluded (e.g., psychological and pharmacotherapy in the same intervention). We also excluded studies testing interventions that were not therapist-driven (e.g., unfacilitated music listening) or targeted environmental enhancement (e.g., a garden in the facility or a pet in the patient's room), as these approaches were considered inconsistent with our definition of a psychological intervention.

Participants and Setting—In order to evaluate outcomes among older adults, we included studies with participants that had a mean or median age of 65 years or older. There were no restrictions based on reason for inpatient PAC admission. Because we were interested in interventions during an inpatient PAC stay, studies were included that completed interventions prior to discharge from an inpatient PAC facility. We excluded studies that delivered or completed interventions in outpatient, in-home, or acute care settings (i.e., intervention started during an inpatient stay and continued after discharge to a different setting of care).

Outcomes—The primary outcomes in this review were depression and anxiety. Studies were included that measured depression or anxiety symptoms pre- and post-intervention using a continuous scale. Because we expected a small number of studies relevant to our research question, we did not impose criteria based on pre-specification of depression or

anxiety as the primary outcome; thus, we included studies that measured depression or anxiety symptoms as secondary or tertiary outcomes. There were no restrictions based on scores of depression or anxiety at baseline.

Information Sources

A comprehensive literature search was designed and performed by a medical librarian [CP] in June 2019 for the key concepts of: *subacute care*, including rehabilitation centers; *psychotherapy* or *behavioral medicine*, including terms for specific psychological interventions; and *depression* or *anxiety*. Using key concepts ensured an expansive search of the literature related to the setting, intervention, and outcome of interest. A combination of standardized index terms and keywords were used for each concept to search the following databases: Ovid MEDLINE ALL, Embase (via Elsevier), Cochrane Library (via Wiley, including Cochrane Database of Systematic Reviews, Database of Abstracts of Reviews of Effect, Cochrane Central Register of Controlled Trials, Cochrane Methodology Register, Health Technology Assessment Database, and NHS Economic Evaluation Database), CINAHL (Cumulative Index to Nursing and Allied Health Literature via EBSCOhost), PsycINFO (via Ovid), and Google Scholar (via Publish or Perish software). No language, date, or study design limits were placed on the search. A complete list of database search strategies, including key terms, is available in the Supplemental Materials.

To reduce publication bias and ensure representation of relevant studies not indexed in popular databases, we conducted additional searches targeting the gray literature via the following sources: [ClinicalTrials.gov](https://clinicaltrials.gov), International Clinical Trials Registry Platform, and ProQuest Dissertations and Theses. In addition, in April 2020, reference lists and citing articles for all included studies were searched via Google Scholar.

Study Selection

Search results were first exported to EndNote X9 and duplicates were removed. Covidence systematic review software was used for study selection. The primary author [EP] conducted an initial screen of titles to remove noticeably irrelevant studies. For example, titles including terms such as “adolescent” or “outpatient” were excluded. Then, two authors [EP, CDM] independently screened all potentially relevant abstracts. Disagreements between raters were settled by a separate author [JDP]. Lastly, full texts of retained studies were screened by the same team of two independent raters, with a third independent rater for settling disagreements, until consensus on a final sample was reached.

Data Collection Risk of Bias Ratings

Data was extracted using a standardized tool developed by the authors for use in the current review, see Supplemental Materials. When possible, a Cohen’s *d* effect size was calculated using the Campbell Collaboration online software (Wilson, 2000). Standardized effect sizes were calculated using the following data: change in mean, standard deviation, sample size, and a pre-post correlation coefficient set to .5 (see Lakens, 2013). Effect size benchmarks were: small = .2, medium = .5, large = .8 (Cohen, 1988).

The current review assessed risk of bias using two tools: the Risk Of Bias In Non-randomized Studies of Interventions (ROBINS-I) tool for quasi-experimental studies (Sterne et al., 2016) and the Cochrane Risk of Bias (RoB-2) tool for individually randomized parallel group trials (Sterne et al., 2019). These rating tools are frequently used to evaluate risk of bias in systematic reviews of health-related interventions (Farrah et al., 2019). For the ROBINS-I, bias is assessed across seven domains and overall risk of bias ratings are categorized as: low (i.e., comparable to a well-performed randomized control trial [RCT]); moderate (i.e., offers sound evidence, but is not comparable to a well-performed RCT); serious (i.e., important problems are evident); or critical (i.e., useful evidence cannot be obtained) risk of bias. The developers of the ROBINS-I recommend excluding studies with critical risk of bias in synthesis (Sterne et al., 2016); however, in order to comment on the quality of existing literature, we included all studies regardless of risk of bias and interpreted results accordingly. For the RoB-2, bias is assessed across six domains and overall risk of bias ratings are categorized as low risk, some concerns, or high risk of bias. Studies with high risk of bias demonstrate concerns in multiple domains and should be interpreted with caution (Sterne et al., 2019). Risk of bias ratings were initially completed by one author [EP] and were independently reviewed by a second author [CDM]. Discrepancies in risk of bias ratings were discussed and consensus was reached.

Results

Study Selection

Search strategies yielded 10,353 records. After removal of duplicates, 7,506 titles and abstracts were screened and 7,340 were excluded. One hundred sixty-six full text articles were reviewed for criteria and nine were retained. See Figure 1 for PRISMA diagram, including reasons for exclusion.

Study Characteristics and Risk of Bias

The final sample included three RCTs (Kongkasuwan et al., 2016; Raglio et al., 2017; Sood et al., 2003), two non-randomized trials (Lichtenberg et al., 1996; Szczepańska-Gieracha et al., 2014), two non-equivalent group design studies (Lopez & Mermelstein, 1995; Schubert et al., 1992), and two single-arm pretest-posttest studies (Ali et al., 2014; Kneebone et al., 2014). All control groups received usual care (UC; e.g., physiotherapy and occupational therapy), which may have inflated effect sizes (Mohr et al., 2014).

None of the included studies assessed depression or anxiety after discharge from inpatient PAC to comment on sustained intervention effects. In addition, no study reported data on harmful outcomes. Even though it is unlikely that serious harm may result from psychological treatment in inpatient PAC settings, adverse outcomes are not uncommon in psychological intervention studies (Moritz et al., 2019) and may have implications for feasibility.

In general, the included studies evidenced significant concerns about risk of bias across multiple domains. The majority of studies had overall either moderate risk or some concerns ($n = 3$), or high, serious, or critical ($n = 5$) overall risk of bias. Thus, the current review is

unable to draw conclusions regarding effectiveness. Among the three RCTs, one study had low overall risk of bias; see Table 1. Among the six quasi-experimental studies, none had low overall risk of bias; see Table 2. Graphical depictions of risk of bias ratings for RCTs and non-RCTs are available in Supplemental Materials.

Sample Characteristics

Setting and participant characteristics are presented in Table 3. Two studies sampled patients in SNFs, seven targeted IRFs. All studies were conducted in a single facility. Sample sizes ranged from 6 to 113 ($M = 40.4$; $SD = 36.0$). Only one study had a sample size of 25 or greater in intervention groups (Kongkasuwan et al., 2016).

Four studies reported participants' racial or ethnic background; three included majority white (Lopez & Mermelstein, 1995; Schubert et al., 1992; Sood et al., 2003) and one included majority African American participants (Lichtenberg et al., 1996). No study reported participant income or insurance type; although, two studies targeted facilities that served low-income patients (Lichtenberg et al., 1996; Schubert et al., 1992).

Five studies, all in IRFs, sampled post-stroke patients. The other four studies included participants with mixed reasons for admission, which reportedly included: fracture, stroke, amputation, cardiac disease, cancer, spinal cord injury, arthritis, Parkinson's disease, and other neurological or orthopedic conditions.

Four studies reported data on baseline cognitive abilities for participants in intervention groups. In all four studies, average scores on cognitive screens were consistent with mild cognitive impairment, based on recommended cutoffs for the mini-mental status exam (MMSE; Nasreddine et al., 2005), dementia rating scale (DRS; Springate et al., 2014), and abbreviated mental test (AMT; Jitapunkul et al., 1991).

Studies used the following measures of depression: Geriatric Depression Scale (GDS, $n = 4$; Yesavage et al., 1982), Hospital Anxiety and Depression Scale (HADS, $n = 3$; Snaith & Zigmond, 1986), and Centers for Epidemiologic Studies Depression Scale (CES-D, $n = 1$; Radloff, 1977). Based on recommended cutoffs (see Greenberg, 2012; Stern, 2014; Weissman et al., 1977), average baseline depressive symptoms of participants receiving interventions were within normal limits ($n = 1$; Schubert et al., 1992), mild ($n = 3$; Ali et al., 2014; Lichtenberg et al., 1996; Raglio et al., 2017; Sood et al., 2003), moderate ($n = 2$; Kongkasuwan et al., 2016; Lopez & Mermelstein, 1995), or probable of depression ($n = 1$; Szczepańska-Gieracha et al., 2014).

Anxiety measures included: HADS ($n = 1$), Profile of Mood States (POMS, $n = 1$; McNair, 1992), and Tension Rating Circles (TRCs, $n = 1$; Turner-Stokes et al., 2005). Based on recommended cutoffs (see Stern, 2014), baseline anxiety symptoms were within normal limits ($n = 2$; Kongkasuwan et al., 2016; Raglio et al., 2017) or mild ($n = 1$; Ali et al., 2014); two studies used a scale without cutoffs (Kneebone et al., 2014; Lopez & Mermelstein, 1995).

Intervention Characteristics

See Table 4 for intervention characteristics. Two interventions were unstandardized (Lopez & Mermelstein, 1995; Schubert et al., 1992), meaning that the length and content of the intervention varied across participants. Three studies reported that interventionists received specialized training prior to delivery and consultation during delivery of the intervention (Lichtenberg et al., 1996; Raglio et al., 2017; Sood et al., 2003); however, none of the studies reported the use of treatment fidelity measures. Lichtenberg et al. had the most rigorous methods to ensure accurate intervention delivery, including self-study of a manual and two videotaped practice sessions with expert feedback. In this study, clinicians had to accurately deliver 95% of the intervention across seven domains prior to administering the intervention with study participants.

Five studies commented on participant attendance. Ali et al. reported that participants attended an average of 5 of 12 group sessions. Kongkasuwan et al. reported that participants attended, on average, 4.7 of 8 group sessions. Kneebone et al. reported that, among participants who attended more than a single session of an open group, the average attendance was 3.8 sessions. Lichtenberg et al. and Schubert et al. did not test fixed-length interventions and participants averaged 4.3 to 7.2 or 4 individual psychotherapy sessions, respectively.

Depression and Anxiety Outcomes

Treatment benefits for depression and anxiety symptoms are presented in Table 3. Eight studies reported outcome data for depression; five identified depression as a primary outcome (Lichtenberg et al., 1996; Raglio et al., 2017; Schubert et al., 1992; Sood et al., 2003; Szczepańska-Gieracha et al., 2014). Three studies measured depression as a secondary outcome, targeting anxiety (Ali et al., 2014), quality of life (Kongkasuwan et al., 2016), and rehabilitation outcomes (Lopez & Mermelstein, 1995) as primary outcomes. Of the five studies that specified depression as a primary outcome, three reported large between-groups effect sizes and one reported a small between-group effect size; one study did not include a comparison group. Among RCTs that measured depression ($n = 3$), two reported large between-group effect size and one reported a small between-group effect size. All of the four studies with low to moderate overall risk of bias (i.e., one RCT and three with depression as a primary outcome) reported large between-group effect size for depression.

Five studies reported outcome data for anxiety; three identified anxiety as a primary outcome of interest (Ali et al., 2014; Kneebone et al., 2014; Raglio et al., 2017). Of these three studies, one reported a small between-groups effect size (Raglio et al., 2017) and two did not report enough data to calculate effect sizes. Each of the two studies with low or moderate overall risk of bias that measured anxiety (i.e., two RCTs and one with anxiety as a primary outcome), reported small between-group effect sizes. None of the included studies reported statistically significant between-group treatment benefits for anxiety.

Differences Between SNFs and IRFs

See Table 5 for a comparison of findings from SNFs and IRFs. Consistent with previous research (Tian, 2016), SNF patients were older and had greater variability in reasons for

admission. Interventions in IRFs consisted of fewer sessions and were more often facilitated by psychologists. However, due to small sample size and methodological limitations, the current study is not able to compare findings across settings, including commenting on intervention effects.

Feasibility Considerations

Eligibility Criteria—Exclusion criteria typically included age, cognitive ability, mental health, and physical ability. Six studies imposed a criterion based on age, excluding patients younger than: 16 (Ali et al., 2014), 40 (Raglio et al., 2017), 50 (Kongkasuwan et al., 2016), 60 (Lichtenberg et al., 1996; Sood et al., 2003) or 65 (Szczepańska-Gieracha et al., 2014). Five studies imposed criteria based on cognitive screens indicative of mild or moderate impairment; i.e., excluding patients scoring below 15 (Szczepańska-Gieracha et al., 2014), 16 (Sood et al., 2003), 18 (Raglio et al., 2017), or 20 (Lopez & Mermelstein, 1995) on the MMSE or below 103 on the DRS (Lichtenberg et al., 1996). Four studies excluded patients with cognitive, physical, or sensory limitations that prohibited them from providing consent or participating in the intervention (Ali et al., 2014; Kneebone et al., 2014; Kongkasuwan et al., 2016; Szczepańska-Gieracha et al., 2014). Three studies included patients who screened positive for depression on the GDS-30 (i.e., ≥ 10 ; Lichtenberg et al., 1996; Sood et al., 2003) or CES-D (Lopez & Mermelstein, 1995). Other exclusion criteria included: antidepressant use (Lichtenberg et al., 1996), previous music therapy treatments (Raglio et al., 2017), substance use disorders (Szczepańska-Gieracha et al., 2014), or serious mental illness (e.g., schizophrenia or bipolar disorder; Kneebone et al., 2014; Raglio et al., 2017; Szczepańska-Gieracha et al., 2014).

Regarding the impact of inclusion criteria, two studies provided data related to eligibility of the patient population in the targeted facility. Kongkasuwan et al. reported that 19% of IRF patients screened were excluded due to aphasia, 12% were excluded due to health issues (e.g., poor vital signs), and 6% refused participation. Szczepańska-Gieracha et al. reported that about 50% of patients in the targeted SNF were excluded due to aphasia, cognitive impairment, or poor health.

Attrition—Four studies reported attrition data. Ali et al. reported that two (25%) participants dropped out of the intervention group due to discharge. Kongkasuwan et al. reported that five (8%) participants dropped out of the intervention group, four due to voluntary withdrawal and one due to discharge. Lichtenberg et al. reported that four (10%) participants dropped out of the study due to acute illness or re-hospitalization. Sood et al. reported that five (26%) participants dropped out of the study due to discharge, voluntary withdrawal, aphasia, or death.

Discussion

The primary purpose of this review was to evaluate the quality of existing literature on psychological interventions for depression and anxiety among older adults during a SNF or IRF stay. Only one retained study had low overall risk of bias, whereas five had high, serious, or critical overall risk of bias. These findings indicate a lack of high-quality evidence regarding the effectiveness of psychological interventions with the

targeted patient population. Many of the included studies were consistent with pilot, feasibility, or program evaluation studies, rather than well-controlled RCTs that could comment on efficacy. Further, the included studies evidenced considerable heterogeneity in intervention modality and delivery. For example, only three studies utilized evidence-based psychotherapy protocols, like cognitive-behavioral therapy, and four interventions lacked standardized protocols (i.e., varying number of sessions and session content). This theoretical and methodological variability suggests the need for the field to invest in more foundational work in order to estimate effect sizes and address feasibility concerns before conducting larger clinical trials. Together, concerns regarding methodological quality, coupled with small sample sizes and variable effect sizes, prohibit conclusions regarding the effectiveness of psychological interventions among older adults during an inpatient PAC stay.

Findings and Future Directions

Effect sizes reported in the current review may be affected by multiple sources of bias, including methodological limitations, small sample size, and estimation approach (Ioannidis et al., 2007; Veroniki et al., 2016). Thus, results must be interpreted with caution and conclusions regarding effectiveness cannot be made. However, some preliminary findings suggest that future investigation targeting psychological interventions with older adults may be warranted in inpatient PAC settings. For example, most studies that measured depression reported large between-group effect sizes compared to UC. These findings suggest that it is possible for older adults to evidence positive changes in depression symptoms during an inpatient PAC stay. Further, psychological interventions appeared to be acceptable among older adults in inpatient PAC settings. For example, participants across multiple studies reported satisfaction with interventions (e.g., Ali et al., 2014; Kongkasuwan et al., 2016) and attrition rates (i.e., 8–26%) were consistent with previous research on psychological interventions in outpatient settings (Cooper & Conklin, 2015). Although, as mentioned, the current study cannot draw decisive conclusions regarding intervention benefits.

It is important to note that none of the included studies found significant between-group reductions in anxiety symptoms. There are a few possible explanations for this finding, including inappropriate treatment targets for anxiety or baseline symptoms at levels too low to detect treatment benefits. It is also possible that the inpatient PAC setting may not be ideal for addressing anxiety using psychological intervention. For example, Lopez & Mermelstein (1995) suggested that null findings may be related to the timing of follow-up measurement at IRF discharge, as this event may increase anxiety. Together, these findings suggest that more conceptual work is needed related to anxiety among older adults in inpatient PAC settings in order to justify investing in future clinical research.

Another potentially important finding from the current review is the possible impact of psychological care on rehabilitation outcomes. All six studies that measured rehabilitation outcome data reported potential benefits associated with psychological interventions. Further, three studies with low or moderate risk of bias evidenced significant between-group improvements in functional ability among participants in psychological intervention groups (Kongkasuwan et al., 2016; Lichtenberg et al., 1996; Szczepańska-Gieracha et al.,

2014). Additional research targeting the potential benefits of psychological intervention on rehabilitation outcomes, including mechanistic research, may offer important information on the feasibility of integrating psychological services in inpatient PAC settings.

Methodological Limitations and Literature Gaps

Major sources of bias identified across multiple studies in this review included poorly controlled confounders, inconsistent adherence to interventions, and lack of available a-priori protocols. These sources of bias likely reflect the small-scale of the final sample of studies, which included few sufficiently-powered or well-controlled RCTs. In addition, sources of bias reflect some of the challenges associated with conducting psychological research in inpatient PAC settings, such as regulatory oversight, complex and heterogeneous patients, and transitional medical models (Gustavson et al., 2019; Quinn et al., 2008; Strong et al., 2020).

Confounders—Uncontrolled confounders were a major source of bias in the included studies, which likely related to the setting and patient population of interest. For example, heterogeneity in reasons for admission, cognitive ability, prognosis, and length of stay are typical of older patients in inpatient PAC settings (Downer et al., 2017; Rahman et al., 2014; Tian, 2013). Additional basic science research (i.e., Stage 0 in NIH Stage Model for Behavioral Intervention; Onken et al., 2014) is needed to test the relationships among these factors, as well as their impact on psychological needs and treatment outcomes among older adults in inpatient PAC settings.

Variations in cognitive ability poses challenges for psychological intervention research with older adults (Douglas et al., 2020). The most common method of addressing variations in cognitive ability was to exclude patients with moderate-severe impairment. This strategy poses significant concerns to external validity as about 56% of older adults in inpatient PAC settings have moderate-severe cognitive impairment (Downer et al., 2017). Other studies reported tailoring interventions to the cognitive makeup of the facility (see Kneebone et al., 2014). However, it is unclear whether adaptations are more appropriate for certain interventions (e.g., relaxation training) compared with others (e.g., cognitive behavioral therapy). Previous studies suggest that behavioral interventions may be effective and adaptable in settings where variability in cognitive functioning is common (Meeks et al., 2015; Yoon et al., 2018). Additional research is needed to determine which psychological intervention modalities are appropriate for older adults in inpatient PAC settings, where variability in cognitive function is expected.

Group psychotherapies, which were highly represented in the current sample ($n = 4$), might be particularly impacted by variability in cognitive functioning (e.g., differences in ability to engage with material across group members). It is possible that arts or music therapy approaches may offer an opportunity for participants with varying cognitive abilities to benefit within the same group intervention (Blackburn & Bradshaw, 2014; Cousins et al., 2020; Strong et al., 2020). For example, a participant with moderate-severe impairment may benefit from stimulation with music, whereas a participant with mild impairment may benefit from discussing emotions associated with the music. Of note, three included

studies, two in a group setting, used arts or music-based approaches and two reported significant benefits for depression symptoms (Kongkasuwan et al., 2016; Raglio et al., 2017). Additional research is also needed to investigate the utility and feasibility of universal interventions that may benefit patients with a range of cognitive abilities (e.g., music therapy) versus individual interventions that are adapted to cognitive ability levels (e.g., behavioral therapy).

Included studies addressed variable lengths of stay by tailoring the intervention to a typical length of stay in the targeted facility (e.g., Ali et al., 2014) or using flexible intervention lengths to meet individual patient needs (e.g., Lopez & Mermelstein, 1995; Schubert et al., 1992). Few studies reported high attrition associated with discharge and intervention lengths were consistent with suggestions for an optimal course of psychological treatment with older adults (i.e., 7–12 sessions; Pinquart et al., 2007). However, included studies often condensed sessions into briefer time periods than in previous research (e.g., weekly sessions). For example, multiple studies met at least three times per week (e.g., Lopez & Mermelstein, 1995; Raglio et al., 2017; Sood et al., 2003; Szczepańska-Gieracha et al., 2014). It is unclear whether the frequency of sessions influences treatment benefits, especially among patients with mild cognitive impairment. Additional dose-response studies are important to consider in inpatient PAC settings, where length of stay will dictate the course of treatment.

Adherence to Interventions—Another common source of bias was poor adherence to intended interventions. Regarding participant adherence, attendance rates varied with lower attendance noted when psychological interventions were complementary to, rather than combined with, physiotherapy (e.g., Ali et al., 2014; Kongkasuwan et al., 2016). These findings may reflect barriers to attendance associated with demanding medical rehabilitation care plans, which is a setting-specific concern for psychological care. Relatedly, some studies combined psychological and physiological interventions (e.g., Lichtenberg et al., 1996; Sood et al., 2003); yet, none included formal assessments of treatment fidelity. Additional research is needed to investigate the feasibility of implementing psychological interventions that are complementary to, versus combined with, physiotherapy (see Lenze et al., 2013), as well as the impact of discipline (e.g., nurses, OT, or psychologists) on intervention fidelity.

Limitations

This review has several limitations to consider. First, due to limited resources for translation, we only included articles published in English, which may have led to the exclusion of relevant studies. Second, research from six different countries were summarized together, even though the implications of findings will vary based on healthcare system, payment structures, and models of care (Wang et al., 2019). Third, we observed many articles that offered limited descriptions of care settings or used non-specific language to describe patient populations (e.g., “patients in rehabilitation”). To ensure this review commented only on inpatient PAC settings, we imposed strict inclusion criteria related to the setting of care. However, in doing so, it is possible we excluded relevant studies. Fourth, this review only targeted psychological interventions and, thus, does not comment on the full scope of treatment options for depression or anxiety (e.g., medication or physical activity). Fifth,

our initial search results yielded a large number of irrelevant articles and a single reviewer screened these articles, which is not consistent with PRISMA guidelines (Moher et al., 2009). To reduce bias, we systematically examined reference lists and citations of included studies, but it is still possible that relevant studies were omitted during this initial review. Lastly, small sample sizes, high risk of bias, heterogeneity, small number of studies, and publication bias must be considered when interpreting findings from studies included in the current review.

Conclusion

Despite conducting a comprehensive systematic review, a lack of high-quality evidence leaves unanswered questions related to the feasibility and effectiveness of psychological interventions for older adults in inpatient PAC settings. More foundational research is needed to build evidence related to patient appropriateness for treatment and mechanisms of change. In addition, this review identified multiple challenges to translational research in inpatient PAC settings, suggesting the need for future development of intervention modalities and delivery methods. It is possible that studies that did not meet criteria for this review offer future directions to address some of these challenges, like employing non-sequential, non-cumulative group interventions (see Strong et al., 2020), stepped-care that continues interventions after discharge from inpatient PAC facilities (see Alexopoulos et al., 2006), or single-day workshops (see Dindo, 2015). Although the literature is significantly limited, our findings suggest that psychological interventions might potentially reduce depression symptoms among older adults during an inpatient PAC stay; thus, we believe that additional attention to this area of research is warranted. Future investigators are encouraged to continue to develop the state of the science, which may potentially lead to accessible psychological care for this high-need patient population.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Impact:

- Sources of bias, including poorly controlled confounders, inconsistent intervention adherence, and lack of available a-priori protocols, prohibit conclusions regarding effectiveness of psychological interventions for depression or anxiety among older adults in inpatient post-acute care settings.
- Even though high-quality evidence is lacking, preliminary findings suggest that psychological interventions may be acceptable for addressing depressive symptoms among older adults during an inpatient post-acute care stay; thus, the need for future rigorous research is justified.
- No study reported treatment benefits for anxiety symptoms, suggesting the need for more conceptual work to understand the appropriateness of psychological interventions for anxiety among older adults in inpatient post-acute care settings.

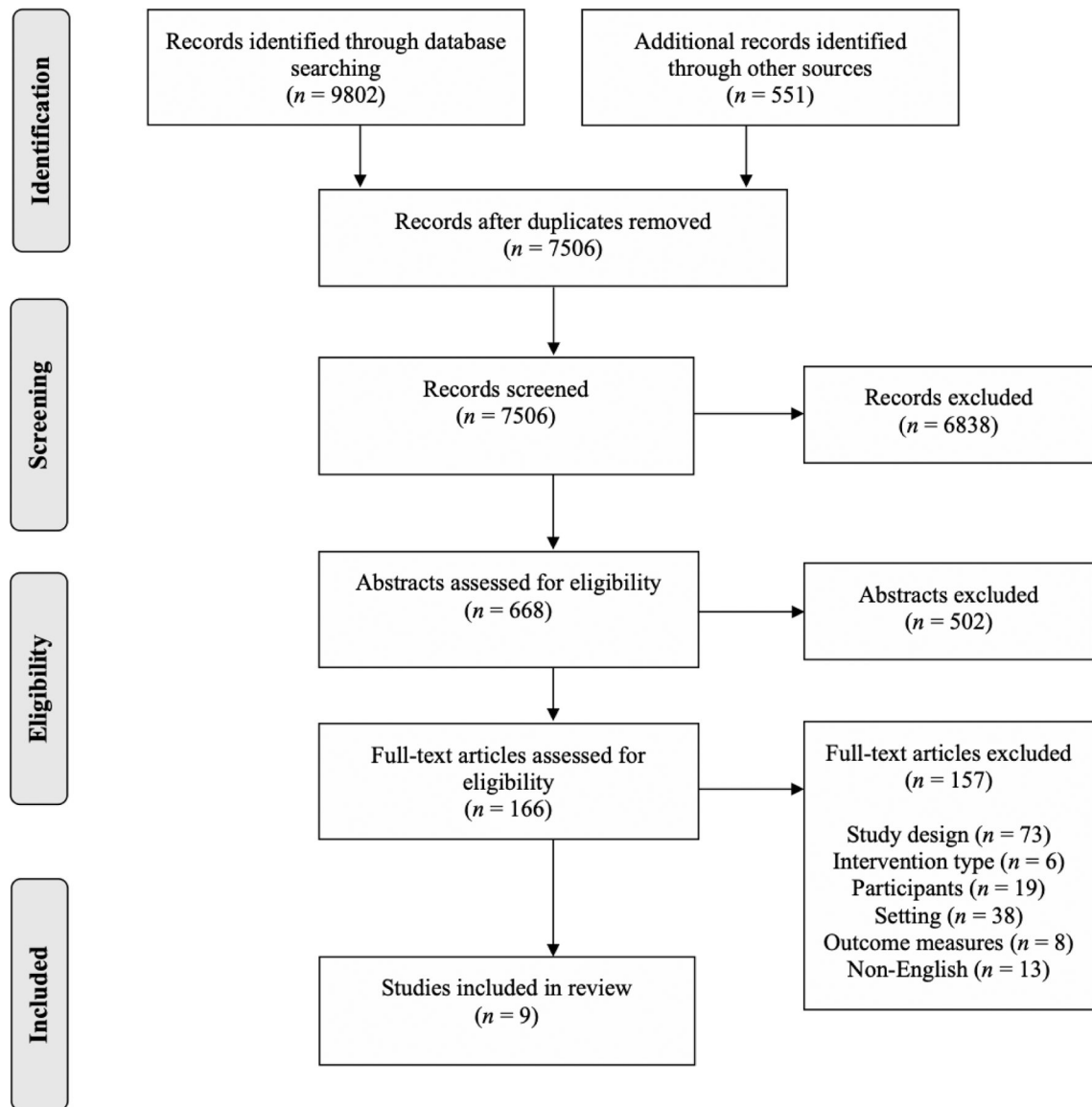


Figure 1. PRISMA Diagram

Note. Identification involved database searching, additional searches, and removing duplicates. Screening involved title review of noticeably irrelevant studies. Eligibility involved abstract and full-text review of articles based on criteria.

Table 1

Risk of Bias Ratings for RCT Studies (RoB-2)

	Bias arising from the randomization process	Bias due to deviations from intended interventions	Bias due to deviations from intended interventions	Bias due to missing outcome data	Bias in measurement of the outcome	Bias in selection of the reported result	Overall risk of bias
Kongkasuwan et al. (2016)	L	L	L	L	L	L	L
Raglio et al. (2017)	S	L	S	L	L	S	S
Sood et al. (2003)	S	L	S	S	L	H	H

Note. L = low risk of bias. S = some risk of bias. H = high risk of bias.

Table 2

Risk of Bias Ratings for Non-RCT Studies (ROBINS-I)

	Bias due to confounding	Bias in selection of participants into the study	Bias in classification of interventions	Bias due to deviations from intended	Bias due to missing data	Bias in measurement of outcomes	Bias in selection of the reported result	Overall Risk of Bias
Ali et al. (2014)	S	L	L	S	M	M	M	S
Kneebone et al. (2014)	C	S	M	S	L	M	S	C
Lichtenberg et al. (1996)	M	L	L	M	L	L	M	M
Lopez & Mermelstein (1995)	S	L	L	M	L	M	M	S

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	Bias due to confounding	Bias in selection of participants into the study	Bias in classification of interventions	Bias due to deviations from intended	Bias due to missing data	Bias in measurement of outcomes	Bias in selection of the reported result	Overall Risk of Bias
Schubert et al. (1992)	S	L	L	M	L	M	M	S
Szczępańska-Gieracha et al. (2014)	M	L	L	M	L	L	M	M

Note. L = low risk of bias. M = moderate risk of bias. S = serious risk of bias. C = critical risk of bias.

Table 3

Effects of Interventions on Anxiety and Depression

Study	Participant characteristics	cognitive Ability of intervention Group	Measures	Baseline <i>M</i> (SD)	Discharge <i>M</i> (SD)	cohen's <i>d</i> for between-group differences (95% CI)	Qualitative description of findings
Ali et al., 2014 <i>IRF</i> (UK)	N = 6 M _{Age} = 69 100% male Dx = Stroke	NR	HADS-D HADS-A	10 8	4 6		
Kneebone et al., 2014 <i>IRF</i> (Australia)	N ₁ = 21 N ₂ = 34 M _{Age} = 74 (14) 51% female Dx = Stroke LOS = 64 (28)	NR	TRC ₁ session TRC ₂₊ sessions	Med = 2 Med = 1.9	Median = 1 Median = 1.45		
Kongkasuwan et al., 2016 <i>IRF</i> (Thailand)	N = 54 N _C = 59 M _{Age} = 67.1 (9.2) 53% female Dx = Stroke	AMT = 7.7 (2.6)	HADS-D HADS-Dc HADS-A HADS-Ac	10.7 (5.8) 9.8 (5.0) 6.4 6.5 (3.7)	4.4 (4.0) 7.9 (4.9) 3.3 (3.1) 4.5 (3.5)	-.89 (-1.27, -.50)* -.29 (-.66, .08)	
Lichtenberg et al., 1996 <i>IRF</i> (USA)	N ₁ = 26 ^a (13/13) N _C = 11 M _{Age} = 78 83% female Dx = Mixed LOS = PSY: 17.9 (7.7); OT: 12.9 (5.3)	DRS PSY = 123.5 (7.8) OT = 117.8 (14.7)	GDS-30 _{psy} GDS-30 _{OT} GDS-30 _C	15.46 (3.3) 16.23 (4.2) 15.55 (4.6)	8.92 (4.1) 10.23 (5.2) 15.55 (5.4)	-1.50 (-2.41, -.59)* -1.23 (-2.11, -.36)*	69% of the intervention group had reductions in depression scores at or above one standard deviation by the time of discharge from the IRF; only 25% of controls reported reductions in depression at this level.
Lopez & Mermelstein, 1995 <i>IRF</i> (USA)	N ₁ = 21 N _C = 52 M _{Age} = 70 71% female Dx = Mixed LOS = 29	NR	CES-D CES-Dc POMS POMS _C	21.5 (11.1) 12.5 (10.6) 15.5 (8.9) 8.3 (7.1)	11.8 (10.5) 12.0 (8.5)		

Study	Participant characteristics	cognitive Ability of intervention Group	Measures	Baseline <i>M</i> (SD)	Discharge <i>M</i> (SD)	cohen's <i>d</i> for between-group differences (95% CI)	Qualitative description of findings
Raglio et al., 2017 <i>IRF</i> (Italy)	N _I = 19 N _C = 19 M _{Age-I} = 70.4 (8.9) M _{Age-C} = 75.4 (7.6) 58% female Dx = Stroke	NR	HADS-D HADS-D _C HADS-A HADS-A _C	7.18 (4.89) 3.80 (3.6) 6.17 4.29 (4.29) 4.83 (3.5)	4.47 (3.57) 5.73 (3.97) 5.8 (3.69) 5.73 (3.97)	-1.15 (-1.83, -.46)* -.33 (-.97, .31)	
Schubert et al., 1992 <i>IRF</i> (USA)	N = 14 Median Age = 72 50% female Dx = Stroke	NR	GDS-30	Median = 7	Median = 3		40% of participants evidenced significant depression at baseline, which was reduced to 20% at discharge from the IRF.
Sood et al., 2003 <i>SNF</i> (USA)	N _I = 6 N _C = 8 M _{Age} = 80.8 (7.0) 67% male Dx = Mixed (18.5) LOS = 53.7 (18.5)	MMSE = 25.8 (2.3)	GDS-30 GDS-30 _C	18.00 (6.26) 19.25 (5.04)	9.33 (5.89) 13.38 (7.41)	-.45 (-1.52, .62)	4 of 6 participants in the intervention with significant depression scores at baseline evidenced scores within normal limits at SNF discharge, whereas only 2 of 8 participants in the control group with significant depression reported scores within normal limits at SNF discharge.
Szczepańska-Gieracha et al., 2014 <i>SNF</i> (Poland)	N _I = 13 N _C = 15 M _{Age} = 77.1 (5.6) 100% female Dx = Mixed	MMSE = 23.1 (3.7)	GDS-15 GDS-15 _C	8.23 (3.24) 8.07 (2.89)	3.15 (2.27) 7.0 (2.8)	-1.42 (-2.25, -.59)*	No participant in the intervention group reported significant depression at discharge from the SNF (38% with significant depression at baseline), whereas 20% of the control group reported significant depression at SNF discharge (40% at baseline).

Note. NR = not reported. I = intervention group. C = control group. Dx = medical diagnosis upon admission. LOS = length of stay in days. Lichtenberg et al. reported two experimental groups: intervention delivered by a psychologist (PSY) or occupational therapist (OT). Between-group comparisons only conducted for studies with equivalent referent groups at baseline.

* $p < .05$.

Table 4
Intervention Characteristics

Study	Intervention Type	Group or Individual	Frequency and Length	Session Length	Facilitator	Description of Intervention	Psychological Components					Psychosocial Support	
							Education	Cognitive	Behavioral	Relaxation			
Ali et al. (2014)	Arts Therapy	Group	2x/week for 6 weeks	50 minutes	Trained arts therapist & speech-language therapist	Arts therapy designed to facilitate expression of emotions and discussion of difficult emotions. Intervention activities were chosen to promote self-efficacy and a sense of identity through constructing a narrative. The intervention included drawing, painting, sculpting, and photography.						X	
Kneebone et al. (2014)	Relaxation Training	Group	1x/week	30 minutes	Psychologist trainee & OT	Introduction to and education on stress and relaxation, and guided prompt of autogenic relaxation training.	X				X		
Kongkasuwan et al. (2016)	Arts Therapy	Group	2x/week for 4 weeks	1.5–2 hours	Trained arts therapist	Creative arts therapy designed to promote self-expression, emotional expression, and spiritual coping. Intervention included: • Meditation with music • Mindful drawing • Painting and drawing • Clay modeling • Mask making • Group singing activity • Group-healing circle				X		X	
Lichtenberg et al. (1996)	Psychotherapy	Individual	2x/week for 4–7 sessions	30 minutes	Psychologist & OT	Behavioral therapy for depression. Intervention included:			X		X		X

Study	Intervention Type	Group or Individual	Frequency and Length	Session Length	Facilitator	Description of Intervention	Psychological Components				
							Education	Cognitive	Behavioral	Relaxation	Psychosocial Support
Lopez & Mermelstein (1995)	Psychotherapy	Individual	3–4x/week	30 minutes	Psychologist resident	• Relaxation and imagery to reduce anxiety					
						• Engaging in a pleasurable event					
						• Positive social praise					
						Cognitive-behavioral intervention to promote coping skills and problem-solving techniques. Interventions included:	X	X	X	X	X
						• Psychoeducation					
Raglio et al. (2017)	Music Therapy	Individual	3x/week, 20 sessions total	30 minutes	Trained music therapist & facility staff	• Realistic goal-setting					
						• Tracking rehabilitation progress and goals					
						• Relaxation training					
						• Pleasant activity planning and tracking					
						• Positive social comparisons and perspective-taking					
Schubert et al. (1992)	Psychotherapy	Individual	2–10 total sessions	30 minutes	Psychologist	• Cognitive restructuring					
						Patient-directed engagement with rhythmical-melodic instruments (e.g., drums) and sharing of emotions.					X
						Psychotherapy for:					
						• Grieving physical losses					
						• Managing anxiety					
						• Integrating medical events into previous lifestyle					

Study	Intervention Type	Group or Individual	Frequency and Length	Session Length	Facilitator	Description of Intervention	Psychological Components					
							Education	Cognitive	Behavioral	Relaxation	Psychosocial Support	
Specific intervention components were not discussed.												
Sood et al. (2003)	Psychotherapy	Individual	4x/week for 7.5 weeks (on average)	50–80 minutes	OT	Geriatric Wellness Program based on Lichtenberg et al. (1996). Intervention included: - Relaxation and guided imagery exercises - Self-monitoring of mood - Positive reinforcement and encouragement for functional rehabilitation gains - Identifying, scheduling, and engaging in pleasant activities		X	X		X	
Szczepańska-Gieracha et al. (2014)	Psychotherapy	Group	4x/week for 4 weeks	90 minutes	Two Supervised Therapists (training background unspecified)	Supportive group designed to establish relationships, learn healthy coping strategies, and promote autonomous engagement in rehabilitation activities. Activities included: - Emotional expression - Relationship-building - Problem-solving strategies to increase self-directed rehabilitation behaviors		X			X	

Note. Schubert et al. did not report specific components of the intervention

Table 5

Study Characteristics and Findings by Setting

	SNFs (2 studies)	IRFs (7 studies)
Low-Moderate Risk of Bias	1	3
RCT	1	2
Sample Size for Intervention Groups	Range: 6–13; $n = 19$ $M = 9.5$, $SD = 4.9$	Range: 6–55; $n = 195$ $M = 27.9$, $SD = 19.2$
Average Age (75+)	2	1
Reduction in Depression Symptoms *	Large: 1	Large: 3
Compared to UC (Effect Size)	Small: 1	NR: 4
Intervention Type (Psychotherapy)	2	3
Interventionist (Psychologist)	0	3
Treatment Duration	7–8 weeks: 1 4 weeks: 1	6–7 weeks: 2 4 weeks: 1 Unspecified: 4
Number of Sessions (≤ 12)	0	5
Treatment Approach: Groups	1	3

Note. NR = not reported due to insufficient data.

* No SNF study measured anxiety, so only depression was reported.