

A Systematic Review of Recreation Therapy for Depression in Older Adults

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Abstract

Background: Recreation therapy (RT) provides a flexible and powerful treatment for depression associated with aging. This article reviewed the effectiveness of RT to treat depression in older adults.

Method: Five electronic databases were employed to identify interventional studies on RT in depressed older adults: Pubmed, PsycINFO, ProQuest, Academic Search Premier and ERIC. Articles were screened against inclusion criteria and assessed with respect to methodological quality.

Results: A systematic literature review included 18 articles. Fourteen studies reported improvement in depression but 6 studies lack adequate significance in the positive effect of RT. Methodological quality assessment of 13 randomized-controlled trials and 5 non-controlled studies indicated an overall mean of 5.67 ± 1.94 points out of 9.

Conclusion: There were positive findings that RT is effective in improving geriatric depression. Future investigation is encouraged to explore the mechanism between physical activity RT and depression improvement.

Keywords: Recreation therapy; Older adults; Depression; Systematic review

Introduction

Depression is among the most prevalent mental health condition affecting the elderly population [1-4]. Not only when quality of life (QOL) is most affected in elderly ladies, but the highest suicidal rate in US belongs to Caucasian men over 70 years old [5-7]. Simultaneously, recent evidence suggested that depressed mood was caused by more negative emotion input with less suitable conflict-solving strategies, and in turn it directly influenced the morbidity and mortality of chronic health conditions. Medical health conditions such as diabetes, stroke, cancers, and dementia became the biggest sources of stress [8,9].

Psychosocially, isolation and unexpected changes in environment could be especially relevant to depressed mood. Henderson [10] found that married couples often share recreation and activity with each other. Loss of spouse would then discourage widows to continue recreational activities, which further limit the positive enjoyment for widows at old age. The loss of mobility further decreases self-esteem to carry out recreational activities [11,12]. As a stress-buffer and response to coping with stress, recreation is vital to the well-being of elderly people [13]. In addition, the length of institutionalization in older adults is positively associated with likelihood of depression and negatively associated with their self-esteem. In one study, 13% of residents develop one major depression over first year of institutionalization and 18% develop new depressive symptoms [14].

Evidence showed that as low as one-tenth of depressed older adults received treatment for their depressed emotion [15]. The common barrier is that some symptoms such as changes in sleep, appetite, fatigue and loss of interests in usual activities can be overlooked as a part of aging. There is desperate need to enhance treatment for depression among elderly.

National Institute of Health [16] suggested that older adults prefer recreation therapy over medical treatment to depression. Recreation therapy (RT), also known as therapeutic recreation and recreational therapy, is defined by the National Therapeutic Recreation Society [17] in the US as *"the therapeutic use of recreational methods in ways that facilitate enhancement of health, functional ability, independence, and perception of QOL. This is in line with one of the goals to increase QOL during treatment of depression"*. Especially for the elderly, recreation therapy has been proved to be effective to promote a healthy lifestyle, improve social life, release stress and depressed mood and with a potential to further shift their focus to obtain a better Quality of Life [18].

An advantage of RT is that such non-pharmacological intervention will not interfere with medication. Aged people are more likely to accept the medication treatment for their chronic conditions. The dynamic and diverse nature of RT can be more flexibly adjusted to suit the different physical and mental needs of depressed older adults.

Importantly, RT can address the social needs of older adults. A quote from the Bureau of Labor Statistics [19] illustrates the spectrum of activities under RT: *"They use a variety of activities, including arts and crafts, drama, music, dance, sports, games and field trips. These activities*

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Received April 20, 2017; **Accepted** April 24, 2017; **Published** April 30, 2017

Citation: Lam MHS, Bik CHOW, Cheung SY, Lee KY, Li WHC, et al. (2017) A Systematic Review of Recreation Therapy for Depression in Older Adults. J Psychol Psychother 7: 298. doi: [10.4172/2161-0487.1000298](https://doi.org/10.4172/2161-0487.1000298)

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help maintain or improve a client's physical and emotional well-being". RT encourages users to release any frustration from their circumstances and communicate with other people. For example, Jordan [20] observed that not only does RT improve Quality of Life; it also refreshes or encourages new purpose of life.

Research has identified the benefits when older adults took part in RT [21,22]. Creative activities nurture the sense of competence and capabilities, which assist older adults to adjust to the physically, psychologically or psychosocially changes around them.

Although overwhelming evidences supported that recreation therapy can benefit elderly to relieve their depression, there is not yet a guideline to allocate appropriate recreational intervention to any group of elderly people. Hunter and Gillen [9] suggested that designing stress-coping RT for elderly adults is challenging and yet well understood. Johnson [12] summarized the general relationship between RT and depression in elderly, which can be regarded as informative, but less systematic in the summary of the results. This lack of knowledge has motivated the current systematic review to update on the recent RT interventions available to the treatment of depression in elderly. The present article reviews the effectiveness of recreation therapy (RT) to treat depression in older adults.

Method

This review searched Pubmed, PsycINFO, ProQuest Academic Search Premier and ERIC, for interventional studies for geriatric depression. The alternative terms for the older age groups were based on a systematic review on health literacy in older people [23]. The following search strategy was used:

- ("elder*" OR "aged" OR "ageing" OR "older adults" OR "old*" OR "older people" OR "geriatr*" OR "senior" OR "nursing home")
- AND ("depression" OR "dysthymia" OR "depressive symptoms" OR "depressive disorder" OR "major depression")
- AND ("recreation therapy" OR "therapeutics" OR "recreational therapy" OR "therapeutic recreation")
- AND ("therapy" OR "treatment" OR "clinical trial" OR "psychosocial intervention" OR "nonpharmacological intervention" OR "outcome study" OR "randomized controlled trials")

Additionally, hand searches were performed by secondary scanning the references of eligible articles to include relevant studies.

Inclusion criteria

The final inclusion of articles had to fulfill all the following criteria:

1. Interventional study aimed to or included evaluation of depressive symptoms after RT.
2. Participants must be labeled as old according to the investigators. The World Health Organisation [24] defines old age as 60 years old or above, whereas others may use cut-off at age 65.
3. Articles have to be in English and available in full text.

Screening the studies

The two of the authors of this paper worked in parallel stages. First, titles of search results are screened for potential eligibility. Second, the abstracts would be screened. Finally the full text of articles from search

result will be assessed. Those that did not meet inclusion criteria were dropped out. Any contrasting decision was discussed until consensus was reached.

Quality of included studies

According to the methodological evaluation by Higgins and Green [25], the two authors carried out the assessment independently and discussed the results until consensus were made. The mean scores and standard errors of each reviewed study were computed [26].

Results

Preliminary search results generated 694 articles. After the first round of screening excluded those incompatible with inclusion criteria, 305 articles remained. From there, 32 articles were left upon abstract screening against the inclusion criteria. During the final stage of full text screening, 15 studies remained from the electronic search. The review of reference lists added 3 more studies by hand searching. In conclusion, a total of 18 interventional studies were selected for use in present review.

The resulting inclusion contains 13 randomised-controlled trials (RCT) studies [18,27-38]. In addition, other 5 studies are non-controlled one-group interventions [39-43]. Table 1 summarizes the characteristics and design of the included studies.

In general, 1691 aged people were covered among eighteen studies while most of them were female and above 65 years old. Sample size ranged from 9 people to 439 people. All participants from eight studies were all diagnosed patients with depression [18,27,31,32,34,37,42], while older adults in another eight studies did not meet criteria for depression, instead they either suffered from chronic physical illness [35,40], balance-problem [29,38], dementia [36] and cognitive decline [44,45] or were regular attendees [39,43]. The last two studies [28,41] mixed up the depressed and non-depressed participants, in which the depressed elderly accounted for 48.3% and 52% of total participants respectively.

In consideration of the types of recreation therapy, the included studies can be divided into twelve exercise interventions, five psychosocial interventions and two combined exercise and psychosocial interventions. Physical interventions embraced multiple forms and included gardening [39], biking [18,27], balance training [29,38], Tai-chi and stretching [30], aerobic and resistance exercise [32,33,43] and Qigong [34,35]. Recreation therapy focusing on the psychological training comprised therapeutic intervention of anticipatory grief [40], support group [31], group reminiscence [36] and behavioral activation [42]. In particular, cognitive behavioral therapy was also regarded as a purely psychological intervention to treat for depressed elderly [37], since the content did not cover any behavioral activities. Besides, Suzanne Fitzsimmons and Buettner [28] combined 73 different types of recreation therapy, including wheelchair biking, relaxation, exercise and therapeutic cooking, which tailored to their needs for the participants. Similarly, Lai et al. [41] divided their intervention in three sessions including education, exercise and social support to connect physical and psychological health to social impact.

None of the 18 included studies reach the 9 point ideal methodological quality in Table 2 [25]. The scores range from 2 points [39] to 8 points [29,30,33,34]. Table 2 illustrates the assessment of the included articles. The overall mean score is 5.67 ± 1.94 points. The randomized control trial (RCT) studies have a higher (mean= 6.54 ± 1.39) than the non-RCT interventional studies (mean= 3.40 ± 1.14).

Author	Interventional and Comparison	Study Design/Length	N	Outcome Measures	Significant Effects *
Austin et al. [39]	T: Planned gardening activities with specific health goals	One-group pre-/post-test	T=6 Age=68	Total Emotional Score in COOP; GDS	Total Emotional Score (p=0.042); GDS score changed without statistical significance
		8 weeks			
Buettner and Fitzsimmons [28]	T: Intensive wheelchair AD-biking and maintenance intervention period.	RCT	T=41	GDS; MMSE; CMAI	GDS within treatment group at post-test (p<0.001); within treatment group at follow-up (p<0.001); between group at post-test (p=0.047)
	C: Not mentioned	2 weeks of 5 days daily 1 hour discussion and riding session; 10-week maintenance included two rides per week	C=29		
Cheng et al. [40]	T: Anticipatory grief therapy with experiential and expressive activities	One-group pre-/post-test and follow-up	T=24 Age=81.8	GDS-Chinese; MQOL-HK (psychological score)	GDS-Chinese decreased significantly at post-test (p=0.013), but not at follow-up; MQOL-HK psychological measure decreased at post-test (p=0.027), but not at follow-up
		4 weekly 1.5 h sessions, 4 week follow up			
Fitzsimmons [18]	T: intensive Easy-rider therapy with small group discussion and 15-min bike ride	RCT	T=19 Age=80.8	GDS	GDS improvement in treatment group at post-test (p<0.001)
	C: Did not receive the therapy biking program until after post-test	2 weeks of 5 daily 1 h session	C=20 Age=80.2		
Buettner and Fitzsimmons [28]	T: individually prescribed therapeutic intervention in small groups	RCT.	T=29 Age=81.3	CMAI; BFS; PiDS; BVP; HR	CMAI improvement at post-test (p=0.029); PiDS improvement at post-test (p<0.001); positive correlation between PiDS and BVP (p=0.013); positive correlation between agitation and HR (p=0.018)
	C: Usual home care for two weeks before delayed intervention	2 weeks of 3-5 daily session of 1.5 h	C=30		
Halvarsson et al. [29]	T: Progressive group balance training	RCT	T=38	FESI; GDS-20; perceived fear of falling	FESI score in treatment group continuously decreased throughout 15 month follow up (p=0.001); GDS did not changed significantly
	C: Not mentioned	3 45-min sessions per week for 12 weeks. 15 month follow up.	C=21		
Lai et al. [41]	T: video conference intervention of education, strength and balance exercise and social support	One-group pre-/post-test.	T=19 Age=69.5	BBS; SSES; SF-36; GDS	After intervention, scores SSES, BBS and SF-36 improved (p<0.001)
		8 weeks of 1.5 h session per week with education, exercise, social support training			
Lam et al. [30]	T: 1 year program to practice 24 simplified forms for Tai Chi	RCT	T=171 Age=77.2	CDS;	The Cornell Depression Score did not decreased significantly after intervention
	C: 1 year of stretching and muscle toning exercise	At least 30 min per day, at least 3 times a week for 1 year	C=218 Age=78.3		
Ong et al. [31]	T: Support group for recently discharged depressed patients by psychogeriatric social worker and community psychiatric nurse	RCT	T=10 Age=72.8	CAPE; ZDI; re-referral rate; re-admission rate	Depression rate did not have any significant changes
	C: No support group	1 year	C=10 Age=76.7		
Penninx et al. [32]	T1: supervised facility-based and independent home-based walking program	RCT	T1=149	CES-D	CES-D score dropped in overall T1 (p=0.004), in the low depressive symptomatology group (p=0.01) and high depressive symptomatology group (p=0.03)

	T2: supervised upper and lower body weight training	Three 1 h session per week over 3 months	T2=146		
	C: Health education by nurse on arthritis management		C=144		
Singh et al. [33]	T: supervised weight-lifting exercise and unsupervised exercises	RCT	T=17	BDI	BDI scores remained lower in the exercise group at 20th and 26th week ($p=0.036$ and $p=0.047$) compared with controls; BDI continued to improve over time (time \times treatment interaction $p=0.001$)
	C: health education lectures	20 weeks	C=15		
Tsang et al. [35]	T: Supervised Qigong session	RCT	T=24	GDS-Chinese	No significant decline in GDS measure
	C: traditional remedial rehabilitation activities	Two 1 h sessions per week for 12 weeks	C=26		
Tsang et al. [34]	T: Supervised Qigong session	RCT.	T=48	GDS-Chinese;	Treatment group showed better scores in GDS at time by group ($p=0.041$), over-time ($p<0.01$), group differences ($p<0.01$) interaction, but not significantly in follow-up sessions
	C: newspaper reading group with qualified therapist	Three 30-45 min session per week over 16 weeks	C=34		
Wang [36]	T: Group reminiscence therapy	RCT	T=51 Age=79.8	GDS, CSDD	Treatment group showed better scores in CSDD ($p=0.026$) and slight improvement in GDS
	C: Not Mentioned	1 h weekly sessions over 8 weeks	C=51 Age=78.9		
Wilkinson et al. [37]	T: Antidepressant medical treatment and CBT	RCT	T=22 Age=72.7	Frequency of recurrence at 6 and 12 month; BDI; MADRS	MADRS decreased without significant. BDI score slightly increased.
	C: Antidepressant medical treatment alone.	2.5 months of CBT, 12 month of antidepressant	C=23 Age=75.2		
Wolf et al. [38]	T: Short, individualized balance training	RCT	T=47 Age=84.5	HADS	HADS did not changed significantly
	C: Individualized extra attention program	4-6 weeks exercise in sitting, standing and walking	C=47 Age=83.6		
Yon and Scogin [42]	T: Behavioral activation therapy with psychologists	One-group pre-/post-test	T=9 Age=75	GDS-30, HRSD-17, DAS, PES, GSHR	GDS score was reduced after intervention ($p<0.05$)
		Twice 1 h session per week over first 4 months, once weekly afterwards			
Yu et al. [43]	T1: Relaxation and tensing of muscles	3 groups pre-test post-test	T1=59 Age=74.9	HADS,;	Comparing with control group, the relaxation group reduced psychological distress in the HADS ($p=0.001$), of which both anxiety and depression subscales were affected ($p=0.017$ and $p=0.033$). Whereas the exercise training could only reduce the anxiety subscale of HADS ($p=0.033$). Significant Group X time interactions were observed in all HADS subscales (total score $p=0.002$; anxiety score $p=0.007$; depression score $p=0.009$).
	T2: exercise therapy including strength, resistance training and aerobic dance	12 weeks	T2=32 Age=73		
	C= received attention through telephone calls by research nurse		C=62 Age=77.6		

6MWT=6 Minute Walk Test; ADAS-Cog=The Cantonese Version of Alzheimer's Disease Assessment Scale - Cognitive Subscale; ASSEI=Self-Concept Scale; BBS=Berg Balance Scale; BDI=Beck Depression Inventory; BFS=Behavior Flow Sheet; BVP=Blood Volume Pulse; C=Control Group; CBT-G=Group Cognitive Behaviour Therapy; CBT=Cognitive Behavioral Therapy; CDS=Cornell Depression Score; CES-D=Centre for Epidemiologic Studies Depression Scale; CGSS=Chinese General Self-Efficacy Scale; CHQ-C=Chronic Heart Failure Questionnaire CMAI=Cohen-Mansfield Agitation Inventory; CMMSE=Cantonese Version of Mini-Mental State Examination; COOP Charts=The Dartmouth COOP Functional Health Assessment Charts; CSDD=Cornell Scale for Depression in Dementia; DAS=Dysfunctional Attitudes Scale; DGI=Dynamic Gait Index; FESI=Fall Efficacy Scale-International; GDS-20=Geriatric Depression Scale - 20 items; GDS-30=Geriatric Depression Scale - 30 Item; GDS-Chinese=Geriatric Depression Scale 15-item Chinese Version; GDS=Geriatric Depression Scale Short Form; GHQ-12=General Health Questionnaire-12; GSHR=Global Status Health Rating; HR=Heart Rate; HRSD-17=17-Item Hamilton Rating Scale for Depression; MADRS=Montgomery Asberg Depression Rating Scale; MMSE=Mini-Mental State Examination; MOS-SSS=The Medical Outcomes Study Social Support Survey; MQOL-HK=McGill Quality of Life Questionnaire-Hong Kong version; PBQ=Perceived Benefit Questionnaire; PES=Pleasant Events Scale; PiDS=Passivity in Dementia Scale; PWI=Personal Well Being Index; QOL=Quality of Life; SF-36=Medical Outcomes Study 36-Item Short Form; SSES=State Self-Esteem Scale; T=Treatment Group; WHOQOL-BREF[HK]=Hong Kong Chinese Version World Health Organization Quality of Life: Abbreviated Version

Table 1: Characteristics and findings of included studies.

Included Studies	A	B	C	D	E	F	G	H	I	TOTAL
Austin et al. [39]	-	-	+	u	-	-	-	-	+	2
Buettner and Fitzsimmons [28]	+	+	+	+	-	u	-	-	+	5
Cheng et al. [40]	-	-	+	u	-	+	-	-	+	3
Fitzsimmons [18]	+	-	+	+	-	+	-	-	+	5
Buettner and Fitzsimmons [28]	+	+	+	+	-	+	-	-	+	5
Halvarsson et al. [29]	+	+	+	+	+	+	-	+	+	8
Lai et al. [41]	-	-	+	u	-	+	-	-	+	3
Lam et al. [23]	+	+	+	+	+	+	-	+	+	8
Ong et al. [31]	+	+	+	+	+	+	-	-	+	7
Penninx et al. [32]	+	+	+	+	+	+	-	-	+	7
Singh et al. [33]	+	+	+	+	+	+	-	+	+	8
Tsang et al. [35]	+	+	+	+	-	+	-	+	+	7
Tsang et al. [34]	+	+	+	+	+	+	-	+	+	8
Wang [36]	+	+	+	+	-	+	-	-	+	6
Wilkinson et al. [37]	+	-	+	+	-	-	-	-	+	4
Wolf et al. [38]	+	+	+	+	-	+	-	+	+	7
Yon and Scogin [42]	-	-	+	-	-	+	-	+	+	4
Yu et al. [43]	-	-	+	+	+	+	-	-	+	5

Quality criteria: A=Randomization, B=Allocation concealment, C=Inclusion/exclusion criteria specified, D=Similarity of groups at baseline, E=Assessors blinded to outcome, F=Characteristics of participants lost to follow-up described, G=Intention-to-treat analysis, H=Power calculated, I=Outcome measures valid
 + = Criterion fulfilled, - = Criterion not fulfilled, u = Unknown if criterion is fulfilled

Table 2: Quality assessment and total score of the included studies

Discussion

This systematic review included eighteen investigations to different RT programs between 1987 and 2013. Fourteen studies reported depressive symptom improvement after intervention, of which six studies did not have sufficient significance at alpha=0.05 [29,30,31,35,38,39]. The general findings provide evidence to support the effectiveness of RT in the treatment of geriatric depression.

Although 11 of 14 depression-improved interventions focused on physical activity, it should be noted that the intensity of physical activity involved does not seem to play an important role in the process. For example, participants in the study by Buettner and Fitzsimmons [27] were pushed around on a bike. The intensity of this bike activity was feeble when compared to Qi-gong practice in Tsang et al. [35], which had no significant results. It may be argued that the differences in sample size, intervention frequency and length could have affected the outcomes. Further evidence from the 3-group pre-test post-test study [43] suggested that, in the relaxation training and exercise training intervention programs, participants reported different levels of improvement on the Hospital Anxiety and Depression Scale (HADS) subscales. Although both interventions had improvement in depression, only the relaxation group yielded significance from the HADS depression subscale while exercise group did not. The differences between the results with other effective exercise training may be due to

non-randomized samplings and variations on age and sample size. The observation of negative interaction between physical activity intensity and improvement to depression from this review encourages future investigations.

Likewise, the psychological training in recreational therapy cannot ensure a stable and obvious result. Three interventions were effective with two showing significant changes [40,42] and one with a slight positive change [31]. Moreover, Wang [36] applied Cornell Scale for Depression in Dementia and Geriatric Depression Scale short form to evaluate the changes, and after intervention the former one has remarkable improvement relative to the minimal changes for the latter. Another divergence has been presented in the study by Wilkinson et al. [37], which showed that increasing depression degree in Beck Depression Inventory (BDI) was not consistent with the slight changes occurred in scores of Montgomery Asberg Rating Scale for Depression after training. Wilkinson et al. [37] suggested the BDI was not suitable for studies with depressed elderly. This invites further investigations.

Unfortunately, the only two interventions that combined physical and psychological types of recreation therapy cannot offer clear conclusion in the context of this review. Fitzsimmons and Buettner [28] focused more on passivity and agitation on elderly with dementia, rather than depression degree. Lai et al. [41] only assessed the depressed symptoms at baseline, but did not demonstrate the changes after

intervention. Theoretically, such combined interventions can draw on the strengths of different forms of recreation therapy and provide the greatest benefits for depressed elderly. Further efforts should be done to fill in the research blanks.

In view of whether the study is helpful in designing therapy for depressed old persons, six of eight studies with pure depressed participants showed significant improvement, while five of eight studies with non-depressed participants only had encouraging but statistically insignificant changes, which can lead to a conclusion that recreational therapy can effectively moderate depression for most elderly, especially for those who displayed depressive symptoms.

Methodological limitations exist in the included studies. Universally, none of the studies fully addressed the intention-to-treat analysis. In the intervention studies, many older adults with high risk of health problems encountered high frequency of attrition. For example, Tsang et al. [35] utilized the RCT design but found no significant result after treatment. An intention-to-treat analysis could help to avoid bias resulting from drop out and crossover effect. Assessments of reviewed articles relied on two independent authors who provided subjective judgments. It is important to have objective assessments [46-51] to improve the objectivity. Meta-analyses and other in-depth statistical analyses [52,53] were not conducted due to the nature of this study which may affect the findings [54].

The variety of intervention portrayed by the included studies fully demonstrated how flexible and accommodating RT can be applied to treat depression in older adults. From gardening [39] to weight-lifting [33], from group reminiscence [36] to anticipatory grief therapy [40], for stroke patients [41] and for dementia patients [28], RT had wide applications in treating geriatric depression. However, the diversity of RT approaches so far used and reported in this analysis of the literature make it difficult to fully determine the cost-effectiveness of RT in the context of care-givers.

Conclusion

To sum up, this systematic review of intervention studies evaluating RT programs concludes that RT is an effective treatment to improve depression in older adults, albeit the aforementioned limitations. Although the benefits of physical activity [23,44,45,55-61] and sports [62-67] have been extensively examined, the effects of physical activity and sport RT on depression warrants further exploration.

Acknowledgement

We are grateful for the support of academic board members of Hong Kong Sport Education and Leisure Tourism foundation, Hong Kong.

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