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Does Laughter Therapy Improve Symptoms of Depression Among the Elderly Population?

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A SELECTIVE EVIDENCE BASED MEDICINE REVIEW
In Partial Fulfillment of the Requirements For The Degree of Master of Science In
Health Sciences-Physician Assistant

Department of Physician Assistant Studies
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ABSTRACT

OBJECTIVE: The objective of this selective EBM review is to determine whether or not laughter therapy improves symptoms of depression among the elderly population.

STUDY DESIGN: A review of three studies written in the English language published between 2007 and 2011.

DATA SOURCES: Two randomized controlled trials and one pilot study comparing the effect of laughter therapy on depression were found using PubMed, Medline, OVID, and Cochrane databases.

OUTOMES MEASURED: Outcomes measured in the studies included depression, quality of life, and life satisfaction.

RESULTS: Laughter therapy was shown to be beneficial as both an independent and adjunctive intervention for depressed elderly patients after several treatment sessions. Laughter therapy yielded fewer depressive symptoms and increased life satisfaction among patients. These results are similar to past studies that have shown a correlation between a sense of humor and decreased depressive features.¹

CONCLUSIONS: The results of these three studies show that laughter therapy is an inexpensive, safe, and effective intervention for elderly patients suffering from symptoms of depression.

KEY WORDS: laughter therapy, humor therapy, depression, elderly

Introduction

Untreated depression is related to the increase of illness and disability, suicide and mortality.¹ While the exact cause of depression is unknown, the etiology is thought to be multifactorial. With a nationwide prevalence rate of approximately 2.3% to 15.8%, older adults are at an increased risk of developing depression, with various studies reporting elderly depression prevalence rates as high as 25 to almost 50%. Furthermore, elderly adults are more likely to be misdiagnosed and undertreated.⁷ While an exact number in recent years has not been specified, the cost of depression noted in 2003 was \$83 billion each year.³ From 2006 to 2007, the average number of health care visits with major depressive disorder as a primary diagnosis was 7.9 million.⁵ Major depression is the fourth leading cause of disability worldwide.⁴ The DSM-IV is used to evaluate major depression; five of nine of the following symptoms be present for a two week period: depressed mood, anhedonia, sleep disorder, appetite/weight loss or gain, fatigue, psychomotor retardation, trouble concentrating, feelings of guilt, suicidal ideation. One symptom must be anhedonia or depressed mood. The Geriatric Depression Scale (GDS) is another tool used to evaluate depression specifically among the elderly population. This paper evaluates two randomized controlled trials and one pilot study comparing the efficacy of laughter therapy in improving symptoms of depression among elderly patients.

In the pharmacologic treatment of depression, Selective Serotonin Reuptake Inhibitors (SSRIs) are agents of choice among the elderly. Citalopram and Sertraline are often used first-line.⁴ Other agents include Tricyclic Antidepressants (TCAs) and Selective Norepinephrine Reuptake Inhibitors (SNRIs). Among TCAs, Nortriptyline and

Desipramine are preferred, but contraindicated in patients with heart disease. Adjuvant treatment of depression includes psychotherapy and electroconvulsive therapy.

Psychotherapy is most often used in combination with medication, and includes cognitive behavioral therapy. Electroconvulsive Therapy is the treatment of choice in cases of refractory depression.

This method of treatment is being proposed because laughter therapy is a noticeable, cost effective psychotherapeutic intervention for depression in the elderly.² In several studies conducted over the past decade, sense of humor has been correlated with improved self-esteem and reduced depressive tendencies.^{1,6} Elderly patients often have co-morbid conditions and are more likely to experience pharmacologic side effects due to drug interactions and altered drug metabolism². Laughter therapy serves as an alternative modality to pharmacologic treatment.

Objective

The objective of this selective EBM review is to determine whether or not laughter therapy improves symptoms of depression among the elderly population.

Methods

Three studies were used for this review and met the following criteria: individuals must be over age 60; individuals must meet criteria of depression via the Geriatric Depression Scale; interventions used must include some form of laughter therapy. Type and length of therapy was slightly different in each study. All three studies compared the above groups to control groups that did not receive laughter therapy; Shahidi et al. also used exercise therapy as a comparative measure. Subjects in both the control group and the experimental group in the Walter et al. study were medicated with SSRIs as standard

therapy; therefore, laughter therapy was used as an adjunct in the experimental group.

Outcomes measured include the GDS, the Life Satisfaction Scale (LSS), and the Anamnestic Comparative Self Assessment Scale (ACSA). The types of studies selected include two RCTs and one pilot study all with “intention to treat” analyses. See **Table 1** for an outline of patient demographics and characteristics.

Research sources used were PubMed, Medline, OVID, and Cochrane databases. Articles for this systemic review were located by key words “laughter therapy”, “humor therapy”, “depression”, and “elderly”. All articles were published in English, in peer-reviewed journals, and were selected based on the importance of outcomes and relevance to patients. Inclusion criteria included studies that were published after 1997, evaluated mood using the GDS, implemented laughter therapy, and included patient oriented outcomes. Studies excluded were those with outcomes not patient oriented, those with subjects under age 60, and systematic reviews or meta analyses. To successfully measure patient outcomes, the following statistical methods were utilized: means, p-values, F-values, confidence intervals, R^2 , ANCOVA, Bonferroni’s Correction, and t-test values.

Table 1: Demographics and Characteristics of included studies

Study	Type	# Pts	Age (yrs)	Inclusion Criteria	Exclusion Criteria	W/D	Interventions
Ko ¹ , 2011	RCT	174	>65	Men and women over age 65	- No history of hospital admission within one month - No involvement in other research studies	65	Laughter therapy group meetings 1 hour per week for 4 weeks.
Shahidi ² , 2011	RCT	70	60-80 years	- Women diagnosed with depression - Members of a cultural community center	None	10	- Ten sessions of laughter yoga - Ten sessions of exercise therapy
Walter ⁶ , 2007	Pilot	40	>65	- Men & women over age 65 from inpatient psychogeriatric department - Patients with Alzheimer's, MDD, or both - First episode of depression > 50 years old	Patients with significant abnormal biological findings, neurological disorders, acute medical illness, severe cognitive impairment, psychotic disorder, or substance/alcohol dependence or abuse.	0	- Humor therapy group every two weeks for 60 minutes for a median of 15 weeks.

Outcomes Measured

All three studies measured depressed mood via the Geriatric Depression Scale, or GDS. Ko et al. and Walter et al. used the short form GDS, a 15-item questionnaire with

possible scores ranging from 1-15; a score of 6 qualifies depressed mood, while a score of 15 implies the most depressive tendencies. Shahidi et al used the long form GDS, which contains 30 questions and divides individuals into groups without depression (0-9), moderate depression (10-19), and severe depression (20-30). Shahidi also used the Diener Life Satisfaction Scale (LSS), a five-item Likert-type scale that assesses general life pleasure. Finally, as a measure of subjective quality of life, Walter et al. used the Anamnestic Comparative Self Assessment Scale (ASCA), which uses subjective ratings of subjects' best and worst memories throughout life.⁶

Results

Two RCTs and one pilot study were analyzed in this review determining the efficacy of laughter therapy at improving symptoms of depression among the elderly population. Trials were conducted with intention-to-treat analysis of data, and outcomes of efficacy of all three studies are reported as continuous, rather than dichotomous, data.

Participants in the Ko et al. RCT received one hour of therapy weekly for four weeks at a community center by a nurse certified in laughter therapy. Two questionnaires – one pre-therapy, one post-therapy – were given to subjects. 174 subjects that sincerely answered the initial questionnaire were included. A total of 65 subjects were further excluded from both groups due to incomplete attendance to therapy, insincere responses on the follow-up questionnaire, or loss to follow-up. Therefore, 109 total subjects participated: 48 in the therapy group, 61 in the control group. Therapy consisted of clapping, laughter meditation, laughter through dance and song, and through expressing both their own and imitating other types of laughing. Severity of depression was analyzed using the GDS at baseline and post-therapy. Findings showed that mean GDS score was

significantly decreased from 7.98 ± 3.58 to 6.94 ± 3.19 ($p=.027$) in the laughter therapy group after receiving therapy, whereas no significant change occurred in mean GDS scores from beginning to end among the control group (See table 2). ANCOVA, which controlled for pre-experimental GDS scores and other variables¹, showed statistical significance in the effect of laughter therapy on GDS ($p=0.011$).

Table 2: Differences of mean values for depression between groups after laughter therapy¹

Group	Pre-test	Post-test	p*	R*	p**
Laughter therapy	7.98 ± 3.98	6.94 ± 3.19	0.027	0.364	0.011
Control group	8.08 ± 3.96	8.43 ± 3.44	0.422		

In the Shahidi et al. RCT, 70 women from a cultural community center with GDS scores over 10 were selected and randomly divided into three groups: laughter yoga (LY), exercise therapy (ET), and control. A total of 60 women completed the study. Exercise therapy, an alternative treatment for depression with existing studies showing its beneficial effects², was used as a well-known comparative measure; in regards to the objective of this paper, focus will remain primarily upon the LY group versus the control group. Participants in the LY group were lead by a trained researcher in 10 sessions of group LY, a combination of laughter and yogic breathing, in which one laughs without relying on humor, jokes, or comedy². Each session consisted of hand clapping and engaging in several types of laughter with deep breathing exercises between therapies. Severity of depression was again analyzed using the GDS at baseline and post-therapy; general life pleasure was measured via the Diener life satisfaction scale (LSS). Shahidi found that individuals in the LY group showed significantly decreased GDS scores and

significant improvement in LSS scores when compared with the control group, which did not show significant changes. Pre and post-test GDS & LSS scores are summarized in Table 3 below, while Bonferroni's Correction for comparison between study groups is seen in Table 4.

Table 3: Pre and post-test scores for Geriatric depression scale and life satisfaction scale in groups²

Tests	Laughter Therapy	Control
GDS: pre-test	16.0 ± 5.3	15.2 ± 3.9
post-test	10.0 ± 6.9	15.2 ± 6.1
LSS: pre-test	19.2 ± 4.1	20.2 ± 6.2
post-test	25.9 ± 5.6	20.0 ± 5.1

Table 4: Bonferroni's Correction for comparison between study groups.²

Dependent Variable	Group (I)	Group (J)	Mean Difference (I-J)	Sig.
GDS	LT	ET	-1.7	0.4
		Control	-6.0*	<0.01
LSS	LT	ET	3.0	0.2
		Control	6.5*	<0.01

• = statistically significant. LT = laughter therapy, ET = exercise therapy

Table 5: Pre and post-test scores for geriatric depression scale and life satisfaction scale in groups²

Dependent Variable	DF	Mean Square	F value	Pr > F	
GDS	GDS pretest	1	1523.02	100.231	0.0001
	Groups	2	191.73	12.62	0.0001
LSS	LSS pretest	1	806.24	31.09	0.0001
	Groups	2	213.53	8.23	0.0001

Unlike the other two studies, participants in the Walter et al. pilot study were recruited through inpatient units of a psychiatric clinic, and met requirements of

Alzheimer’s Disease (AD), Major Depressive Disorder, or a combination of both. The total sample consisted of 26 women and 14 men with an average age of 78 years. Ten patients with depression were included in the standard therapy (ST) group and ten patients with depression were included in the humor therapy (HT) group. It is of note that three patients in the HT group and two patients in the ST group had a dual diagnosis of AD and depression; therefore, some patients were being treated with both AD and depression medication. As mentioned previously, all subjects were on psychopharmacotherapy; therefore, “standard therapy” refers to medication only. All AD patients were treated with a cholinesterase inhibitor, galantamine; all patients with depression were receiving either escitalopram or mirtazapine, and four depressed patients were additionally receiving a low-dose neuroleptic medication. Subjects in the HT group underwent laughter therapy for one hour every 2 weeks for a median of 15 weeks. A monitor in charge of each session read humorous stories, intervened with humor when appropriate, and prompted the sharing of humorous life events among subjects. Severity of depression was analyzed at baseline and post-therapy using the GDS, and QOL was assessed via the ACSA. Results showed that patients with late life depression receiving both HT and ST showed significant improvements in both their GDS ($t = 3.16, df = 19, p = 0.0005$) & ACSA ($t = -5.17, df = 19, p < 0.001$) when compared to before treatment. Patients receiving HT showed a more improvement in QOL than those receiving ST alone. Table 6 summarizes QOL before and after treatment with both HT & ST.

Table 6: Quality of life of depressed patients before and after treatment ⁶

	QOL at admission	QOL before discharge	p-value
Humor Therapy (HT)	3.8	6.8	<0.01
Standard Therapy (ST)	4.3	6.1	<0.01
Control	5.5	5.5	

Discussion

The above results indicate that humor therapy can be effective in improving depressive symptoms among elderly patients. No safety issues or adverse events exist among any of the three studies. P values less than 0.05 indicate statistical significance. In addition to high drop out rate and small sample size as limitations, Ko et al. states incomplete blindness to LT may have lead to increased depression scores on the GDS for the control group. A noted possible contribution to increased post-test GDS scores is the effect of group-meeting therapy by itself, independent of laughter therapy. Finally, several factors that influence geriatric depression such as female sex, poor economic state, single living, and presence of comorbidities were characteristic of participants within the study; this may have lead to higher than typical pre-test GDS scores, and therefore more dramatic results.

Shahidi et al. state they are the first to their knowledge to provide evidence that laughter yoga can effectively improve symptoms of depression and life satisfaction.² Table 4 includes data on exercise therapy, which was used as comparison; however, this data is not the focus of this review, and was included only out of necessity due to the nature of statistical tests used (ANCOVA). Limitations noted include a small sample size, lack of relevant literature, and short duration of the study. The authors also note that they would have preferably implemented laughter yoga in an outdoor setting, but this was impossible due to socio-cultural reasons.²

Walter et al. found significant improvements in both GDS and ACSA score after both humor therapy and standard therapy. Depressive patients that received HT showed

the higher quality of life after intervention than those receiving ST alone, but not significantly higher. Although significant changes in QOL cannot be attributed to HT alone, HT was shown to be an effective adjuvant therapy in this study. Specific GDS scores before and after treatment were not provided, and therefore could not be represented within a table. Limitations include a small sample size, infrequent therapy, and that despite differentiation between depressed and AD patients, an overlap between groups existed.

Conclusion

Based on the articles selected for this EBM review, laughter therapy has shown to be effective in improving symptoms of depression among the elderly population. Laughter therapy is inexpensive, easy performed, and lacks the side effect profile of pharmaceutical treatments that many elderly patients with comorbidities experience. Future studies may consider longer intervention times, more frequent therapy, more male subjects, and vaster regional participation. Although attempted, the number of daily medications taken by subjects should be limited further in the future.

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