The Effects of Depression and Self-Efficacy on Progress in Physical Therapy among the Elderly

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Abstract

It has been shown that depression severely affects the lives of elderly individuals in a very harmful manner. One potential impact could be its effect on a patient's progress in physical therapy, which a significant number elderly people receive. One way to counter this problem could be done through increasing the level of self-efficacy the patient has. This study was designed to investigate the effects of depression and self-efficacy on progress among geriatric physical therapy patients. To examine this question A Geriatric Depression Scale, a Self-Efficacy for exercise scale modified for physical therapy was administered to geriatric patients. Progress reports were then taken from assessments and re-evaluations or physical therapy notes to determine the amount of progress made. It is expected that more depressed older adults will show less progress in physical therapy than older adults who are not depressed and that this relationship will be mediated by self-efficacy.

Effects of Depression and Self-Efficacy on Progress

Depression rates among the elderly are quite high. According to a Medicare study, the prevalence rates of major depression and dysthymia (a milder form of depression) among people 65 years or older is 25% (McCall, Parks, Smith, Pope, Griggs, 2002). Major depression alone is experienced by 1-4% percent of older adults living in a non-institutionalized environment and 10% percent of older adults living in nursing homes (Blazer, 1993,1994; Forsell and Winbald, 1998; Lindesay, Briggs and Murphy, 1989).

A person who is clinically depressed is said to have experienced at least one major depressive episode, where depressive symptoms such as depressed mood, loss of interest that lasts at least two weeks, and weight gain or loss, but never went into a manic or hypomanic episode (Sarason & Sarason, 2005). On the other hand, dysthymia, is a condition where there are only mild chronic depressive symptoms (Sarason & Sarason, 2005). Symptoms of dysthymia include disturbed appetite and sleep, low energy and self-esteem, poor concentration, and hopelessness (Kirby, Bruce, Coakley, & Lawlor, 1999).

While the prevalence rates of depression and dysthymia are high, it is even more disconcerting to know that the rates might actually be higher than reported. Depression is likely to be under-diagnosed and under-treated in the elderly (NIH, 1992). Under-diagnosis could be due to symptoms of depression mirroring the expected traits of elderly individuals, as well as overlapping with symptoms of other illnesses. According to Keller et al. (1995), patients with depression or dysthymia show symptoms of a loss of

interest or pleasure, a reduced general activity level, feelings of worthlessness, a loss of energy or fatigue and social withdraw (Sarason & Sarason, 2005). Patients with a major depressive disorder show these symptoms more frequently, although these symptoms are evident among individuals suffering from both disorders (Sarason & Sarason, 2005). These are traits that are almost expected of elderly people, especially elderly patients in an institutionalized setting. Another reason why the elderly may be under- diagnosed could be that symptoms of depression overlap with symptoms of another illness, such as cognitive impairment and fatigue associated with vascular degeneration or heart disease (McCall, et.al., 2002). Elderly people also do not have as many others around them to witness and report depression, which could also lead to under-diagnosis.

The statistics on depression are alarming due to the negative effects depression could have on a person's life. Depression could cause a person to suffer from less productivity at work, more problems in relationships, as well as more health problems (Blum and Kirchner, 1997; Allen, Agha, Duthie, and Layde, 2004; Sadler, 1999). One study shows evidence that depressed individuals are less likely than non-depressed individuals to engage in physical activity and, perhaps as a result, more likely to experience a variety of negative health outcomes, including cardiovascular disease (Allen, Agha, Duthie, and Layde, 2004). Indeed, Sandler (1999) reports that depression is the leading cause of years lost to illness-related disability. Depression among the elderly has numerous negative outcomes, from "increased disability, decreased quality of life, and shortened life span" as well as "poorer outcomes on other medical conditions, such as diabetes and heart disease" (Hasche & Morrow-Howell, 2007).

Given these findings, it seems likely that depressed individuals may also not improve as well as non-depressed individuals in physical therapy settings. Specifically, depression may hinder the rate of progress in patients such that depressed patients may not regain physical abilities that could normally be regained in physical therapy if one were not depressed. Supporting this notion is a study by Allen, Agha, Duthie, and Layde (2004). Data were collected upon entry to an acute rehabilitation facility as well as at discharge. There was a statistically significant negative association found between minor depressive symptoms and the level of improvement made in therapy (Allen et. al., 2004). In interpreting their findings, Allen et. al (2004) suggest that "minor depression is a quality of life issue for older adults insofar as it affects both general functioning and recovery of functioning following an injury or illness" (2004).

Although the findings of Allen et al. (2004) are important, they fail to explain *why* depression is linked to decreased progress. One possibility is that depressed individuals have lower self-efficacy regarding their abilities to do well in physical therapy. A study by Paukert (2009) showed that physical health and depression had the strongest negative correlation when a person was suffering from low self-efficacy. This would indicate that depression and self-efficacy are linked together, and the study by Paukert goes as far as show self-efficacy as a moderator for physical well being and depression. Self-efficacy was defined in 1977 by Albert Bandura as "a person's estimate that a given behavior will lead to certain outcomes." In other words, self-efficacy is the level of confidence a person has in succeeding at a task (Cowan, 2008). Some of the negative outcomes of low self-efficacy are loneliness and psychological distress (Fry & Debats, 2002), less participation in physical and social activities (Perkins,

Multhaup, Perkins, & Barton, 2008), and less exercise (Resnick, 2004). Given these associations, it makes sense that individuals with low-self-efficacy may show less progress in physical therapy.

Several studies confirm the link between low self-efficacy and lower physical functioning. For example, a study by Bosscher, Van Der Aa, Van Dasler, Deeg (1995) indicated that males who have low levels of physical self- efficacy perform substantially less well on tests of physical performance. Among an elderly sample, Li et al. (2001) also showed a positive association between "self-efficacy and physical function."

The relationship between the progress within physical therapy and depression due to self-efficacy will be established throughout this study. Depression has severe affects among the elderly and this in turn creates a noticeable impact on their physical functioning as well as their progress within physical therapy. This is also representative of self-efficacy. It was shown that low physical self-efficacy also has a severe affect on elderly people's physical functioning, which then could correspond to a negative impact on their progression in physical therapy. Self-efficacy has also been shown to have an impact on depression. With these relationships it could be seen that depression affects progress within physical therapy, while physical self-efficacy affects not only progress within physical therapy, but also depression.

In this study, I hypothesize that older adults who are depressed will show less progress in physical therapy than older adults who are not depressed. Furthermore, I predict that this relationship will be mediated by self-efficacy.

To test the hypothesis, a geriatric depression scale and a self-efficacy scale will be given to patients after their first physical therapy session. After two weeks, the patients will be asked to record how much they feel they are progressing. The therapist will also document how much they feel the patient is progressing.

Method

Participants

Participants included 20 elderly (66-98 year old) physical therapy patients. No preference was given to gender or race. The participants were all patients of one physical therapy agency that does home health visits. Some patients lived in their own home, while others were in an assisted living facility. The ratio of participants was 79% female and the other 21% were male. Only partial data was collected for one participant who was receiving therapy for back pain; their spouse began answering questions for the participant during the depression scale because the patient had dementia.

Materials

The patients were given a Geriatric Depression Inventory (Appendix 1), the Self-Efficacy for Exercise Scale (Appendix 2), and a Progress Report (Appendix 3). The questions on the Geriatric Depression Scale will be given a score of 0 for yes, 1 for no, but reverse scoring was done for questions 1, 5, 7, 9, 15, 19, 21, 27, 29, and 30. A higher number indicated a person that was more depressed with a normal score of 5 ± 4, a mildly depressed score of 15 ± 6, and a very depressed score of 23 ± 5 (See Appendix 1). The norm Cronbach's alpha for this study was found to be $\alpha = 0.89$ (Lopez, M., Quan, N., & Carvajal, P., 2010). The Self-Efficacy for Exercise Scale was scored by adding the numbers for each of the nine items, and a low score indicated a low self-efficacy (See

Appendix 2). Prior research has shown sufficient reliability with this scale, α =0.93 (Resnick & Jenkins, 2000). This scale was adapted for physical therapy as opposed to exercise in this study. The original statement asked for confidence on exercising this questionnaire asked for confidence in participating in the physical therapy activities. The Progress report looked at the standard measures in the field of physical therapy, ambulation, strength, and transfers, at the patients assessment and at the patients re-evaluation or discharge, as well as recording their goal for each measure (See Appendix 3). These measures are further described in the following section.

Standard Measures

Ambulation

Ambulation was determined by the length the patient can walk from one point to the next; it was recorded if they have to stop and rest. This measure is slightly subjective because the physical therapists do not always take a tape measure to calculate the distance. The physical therapists are familiar with the area and have measured the distances between points such as between the dining room and the front lobby. This measurement is a fairly accurate prediction.

Strength: Ankle, Knee, Hip

The patients were scored on a graded scale from 0-5 (i.e. +3 is lower than a -4). A score of a three indicated they could lift their ankle, knee, or hip without assistance, but they could not resist pressure. A score lower than a three indicated they needed assistance; the amount of assistance determined by the therapist and recorded respectively. A score higher than three indicated the patient could lift their ankle, knee, or hip against pressure;

the amount of pressure determined by the therapist and recorded respectively. Strength was measured in three areas: Ankle, knee, and hip.

Transfers:

Transfers from various positions were recorded: Bed, Chair, W/C, Sit to Stand, Toilet, Tub, Shower, Car, Incline/Ramp. They were scored on their ability to transfer to this places on a scale ranging from maximum assistance to independent: Maximum Assistance, Moderate Assistance, Minimum Assistance, Contact Guard Assistance, Stand by Assistance, Modified Independent (the aid of a cane, etc.), and Independent. This scale was coded 1-7 respectively and averaged for each participant, to determine a total transfer score.

Procedure

A patient currently in a physical therapy session was asked to answer the demographic questionnaire, the Geriatric Depression Inventory, and a Self-Efficacy Scale. While this was done at different points in the therapy session for different patients, the beginning of a session for some or the end for others, depression and self-efficacy do not typically change over time. These patients were relatively familiar with this system and had not experienced many major changes to affect their fairly consistent levels of self-efficacy and depression. The date the patients start therapy, were interviewed, and the end of their therapy session was recorded. Through looking that the physical therapist records progress was measured by recording the standard measures the field uses: ambulation, strength, and transfers. These measures were recorded for the patient's assessment (beginning of this therapy session, so potentially a re-evaluation from the previous visit), their goal for this session, and their discharge form or re-

evaluation at the end of this session. A progress percent was calculated by taking the (result-assessment)/(goal-assessment) *100 for each measure: ambulation, strength, and transfers. Then the average among theses standard measure percentages was recorded as the progress percent.

Results

The Geriatric Depression Inventory, Self-Efficacy for Exercise Measure, and the Progress Percentages were found to be reliable (α = 0.91, 0.86, 0.66 respectively). Then, to test the hypothesis that depression predicts less progress which is mediated by low self-efficacy, a mediational analysis was run (See Figure 1).

Figure 1. Mediational Analysis. Self-Efficacy is not mediating the regression between depression and progress. However there is a significant regression between depression and progress ($\beta(19)=-0.45$, $p<0.10$), as well as between depression and self-efficacy ($\beta(19)=-0.63$, $p<0.01$).

Due to the small sample size (N=20), An alpha of 0.10 instead of 0.05 will be used and the results will be treated as tentative. The first regression is between depression (the predictor) and progress, the progress percentage (the dependent variable). There was a significant negative regression between depression and progress, $\beta(19)=-0.45$, $p<0.10$ (See Figure 1, relationship number 1). This regression indicates that people who are more depressed tend to progress less than people who are not as depressed. The second regression is between depression (Independent Variable, IV), and self-efficacy (the mediator). There was a significant negative regression between depression and self-efficacy, $\beta(19)=-0.63$, $p<0.01$ (See Figure 1, relationship number 2). This regression indicates people who are more depressed have lower self-efficacy than participants who are less depressed. The third regression is between self-efficacy (mediator) and progress (D.V.) controlling for depression (I.V.). The regression between self-efficacy and progress controlling for depression was not significant, $\beta(19)=0.01$, $p=0.97$ (See Figure 1, relationship number 3). While a significant regression between the mediator and dependent variable controlling for the independent variable is necessary for a mediational analysis, the last regression between depression (I.V.) and progress (D.V.) controlling for self-efficacy (mediator), was run. This will give the strength of depression as a predictor when controlling for self-efficacy. If self-efficacy is a mediator this relationship (4) will no longer be significant and the coefficient much smaller. The regression between depression and progress controlling for self-efficacy is not significant $\beta(19)=-0.44$, $p=0.14$ (See Figure 1, relationship number 4). While the fourth regression run should no longer be significant, $\beta 1$ should be much different than $\beta 4$. In this analysis $\beta 1= -.045$, while $\beta 4=-0.44$. This difference between the beta coefficients is minimal, which

indicates the hypothesis that self-efficacy is a mediator between depression and progress is not supported. (See Figure 1).

A regression was also run between self-efficacy and progress, not controlling for depression. The regression between self-efficacy and progress is not significant $\beta(19)= 0.29$, $p=0.23$.

Discussion

The hypothesis that depression predicts less progress which is mediated by low self-efficacy was not supported. However, there was a direct relationship between depression and progress as well as between depression and self-efficacy. Depression as a direct predictor, which is what is indicated by these results, fits previous research. Lieberman, et.al. showed that depression symptoms decreased during rehabilitation within a study among elderly individuals (1999). The symptoms of depression even indicate a lack of interest in activities (Sarason & Sarason, 2005), and the lack of interest and involvement in therapy activities would then imply that the patients who were depressed would not progress as much. While depression was not found to be a mediator, looking at the trend in the data analysis more participants could lead to a significant relationship between self-efficacy and progress ($\beta(19)= 0.29$, $p=0.23$).

Looking at this data there is a possible interpretation that depression could act as a mediator for self-efficacy on progress (See Figure 2).

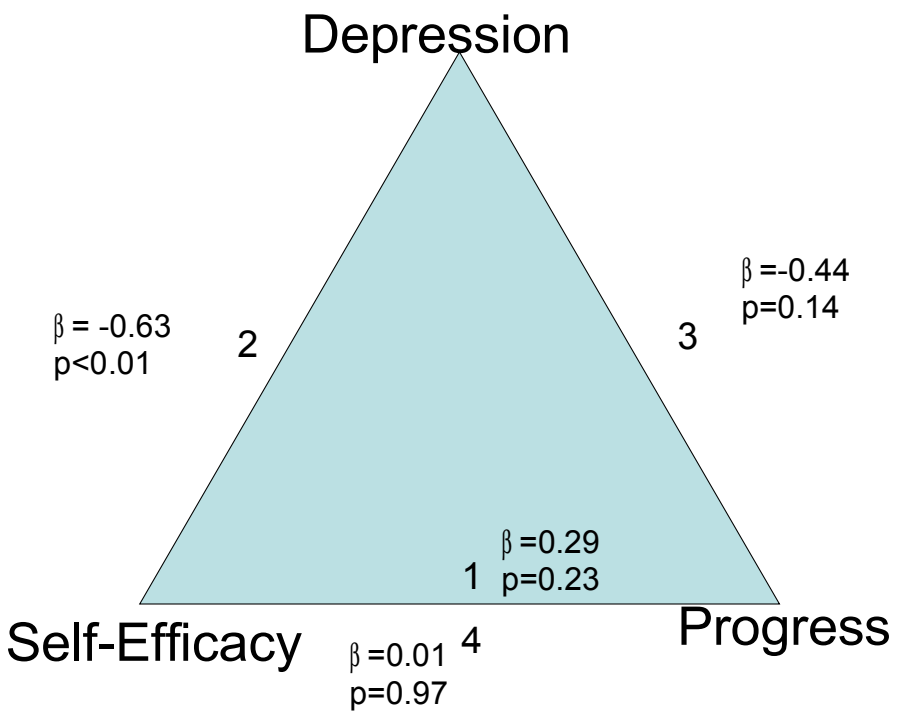

Figure 2. Mediational Analysis. A possible interpretation where depression is acting as a mediator between self-efficacy and progress.

The regression that is run between self-efficacy and progress is quite different than the relationship between self-efficacy and progress when controlling for depression. This difference in the beta coefficients (0.29 and 0.01 respectively) could indicate that depression is causing the relationship to exist between self-efficacy and progress. In this interpretation depression becomes a key variable because it has a direct effect on self-efficacy by acting as a mediator.

The implications of this study show the importance of looking for and treating depression among the elderly. It is important for physical therapists to know the signs of depression and to help patients receive the appropriate help when depression is detected. Studies have shown that depression frequently goes undetected among the elderly because it some symptoms are instead viewed as normal signs of aging (Hasche & Morrow-Howell, 2007). However, there are biological, psychological, and social

influences that impact depression, which are not the normal signs of aging (Hasche & Morrow-Howell, 2007). Physical therapists spend a lot of time with patients and would have the opportunity to detect the signs of depression. This could then help more elderly patients receive the appropriate help that is needed. With the depression being treated, this could lead to more elderly patients having a better quality of life. While relation does not mean causation, if the patient became less depressed then they should progress more.

In this study, there was the limitation with the number of participants and the diversity among them. In working with only one physical therapy agency, the specific therapists working with the patient could have affected the study; in a larger selection more therapists would use different techniques in treating patients and this could also be considered a factor. Future research could also look at gender differences, as well as between facilities, such as home care, nursing homes, and assisted living facilities. There could be a trend in what is seen depending on where a patient lives. If future research includes more participants, then clearer signs of depression could potentially be detected. This would help caregivers, and the medical staff, identify depression more readily and help people who are depressed receive the appropriate care. There are a variety of areas in which this study could be expanded and then produce practical implications of the field of geriatrics.

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Appendix 1: Geriatric Depression Scale

Choose the best answer for how you felt this past week
Circle One

1.	Are you basically satisfied with your life?	**YES**	**NO**
2.	Have you dropped many of your activities and interests?	**YES**	**NO**
3.	Do you feel that your life is empty?	**YES**	**NO**
4.	Do you often get bored?	**YES**	**NO**
5.	Are you hopeful about the future?	**YES**	**NO**
6.	Are you bothered by thoughts you can't get out of your head?	**YES**	**NO**
7.	Are you in good spirits most of the time?	**YES**	**NO**
8.	Are you afraid that something bad is going to happen to you?	**YES**	**NO**
9.	Do you feel happy most of the time?	**YES**	**NO**
10.	Do you often feel helpless?	**YES**	**NO**
11.	Do you often get restless and fidgety?	**YES**	**NO**
12.	Do you prefer to stay at home, rather than going out and doing new things?	**YES**	**NO**
13	Do you frequently worry about the future?	**YES**	**NO**
14	Do you feel you have more problems with memory than most?	**YES**	**NO**
15	Do you think it is wonderful to be alive now?	**YES**	**NO**
16	Do you often feel downhearted and blue?	**YES**	**NO**
17	Do you feel pretty worthless the way you are now?	**YES**	**NO**
18	Do you worry a lot about the past?	**YES**	**NO**
19	Do you find life very exciting?	**YES**	**NO**
20	Is it hard for you to get started on new projects?	**YES**	**NO**
21	Do you feel full of energy?	**YES**	**NO**
22	Do you feel that your situation is hopeless?	**YES**	**NO**
23	Do you think that most people are better off than you are?	**YES**	**NO**
24	Do you frequently get upset over little things?	**YES**	**NO**
25	Do you frequently feel like crying?	**YES**	**NO**
26	Do you have trouble concentrating?	**YES**	**NO**
27	Do you enjoy getting up in the morning?	**YES**	**NO**
28	Do you prefer to avoid social gatherings?	**YES**	**NO**

29	Is it easy for you to make decisions?	**YES**	**NO**
30	Is your mind as clear as it used to be?	**YES**	**NO**

Appendix 2: Self-Efficacy for Exercise Scale (adapted)

How confident are you that you could participate in your physical therapy activities (e.g., exercises outside of therapy, activities in therapy) every time that was recommended if

	Not Confident										Very Confident
1) the weather was bothering you	0	1	2	3	4	5	6	7	8	9	10
2) you were bored by the exercises or activity	0	1	2	3	4	5	6	7	8	9	10
3) you felt pain when exercising	0	1	2	3	4	5	6	7	8	9	10
4) you had to exercise alone	0	1	2	3	4	5	6	7	8	9	10
5) you did not enjoy it	0	1	2	3	4	5	6	7	8	9	10
6) you were too busy with other activities	0	1	2	3	4	5	6	7	8	9	10
7) you felt tired	0	1	2	3	4	5	6	7	8	9	10
8) you felt stressed	0	1	2	3	4	5	6	7	8	9	10
9) you felt depressed	0	1	2	3	4	5	6	7	8	9	10

Appendix 3: Progress Percentage

	Ambulation	Strength		
Patient #	in feet	Hip	Knee	Ankle
1 assess				
1 goal				
1 results				

	Transfers: Maximum Assistence to Independent								
	Bed	Chair	W/C	Sit to Stand	Toilet	Tub	Shower	Car	Incline
1 assess									
1 goal									
1 results									