

Does Literacy Education Improve Symptoms of Depression and Self-efficacy in Individuals with Low Literacy and Depressive Symptoms? A Preliminary Investigation

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Background and Objectives: Individuals with low literacy and symptoms of depression have greater improvement of depression symptoms when their treatment includes education to enhance literacy skills. The reason why literacy enhancement helps depression symptoms is unknown, but we hypothesize that it might be due to improved self-efficacy. We studied whether providing literacy education to individuals with both depression symptoms and limited literacy might improve their self-efficacy.

Methods: We studied 39 individuals enrolled in an adult literacy program and who, on further testing with the Patient Health Questionnaire (PHQ-9) had symptoms of depression. While they participated in the literacy program, we monitored their self-efficacy using the General Self Efficacy (GSE) scale, and also monitored the severity of depression symptoms with the PHQ-9. Changes in GSE and PHQ-9 scores from baseline were assessed with the Wilcoxon Signed Ranks Test.

Results: Thirty-one (79.5%) subjects participated for 1 year. There was a significant increase in their self-efficacy ($P = .019$) and a significant decrease in depression symptoms ($P < .002$).

Conclusion: The results of this preliminary study suggest that among persons with low literacy and symptoms of depression, depression symptoms lessen as self-efficacy scores improve during participation in adult basic literacy education. (J Am Board Fam Med 2007;20:23–7.)

Previous research demonstrates that, among depressed individuals who have limited literacy skills, results of depression treatment are better if education to improve literacy is added to standard treatments for depression such as medication and counseling.¹ The reason why literacy enhancement lessens symptoms of depression is unclear, but we hypothesize that it might be due to improved self-efficacy.

Self-efficacy is people's belief in their capacity to perform and behave in ways that influence events affecting their lives.² Such an outlook produces personal improvement, decreases stress, and reduces susceptibility to depression.² In contrast, individuals with low self-efficacy shy away from challenges, are quick to discontinue difficult processes, and are prone to higher levels of depression and stress.²

Low self-efficacy is seen in both depression and limited literacy. Individuals who suffer from depression report poor self-efficacy, plus low self-esteem, feelings of worthlessness, an external locus of control, and experience guilt or shame over their limitations^{3–7} – some of the very same characteristics reported by individuals with limited literacy.^{8–10} Indeed, depression and limited literacy often coexist. One study showed that persons with limited literacy are nearly 3 times more likely to have depression symptoms than those with adequate literacy skills.¹¹

Because limited self-efficacy is a characteristic of people with depression and of those with limited

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literacy, it is possible that improving self-efficacy through literacy enhancement may also improve symptoms of depression. This paper reports the results of our preliminary investigation to test the hypothesis that improved self-efficacy of individuals with both limited literacy and symptoms of depression can be achieved by providing them with adult basic education to enhance their literacy skills (ie, enhancing literacy skills could improve sense of self-efficacy). Our specific objectives were to identify participants in an adult education program who had both low literacy and symptoms of depression, provide them with literacy education, and monitor their self-efficacy and depression symptoms over time to determine whether they both improved.

Methods

Overview

This observational study involved clients of an adult education program, all whom had both limited literacy skills and symptoms of depression. They underwent assessments of self-efficacy and depression symptoms over time to detect changes as they participated in the adult education program.

Setting

This study was conducted at an adult basic literacy education (ABLE) program in Livingston, MT, that is affiliated with and located in the same building as a federally qualified community health center. The study methods were reviewed and approved by the health center's institutional review board; all participants gave informed consent.

The ABLE program serves residents of a rural county in which approximately 40% of the population has limited literacy.¹² Participants in the ABLE program either self refer to the program or are referred by social service agencies. Enrollment in the program is voluntary, and duration of participation depends solely on participant's interest in continuing. There is no cost for participation.

ABLE Intervention

When individuals present to the ABLE program, they are evaluated by program staff to determine their learning style, educational history, and academic strengths and weaknesses. The evaluation uses tools such as the Tests of Adult Basic Education and PowerPath.^{13,14} After the evaluation, ABLE staff and the participant discuss educational

goals and develop a learning plan. Participants then attend as many ABLE sessions as they wish, and can choose to work individually, in small groups, or with a one-on-one tutor; most students participate in all these modalities to some extent.

Subjects

Individuals enrolling in the ABLE program were eligible for the study if they were older than 18 years and had depression symptoms based on assessment with the Patient Health Questionnaire (see below). They were not eligible, however, if visual impairment prevented them from reading, if they planned to move from the area within 6 months, or if they had no permanent address in the community.

Measures

Demographics

At the time of study enrollment, demographic information was collected from each subject. This included age, gender, self-reported ethnic group, insurance status, and occupation.

Patient Health Questionnaire (PHQ-9)

Following the literacy assessment, ABLE participants next underwent an evaluation for depression symptoms with the PHQ-9, which we administered orally. PHQ-9 is based on the *Diagnostic and Statistical Manual (DSM-IV)* criteria for diagnosis of depression, and is widely used for both identification of depression symptoms and monitoring the severity of symptoms over time.^{7,15,16} The PHQ-9 scores the frequency of each of the 9 DSM-IV depression criteria from 0 (not at all) to 3 (nearly every day). Scores of 5, 10, 15, and 20 represent mild, moderate, moderately severe, and severe depression symptoms, respectively. A score ≥ 5 has a sensitivity of 92% and a specificity of 73% for diagnosis of depressive disorder.¹⁷

Individuals seen at the ABLE program who had PHQ-9 scores ≥ 5 were referred to their primary care physician for formal assessment and treatment of depression, but we did not review medical records to determine whether subjects actually obtained a formal diagnosis of depression, nor the nature of treatments they may have obtained. In addition to referral to their physician, subjects were also offered participation in the study, which next involved an assessment of self-efficacy.

General Self-efficacy (GSE) Scale

The GSE scale is an instrument for measuring self-efficacy that has been used and validated in thousands of patients in many countries.^{18,19} The 10-item scale that can be self-administered or administered orally; we administered it orally.

The 10 items include statements such as “I can always manage to solve difficult problems if I try hard enough,” “I am confident that I could deal efficiently with unexpected events,” “I can solve most problems if I invest the necessary effort,” “If I am in trouble, I can usually think of a solution,” and others with similar content. Each item is scored by the subject on a 4-point scale ranging from “not at all true” (1 point) to “exactly true” (4 points).

GSE scores range from 10 to 40, with higher scores indicating greater self-efficacy. The scale has good reliability (Cronbach- α 0.76 to 0.90) and validity.^{19,20}

Monitoring

Participants with PHQ-9 scores ≥ 5 were enrolled in the study after measuring baseline GSE scores. Study personnel contacted participants while they continued in ABLE classes and measured their GSE and PHQ-9 scores at 3 to 6 months, 6 to 12 months, and 12 to 15 months after enrollment.

Data Analysis

Demographic characteristics are reported with descriptive statistics. Because scores on the GSE and PHQ-9 were not normally distributed, both mean and median scores are reported, and we used the nonparametric Wilcoxon signed ranks test to determine whether changes in GSE and PHQ-9 scores from baseline to the 3- to 6-, 6- to 12-, and 12- to 15-month evaluations were significant at a value of $P < .05$.

Results

Thirty-nine ABLE enrollees met eligibility criteria and agreed to participate in the study. Their demographic characteristics are shown in Table 1.

Of the 39 participants, 26 (66.6%) underwent the 3- to 6-month measurement of GSE and PHQ-9, 24 (61.5%) underwent the 6- to 12-month measurement, and 31 (79.5%) underwent the 12- to 15-month measurement. Participants spent an average of 67 hours (median 36, range 3 to 406) attending ABLE classes over the duration of this study.

Table 1. Demographic Characteristics of Subjects

Characteristic	
Age in years: Mean (\pm SD)	29.8 (\pm 8.2)
Range	19 to 50
Gender	Number (%)
Female	31 (79.5)
Male	8 (20.5)
Ethnic group	
White	36 (92.3)
Hispanic	1 (2.6)
Native American	2 (5.1)
Insurance status	
Self-pay (no insurance)	23 (59.0)
Medicaid	9 (23.1)
Private (commercial)	4 (10.3)
Medicare	3 (7.7)
Occupation	
Employed (unskilled worker)	17 (43.6)
Homemaker	13 (33.3)
Unemployed	6 (15.4)
Student	3 (7.7)

Changes in GSE and PHQ-9 Scores

Table 2 shows mean and median values for GSE and PHQ-9 scores. The median GSE score at baseline was 28. It rose to 29 at 3 to 6 months and 6 to 12 months, and then to 30 at 12 to 15 months, representing a statistically significant improvement in self-efficacy ($P = .019$).

The median PHQ-9 score at study entry was 10, indicating depression symptoms of moderate severity. The median score at 3 to 6 months fell to 7 and at 6 to 12 months was 5. The mean score at 12 to 15 months was 4, which is below the threshold for detecting depression. The 3- to 6-month, 6- to 12-month, and 12- to 15-month scores were all significantly lower than the baseline score ($P < .002$).

Discussion

Our results suggest that literacy education for adults with limited literacy and depression symptoms results in a small but significant enhancement in self-efficacy and a substantial reduction in depression symptoms. This finding makes it possible that the previously reported improvement in depression severity after literacy education might be mediated to some degree through enhancement of self-efficacy, but further study is needed to confirm that this is the case.

Table 2. GSE and PHQ-9 Scores

Measure	Baseline n = 39	3 to 6 Months n = 26	6 to 12 Months n = 24	12 to 15 Months n = 31	Significance
GSE					
Mean (SD)	27.9 (3.7)	29.0 (2.8)	29.3 (1.7)	29.9 (1.9)	$P = .019^*$
Median	28	29	29	30	
PHQ-9					
Mean (SD)	11.9 (5.2)	7.4 (5.0)	7.5 (5.4)	6.0 (3.9)	$P < .002^\dagger$
Median	10	7	5	4	

* Difference between baseline and 12- to 15-month value significant by Wilcoxon Signed Ranks test.

† All values significantly different from baseline value by Wilcoxon Signed Ranks test.

This study was a preliminary investigation. It involved only a few subjects, had no control group, did not confirm the diagnosis of depression, and interviewers were not blinded to the subjects' status in the study.

Despite the limitations, however, our finding that depression symptoms improved with literacy education is concordant with 2 randomized-controlled trials that had similar findings.^{1,21} Our study adds to that prior work by showing that self-efficacy also improves, raising the possibility that enhanced self-efficacy might be a mediating factor in the lessened severity of depression symptoms after literacy education. Further study is needed to confirm that this is true.

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References

- Weiss BD, Francis K, Senf JH, Heist K, Hargarves R. Literacy education as treatment for depression in patients with limited literacy and depression: a randomized controlled trial. *J Gen Intern Med* 2006;21:823–8.
- Bandura A. Self-efficacy: toward a unifying theory of behavior change. *Psychol Rev* 1977;84:191–215.
- Wardle J, Steptoe A, Gulis G, et al. Depression, perceived control, and life satisfaction in university students from Central-Eastern and Western Europe. *Int J Behav Med* 2004;11:27–36.
- Schreiner AS, Morimoto. The relationship between mastery and depression among Japanese family caregivers. *Int J Aging Hum Dev* 2003;56:307–21.
- Blazer DG. Self-efficacy and depression in late life: a primary prevention proposal. *Aging Ment Health* 2002;6:315–24.
- Beck JG, Novy DM, Diefenbach GJ, Stanley MA, Averill PM, Swann AC. Differentiating anxiety and

- depression in older adults with generalized anxiety disorder. *Psychol Assess* 2003 Jun;15:184–92.
- Diagnostic and Statistical Manual of Mental Disorders, 4th Ed: DSM-IV. Washington, DC: American Psychiatric Association, 2004.
- Parikh NS, Parker RM, Nurss JR, Baker DW, Williams MV. Shame and health literacy: the unspoken connection. *Patient Educ Couns* 1996;27:33–39.
- Wallerstein N. Powerlessness, empowerment, and health: implications for health promotion programs. *Am J Health Promot* 1992;6:197–205.
- Weiss BD, Coyne C, Michielutte R, et al. Communicating with patients who have limited literacy skills: Report of the National Work Group on Literacy and Health. *J Fam Practice* 1998;46:168–176.
- Gazmararian J, Baker D, Parker R, Blazer DG. A multivariate analysis of factors associated with depression: evaluating the role of health literacy as a potential contributor. *Arch Intern Med* 2000;160:3307–14.
- Reder S. State of Literacy in America: Synthetic Estimates of Adult Literacy Proficiency at the Local, State, and National levels. National Institute for Literacy. http://www.casas.org/lit/litcode/Detail.CFM?census_AREAID=1941.
- TABE: Tests of Adult Basic Education. Monterey, CA: CTB/McGraw-Hill. 2002.
- PowerPath to Basic Learning. PowerPath/TLP Group, 2000. <http://www.powerpath.com>
- Dietrich AJ, Oxman TE, Burns MR, Winchell CW, Chin T. Application of a depression management office system in community practice: a demonstration. *J Am Board Fam Pract* 2003;16:107–14.
- Löwe B, Unützer J, Callahan CM, Perkins AJ, Kroenke K. Monitoring depression treatment outcomes with the PHQ-9. *Med Care* 2004;42:1194–201.
- Kroenke K, Spitzer RL, Williams JBW. The PHQ-9: Validity of a brief depression severity measure. *J Gen Intern Med* 2001;16:606–13.
- Schwarzer R, Jerusalem M. Generalized Self-Effi-

- cacy Scale. In Weinman J, Wright S, Johnston M, Measures in Health Psychology: A User's Portfolio. Causal and Control Beliefs (pp. 35-37). Windsor, UK: Nfer-Nelson, 1995.
19. Luszczynska A, Scholz U, Schwarzer R. The general self-efficacy scale: multicultural validation studies. *J Psychol* 2005 Sep;139:439-57.
 20. Schwarzer R. Everything you ever wanted to know about the Self Efficacy Scale but were afraid to ask. http://userpage.fuberlin.de/~health/materials/faq_gse_220405.pdf, 2005.
 21. Poresky RH, Daniels AM. Two-year comparison of income, education, and depression among parents participating in regular Head Start or supplementary family service center services. *Psychol Rep* 2001;88: 787-96.