Published in final edited form as:

Musculoskeletal Care. 2010 December ; 8(4): 197–203. doi:10.1002/msc.181.

Factors Related to Self-Efficacy in Persons With Scleroderma

Una Buck, MOT, OTR,

Occupational Therapist, Chinle Unified School District, Chinle, Arizona

Janet L. Poole, PhD, OTR/L, FAOTA, and

Professor, Occupational Therapy Graduate Program, MSC09 5240, 1 University of New Mexico, Albuquerque, New Mexico 87131-0001, Phone: 505-272-8276, FAX: 505-272-3583

Cindy Mendelson, PhD, RN

Associate Professor, University of New Mexico, College of Nursing, Albuquerque, New Mexico

Janet L. Poole: jpoole@salud.unm.edu

Abstract

Purpose—Scleroderma (SSc) is rare, and few studies have examined self-efficacy in persons with the disease. Self-efficacy is one precursor that has been shown to initiate changes in behavior when managing chronic disease. The objective of this study was to explore the levels of self-efficacy in persons with SSc, compare self-efficacy in persons with limited or diffuse SSc, and determine correlations between self-efficacy, physical function, and psychological variables.

Methods—Sixty-two participants with SSc completed measures assessing self-efficacy, depression, fatigue, pain, hand function, and activity limitations. The mean age of participants was 52.9 years. The mean educational level was 15.8 years. Sixty-seven percent were married, and 87.1% were women. Thirty participants had diffuse SSc, 27 had limited SSc, and 5 were unclassified.

Results—The only significant differences between the two disease subtypes were in hand function and self-efficacy function subscale scores. Total self-efficacy scores significantly correlated with marital status, employment, self-reported health, depression, functional ability, fatigue, pain, and hand function. Similarly, self-efficacy function scale scores significantly correlated with employment, self-reported health, functional ability, pain, and hand function. Self-efficacy pain scale scores significantly correlated with fatigability. The self-efficacy other scale scores significantly correlated with depression and fatigability. Participants with higher levels of pain and depression, more fatigue, more general disability, and more hand disability had lower self-efficacy.

Conclusion—Self-efficacy correlates with physical function and psychological variables, and could predict how patients manage their health. Self-efficacy may increase through participation in educational programs focusing on self-management of these variables.

Keywords

Self-efficacy; scleroderma; Arthritis Self-efficacy Scale

Introduction

Systemic sclerosis (SSc), or scleroderma, is a chronic, progressive, rheumatic disease that receives little attention despite findings that it results in significant disability, fatigue, social isolation, depression, pain, and decreased quality of life (Mouthon et al., 2008; Sandqvist et al., 2005; Sandqvist et al., 2004; Thombs et al., 2008). SSc is characterized by skin thickening, vascular involvement (Raynaud's phenomenon), and involvement of internal

organs (Medsger, 2004). There are two subtypes of SSc based on the extent of skin involvement: limited cutaneous SSc and diffuse SSc (Medsger, 2004). Limited SSc is more common; skin thickening is restricted to the face and hands, and internal organ involvement occurs later. In diffuse SSc, the more severe type, skin involvement occurs more proximally and involves the trunk, face, and extremities, with early involvement of the internal organs (Medsger, 2004).

Managing a chronic disease such as SSc can be challenging. Author (2007) found that individuals with SSc have to become their own advocates to secure effective medical management for this rare disease and cope with the physical and emotional challenges. These challenges include pain; fatigue; deformities, particularly in the hands; and changes in facial appearance and self-image (Author, 2007). To maintain a high quality of life, participants reported that they took control of their illness and advocated for themselves. Taking control and self-advocacy are consistent with self-efficacy, which refers to the perception of one's ability and capability to successfully achieve valued behavioral outcomes (Bandura 1977, 1997). Individuals with high self-efficacy gain an increased sense of confidence in their ability to control and manage the symptoms associated with their chronic disease (Daltroy, 1993) and demonstrate long-term adherence in managing their disease, which significantly enhances quality of life (Han et al., 2003; Rosenstock, 1985). Alternatively, low self-efficacy has been shown to have a negative impact on disease management behaviors, resulting in poorer health outcomes, more pain, poorer psychological well-being, and decreased physical health status (Shifren et al., 1999). Self-efficacy appears to be a modifiable variable that can affect health status, influence mood and motivation, and maintain participation in daily routines and roles (Bodenheimer et al., 2002; Marks et al., 2005). Studies have shown that successful management programs can be linked to self-efficacy by equipping people with the necessary knowledge, skills, and confidence to deal with the problems associated with chronic diseases (Barlow et al., 2001; Lorig and Holman, 2003; Lorig et al., 2001).

However, little is known about self-efficacy beliefs in persons with SSc or whether self-efficacy differs according to disease severity. Because self-efficacy has been linked to functional ability, and diffuse SSc results in significantly more functional and hand disability (Author, 1991, 2004; Khanna et al., 2007; Mouthon et al., 2008; Rannou et al., 2007) than does limited SSc, self-efficacy might be different between the two subtypes. It is also not known which factors relate to a stronger self-efficacy in persons with SSc. This knowledge might suggest areas to target in self-management programs designed to improve self-efficacy. Therefore, the purposes of this study were to investigate levels of self-efficacy in persons with SSc, compare self-efficacy in persons with limited and diffuse SSc, and determine associations between self-efficacy, physical function, and psychological variables.

Methods

Study Design

We used cross-sectional study data collected at baseline from individuals who were participating in a study to test a self-management program for people with scleroderma. Post-intervention follow-up data are currently being collected and analyzed. This study was approved by the institutional review board.

Participants

Participants were recruited from an announcement on the Scleroderma Foundation Website. To be eligible, participants had to (1) be a resident of the United States, (2) have a diagnosis of SSc, and (3) be able to communicate in English. Interested participants contacted the

principal investigator and were screened regarding their willingness and ability to complete the self-management study. Sixty-two participants with SSc completed baseline questionnaires. Demographic information was collected on age, sex, disease, length of time since disease onset, ethnicity, education level, marital status, employment, and self-rated health.

Measures

Self-efficacy was measured with the Arthritis Self-Efficacy Scale (ASE), which measures perceived self-efficacy to perform specific tasks and behaviors and the perceived ability to control or manage different aspects associated with arthritis. The ASE comprises three subscales: self-efficacy pain scale (SE pain), self-efficacy function scale (SE function), and self-efficacy other (SE other). Participants rated their perceived ability to perform each item on a scale, ranging from 1 (very uncertain) to 10 (very certain) in increments of 10. The mean scores for each subscale were calculated, as was a mean total ASE score. A high ASE score indicated greater self-efficacy or confidence that one could perform specific tasks or behaviors (Lorig, Chastain et. al, 1989).

Psychological health and well-being were measured using the 20-item Center for Epidemiological Studies Depression Scale (CES-D). Items were rated on a Likert-type scale from 0 (rarely or none of the time) to 3 (most or all of the time), with the scoring reversed for four questions. The total score for the CES-D ranges from 0 to 60 (Radloff, 1977). A score greater than 16 indicated possible depression, and a score greater than 23 indicated probable depression (Radloff, 1977; Thombs et al., 2008).

Functional ability was measured using the Health Assessment Questionnaire (HAQ; Fries et al., 1980). The HAQ addresses eight dimensions of daily living: dressing and grooming, arising, eating, walking, hygiene, reaching, grip, and outdoor activity. Participants rated the level of difficulty for each item, from 0 (no difficulty) to 3 (cannot do). The highest scores from each category were summed and then divided by 8 (the number of categories), which resulted in total score of from 0 (no disability) to 3 (severe disability; Fries et al., 1980). A total score of 1 or more indicated moderate to severe limitations (Clements et al., 1999).

Hand function was measured using the Scleroderma Functional Assessment Questionnaire (SFAQ), a self-report of upper extremity functioning (Silman et al., 1998). The questionnaire consists of 11 items covering grooming, dressing, toileting, and holding and manipulating different objects. Items were scored on a 4-point scale from 0 (able to perform in normal manner) to 3 (impossible); the scores were summed to yield a total score of from 0 to 33 (Silman et al., 1998). Higher scores reflected more disability.

Pain was measured using a 100-mm horizontal visual analog scale (Burckhardt and Jones, 2003). Participants rated their pain level on the scale from 0 (no pain) to 10 (very severe pain/as bad as it could possibly be). A score of 4 or more indicated moderate to severe pain (Clements et al., 1999).

Fatigue was measured using the Multidimensional Assessment of Fatigue Scale (MAF; Belza, 1995; Belza et al., 1993; Piper et al., 1989; Tack, 1991). The MAF is a 16-item scale that measures four subjective domains of fatigue: degree and severity, amount of distress it causes, timing, and degree to which fatigue interferes with the activities of daily living. The MAF contains 14 items that are rated on a scale ranging from 1 (not at all, not severe) to 10 (a great deal, severe) and 2 multiple-choice items that ask participants how often they have been fatigued (1 = hardly any days; 2 = occasionally; 3 = most, but not all, days; and 4 = every day) and to what degree their fatigue has changed over the past week (1 = decreased, 2 = stayed the same, 3 = fatigue has gone up and down, and 4 = increased). The global fatigue

index was calculated by summing the total scores for the severity and distress subscales (items 1–3), averaging the degree of interference with activities of daily living (items 4–14), and averaging one timing item (item 15: how often have you been fatigued), which was converted to a 0 to 10 scale by multiplying each score by 2.5 (Piper et al., 1989; Sandusky et al, 2009). Scores ranged from 1 (no fatigue) to 50 (severe).

Statistical Analysis

Means and standard deviations were calculated for each measure. *T* tests were performed to compare the participants with limited and diffuse scleroderma on all variables (the 5 participants who noted that their disease was unclassified were not included in the analysis). Spearman rho correlation coefficients were calculated to determine the relationships among the variables associated with self-efficacy measures. Two sample *t* tests were used to compare ASE scores with three dichotomized values of pain (VAS), fatigue (MAF), functional ability (HAQ), depression (CES-D), and hand function (SFAQ).

Results

Table 1 shows that most participants were women and Caucasian. The mean age of the sample was 52.9 years, and the mean disease duration was 7 years. The demographic variables were similar for both types of SSc, except for marital status and self-reported health. Significantly, more participants in the limited SSc group were married and had better self-reported health than in the diffuse group. Table 1 also shows that there were no significant differences between the disease subtypes for any of the other variables except SFAQ and SE function, which is consistent with other findings that diffuse SSc results in significantly more overall functional and hand disability. Thus, this group may feel less confident in their ability to manage and participate in functional activities.

Table 2 shows the results from the correlational analyses. Total self-efficacy ASE scores significantly correlated with marital status, employment, self-reported health, CES-D, HAQ, MAF, pain, and SFAQ. The SE pain scale significantly correlated with the MAF. The SE function scale significantly correlated with employment, self-reported health, HAQ, pain, and SFAQ. The SE other scale significantly correlated with CES-D and MAF.

Table 3 shows the results of the univariate analysis. Significant differences in self-efficacy were found in each of the following variables: pain, MAF, CES-D, HAQ, and SFAQ. Participants who had higher levels of pain, depression, fatigue, and functional and hand disability had lower self-efficacy.

Discussion

The purpose of this study was to investigate the levels of self-efficacy in persons with SSc, compare self-efficacy in persons with limited or diffuse SSc, and determine the relationships between self-efficacy and physical and psychological variables. In our sample, self-efficacy varied according to the different self-efficacy subscales. Overall, for all participants and the limited group, SE for function was higher than SE for controlling other symptoms and for controlling pain. This was not the pattern in the diffuse group; the highest self-efficacy scores were for SE other, and SE for function was significantly lower in the diffuse group than in the limited group. Furthermore, the only significant difference between the two subtypes was in SFAQ scores and SE function, whereas the HAQ scores approached significance. As previously mentioned, diffuse is the more severe subtype of SSc, resulting in more functional and hand disability.

Total SE for pain and other symptoms was higher in our sample compared with levels reported in the literature for individuals with rheumatoid arthritis (Barlow et al., 2000; Barlow et al., 2002; Barlow et al., 2008; Lorig et al., 2008), systemic lupus erythematosus (Sohong, 2003), and fibromyalgia (Lorig et al., 2008). It is possible that self-efficacy may be higher in individuals with SSc because it is a rare unfamiliar disease. Individuals with SSc may be forced to take the initiative to seek out additional information beyond what they have already been told by their doctor and other health professionals.

Our study showed that overall self-efficacy on the ASE was associated with several psychological and physical variables, including depression, pain, fatigue, and disability. These findings are also similar to studies of persons with rheumatoid arthritis that showed low overall self-efficacy related to greater physical limitations, increased pain, increased fatigue, more depression, and decreased acceptance of their condition (Barlow et al., 2002; Hewlett et al., 2008). We also found that higher SE for function was associated with less physical disability and less pain, which is also similar to findings with persons with rheumatoid arthritis (Barlow et al., 2000; Barlow et al., 2002; Makelainen et al., 2008).

Indeed, Marks et al. (2005) reported similar findings in that persons who had higher self-efficacy for pain were more likely to have fewer severe symptoms and a better quality of life, and possibly few problems with mobility and suffering. Thus, self-efficacy could play a role in mediating the association between physical functioning and psychological well-being in persons with SSc and should be a factor to consider when working with this population.

Our study had several limitations. First, the findings may be limited by the small sample size ($N = 62$) and the recruitment method. We recruited participants from an announcement on the Scleroderma Foundation Website, which may have eliminated persons who did not have Internet access or knowledge of the Foundation. This sampling strategy also may have selected for individuals with higher self-efficacy because they had engaged with the Scleroderma Foundation and sought information about ongoing studies. In addition, our participants were primarily women (87.1%) and Caucasian (75.8%), with a moderately high level of education (mean, 15.8 years). Although SSc is four times more common in women than in men, self-efficacy may be different in men and/or people from different ethnic groups or education levels. Participants also self reported a diagnosis of scleroderma and type of scleroderma. Future studies might include a larger sample size and recruitment of more men and persons from varying ethnic backgrounds. Also, the method of recruitment might include enrollment from physicians' offices and/or local and state SSc chapters of the Scleroderma Foundation, in addition to the Internet.

Implications and Conclusions

Self-efficacy has been shown to determine how one will manage a chronic disease (Bandura, 1997, Cross et al., 2006; Lorig, Seleznick et al., 1989). Self-management programs have been successful in equipping participants with the tools needed manage day-to-day fluctuations in their illnesses. However, these programs have focused on managing rheumatoid arthritis, osteoarthritis, and fibromyalgia (Barlow et al., 2000, Lorig and Holman, 2003; Lorig, Seleznick et al., 1989). Author (2009) and Author (2007) have shown that individuals frequently desire information specific to their disease and often feel marginalized when the specific impact of the disease on their lives is not addressed. Thus, self-management programs focused on scleroderma could be beneficial. The findings from two pilot education programs (Brown et al., 2004; Samuelson and Ahlmen, 2000), focus groups (Author, 2007), and the present study support the need for a scleroderma-specific self-management program. Our findings support these studies also in the areas related to

self-efficacy that such a program should address issues such as pain and fatigue management, depression, and the performance of daily tasks.

Acknowledgments

This study was funded by the National Institutes of Health, National Institute of Nursing Research Grant # 1 RO3 NR009697 through the US Department of Health and Human Services. We wish to thank the people who participated in this study and Betty Skipper, PhD for statistical assistance.

References

- Author. The use of the Health Assessment Questionnaire (HAQ) to determine physical disability in systemic sclerosis. *Arthritis Care and Research* 1991;4:27–31. [PubMed: 11188583]
- Author. Reliability and validity of the Duruöz Hand Index in persons with systemic sclerosis. *Arthritis Care and Research* 2004;51:805–809. [PubMed: 15478150]
- Author. Diagnosis: A liminal state for women living with lupus. *Health Care for Women International* 2009;30:390–407. [PubMed: 19350436]
- Author. Become your own advocate: Advice from women living with scleroderma. *Disability and Rehabilitation* 2007;29:1492–1501. [PubMed: 17852224]
- Bandura, A. *The Exercise of Control*. New York: Freeman; 1997. Self-Efficacy.
- Bandura A. Self-Efficacy: Toward a Unifying Theory of Behavioral Change. *Psychology Review* 1977;84:191–215.
- Barlow JH, Cullen IF, Rowe IF. Educational preferences, psychological well-being and self-efficacy among people with rheumatoid arthritis. *Patient Education and Counseling* 2002;46:11–19. [PubMed: 11804765]
- Barlow JH, Turner AP, Wright CC. A randomized controlled study of the arthritis self-management programme in the UK. *Health Education Research Theory & Practice* 2000;15:665–680.
- Barlow J, Turner A, Swaby L, Gilchrist M, Wright C, Doherty M. An 8-yr follow-up of arthritis self-management programme participants. *Rheumatology* 2008;48:128–133. [PubMed: 19036778]
- Barlow JH, Williams B, Wright CC. Patient education for people with arthritis in rural communities: the UK experience. *Patient Education and Counseling* 2001;44:205–214. [PubMed: 11553421]
- Belza B. Comparison of self-reported fatigue in rheumatoid arthritis and controls. *Journal of Rheumatology* 1995;22:639–643. [PubMed: 7791155]
- Belza B, Henke C, Yelin EH, Epstein WV, Gilliss CL. Correlates of fatigue in older adults with rheumatoid arthritis. *Nursing Research* 1993;20:195–204.
- Bodenheimer T, Lorig KL, Holman H, Grumbach K. Patient self-management of chronic disease in primary care. *The Journal of American Medical Association* 2002;288:2469–2475.
- Brown SJ, Somerset ME, McCabe CS, McHugh NJ. The impact of group education on participants' management of their disease in lupus and scleroderma. *Musculoskeletal Care* 2004;2:207–217. [PubMed: 17041984]
- Burckhardt CS, Jones KD. Adult measures of pain. *Arthritis Care and Research* 2003;49:S96–S104.
- Clements PJ, Weng KW, Hurwitz EL, Furst DE, Mayes M, White B, et al. Correlates of the disability index of the Health Assessment Questionnaire: A measure of functional impairment in systemic sclerosis. *Arthritis and Rheumatism* 1999;42:2372–2380. [PubMed: 10555033]
- Cross MJ, March LM, Lapsley HM, Byrne E, Brooks PM. Patient self-efficacy and health locus of control: Relationship with health status and arthritis-related expenditure. *Rheumatology* 2006;45:92–96. [PubMed: 16287930]
- Daltroy LH. Doctor-patient communication in rheumatological disorders. *Ballieres Clinical Rheumatology* 1993;7:221–239.
- Fries J, Spitz P, Kraines G, Holman H. Measurement of patient outcome in arthritis. *Arthritis and Rheumatism* 1980;23:137–45. [PubMed: 7362664]
- Han K, Lee P, Lee S, Park E. Factors influencing quality of life in people with chronic illness in Korea. *Journal of Nursing Scholarship* 2003;35:139–144. [PubMed: 12854294]

- Hewlett S, Cockshott Z, Almeida C, Richards P, Lowe R, Greenwood R, Kirwan J. RASE Study Group. Sensitivity to change of the rheumatoid arthritis self-efficacy scale (RASE) and predictors of change in self-efficacy. *Musculoskeletal Care* 2008;6:49–67. [PubMed: 18228530]
- Khanna D, Ahmed M, Furst DE, Ginsburg SS, Park GS, Hornung R, Tsevat J. Health values of patients with systemic sclerosis. *Arthritis Care & Research* 2007;57:86–93. [PubMed: 17266070]
- Lorig KL, Chastain RL, Ung E, Shoor S, Halsted HR. Development and evaluation of a scale to measure self-efficacy in people with arthritis. *Arthritis and Rheumatism* 1989;32:37–45. [PubMed: 2912463]
- Lorig KL, Holman HR. Self-management education: History, definition, outcomes, and mechanisms. *Annals of Behavioral Medicine* 2003;26:1–7. [PubMed: 12867348]
- Lorig KR, Ritter PL, Laurent DD, Plant K. The Internet-based arthritis self-management program: A one-year randomized trial for patients with arthritis or fibromyalgia. *Arthritis & Rheumatism* 2008;59:1009–1017. [PubMed: 18576310]
- Lorig KL, Seleznick M, Lubeck D, Ung E, Chastain RL, Holman HR. The beneficial outcomes of the arthritis self-management course are not adequately explained by behavior change. *Arthritis and Rheumatism* 1989;32:91–95. [PubMed: 2912467]
- Lorig KR, Sobel DS, Ritter PL, Stewart AL, Laurent D, Hobbs M. Effect of a self-management program on patients with chronic disease. *Effective Clinical Practice* 2001;4:256–562. [PubMed: 11769298]
- Makelainen P, Vehvilainen-Julkunen K, Pietila AM. A survey of rheumatoid arthritis patients self-efficacy. *The Internet Journal of Advanced Nursing Practice* 2008;9:1–9.
- Marks R, Allegrante JP, Lorig KL. A review and synthesis of research evidence for self-efficacy-enhancing interventions for reducing chronic disability: Implications for health education practice (part II). *Health Promotion Practice* 2005;6:148–156. [PubMed: 15855284]
- Medsger, TA, Jr. Classifications, prognosis. In: Clements, PJ.; Furst, DE., editors. *Systemic Sclerosis*. Philadelphia: Lippincott Williams & Wilkins; 2004. p. 17-28.
- Mouthon L, Rannou F, Berezne A, Pagnoux C, Guilpain P, Goldwasser F, et al. Patient preference disability questionnaire in systemic sclerosis: A cross-sectional survey. *Arthritis Care & Research* 2008;59:968–973. [PubMed: 18576298]
- Piper, B.; Lindsey, A.; Dodd, M.; Ferketich, S.; Paul, S.; Weller, S. The development of an instrument to measure the subjective dimension of fatigue. In: Funk, S.; Tornquist, E.; Champagne, M.; Wiese, R., editors. *Key Aspects of Comfort: Management of Pain, Fatigue, and Nausea*. New York: Springer; 1989. p. 199-207.
- Radloff LS. The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychology Measure* 1977;1:385–401.
- Rannou F, Poiraudreau S, Berezne A, Baubet T, Le-Guern V, Cabane J, et al. Assessing disability and quality of life in systemic sclerosis: Construct validities of the Cochin hand function scale, health assessment questionnaire (HAQ), systemic sclerosis HAQ, and medical outcomes study 36-item short form health survey. *Arthritis Care & Research* 2007;57:94–102. [PubMed: 17266096]
- Rosenstock IM. Understanding and enhancing patient compliance with diabetic regimens. *Diabetes Care* 1985;8:610–616. [PubMed: 3908028]
- Samuelson UK, Ahlmen EM. Development and evaluation of a patient education program for persons with systemic sclerosis (SSC). *Arthritis Care & Research* 2000;13:141–148. [PubMed: 14635287]
- Sandqvist G, Akesson A, Eklund M. Daily occupations and well-being in women with limited cutaneous systemic sclerosis. *American Journal of Occupational Therapy* 2005;5:390–397. [PubMed: 16124205]
- Sandqvist G, Eklund M, Akesson A, Nordenskiöld U. Daily activities and hand function in women with scleroderma. *Scandinavian Journal of Rheumatology* 2004;33:102–107. [PubMed: 15163111]
- Sandusky SB, McGuire L, Smith MT, Wigley FM, Haythornthwaite JA. Fatigue: an overlooked detriment of physical function in scleroderma. *British Society for Rheumatology* 2009;48:165–169.
- Shifren K, Park DC, Bennett JM, Morrell RW. Do cognitive processes predict mental health in individuals with rheumatoid arthritis. *Journal of Behavioral Medicine* 1999;22:529–547. [PubMed: 10650535]

- Silman A, Akesson A, Newman J, Hendricksson H, Sandquist G, Nihill M, Palfrey S, Lomas R, Wollheim F, Black C. Assessment of functional ability in patients with scleroderma: A proposed new disability assessment instrument. *Journal of Rheumatology* 1998;25:79–83. [PubMed: 9458207]
- Sohong KY. Effects of a self-management course for patients with systemic lupus erythematosus. *Journal of Advance Nursing* 2003;42:479–486.
- Tack, B. Doctoral dissertation. University of California; San Francisco: 1991. Dimensions and correlates of fatigue in older adults with rheumatoid arthritis. (UMI No. PUZ9202459)
- Thombs BD, Hudson M, Schieir O, Taillefer SS, Baron M. Canadian Scleroderma Research Group. Reliability and validity of the center for epidemiologic studies depression scale for patients with systemic sclerosis. *Arthritis and Rheumatology* 2008;59:438–43.

TABLE 1

Descriptive statistics for participants

Variable	All participants (n= 62)	Limited scleroderma (n = 27) ¹	Diffuse scleroderma (n = 30) ¹	p Value ²
Mean age (SD), years	53.0 (11.7)	50.3 (9.2)	53.4 (13.0)	.32
Mean disease duration (SD), years	6.0 (6.4)	6.6 (5.6)	7.0 (7.7)	.39
Mean years of education (SD)	15.8 (3.0)	15.7 (2.7)	15.9 (3.1)	.77
Caucasian, %	75.8	77.8	73.3	.91
Women, %	87.1	88.9	86.7	.90
Married, %	67.7	85.2	60.0	.02
Full-time employment, %	43	59.3	36.7	.08
Mean self-reported health score (SD)	3.0 (0.8)	2.7 (0.8)	3.2 (0.8)	.02
Mean CES-D (SD)	14.0 (10.2)	14.8 (1.9)	9.2 (1.7)	.42
Mean HAQ, (SD)	0.89 (0.7)	0.7 (0.6)	1.1 (0.7)	.07
Mean MAF (SD)	25.9 (11.0)	25.7 (11.1)	26.7 (10.7)	.73
Mean Pain (SD)	3.0 (2.6)	2.8 (2.3)	3.2 (2.7)	.62
Mean SFAQ (SD)	6.3 (5.4)	4.7 (4.5)	8.0 (5.9)	.02
Mean SE pain (SD)	5.2 (2.6)	5.4 (2.1)	4.9 (2.7)	.50
Mean SE function (SD)	7.5 (2.9)	8.4 (3.0)	6.5 (2.6)	.01
Mean SE other (SD)	6.5 (2.5)	6.0 (2.0)	7.1 (2.7)	.09
Mean ASE total (SD)	6.5 (2.0)	6.7 (1.9)	6.2 (1.9)	.30

CES-D = Center for Epidemiological Studies Depression Scale; HAQ = Health Assessment Questionnaire; MAF = Multidimensional Assessment of Fatigue; VAS = visual analog scale; SFAQ = Scleroderma Functional Assessment Questionnaire; SE = self-efficacy; ASE = Arthritis Self-Efficacy Scale.

¹The 5 participants who noted that their disease was unclassified were not included in the analysis.

²Comparison only includes participants with diffuse and limited scleroderma subtypes.

TABLE 2

Spearman rho correlation coefficients between variables associated with self-efficacy measures

Variables	SE pain	SE function	SE other	SE total
Age	NS	NS	NS	NS
Disease duration, years	NS	NS	NS	NS
Education	NS	NS	NS	
Marital status	NS	NS	NS	-.29 *
Employment	NS	-.27 *	NS	-.29 *
Self-reported health	NS	-.38 **	NS	-.45 **
CES-D	NS	NS	-.30 *	-.44 **
HAQ	NS	-.62 **	NS	-.55 **
MAF	-.25 *	NS	-.39 **	-.50 **
Pain	NS	-.32 *	NS	-.49 **
SFAQ	NS	-.58 **	NS	-.47 **

SE = self-efficacy; NS = non significant; CES-D = Center for Epidemiological Studies Depression Scale; HAQ = Health Assessment Questionnaire; MAF = Multidimensional Assessment of Fatigue; SFAQ = Scleroderma Functional Assessment Questionnaire.

*
p < .05.

**
p < .01.

TABLE 3

Univariate results: Self-efficacy total score by levels of pain, fatigue, disability, depression, and hand disability

Variable	Mean self-efficacy total score	<i>p</i> Value
Pain		< .001
< 4	7.2	
≥ 4	5.5	
MAF – fatigue		< .05 ¹
< 18	7.8	
18–23	6.3	
> 24	6.1	
HAQ – disability		< .001
< 1	7.5	
≥ 1	5.5	
CES-D – depression		< .01
< 16	7.1	
≥ 16	5.4	
SFAQ – hand disability		< .01
< 1	8.4	
≥ 1	6.3	

MAF = Multidimensional Assessment of Fatigue; HAQ = Health Assessment Questionnaire; CES-D = Center for Epidemiological Studies Depression Scale; SFAQ = Scleroderma Functional Assessment Questionnaire.

¹ MAF < 18 significantly different from MAF < 24.