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Learning Preference and Motivation to Learn by Age and Gender in Patients with Chronic Wound

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Abstract

Background: Effective patient education requires assessment of patients' learning preferences. Learning preferences and motivation to learn are largely unexplored among patients with chronic wounds.

Objective: This study examined learning preferences and motivation to learn in adult patients by age and gender.

Design and methods: A retrospective study design. Data were abstracted from 1003 (29 % elderly, 53% females) patient charts at a Chronic Wound Center; patients were treated for non-healing chronic wounds.

Key results: The mean age was 55.2 ± 17 years; 48% had a high school education. Half (51%) were eager to learn and 69% asked questions but 17% were anxious/uninterested/confused/ uncooperative during assessment by the nurse manager. The majority preferred to learn by explanation (59%) or demonstration (56%); printed materials (34%), video and group learning (1%) was not favored. Females preferred the demonstration/printed materials than males ($p<.05$); females and older patients (≥ 65 years) were less likely to ask questions and were anxious than males/ younger patients. Motivation to learn was a significant predictor of wound closure in the multivariate logistic regression model ($p<.05$).

Conclusions: Results have implications for tailoring treatment regimens, particularly those involving self-care measures.

Practice implications: Tailored age- and gender-education and visual models for learning can improve compliance and empower patients.

Keywords: Patient education; Wound care; Motivation; Learning; Age differences; Gender differences

Introduction

None healing or slow healing wounds affect nearly six million patients at an estimated cost of 20 billion dollars annually. Wounds that do not heal within three months are often considered chronic; these wounds often remain inflammatory for a long time and may never heal or take months to do so. Acute and chronic wounds are at opposite ends of a spectrum of wound healing types that progress toward being healed at different rates [1]. The vast majority of chronic wounds can be classified into three categories: venous ulcers, pressure, and diabetic ulcers [1].

Over 20 million Americans have diabetes with increased risk for developing diabetic foot ulcer due to neuropathy and vascular diseases [2]. Diabetes remains the leading cause of non-traumatic amputation and appropriate intervention strategies may reduce the risk for the cascade of events towards ulceration and subsequent amputation. The elderly are at risk for chronic wounds that do not heal [3]. According to the National Institute of Health, "wounds in the elderly can take up to four times longer to heal than among a younger population," due to the aging process, underlying medical conditions, increased falls and poor nutrition. Chronic lower extremity ulcers alone impact approximately 2.5 million to 4.5 million people in the US and up to one million Americans develop chronic wounds every year [3-5].

Not only do chronic wounds represent a major burden in terms of expenditure of health care resources, additional costs include number of days lost from work, decreased quality adjusted life years and disability adjusted life years. Patients with chronic wounds suffer pain and distress from wounds that can require treatment for many months with possibility of hospital readmission from ulcer-related conditions [3]. The economic costs are high because management of chronic wounds is typically costly and prolonged. Patient education is therefore very important and could save patients months of unnecessary pain and suffering as well as essential to chronic disease management and positive healing outcomes [6]. Accordingly, The Joint Commission (TJC) mandates all clinics and hospitals to assess patients' needs and provide patient education. However, requirements for patient education for the management of chronic wounds vary across clinics and hospitals.

For patient education to be effective, a number of factors must be taken into account. Among them are patients' motivation to learn and learning preferences [6], that are part of the learning assessment completed by clinics and hospitals. Generally, the learning assessment taps into the patient's educational level, readiness, behavior, prior learning experiences, past experiences with treatment/medical

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personnel, personal medical history, social supports, physical environment for learning and relationship between care giver/patient. Motivation to learn and learning preferences, though, are two largely unexplored factors that contribute to the management of chronic diseases.

Another aspect of patient care receiving little attention in the chronic wounds literature is gender. In the psychological and educational literature, for example, gender has been shown to be a key determinant of motivation. Gender differences were noted in learning needs among patients who underwent heart surgery and patient self-management behaviors [7-9]. Motivation to learn has been shown to differ by gender even in children with boys, for example, more motivated to achieve in mathematics and science and girls in English and social studies [10]. Gender differences among patients with chronic wounds may have direct implications for practice and treatment among health care educators and workers. Knowing if men and women respond differently to patient education, for example, may be helpful in tailoring treatment regimens, particularly those involving self-care.

Very few studies have examined patients' motivation to learn and learning preferences, in relation to the management of chronic wounds. Therefore, this study will examine learning preferences and motivation to learn in adult patients with chronic wounds. Specifically, the three research questions are: (a) what learning preferences, motivation to learn and healing rates do adult patients with chronic wounds have and do they differ by age and gender? (b) What are the relationships among patients' learning preferences, motivation to learn and healing rates of chronic wounds? (c) Do these relationships differ by age and gender?

Methods

Study design and data collection sites

This project used a retrospective study design. The retrospective study allowed the researchers to analyze the wound healing outcomes by important patient characteristics in a short period of time and expense. Data were abstracted from patient charts for the period of 2006 and 2009 from a hospital-affiliated and research-based Comprehensive Wound Center (CWC) in Columbus Ohio. The CWC provides advanced outpatient wound care for 16 weeks to patient with chronic, non-healing wounds despite their primary etiology of acute, surgical, neurophathic, non-neuropathic, pressure, or other causes (information was collected during their initial visit). The CWC was part of a national network of 164 wound centers managed by National Healing Corporation (NHC).

Six trained research assistants completed the data abstraction in standardized forms developed for the study. All data abstractors were trained in data abstraction, received uniform verbal and written directions, and completed data entry practice sessions prior to data collection. The training of the research assistants included: (1) completion of the CITI training on regulations, privacy and confidentiality, research ethics, and conflict of interest, (2) training was provided by the project lead investigator on the protocol and process of data abstraction who received uniform verbal and written directions on how to complete the data abstraction form. All staff signed a form to ensure they will not discuss information collected nor regarding patient information outside, (3) The pilot data collection included initial patient data collection forms (100 patients) reviewed by the project investigators and anomalies corrected. *Inter-rater reliability* was verified for these 100 patients and the reliability coefficient was 0.99 indicating all abstraction was similar for the six assistants. The inter-rater reliability allowed the researchers to assess if the different research staff were abstracting the information from the patient chart accurately. By using the example of one patient, the data was compared and discussions ensured all of them were alike. There were very few missing data on patient demographics and wound healing in the patient charts that were reviewed for this study.

The study coordinator was responsible to abstract the clinical parameters from the Electronic Medical Records for each patient. De-identified data was coded and entered into a database. In compliance with the ethics requirement, this research project was approved by the IRB committee at the Ohio State University. All persons associated with the study completed the CITI certification.

Study procedures and measures

This research combined clinical and non-clinical data on patients who had completed an outpatient 16 week treatment at the CWC. While the target is to get patients healed by 16 weeks, those who do not heal during this period continue to receive treatment at the Wound Center. These patients are called "outliers" and constitute approximately 10% of the population. However, for the purpose of this study, all patients who did not heal in 16 weeks were considered "not healed" and coded appropriately. Information was collected on patient's demographics (age, gender, race, type of insurance, educational level), knowledge of health problems, use of nutrition supplement shealth risk behaviors (tobacco use), perception of current health status, and body mass index. Learning preferences was measured by five different preference noted by the patient (explanation, demonstration, printed materials, video and group session) and motivation to learn was measured by the following: the patient asks questions, eager to learn, anxious, calm, uninterested and confused. Both learning preference and motivation to learn were assessed by the nurse case manager during the patient's initial visit. Response format was yes (1) or no (0) for all motivation and learning preference options indicated above. Clinical measures included wound age, number, size, and stage/grade. Number of wounds is defined as the total number of wounds in the lower extremity or other parts of the body. Information for each wound's etiology and its primary underlying factor was also obtained.

Statistical analysis

Basic descriptive statistics were obtained for the demographic variables, wound factors, motivation to learn and learning preferences. Chi-square (χ^2) analysis and Person's correlation were used to measure associations among learning preferences, motivation to learn and healing rates of chronic wounds. Independent t-tests examined differences in learning preferences, motivation to learn and healing rates by participant's age and gender. Effect sizes estimated the magnitude of differences between the groups. Adjusted odds ratio was calculated for wound healing status, the primary dependent variable (healed versus not healed), controlling for other variables in the model in the logistic regression analysis. The list of independent/confounding variables included number of wounds, age/stage of the wound, body mass index, smoking behavior, infection, knowledge of health problems, use of nutrition supplements, diabetes status, race, gender, and age (>=65 years versus < 65 years), educational level, health insurance, learning preferences, and motivation to learn. The interaction effect of age and gender was tested in the multi variate analysis. However, since the interaction variable was not significant it was not included in the final model. All statistical analyses were performed using the Statistical Package for Social Sciences (SPSS) (version 16 .0, SPSS Inc, Chicago).

Results

Demographics

The sample comprised of 1003 patients. . The mean age of patients was 55.2± 17.3 years. The majority were < 65 years of age (73%), women (53%), had less than a college degree (54%), non-Hispanic whites (73%), and Medicare coverage (44%) Approximately, 63% were diabetic, 52% were tobacco users, 70% were overweight or obese, and 31% had infected wounds. On average, patients had 1.87 wounds with the wound age of 7.14 months. Table 1 shows the demographic characteristics of patients by gender and age groups (< 65 years, ≥ 65 years).

Although the average number of wounds and wound age (in months) were similar between males and females, females had a lower prevalence of diabetes, infection of wounds, and used tobacco but were more likely to be overweight or obese than their male counterparts (P<0.05) (Table 1).

Age differences

Younger patients also significantly differed from the older patients in the use of tobacco, educational background, racial/ethnic categories, overweight/obesity status, and wound age (but not the number of wounds). Younger patients were generally more educated than older patients older (44.9% versus 37% had some college education; P <0.001) and had higher wound age (7.02 versus 6.32; P<0.001). However, prevalence of diabetes was similar in both groups (p=0.716). Overweight and obesity was significantly higher among those < 65 years of age (50.8%) as compared to their older peers (28.9%; P<0.001). Younger patients were also more likely to report use of tobacco (56.5%) as compared to older patients (46.1%; P<0.001).

Age and gender differences in motivation to learn and learning preferences

Table 2 presents age and gender differences in motivation to learn and learning preferences of patients. In general, the majority of patients preferred to learn via explanation (59.4%) or demonstration (55.7%) and approximately one-third preferred printed materials (33.5%). Videotapes were not a preferred method by the patients with only 0.5% indicating they favored it. While patients were generally similar in their preferences, females (P=.001) preferred demonstration over other methods more than male patients. Motivation to learn also varied, more by age than by gender. For example, older patients were also less likely to ask question, note ager to learn and were anxious and confused than younger patients (P<.01). However, it should be noted that only a small percentage of the patients were anxious (10.6%), confused (3.3%), and uncooperative (0.7%). Gender differences also existed in motivation to

Variable	Total N=1003	Male n=468 (46.7%)	Female n=535 (53.3%)	Gender Difference P-value	<65 years n=730 (73%)	≥65years n=270 (27%)	Age Difference P-value
	Mean (SD)	Mean (SD)	Mean (SD)		Mean (SD)	Mean (SD)	
Age (years) **	55.19 (17.29)	51.95 (16.29)	56.05 (17.67)	<0.001			
Number of Wounds*	1.87 (1.4)	1.93 (1.34)	1.82 (1.45)	0 .680	2.92(2.19)	2.95(1.17)	0.908
Wound Age(months)*	7.14 (22.46)	8.11 (26.39)	6.61 (20.72)	0.912	7.02 (21.7)	6.32(20.1)	<0.001
Body Mass Index**	31.21 (10.79)	29.93 (9.20)	32.29 (11.89)	<0.001	32.67 (11.3)	27.94(7.08)	<0.001
	Frequency (Percent)	Frequency (Percent)	Frequency (Percent)		Frequency (Percent)	Frequency (Percent)	
Wounds Healed*	592 (59.3)	343 (64.3)	249 (53.4)	<0.001	435 (59.9%)	155 (57.4)	0.259
Educational Background** Grade school High school College	 57 (6.4) 426 (47.9) 407 (45.7)	 10 (3.0) 155 (46.7) 167 (50.3)	 22 (5.6) 192 (48.6) 181 (45.8)	0.251	 58 (4.7) 625 (50.4) 556 (44.9)	 42 (9.7) 230 (53.2) 160 (37.0)	<0.001
Health Insurance** Private Medicare Medicaid Self pay	 385 (38.5) 438 (43.8) 136 (13.6) 27 (13.6)	 164 (35.0) 222 (47.4) 65 (13.9) 17 (3.6)	 184 (34.5) 268 (50.3) 71 (13.3) 10 (1.9)	0.342	 348 (47.8) 224 (30.8) 130 (17.9) 26 (3.6)	 0 (0.0) 264 (97.8) 5 (1.9) 1 (0.4)	<0.001
Diabetes** Yes No	 603 (62.8) 357 (37.2)	 147 (40.7) 214 (59.3)	 149 (35.1) 276 (64.9)	0.009	 503 (38.9) 790 (61.1)	 191 (38.0) 312 (62.0)	0.716
Body Mass Index** Normal Overweight Obese	 231(30.3) 200 (26.2) 322 (43.5)	 105 (28.8) 117 (32.1) 143 (39.2)	 139 (32.2) 85 (19.7) 207 (48.0)	<0.001	 298 (26.4) 256 (22.7) 573 (50.8)	 133 (36.6) 125 (34.4) 105 (28.9)	<0.001
Race** White African American Other	 583 (73.1) 91 (11.4) 124 (15.5)	 268 (73.2) 43 (11.7) 55 (15.0)	 315 (72.9) 48 (11.1) 69 (16.0)	0.573	 1010 (74.8) 187 (13.8) 154 (11.4)	 369 (71.9) 47 (9.2) 97 (18.9)	<0.001
Infection* Yes No	 239 (31.4) 521 (68.6)	 118 (34.2) 227 (65.8)	 121 (29.2) 294 (70.8)	0.040	 397 (29.3) 956 (70.7)	 150 (29.1) 366 (70.9)	0.908
Tobacco Use** Yes No	 410 (52.0) 378 (48.0)	 216 (59.8) 145 (40.2)	 194 (45.4) 233 (54.6)	<0.001	 729 (56.5) 562 (43.5)	 226 (46.1) 264 (53.9)	<0.001

*Clinical measures; ** Non clinical measures
P-values are based on χ^2 values for nominal/ordinal variables and t-value for interval/ratio level variables

Table 1: Demographics of patients.

Variable	Total N=1003	Male	Female	Gender Difference P-value (Effect Size)	<65 years n=730 (73%)	≥65years n=270 (27%)	Age Difference P-value (Effect Size)
Learning Preferences	Frequency (Percent)	Frequency (Percent)	Frequency (Percent)				
Prefer Explanation Yes No	 561 (59.4) 384 (40.6)	 258 (59.3) 177 (40.7)	 303 (59.4) 207 (40.6)	0 .975 (0.001)	 408 (59.0) 283 (41.0)	 152 (60.6) 99 (39.4)	0.676 (0.014)
Prefer Demonstration Yes No	 527 (55.7) 419 (44.3)	 216 (49.7) 219 (50.3)	 311 (60.9) 200 (39.1)	0.001 (0.112)	 393 (56.9) 298 (43.1)	 132 (52.4) 120 (47.6)	0.219 (0.098)
Prefer Printed Materials Yes No	 317 (33.5) 629 (66.5)	 134 (30.8) 301 (69.2)	 183 (35.8) 328 (64.2)	0.104 (.053)	 224 (32.4) 467 (67.6)	 93 (36.9) 159 (63.1)	0 .197 (0.042)
Prefer Videotapes Yes No	 5 (0.5) 941 (99.5)	 5 (1.1) 430 (98.9)	 0 (0.0) 511 (100)	0.115 (0.079)	 4 (0.6) 687 (99.4)	 1 (0.4) 251 (99.6)	0.733 (0.011)
Motivation to Learn							
Asks Questions Yes No	 647 (68.6) 296 (31.4)	 311 (71.7) 123 (28.3)	 336 (66.0) 173 (34.0)	0.063 (0.06)	 497 (72.1) 192 (27.9)	 148 (59.0) 103 (41.0)	<0.001 (0.126)
Eager to Learn Yes No	 479 (50.8) 464 (49.2)	 226 (52.1) 208 (47.9)	 253 (49.7) 256 (50.3)	0 .468 (0.024)	 375 (54.4) 314 (45.6)	 103 (41.0) 148 (59.0)	<0.001 (0.119)
Anxious Yes No	 100 (10.6) 843 (89.4)	 39 (9.0) 395 (91.0)	 61 (12.0) 448 (88.0)	0.136 (0.049)	 61 (8.9) 628 (91.1)	 39 (15.5) 212 (84.5)	<0.003 (.096)
Calm Yes No	 282 (29.9) 661 (70.1)	 125 (28.8) 309 (71.2)	 157 (30.8) 352 (69.2)	0.495 (0.022)	 202 (29.3) 487 (70.7)	 78 (31.1) 173 (68.9)	0.602 (0.017)
Uncooperative Yes No	 7 (0.7) 936 (99.3)	 0 (0.0) 434 (100)	 7 (1.4) 502 (98.6)	0.014 (0.080)	 5 (0.7) 684 (99.3)	 2 (0.8) 249 (99.2)	0.911 (0.004)
Uninterested Yes No	 21 (2.2) 922 (97.8)	 11 (2.5) 423 (97.5)	 10 (2.0) 499 (98.0)	0.554 (.019)	 14 (2.0) 675 (98.0)	 7 (2.8) 244 (97.2)	0.487 (.023)
Denies the Need for Education Yes No	 1 (0.1) 942 (99.9)	 1 (0.2) 433 (99.8)	 0 (0.0) 509 (100)	0.279 (0.035)	 1 (0.1) 688 (99.9)	 0 (0.0) 251 (100)	0.546 (0.020)
Confused Yes No	 31 (3.3) 912 (96.7)	 7 (1.6) 427 (98.4)	 24 (4.7) 485 (95.3)	0 .008 (.087)	 8 (1.2) 681 (98.8)	 23 (9.2) 228 (90.8)	<0.001 (0.198)

Learning Preference and Motivation are non clinical measures
P-values are based on χ^2 values for nominal/ordinal variables and t-value for interval/ratio level variables
φNC- Not computed
Effect size computed by Phi statistics

Table 2: Learning preference and motivation to learn of patients.

learn with females more likely to be uncooperative and confused than male patients (P<0.05).

Pearson's correlation between patients' learning preferences, motivation to learn, and healing rates of chronic wounds showed a significant positive association between healing rates and patient's eagerness to learn (r=.106, p<0.001), patient asking questions (r=.06, p=0.011), and preference of learning via demonstration (r=.046, p=0.05). Patients who were confused had a lower healing rate (r=-.086, P<0.001).

Predictors of wound healing status

Table3 shows the predictors of wound healing status using a logistic regression model. Adjusted odds ratio for wound healing status (healed versus not healed) is shown in the table after controlling for clinical measures (number of wounds, age of the wound, infection) and non-clinical measures (BMI, smoking behavior, knowledge of health problems, use of nutrition supplements, diabetes status, race, gender, educational level, and health insurance). Age was included as a categorical variable (>=65 years versus < 65 years) in the model since learning preferences, motivation to learn and healing rates may differ between the elderly and younger patients. Results showed males were 1.7 times more likely to have their wounds healed as compared to their female counterparts [Wald's χ^2 value= 6.58; 95% CI= 1.13, 2.55]. Diabetic patients had a decreased odds of their wounds healed (OR=0.55; 95% CI=0.34, 0.87) than non-diabetic patients, and patients who had wounds for a longer period of time (wound age in months) were also less likely to have their wounds healed as compared to those with a shorter period of time [OR= 0.97; 95% CI= 0.95, 0.98].

Patient's learning preference and motivation to learn also predicted wound healing outcome. The odds for wound healed among patients who preferred demonstration as their learning preference was 1.6 times higher among those who choose the other methods of learning [OR= 1.57; 95% CI= 1.02, 2.42]. Similarly, eagerness to learn improved the odds of wound healing 1.64 times among patients [OR= 1.64; 95% CI= 1.04, 2.59]. Patient's age was not a significant predictor of healing outcome in this sample.

Independent variable	Wald (df)	P-value	Odds Ratio (OR) 95% CI (Lower, Upper)
Gender			
Female Male	Ref 6.58	Ref 0.010	Ref 1.70 (1.13 ,2.55)
Diabetes			
No Yes	Ref 6.33	Ref 0.012	Ref 0.55 (0.34, 0.87)
Prefer demonstration			
No Yes	Ref 4.25	Ref 0.039	Ref 1.57 (1.02 , 2.42)
Eager to learn			
No Yes	Ref 4.66	Ref 0.031	Ref 1.64 (1.04, 2.58)
Wound age (in months)			
Wound Age	11.56	.001	0.97 (0.94, 0.98)

df = Degree of Freedom
CI= Confidence Intervals
Ref= Referent Category
OR= Odds Ratio calculated from logistic regression analysis
Predictor variables not significant in the logistic regression model were: *race, tobacco use, BMI (Body Mass Index), Infection, Educational Background, wound stage, total number of wounds, age of patients, learning preferences- prefer explanation, prefer printed material and motivational levels- asks questions, anxious, confused.*

Table 3: Predictors of wound healing status using logistic regression.

Discussion and Conclusion

Twenty-five years ago Knowles [11] described attributes of adult learners that included a need to know and understand the rationale for a treatment, a tendency to be problem-centered and being intrinsically motivated. Lipkin [12] added that adults learn best through active participation and not the need to acquire skills through demonstration and performance. Results of this study provided evidence of learning preferences supporting Knowles' [11] and Lipkins' [12] characteristics of adult learners. Both, male and female patients preferred explanation and/or demonstration though, interestingly, female patients and patients under 65 favored these learning preferences more so.

Significant differences were noted by gender and age in learning preferences, motivation to learn and healing rates in this population. Overall, the majority of patients preferred explanation and/or demonstration as their learning preference. Sheffield and Fife [13] report that patient education in the chronic wound setting is a critical component of wound healing. At the CWC site, patients do receive demonstrations and explanations that involve the discharge nurse ensuring that patients understand the physician's orders, how to apply dressings, and the demonstrations and explanations. Nevertheless, due to time constraints, written materials are used to supplement and reinforce what is taught. The written materials, designed at the eighth grade level, may not have been a salient match given that just 48% of the population completed high school. Embarrassment with being unable to understand written materials represent an important reason preventing older adults from being active participants in the learning process [14,15]. Since adult learning theory postulates that teaching is more effective when directed toward educational needs identified by the learners themselves [11,12], perhaps changing the teaching methods on site may better improve the outcomes of these patients.

Significant differences were also noted in patients' motivation to learn. Men were more eager to learn than women and though not statistically significant, men were more likely to ask questions. Of note, however, are the significant differences by age. Patients over the age of 65 were less eager to learn and less likely to ask questions. Regardless of learning preferences or quality of patient training, learning will not occur unless the patient is motivated. That the older patients were unwilling to ask questions is problematic when trying to ensure successful wound care. The majorities of elderly patients seen in the wound care center were from extended care facilities or utilized home health care for dressing changes. These patients had additional co-morbidities and wound care often was secondary to other health issues in their lives.

The data revealed differences that occurred and where they occurred, but do not account for why they occurred. Older patients may be more reluctant to ask questions than their younger counterparts for fear of appearing ignorant or unable to care for themselves. Lack of perceived self-concept or self-efficacy may play a role here. Bandura [1977] [16] defined perceived self-efficacy as "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (p. 3). It is a future-oriented judgment that examines perceptions of competence rather than actual competency levels. Bandura's model [16,17] also alludes to an individual's level of emotional arousal that can contribute to feelings of mastery or incompetence toward task performance. Since older patients were more anxious and confused than their younger counterparts, it may be an indicator of a lower perceived self-efficacy related to learning how to care for their wounds. For example, self-efficacy beliefs are a powerful force in learning and motivation and affect choice of activities, effort expended on the activity, and how long individuals will persevere when facing difficulties or obstacles [17]. Although additional research is required to support or refute this assertion, perceived self-efficacy is an area that has direct implications for teaching wound care and its importance should not be underestimated when offering instruction.

Also noted were healing rates of men compared to women. As seen in Table 3, male wounds healed faster than women (64.3 % to 53.4%) even though the men had more wounds (1.93 vs. 1.82). Men were more overweight than the women (32.1% vs. 19.7%), had higher diabetes levels (40.7% vs. 35.1%) and recorded longer wound duration (8.11 vs. 6.61 months). That women were more obese and older may provide one reason for women healing more slowly than men. However, since all patients received the same information about wound care and were exposed to latest treatment protocols and care, the gender findings are remarkable. Accounting for gender differences may be unrelated to treatment protocols provided in the clinic and perhaps better found in the literature focusing on psychosocial issues that impact patient care [18-20].

Some of the psychosocial issues that was not explored in this study due to the retrospective nature of the design is social support, an important resource that helps in patients with chronic wounds coping with stress and treatment [18,21]. There is evidence that social support buffers the effect of stress and anxiety among patients [22]. Given that women are traditional caretakers in the home, there may be indicators that they put family members ahead of their own health needs. This could explain why the men had faster healing rates—they may have received an emotional support system required for wound healing more so than the women. Future studies should explore the relationship between social support and healing among patients with chronic wounds [20], especially who accompanies patients with chronic wounds to the clinic and their interactions.

Literature show wound healing is hindered by bacterial infection. Hence, treatment of infection and surgical debridement and drainage of wound fluid are important part of ulcers [23]. Similarly, smoking constricts the blood vessels and reduces the oxygen and nutrient supply that are important for wound healing [24]. Individuals with diabetes

also take a longer time to heal. Hence, confounders of wound healing outcomes such as infection, smoking and diabetes status were included in the multivariate model.

Though promising results emerged on learning preferences and motivation to learn among adult patients with chronic wounds, there are limitations to the present study. Motivation to learn and learning preferences were assessed by a single question and may not have captured the construct adequately. Both the variables were obtained during the patient's initial visit by a nurse manager. It is possible many patients are overwhelmed during the initial visit which may have biased their answers. Furthermore, the retrospective study design limited our use of what patient characteristics we could include in our multivariate regression model. Hence, we were unable to assess anxiety and depression levels that could be factors impacting motivation to learn. Anxiety, for example was based on self-report data or by observations from a clinician. Another limitation of the retrospective chart review is the possible misclassification of information in the charts. Future research might examine these two factors particularly in relation to wound severity. Additionally, the retrospective nature of the study and self-report measures, precluded in depth assessment and interpretation about the motivational influences and learning preferences identified among this population.

Practice Implication

Definitive implications for health care professionals emerged from this study. TJC mandates that all clinics and hospitals provide patient education and our results provide direction in wound care for a more individualized approach to patient education. A 'one size fits all' approach to chronic wound care is not effective. Data highlighting gender and age differences, for example, can be used to better inform and educate women and older patients about wound care. From first contact, women can be informed that their wounds may take longer to heal and then shown how other women with similar wounds did indeed recover. Ensuring social support systems are in place for female patients can also be added to follow up home care. Since demonstration is a learning preference, health care workers can provide carefully worded and visual models for learning that are delivered in a nurturing and supportive way. Older patients can be reassured and encouraged to ask questions about their treatment in order to reduce anxiety and confusion.

Providing an environment that is conducive to learning, empowering them to learn, and helping them to be more compliant such as maintaining a journal or records may provide specific information about motivational cues in the environment that might impact adult learning preferences. However, the time constraints of nursing and patent educators for patient teaching allows for creative ways to incorporate patient education during the patient visits by engaging them in reading the written materials, provide short explanation, getting the point across, taking advantage of teachable moments, and reinforce important points. The constraint in time might be overcome with use of e-based learning and information technology for educated patients who want to learn at their own pace and/or at home. Finally, future study might be framed within a theoretical framework such as Bandura's model [16,17] to account for and explain motivation to learn and adult learning preferences among adults with chronic wounds.

References

1. Moreo K (2005) Understanding and overcoming the challenges of effective case management for patients with chronic wounds. Case Manager 16: 62-63,67.
2. Lavery LA, Peters EJ, Armstrong DG (2008) What are the most effective interventions in preventing diabetic foot ulcers? Int Wound J 5: 425-433.
3. Jones KR, Fennie K, Lenihan A (2007) Chronic Wounds: Factors influencing healing within 3 months and non healing after 5-6 months of care. Wounds 19: 51-63.
4. Branski LK, Gauglitz GG, Herndon DN, Jeschke MG (2009) A review of gene and stem cell therapy in cutaneous wound healing. Burns 35: 171-180.
5. Mendez ES (1998) When wounds won 't heal. RN 61: 20-23.
6. Bastable SB (2006) Essentials of Patient Education. Jones and Bartlett Publishers, Boston, MA.
7. Eastwood JA, Doering LV (2005) Gender differences in coronary artery disease. J Cardiovasc Nurs 20: 340-351.
8. Fredericks S, Beanlands H, Spalding K, Da Silva M (2010) Effects of the characteristics of teaching on the outcomes of heart failure patient education interventions: a systematic review. Eur J Cardiovasc Nurs 9: 30-37.
9. Fredericks S, Guruge S, Sidani S, Wan T (2009) Patient demographics and learning needs: examination of relationship. Clin Nurs Res 18: 307-322.
10. Eccles, Jacquelynne S, Wigfield, Allan, Schiefele, et al. (1998) Motivation to succeed. Handbook of child psychology (5th edn) WDN Eisenberg, New York: Wiley.
11. Knowles M (1984) The adult learner: A neglected species (3rd edn) Gulf Publishing: Houston, Texas.
12. Lipkin M (1996) Patient education and counseling in the context of modern patient-physician-family communication. Patient Educ Couns 27: 5-11.
13. Sheffield JR, Fife C (2007) Wound Care Practices (2nd edn). AZ Best Publishing Company: Flagstaff, AZ.
14. Fisher E (1999) Low literacy levels in adults: implications for patient education. J Contin Educ Nurs 30: 56-61.
15. Murphy PW, Davis TC (1997) When low literacy blocks compliance. RN 60: 58-63.
16. Bandura A (1977) Social learning theory. Oxford, England: Prentice-Hall.
17. Bandura A (2004) Health promotion by social cognitive means. Health Educ Behav. 31: 143-164.
18. Cohen S (2004) Social relationships and health. Am Psychol 59: 676-684.
19. Solowiej K, Mason V, Upton D (2010) Psychological stress and pain in wound care, part 3: management. J Wound Care 19: 153-155.
20. Brown A (2008) Does social support impact on venous ulcer healing or recurrence? Br J Community Nurs 13: S6, S8, S10.
21. Keeling D, Price P, Jones E, Harding KG (1997) Social support for elderly patients with chronic wounds. J Wound Care 6: 389-391.
22. Kawachi I, Berkman LF (2001) Social ties and mental health. J Urban Health 78: 458-467.
23. Mustoe T (2004) Understanding chronic wounds: a unifying hypothesis on their pathogenesis and implications for therapy. Am J Surg 187: 65S-70S.
24. Malay DS (2011) Cigarette smoking and foot and ankle surgery. J Foot Ankle Surg 50: 515-516.