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# Qualitative and quantitative measurement of depression in veterans recovering from stroke

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**Abstract**—This analysis triangulates qualitative and quantitative data from interviews, Geriatric Depression Scale scores, and patient records to evaluate poststroke depression. Participants were veterans who were discharged home following a new stroke. Findings indicated underrecognition and treatment of depression. Narrative data uncovered a rich description of respondents' perceptions and emotional experiences during stroke recovery.

**Key words:** cerebrovascular accidents, culture, depression, geriatric, measurement, mental health, qualitative methods, rehabilitation, stroke recovery, triangulation.

## INTRODUCTION

Depression is a significant problem in recovery from stroke because it has been linked to disability, caregiver burden, institutionalization, and mortality [1–3]. Since depression frequently complicates stroke recovery, the issue of measurement is critical to the development of knowledge about prevalence, change over time, and treatment [4]. Yesavage et al. describe the Geriatric Depression Scale (GDS) as a screening tool for depression [5], although it has been used as an outcome measure as well [6]. The GDS has been determined to be reliable and valid in many studies [7–8] and has been used with the poststroke population [9]. Although it has been widely used, less is known about how GDS self-ratings compare to qualitative descriptions of mood and clinical data from patient records.

This study describes early poststroke emotional recovery in a population of veterans and explores the extent to which the GDS agrees with narrative descriptions of negative mood experiences obtained from at-home interviews and clinical indicators of depression obtained from patient records. Two research questions guided the qualitative component of the study: (1) "What

are the emotional recovery experiences of veterans following hospitalization for stroke?" and (2) "What is the relationship of GDS scores to descriptions of emotional recovery as related by veterans during at-home interviews at the same point in time?" The following additional research question guided quantitative analyses: (3) "What is the relationship between GDS scores, participant ethnicity, and clinical indicators of depression?" We hypothesized that no relationship would exist between GDS scores and ethnicity. To address the relationship between the GDS and clinical data, we hypothesized that the number of participants self-reporting depression (via the GDS) would be similar to the number diagnosed and treated for depression.

## BACKGROUND

Depression is common after stroke, occurring in over 50 percent of survivors [10–13], yet it is often undiagnosed [14]. Treating depression has been shown to improve functional ability [15–16]; therefore, appropriate measurement is crucial to maximize remaining abilities. Detecting and treating depression early is important because depression predicts adverse health outcomes [15].

The older person who experiences a stroke is vulnerable to depression from biologic causes such as hypoxia and from psychosocial stressors due to the loss of physical function and decline in quality of life. In the poststroke period, depression is a strong predictor of quality of life and mortality [16–21]. Depression may occur up to 2 years following stroke and may worsen during stroke recovery [21]. Improvement in poststroke depression (PSD) is associated with better performance in activities of daily living [22] poststroke. Whether depression is organic, reactive, or a combination of the two, intensity varies from major depression to subsyndromal depression. Major depression is the most serious and debilitating, but mild depression may also adversely affect physical function and quality of life [23]. Measurement scales, therefore, must be sensitive enough to detect a range of depressive symptoms.

Standardized measures such as the GDS have been widely used in stroke patient populations; however, questions remain regarding the relevance of the GDS in PSD. One advantage of the GDS for this population is the focus on psychological symptoms of depression to decrease the potentially confounding effects from the physical symptoms of stroke [9]. Since older adults may not describe their mood in psychological terms, this emphasis may be problematic.

In some studies, the GDS was an adequate screening measure in the poststroke population. For example, Johnson and associates compared the GDS to other screening instruments and depression diagnoses using Diagnostic and Statistical Manual of Mental Disorders, 3rd edition (DSM-III) criteria [24]. They reported that the GDS performed satisfactorily for sensitivity (80%) but less so for specificity (66%). They found a prevalence of 26 percent. Agrell and Dehlin compared the GDS to five other depression rating scales in a stroke population and found that the GDS and the Zung performed best of the six instruments [25]. Rao, Jackson, and Howard found that the performance of the 15-item GDS was satisfactory and similar to the modified Hamilton Rating Scale for Depression [26]. Lieberman and associates translated the GDS to Hebrew and used it to measure depression in 276 individuals receiving rehabilitation in Israel (126 poststroke and 150 posthip fracture) [27]. They found a high prevalence of depression overall (41%) and no difference in prevalence between the two groups. Depression was significantly related to independence and self-care ability before the event and improved over the course of hospitalization (mean = 23 days).

Other studies using the GDS in elders from minority cultures have yielded mixed results. In a study of 41 older Mexican Americans diagnosed with PSD with the use of the DSM-III criteria, Baker and Espino found only 39 percent screened positive for depression with the recommended cutoff of 6 on the 15-item GDS Spanish version short form [28]. Baker and Espino recommended using a cutoff of 4. They cautioned that Mexican Americans may be more likely to express mood in somatic symptoms than psychological symptoms. Since the GDS is designed to minimize somatic complaints, under-diagnosis may be more likely.

Fernández-San Martin and colleagues found the 30-item Spanish version of the GDS to be satisfactory for a sample of 218 mostly female patients in primary care [29]. However, they recommended a lower cutoff (9/10) for primary-care patients (sensitivity 86.7% and specificity 63.1%). They found no difference in mean scores for those with and without cognitive impairment.

Tang and colleagues used a Chinese version of the GDS short form to screen 127 older Chinese participants for depression 3 months after an acute stroke [30].

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Although sensitivity and specificity were acceptable (87% and 73%, respectively), they found a low positive predictive value (37%). They recommended the use of additional methods for more accurate screening.

In a study of African-American and Caucasian nursing-home residents, Harralson and associates found that Caucasian residents evidenced more depression than African-American residents [31]. African Americans were less likely to be diagnosed with depression and less likely to be taking antidepressant medication, and also had lower GDS scores. They concluded that Caucasians were more likely to report psychological symptoms than African Americans and that the GDS with its focus on psychological symptoms may not be as accurate in African-American nursing-home residents. This study was designed to further explore the use of selected measures of depression in a population of poststroke patients. The study took place in two phases: first, comparing two forms of self-report (responses to GDS items and narrative data from interviews), and second, comparing self-reports to information from patient records including interdisciplinary progress notes, current medications, and medical diagnoses.

## METHODS

Participants were part of a larger ongoing multisite longitudinal study of stroke recovery in three ethnic groups: African-American, Puerto-Rican-Hispanic, and European-American veterans. The overall aim of the project was to develop culturally sensitive models of the recovery experience after discharge home from the hospital. The design included interviews with both survivors and their primary caregivers. The goal was to define and describe recovery trajectories for the three groups. Although the focus of this paper is emotional recovery from stroke, the overall study focused on physical recovery as well.

We recruited 112 respondents from five Department of Veterans Affairs (VA) Medical Centers in Florida and Puerto Rico while they were hospitalized for a new stroke. Each site had a project manager and a group of data collectors representing the three ethnic groups. Data collectors and project managers were nurses or graduate students selected and trained by the investigators. Data collection procedures were reviewed periodically by the researchers and project managers to ensure the reliability of data.

The recruitment process began when patients were hospitalized with a new stroke. Nurses introduced the study and asked patients if they would be willing to speak to a member of the research team about participation. If the patient expressed interest, a research team member visited the potential participant, provided detailed information regarding the study, and requested consent. Following consent, eligibility was determined according to the inclusion and exclusion criteria and initial screening data were collected. Participants were included if they had been hospitalized for a new stroke, had a caregiver willing to participate, and were to be discharged directly home. Participants were excluded if they had a Mini-Mental State Examination (MMSE) score [32] below 18 or were unable to communicate verbally and participate in an interview.

To avoid excluding individuals with cognitive symptoms, we chose to include those with MMSE scores in the mildly impaired range. Folstein writes that older adults with mild cognitive impairment may be depressed, and their low MMSE scores are lowered by depression rather than irreversible dementia [33]. Since the GDS has been used successfully to measure depression in older adults with MMSE scores as low as 15 [34], we decided to include individuals with an MMSE score of 18 or above.

The sites included inner city, suburban, and rural VA facilities. Demographic data were collected prior to hospital discharge, and the GDS was administered at a home visit 1 month postdischarge. Participants were interviewed at home. A subset of 51 1-month postdischarge interviews were included in the qualitative analysis described in this paper. All interviews that were completed, transcribed, and validated were included. The remaining 61 interviews were either incomplete or unavailable.

The study was approved by the committees for protection of human subjects at each site. Participants who showed evidence of serious depression were encouraged to report their symptoms to their primary-care provider. None of the participants evidenced acute suicidal ideation.

### Methodological Rationale

We used methodological triangulation in this study to enhance understanding of the phenomena of interest—depression in the poststroke period. The purpose of triangulation is to overcome bias that occurs when data are obtained from a single method. The use of divergent methods potentially can improve understanding of a phenomenon because it blends the structured, quantitative

information obtained from the GDS with semistructured information reported in the patient record and the personal, descriptive data obtained from in-depth interviews [35]. Since a scale such as the GDS restricts participants to a "yes" or "no" response to specific items and does not allow for explanation, triangulation was chosen to obtain a more complete understanding of PSD.

## Qualitative Data

Qualitative data included transcribed interviews, field notes, and observations made in the home. Using a structured interview guide constructed for the larger study (**Figure**), graduate students and nurses interviewed consenting participants matched by ethnic background. At all sites, investigators trained interviewers using written instructions and role playing. Interviews were tape recorded, transcribed, and validated. Investigators monitored tape recordings at regular intervals to ensure that data collectors followed the protocol consistently. When indicated, data collectors were given further instruction on interviewing.

## Quantitative Data

We selected the GDS to measure depression because it is recommended in the VA's Clinical Practice Guidelines for Management of Stroke [36] and because it excludes somatic symptoms of depression that could be confused with physical consequences of stroke such as weight loss, insomnia, fatigue, and psychomotor changes [9]. The GDS is a 30-item dichotomous scale with possible scores ranging from 1 to 30, where higher scores indicate higher levels of depression. Using a cutoff score of 11, Yesavage and colleagues reported the GDS to be 84 percent sensitive with a 95 percent specificity rate [5].

Because our participants had impaired health due to their recent stroke, we were concerned about their ability to fill out a questionnaire; therefore, data collectors read the GDS items to participants, asked them to respond "yes" or "no," and recorded their answers on a data-collection sheet. This method has been found acceptable in another large study of stroke patients [35], although Cannon and associates reported that subjects with higher cognitive ability endorsed more items when they used the written format as compared to an oral method [37]. Having to answer aloud may have discouraged some respondents from endorsing potentially embarrassing items. Participants for whom English was the primary language were tested in English. Hispanic participants were given a choice to be interviewed in English or Spanish.

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**1. Typical Day**
What usually happens?
What is the best part of the day for you now?
What is the worse part of the day for you now?
Does having anyone around make a difference in whether a day is better or worse?

**2. Life Before/After the Stroke**
What was your life like before the stroke? In what ways has your stroke changed?
How does your age relate to the problems you've had since your stroke?
If you were talking to another veteran who had had a stroke and he was ready to go home, what advice would you give to him?
Are there things you'd say the VA provided that were helpful to you?

**3. Self-Construction**
Do you see yourself differently as a person now that you have had a stroke?
Do others see you differently as a person now that you have had a stroke?
Are you frustrated about things now that you weren't frustrated by in the past?
Tell me a bit about how your family is reacting to you since your stroke.

**4. Managing Public Settings**
When you go out to shop or to do other things out in public, what is that like for you?
Are you reluctant to go out because of how you think others will view you?
Now that you've had a stroke, do you feel safe when you go out in public?

**5. Body/Stroke Construction**
What are your greatest concerns about your body now?
Do you find that you focus on your body more now than before the stroke?
What do you do to stay healthy?

**6. The Meaning of Life**
How does your philosophy about life help you with your life now after having a stroke?
What beliefs help you manage since you have had a stroke?

**7. Cultural Meanings**
Tell me your thoughts regarding how your race and ethnic background affect how you are reacting to having a stroke.

**8. The Future and the Past**
Now that you've had a stroke, what does the future look like to you?
What do you think life will be like for you a year from now?
Do you have plans for the future now that you've had a stroke? What are they?

**Figure 1.**
Stroke suvivor interview guide sample questions. VA = Department of Veterans Affairs

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## Review of Records

Data from patient records provided insights to clinicians' judgments about participants' mood states. Records were reviewed for depression diagnoses in the problem list. All International Classification of Diseases, 9th edition (ICD-9), codes related to depression were included. Antidepressant medications were taken from the list of current medications. Progress notes and order sheets were checked for discussions of depressive symptoms and referrals to psychiatry for depression screening.

## DATA ANALYSIS

Transcribed interviews, observations, and field notes for each visit were entered into the N6 version of NUD*IST, which is an acronym for "Nonnumerical Unstructured Data Indexing Searching and Theorizing," a qualitative data analysis software program that also assists with organizing and coding large quantities of data by a research team [38]. N6 is the latest version of this QSR International (Doncaster, Victoria, Australia) software program. This software program was chosen for the project because of its capacity to handle large data sets among a team of coders. The program includes a document system for interview data and research notes as well as a node system for categories relevant to the project. The node system is used to code or categorize data gleaned from the document system and to specify relationships between codes.

A document for each respondent was created including a transcribed interview, the data collector's observation's and related field notes, demographic data, the interviewer's name, and the data collection site. All documents were read and reread by each member of the research team as they were created. Patterns or temporary categories emerged from the data rather than being imposed from a preconceived framework [39]. In face-to-face meetings or conference calls, team members shared their individual findings. The team discussed the codes and developed definitions and rules for categorizing the data until an exhaustive classification scheme or framework developed (herein referred to as framework). Investigators moved back and forth between the categories and data to refine the framework. The framework forms the basis of this data analysis (a detailed description of the framework is beyond the scope of this paper). Thirty interviews were coded before saturation; refinement and consensus on the framework were reached. The codes were stored in N6 as "nodes" and used to code each new document (**Table 1**). Individual members of the research team coded the remaining documents using the node system. For each participant, narrative data were compared to the categories and coded with the use of the framework. When questions arose about coding, they were resolved with the team.

For this analysis, data related to depression were extracted from the coded data in the following manner. A subset of the larger sample with completed, transcribed, and validated qualitative interviews (51 individuals) was used for the qualitative analysis. Using N6, we created 30 additional nodes for each of the 30 GDS items and added them to the original list of nodes. The total GDS score for each of the 51 individuals was also added to the corresponding document. Data previously coded on nodes in the original framework were reexamined. Some of the same data that applied to nodes in the framework were recoded on the new depression nodes as appropriate. To complete this process, we identified nodes from the framework that contained text relevant to GDS items. For example, "perspective on life" was a node created by the research team that contained narrative data reflecting "expressions of optimism, pessimism, or stoicism." For GDS item 1, text coded on "perspective on life" was retrieved and reread for relevance to GDS item 1, "Are you basically satisfied with your life?" Another node, "mental status/emotion," contained "mind and feeling talk." Text coded on this node was also reread for relevance to GDS item 1 and cross-referenced as appropriate. For GDS item 2, narrative data that was coded "rhythms and routines, before and after stroke" were examined for relevance to the GDS item 2, "Have you dropped many of your activities and interests?" This process was completed for all relevant nodes from the framework. **Table 1** contains a list of codes and corresponding items from the GDS. Using the N6 "search and compare" command, we examined overlapping units of text from relevant nodes from the framework and GDS item nodes for meaning and relevance to depression.

Relevant narrative data for those participants who scored below the GDS cutoff of 11 (not depressed) were read and reread as a whole until themes emerged related to their emotional recovery. This process was repeated for the group of participants who were depressed (scored above the cutoff on GDS).

**Table 1.**
Geriatric depression scale items and sample codes from qualitative data.

| Item | Geriatric Depression Scale Items | N6 Codes |
|------|----------------------------------|----------|
| 1 | Are you basically satisfied with your life? | Perspective on life |
| 2 | Have you dropped many of your activities and interests? | a. Mental status/emotional<br>b. Rhythms & routines, before & after stroke–home/public |
| 3 | Do you feel that your life is empty? | a. Self conception<br>b. Perspective on life |
| 4 | Do you often get bored? | Passing time–home/public |
| 5 | Are you hopeful about the future? | a. Future plans<br>b. Perspective on life |
| 6 | Are you bothered by thoughts you can't get out of your head? | Mental status/emotional |
| 7 | Are you in good spirits most of the time? | a. Mental status/emotional<br>b. Perspective on life |
| 8 | Are you afraid that something bad is going to happen to you? | Perspective on life |
| 9 | Do you feel happy most of the time? | Mental status/emotional |
| 10 | Do you often feel helpless? | Mental status/emotional |
| 11 | Do you often get restless and fidgety? | Mental status/emotional |
| 12 | Do you prefer to stay at home rather than going out and doing new things? | a. Social interaction<br>b. Rhythms and routines |
| 13 | Do you frequently worry about the future? | Future plans |
| 14 | Do you feel you have more problems with memory than most? | a. Mental status/emotional<br>b. Health status |
| 15 | Do you think that it is wonderful to be alive now? | Perspective on life |
| 16 | Do you feel downhearted and blue? | Mental status/emotional |
| 17 | Do you feel pretty worthless the way you are now? | Mental status/emotional |
| 18 | Do you worry a lot about the past? | Perspective on life |
| 19 | Do you find life very exciting? | Perspective on life |
| 20 | Is it hard for you to get started on new projects? | a. Mental status/emotional<br>b. Rhythms and routines |
| 21 | Do you feel full of energy? | a. Symptoms<br>b. Sleep<br>c. Health status |
| 22 | Do you feel that your situation is hopeless? | a. Mental status/emotional<br>b. Hope<br>c. Perspective on life<br>d. Perspective on recovery |
| 23 | Do you think that most people are better off than you are? | a. Benchmarking<br>b. Perspective on life |
| 24 | Do you frequently get upset over little things? | a. Mental status/emotional<br>b. Perspective on life |

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**Table 1. (Continued)**
Geriatric depression scale items and sample codes from qualitative data.

| Item | Geriatric Depression Scale Items | N6 Codes |
|------|----------------------------------|----------|
| 25 | Do you feel like crying? | Mental status/emotional |
| 26 | Do you have trouble concentrating? | Mental status/emotional |
| 27 | Do you enjoy getting up in the morning? | Rhythms & routines |
| 28 | Do you prefer to avoid social gatherings? | Social interactions |
| 29 | Is it easy for you to make decisions? | Mental status/emotional |
| 30 | Is your mind as clear as it used to be? | a. Mental status/emotional<br>b. Before/after stroke |

N6 = latest version of QSR International (Doncaster, Victoria, Australia) software program for qualitative computing, formerly known as NUD*IST, an acronym for "Nonnumerical Unstructured Data Indexing Searching and Theorizing."

## RESULTS

The participants screened for depression included 112 veterans ranging in age from 40 to 88 with an average age of 66 years. Participants' ethnic backgrounds were as follows: 24 African Americans, 44 Hispanic Americans (Puerto Rican), and 44 European Americans. When sociodemographic characteristics were examined, African Americans were significantly younger as a group than either Hispanic or European Americans (**Table 2**). The groups were equivalent in all other characteristics, including MMSE. Most held a high school diploma, were living with a partner, had at least two comorbidities, and were retired. The qualitative analysis was based on interviews with a subset of 51 of the 112 veterans that included 17 African Americans, 17 Hispanic Americans, and 17 European Americans.

At 1 month following discharge from the hospital, participants had a mean score on the GDS of 8.76 with a standard deviation (SD) of ±6.5 for the total sample of 112, indicating that in general they reported few depressive symptoms. For this sample of 112 individuals, the GDS was found to be reliable ($\alpha = 0.89$). The overall prevalence of depression was 35 percent. Thirty-one participants (28%) scored in the mildly depressed range (11–19) and eight participants (7%) had scores in the severe range (20–30). Of the 39 who scored in the depressed range, 15 were European American, 20 were Hispanic American, and 4 were African American.

To answer the research questions regarding the emotional recovery of veterans following stroke and the relationship of GDS scores to interview data, we retrieved relevant material from each participant document and read it as a whole. Next, interviews for those who fell below the cutoff (not depressed) were reviewed as a group, as were those in the depressed group. Themes related to mood and emotional recovery were extracted for each group.

Those who were not depressed described recovery from stroke as manageable. Some viewed their losses as minimal, while others who described significant losses were optimistic. Themes that emerged from the data follow.

### Themes for Nondepressed Participants

*Facing Adversity with Strength*

In general, respondents who were physically impaired and suffered functional losses faced their problems directly and were determined to handle the situation in a constructive manner. An African-American stroke survivor (GDS = 5) who experienced significant loss of function and independence described how his image of himself as strong and healthy remained intact:

> Interviewer: "Do you see yourself differently as a person now that you had a stroke?"

> Participant: "No, 'cause I'm bo gator. I call myself bo gator and I always say that, I'm bull gator. Always believe in yourself. So, anybody tell me, say 'Boy, you don't even limp. Let me see you run a little bit.'"

A survivor who was Hispanic American (GDS = 4) credited his Puerto-Rican culture for his strength: "We are very strong . . . Puerto Ricans fight for everything they have in life . . . If I were someone else, at my age, I would stay in bed to let myself die there."

**Table 2.**
Sociodemographic characteristics.

| Characteristics | African Am $N = 24$ | European Am $N = 44$ | Hispanic Am $N = 44$ | Total $N = 112$ |
|---|---|---|---|---|
| Age | 61* (range 46–77) | 67 (range 40–93) | 69 (range 48–88) | 65.6 (range 40–93) |
| MMSE Score | 26.54 (range 19–30) | 26.95 (range 20–30) | 26.45 (range 18–30) | 26.65 (range 18–30) |
| Education | | | | |
| &lt;7 Years | 2 | 0 | 2 | 4 |
| Grades 7–9 | 0 | 2 | 0 | 2 |
| Grades 10–11 | 2 | 4 | 3 | 9 |
| High School Graduate | 9 | 14 | 16 | 39 |
| Some College | 7 | 18 | 15 | 40 |
| College Graduate | 4 | 5 | 4 | 13 |
| Graduate School | 0 | 1 | 4 | 5 |
| Marital Status | | | | |
| Married | 15 | 29 | 32 | 76 |
| Never Married | 1 | 2 | 1 | 4 |
| Widowed | 1 | 4 | 2 | |
| Separated | 2 | 0 | 1 | 7 |
| Divorced | 5 | 9 | 8 | 3 |
| Missing Data | — | — | — | 14 |
| Employment Status | | | | |
| Full-time | 10 | 10 | 7 | 27 |
| Part-time | 1 | 1 | 0 | 2 |
| Adjusted Workload | 0 | 1 | 1 | 2 |
| Retired | 13 | 32 | 36 | 112 |
| Comorbidities | 2.46 (range 0–7) | 2.55 (range 0–6) | 2.68 (range 0–6) | 2.53 (range 0–7) |

*$p < 0.02$        Am = American        MMSE = Mini-Mental State Examination

*Finding Meaning in a Setback*

Participants looked for a reason for the stroke, and many gave spiritual explanations that included a purpose for the event. They explained that the stroke would result in some benefit to them such as causing them to slow down, take better care of themselves, or appreciate their family and the remainder of the time they had.

A European-American veteran (GDS = 3) who worked as an iron worker for 27 years told the interviewer, "I'm grateful enough to have the life I've had, and there's a reason for it [stroke], yeah. God's stoppin' me or somethin'. Maybe He doesn't want me walkin' iron, the red irons . . . ."

Another respondent of Hispanic-American background (GDS = 1) explained why he thought this stroke happened:

"I think what happened to me, I guess, was a message to slow down . . . life is more than just every time you are running and doing things fast . . . " and "I'm not bitter. I just look at it positive and it just woke me up that anything can happen to anybody, doesn't matter how healthy you are."

Mr. O., European-American (GDS = 9), finds meaning in his life despite his disabilities: "I'm still able to get up in the morning and have a bite to eat and get outside and look

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at the wonders of nature . . . I'm still a vital person, I can still do things for people, I can do things for myself."

### Staying Present

Respondents in the nondepressed group spoke of focusing on what was happening in the present rather than longing for the past or worrying about the future. Staying busy and distracting oneself from distressing thoughts represented valuable strategies for promoting optimism.

One subject, who was Hispanic American (GDS 1), described his ability to distract himself with tasks: "All day I keep myself busy doing something new so I get distracted doing things and I don't think about what happened to me . . . ." An African-American man (GDS = 3) described how he tried to avoid worrying about the future: "If you forget about the worryin' uh, it won't be so bad on you . . . Do not worry, 'cause to me, I believe that worryin' brings it down on you."

A European-American participant (GDS = 5) explained how he stayed in the present: "There's no sense in . . . agitating yourself about things you can't immediately do anything about, so I try to get those things out of my head and deal with the immediacy of whatever I'm trying to accomplish . . . ."

### Hope for the Future

For many veterans in this group, the future was promising. At this early stage of recovery, they were optimistic about what was ahead and they were expecting some recovery of previous abilities. One Hispanic-American stroke survivor (GDS = 2) seemed to disregard the possibility that he may not recover completely: "My body is not perfect, but I think that in a couple of months everything is going to be all right." Another Hispanic American (GDS = 1) held very high expectations for recovery: ". . . I am going to keep exercising until I get into that shape that I can run." A survivor from the African-American group (GDS = 2) had faith in his body's self-healing powers: "I'm concentrating on getting my life straight . . . my stroke is going to heal itself. It's up to me to heal my other things." A European-American participant (GDS = 4) described his more guarded expectations. He recognized that everything may not turn out well but seemed satisfied with less. "I'm still looking forward to it [future], it's just gonna' have to get there a little slower, cause I can't, I can't outrun it . . . It ain't gonna be no bed of roses, but I'm gonna get along. I've got enough money to last the rest of my life, I'll be able to eat beans an' taters, as they say . . . ."

### Themes for Depressed Participants

In the depressed group, participants described poor quality of life, including loss of meaningful roles, pleasurable activities, and social contacts. Thematic analysis for the depressed group revealed three themes: taking in multiple losses, resisting the new reality, and preparing for the worst.

### Taking in Multiple Losses

Respondents in the depressed group reported significant losses that ranged from work, income, opportunities for socialization, and independence to loss of a positive self-image. A stroke survivor of Puerto-Rican descent (GDS = 19) described how overwhelmed he felt by his losses. He described being "sick of life" and said he had suicidal thoughts in the past:

" . . . when one is all right and you can go out and get some beer and everything else and your friends take you anywhere, but when you are in this disgrace, you are apart. I wouldn't say [I am] frustrated, I would say sick of life. Once I even thought of killing myself to be clear, I thought of taking my life, I thought of a lot of things."

A European-American subject (GDS = 27) who was wheelchair-bound, almost home-bound, and very dependent on his wife for activities of daily living was forced to stop driving and working and had few activities he enjoyed other than watching TV. He told the interviewer that he was unwilling to perform his physical therapy exercises and stated, "I'm just tired of everything." His view of himself was negative: "I didn't realize I'd be crippled." And he complained that he was socially isolated: ". . . other people just ignore ya." He stated that the only ones who came to see him were the "death watch" (hospice workers). His adult children were also less attentive than he expected. "When I first had it [stroke], they were all here for a meeting . . . they were all gonna help. That didn't materialize." Although he stated that he still had some hope, he admitted that the future was "not good."

One loss sometimes led to others. A participant who was Hispanic American (GDS = 14) decided not to go to restaurants because he believed people were watching him as he ate and spilled food. He related how his life has changed:

Participant: "No, um, I've limited my outings, other than, like we go, ah, I'll get a hamburger or somethin' like that, somethin' I can take it and, and get it in the truck or the car and go."

Interviewer: "And why is that?"

Participant: "Well, I just, ah (laughs) I don't want 'em to, to look at me the, the way that, you know, as a disabled."

He also described a loss of part of himself: "Umm, it is difficult to walk, to get up, you know. I feel bad in that sense. I am like half of a person."

*Battling a New Reality*

A recurring theme for the depressed participants was discomfort with the current situation. They described tension and resistance to altered circumstances. One Hispanic American (GDS = 14) described his "battle" with his current condition and wanting to set things right: "I find myself battling to maintain myself or improve my health and improve my life both physically and financially." A veteran who was European American (GDS = 21) also spoke of his struggle with the present:

"I just can't handle not being able to do what I always do . . . all I know how to do is work and I can't work, and it's, it's you know, it's emotionally, it's really hard. I'm just used to always having things under control, always had money in my pocket always, you know, always my bills were all paid."

Another European American (GDS = 17), when asked "Do you think the stroke has changed your independence at all?" replied this way: "Yeah, it has changed tremendously. Um, it, it's just that, I'm, I'm not able to do the things I used to do when I, when I wanted to, and, ah (sighs) and I just (pause) can't get used to the idea. Like I told you before, I was a very independent person, I worked for myself. Now I feel resentful. Well, I feel truthfully very incapacitated . . . I resent having to ask for so much help because I was independent before. This causes me a lot of stress." For another European-American survivor (GDS = 17), the struggle was to understand how this happened to him: "Sometimes I say, 'God, why me? Why, why did you have to do this to me, you know? I mean, what did I do wrong? I-I've never hurt nobody.'"

*Preparing for the Worst*

This theme included respondents' outlook on the future as somewhat pessimistic. Participants described bracing for more difficult times ahead. A Hispanic-American survivor (GDS = 21) attributed much of the problem to his age (he is 78). He believed he was "dying every second" and was cautious about recovery: "I don't know how long this is going to be, if I don't die first." When asked "Do you think that you are going to get better?" he replied "I have faith, but no." A European-American participant (GDS = 21) tells the interviewer:

"I need to get prepared mentally, uhh, for down the road 'cause I imagine I'm gonna get worse that where I can't do more, of course that was the impression, I was told they, they can't do anything so I guess you are gonna deteriorate, I would assume, right?"

An African-American respondent (GDS = 18) concurs: "I realize that I'm going downhill . . . I feel all right now, I don't expect to feel no better."

**Apparent Discrepancies**

When we were comparing narrative data to GDS total scores, some discrepancies were apparent. Six participants (four African American and two Puerto Rican) whose GDS scores were below the cutoff described pervasive negative mood throughout their interviews. The following example illustrates this point. A Hispanic-American participant (GDS = 5) described himself as helpless and questioned his self-worth: "What good is someone who is sitting in a chair?" He explained that he "feels bad" and that he was a "burden" to his wife. He indicated pessimism about many aspects of his life, but his spiritual beliefs led him to accept his changed circumstances. "Well actually, I am satisfied because all of life is not happiness. You have to suffer the way our Father, Jesus Christ, suffered." Another respondent who was of African-American background scored below the cutoff (GDS = 10) but explained that he felt "really bad" about being dependent and he viewed himself as a "burden." He claimed, "I just feel I can't measure up to that point I was, had before, and therefore, I feel substandard." His related that his daughters patronized him and " . . . for a man, it's a bad feeling." He explained that he denied his feelings when his daughter asked him how he was doing. He told her, "'Well, I'm doin' all right,' knowing I'm feeling bad, but she don't say anything." He told the interviewer that having a stroke was unfair. "I felt that I got a blow . . . a dirty blow. Why did it happen to me? I don't smoke, I don't drink, I, you know, try to go to church . . . ." He provided many examples of how his life had changed for the worse.

To answer the research question, "What is the relationship between GDS scores, participant ethnicity, and clini-

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cal indicators of depression?" we compared participants who scored above and below the cutoff on the GDS for ethnicity, depression diagnoses, antidepressant medications, notations in progress notes, and referrals for a psychiatric consult for depression screening. Records were reviewed following the 1 month poststroke home visit.

**Table 3** shows that of the 39 individuals who scored above the GDS cutoff for depression, 2 were diagnosed with depression, 9 were being treated with antidepressants, and 5 had notations in progress notes indicating depressed mood. Fewer African Americans (4 of 24) had scores in the depressed range; however, the differences between ethnic groups were nonsignificant $\chi^2$ (degrees of freedom = 2, $N$ = 112) = 4.89, $p > 0.10$.

Of those who scored below the cutoff, 3 were diagnosed with depression and 10 were being treated with antidepressants (perhaps indicating successful treatment). Interestingly, when the 19 veterans on antidepressants were examined, only 2 were minority veterans (1 African American and 1 Puerto Rican). Of those with GDS scores >19 ($n$ = 8), three were European Americans who were receiving antidepressants and five were minority elders (one African American and four Puerto Rican) who were not receiving antidepressants.

## DISCUSSION

In the literature, PSD is described as common and frequently overlooked [14]. In our sample, 34 percent of participants had GDS scores suggesting that further evaluation for depression was indicated. Although Clinical Practice Guidelines for PostStroke Rehabilitation developed by the VA recommend that all patients be screened for depression [36], only 6 of 112 patients had been referred for a psychiatric consultation, and only 5 were diagnosed with depression. Clinical Practice Guidelines also recommend that depressed individuals receive anti-

depressant medication, yet many participants with high GDS scores were not taking medication for depression, suggesting the possibility that at least some of these individuals may have been depressed and in need of treatment. Undertreatment of depression in the poststroke population has been reported in other studies [40]. The number of patients in our sample taking antidepressant medications was greater than the number diagnosed with a depressive disorder. As mentioned earlier in the discussion of the GDS score, this may indicate that symptoms have been successfully treated.

When ethnic comparisons were made in the current study, more older minority participants than older Caucasian participants who were not taking antidepressants and had high GDS scores. Among those treated with antidepressants, older minority participants were underrepresented. These findings were unexpected in a population of veterans who have similar access to care through the VA.

Some apparent discrepancies emerged between items endorsed on the GDS and text from interviews. Of note, the six participants who described pervasive negative mood in their interviews but had low GDS scores were all older minority participants. This highlights the importance of cultural influences in the way that depression is expressed. Others have noted that older African-American and Hispanic participants were more likely to express depressive symptoms in somatic rather than in psychological terms [37,39]. The GDS excludes the vegetative signs of depression and may not adequately capture symptoms of depression in those who focus on somatic complaints. No instances found in narrative data suggested less depression than GDS scores would indicate. When discrepancies were found between narrative data and the GDS scores or between the GDS scores and clinical judgments, the problem seemed to be underrecognition of depression. Older patients are known to have nonspecific presentation of depression (depression without sadness) [41], so depression may not be easily recognized by nurses, physicians, and other professionals who are not trained in the recognition of late-life depression. Further, the myth that depression is somewhat "normal" in light of losses that accompany stroke may be a barrier to diagnosis and treatment. Since this was a sample of men only, gender differences must be considered as well. Men are traditionally socialized to suppress emotional distress and may be less likely to express depressive symptoms and seek help for depression [42].

**Table 3.**
Clinical data from patient records compared to Geriatric Depression Scale (GDS) scores above and below cutoff ($N$ = 112).

| Clinical Data | GDS = 1–10 Not Depressed | GDS = 11–30 Depressed | GDS = 1–30 Total |
|---|---|---|---|
| Depression Diagnosis | 3 | 2 | 5 |
| Antidepressant | 10 | 9 | 19 |
| Depressed in Progress Notes | 5 | 5 | 10 |

## LIMITATIONS

One of the methodological limitations of the study was that the GDS was read to the participants and interviewers recorded their responses. This may have inhibited some individuals from endorsing items indicating depression. In addition, when respondents described mood in ways that seemed inconsistent with their responses to GDS items, they were not directly asked to elaborate or explain. If the discrepancy had been called to their attention later in the interview, this strategy might have provided better explanations of their unique understanding of the items and their experiences of dysphoria.

Our study did not include a diagnostic interview by a psychiatrist using a structured clinical interview and DSM-IV-TR (4th edition) criteria, the gold standard for diagnosis of depression. If this information were available, a more accurate assessment of false negatives would have been possible. Future research should include a diagnostic interview by a clinician trained to make a clinical diagnosis.

Inclusion and exclusion criteria also limited the generalizability of the results. Only patients who were discharged directly home and who had a caregiver were included in the study. These individuals may have been higher functioning and less depressed than those discharged to long-term care or those who could not identify a caregiver. The low overall mean GDS scores may also be partially due to those with the most severe strokes being excluded from our study because of cognitive impairment or severe communication difficulties. In their study of individuals with dementia, Bedard and associates found that the validity of the GDS declined when MMSE scores were lower than 20 [43]. Since we included participants with MMSE scores as low as 18, the GDS responses for those respondents may have been unreliable.

## IMPLICATIONS FOR FUTURE RESEARCH

Several areas for future research are suggested. Further study with larger samples is needed to adequately compare cultural groups. Further qualitative analyses are indicated, such as themes of emotional recovery compared across cultural groups. Larger numbers of respondents would permit comparisons of various levels of depression within each ethnic group.

The apparent discrepancies between narrative data and GDS scores for six minority participants raise the question of whether the items are equally appropriate for veterans from different ethnic backgrounds. Cultural values may influence the likelihood that a participant will self-report symptoms of depression. After finding greater prevalence of depression in Caucasian versus African-American nursing-home residents in several nursing homes, Harralson and associates conjectured that older Caucasian participants may be more likely to report psychological symptoms than older African American participants [31]. Since the GDS items focus on psychological rather than somatic symptoms of depression, the GDS may not be sensitive in older minority participants who express their depression in somatic terms. After administering the GDS to 41 depression-diagnosed older Mexican Americans, Baker and Espino found a high rate of false negatives [28]. They also suggested that this minority group was less likely to report psychological symptoms. Educational and gender differences may also have a confounding effect on reporting psychological symptoms. Further research is needed to evaluate the GDS for older minority participants and explore the impact of educational and gender differences.

Research is needed to explore potential differences in prescribing practices for older patients from different ethnic groups. If such differences do occur, what factors influence providers in decision-making about medications? For example, were antidepressants offered by providers, and were minority participants reluctant to take medications? Future studies could be designed to obtain additional information about acceptability of medication and psychosocial treatment for depression in older minority participants.

Oral versus written administration should be studied further. Reading questions to older participants who would not otherwise be able to participate may introduce response-set bias. Having to endorse potentially embarrassing items aloud may inhibit some participants from responding truthfully.

## CONCLUSIONS

Qualitative data uncovered a rich description of respondents' perceptions and emotional experiences during stroke recovery. Although quantitative instruments provide numerical indicators, allowing the researcher to

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compare depression in groups of individuals, the triangulation of qualitative data enriches the researcher's understanding of what participants are depressed about. Further, the GDS may not represent every dimension of PSD. Further work is needed to identify salient items for individuals in poststroke recovery and to test new items to improve screening for depression in this population.

Narrative data were supportive of psychosocial theories of depression. Participants were distressed about loss of functional abilities and roles, overwhelming negative changes brought on by lost ability to work, and negative perceptions of their future. Age was unrelated to GDS scores in our sample.

Depressive symptoms have a profound effect on morbidity and mortality following stroke. Since patients are at high risk for depression in the poststroke period and the consequences of overlooking depression are serious, every person diagnosed with stroke should be screened with the use of a rating scale such as the GDS as well as a clinical interview by a mental health professional to confirm the presence of depression. Careful assessment of older minority participants with attention to somatic complaints may improve recognition and treatment of depression. Depressed patients need the opportunity to tell their story about how stroke has changed their lives and their efforts to come to terms with the changes.

The themes identified for depressed and nondepressed patients are useful in guiding clinicians to recognize depression. The themes identified from narrative accounts illuminate how patients experience stroke in unique ways. Listening for themes of taking in multiple losses, resisting the new reality, and preparing for the worst may help clinicians identify patients who need additional support as well as referral for evaluation for a mood disorder.

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