State Self-Esteem Following Stroke

Anne M. Chang, MEdSt, RN; Ann E. Mackenzie, PhD, RN

Background and Purpose—Physical rehabilitation after stroke is often highlighted in the absence of consideration of psychosocial factors. This study sought to determine the relationship between state self-esteem and functional independence in patients recovering from stroke.

Methods—In a longitudinal study, data were collected from 152 stroke patients within 48 hours of admission to a rehabilitation hospital and at 2 weeks and 3 months after admission. The Modified Barthel Index was used to assess functional ability. Patients’ current feelings of self-worth were assessed with use of the State Self-Esteem Scale. Additional variables included perceived social support, trait self-esteem, age, previous stroke, side of stroke, comorbidity, marital status, and gender.

Results—State self-esteem was significantly correlated to functional independence. The results of linear stepwise regression analysis indicated that functional ability and state self-esteem at 2 weeks, as well as the presence of heart disease, were significant predictors (55%) of functional ability at 3 months. For those with a functional ability score of $\geq 81$ on admission to the rehabilitation unit, state self-esteem and functional ability at 2 weeks as well as previous stroke explained 53% of the variance in functional ability at 3 months. When functional ability was $\leq 80$, baseline and 2-week functional ability, state self-esteem at 2 weeks, and age predicted 53% of the variance in functional ability at 3 months.

Conclusions—Functional ability at 2 weeks was a stronger predictor than baseline functional ability in this study. The level of state self-esteem was also a consistent factor in the prediction of functional outcome of patients after stroke. (Stroke. 1998;29:2325-2328.)

Key Words: psychology ■ rehabilitation ■ stroke outcome

Many of the factors included in studies predicting functional recovery following stroke have focused on the neurological features of stroke, time from onset to admission to acute care and rehabilitation settings, comorbidity, age, and occurrence of a previous stroke.1-3 Increasingly, the psychosocial handicap resulting from stroke and other chronic diseases is recognized to be as overwhelming as the physical disability.1-8

Such disabilities can lead to enduring problems for both the stroke patient and the family, as well as for the community and health services. Levenson4 found that medical patients who had high psychosocial symptoms and no major differences in severity of illness had greater hospital costs and longer length of stay. Browne et al10 reported that those discharged home with poorer psychosocial adaptation had greater use and thus greater costs of health services.

Self-esteem can be influential in a person’s response to illness.11-13 Although a number of studies have examined depression in those recovering from stroke,4-16 little has been reported on the level of self-esteem in those with stroke. Self-esteem is viewed both as a symptom of depression and a causal factor in reactive depression.19-21 Muhlenkamp and Sayles22 found that self-esteem and social support jointly influence the practice of self-care behavior in patients with stroke.

Trait self-esteem is the more enduring aspect of a person’s feelings of self-worth and is relatively unchanged. As Crouch and Straub23 have proposed, a person’s trait, or basic, self-esteem is established and unchanged by adulthood. State self-esteem, however, refers to the aspect of a person’s feeling of self-worth that is more subject to change, depending on the particular state or situation. Butler et al24 use the term “self-esteem lability” to refer the reactivity of state self-esteem to contextual and situational factors. This state or functional self-esteem thus refers to the changeable type of self-esteem that can alter in situations of acute or chronic stress, such as disease or unemployment.25 The normally close relationship between state and trait self-esteem is reduced when a threat to ego is experienced.25 as in patients who have a stroke and associated disability. Thus, the purpose of our study was to examine the relationship between stroke patients’ state self-esteem and their functional ability during their rehabilitation. The inclusion of self-esteem in the prediction of functional outcome may contribute to a more comprehensive understanding of the factors that influence stroke rehabilitation.
TABLE 1. Correlations Between Functional Ability, State Self-Esteem, Social Support, Age, and Length of Stay (n = 115)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>r</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Functional ability (MBI)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 mo</td>
<td>91.48</td>
<td>15.20</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>2 wk</td>
<td>80.48</td>
<td>21.58</td>
<td>0.70</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Baseline (rehabilitation admission)</td>
<td>67.23</td>
<td>21.08</td>
<td>0.56</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>State self-esteem</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 wk</td>
<td>75.16</td>
<td>11.08</td>
<td>0.40</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Baseline</td>
<td>71.86</td>
<td>11.10</td>
<td>0.33</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Social support satisfaction</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 wk</td>
<td>29.16</td>
<td>6.12</td>
<td>0.22</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Baseline</td>
<td>29.17</td>
<td>5.60</td>
<td>0.15</td>
<td>NS</td>
</tr>
<tr>
<td>Age, y</td>
<td>69.44</td>
<td>9.33</td>
<td>−0.17</td>
<td>NS</td>
</tr>
<tr>
<td>Length of stay, d</td>
<td>21.80</td>
<td>13.66</td>
<td>−0.56</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Subjects and Methods

A longitudinal design was used to collect data from stroke patients within 48 hours of admission to a rehabilitation hospital and at 2 weeks and 3 months after admission. Because the patients remaining in the study at 3 months had been discharged from the rehabilitation hospital, data were collected from the patients at their home or nursing home. Patients were transferred to the rehabilitation hospital from the acute-care hospital when assessed by medical staff as having a stable condition and rehabilitation potential. One hundred fifty-two patients in the rehabilitation hospital met the inclusion criteria of speaking Cantonese and being able to communicate, having no severe hearing impairment, having a score of ≥4 on the Abbreviated Mental Test,26 and agreeing to participate in the initial data collection. Those excluded from the study were those who had a second stroke within the 3-month study period and would not remain in Hong Kong upon discharge. The response rate for data collected at 2 weeks was 143 (94%) and at 3 months was 115 (76%). The mean baseline and 2-week Modified Barthel Index (MBI) scores for the 37 patients (24%) who did not remain in the study at 3 months were 64.11 (SD, 19.27) and 75.54 (SD, 23.77), respectively. Comparison with the mean values for the 115 patients who remained in the study (see Table 1) indicates the similarity between mean levels of MBI. The time from onset of stroke to admission to the rehabilitation hospital ranged from 1 to 17 days, with the mean being 5.02 (SD, 2.62) days. The length of time spent in the rehabilitation hospital ranged from 3 to 67 days (mean, 21.18; SD, 13.66 days). Ethics approval was gained by the Institutional Review Panel. Informed consent was obtained before collection of data from the patients.

The MBI was used to assess total functional independence and the 2 subscores of self-care and mobility. Granger et al27 modified the original 10-item Barthel Index to improve clinical sensitivity, extending the number of items to 15. This index comprises 9 items relating to independence in self-care and 6 items focusing on mobility.

Patients’ feelings of current self-worth were assessed with use of the 20-item State Self-Esteem Scale developed by Heatherton and Polivy25 to detect changes in self-esteem that measures of trait self-esteem often fail to detect. Trait self-esteem was measured using the 10-item Rosenberg Self-Esteem Scale.28 Social support satisfaction and number of support persons were measured using the Social Support Questionnaire short form.29 This short form was developed from the original 27-item Social Support Questionnaire following recognition of the need for rapid assessment in clinical settings.

Additional variables included age, marital status, religion, educational level, comorbidity, and length of stay. Multiple regression analysis was used to identify factors predicting functional independence at 3 months.

Results

The mean ± SD age of patients was 69.44 ± 9.33 years (range, 24 to 93 years). The majority of patients (91) were married, with 61 being either single, widowed, separated, or divorced. There were 67 female patients (44%) and 85 male patients (66%). One hundred thirteen patients (74%) had no previous stroke, 31 (20%) had 1 previous stroke, 7 (5%) had 2 previous strokes, and 1 patient had 4 previous strokes. The majority of patients (70; 46%) had right-sided CVA; 51 patients (34%) had left-sided, 3 had brain stem, and 1 had cerebellar stroke; 20 (13%) were unclassified. Most patients (124; 82%) had an ischemic type of stroke; 18 (12%) had a hemorrhagic stroke. The number of days between stroke occurrence and baseline data collection ranged from 2 to 20 (mean ± SD, 6.5 ± 2.75 days). The number of days spent in the rehabilitation hospital ranged from 3 to 67 (mean ± SD, 21.18 ± 13.66). The majority of patients had no cardiac disease (90%), while 32% had diabetes and 64% had hypertension.

Significant positive correlations were found between functional ability and state self-esteem (Table 1). Social support satisfaction at 2 weeks was positively correlated with state self-esteem at all stages of data collection and with MBI at 2 weeks and at 3 months. The number of persons providing social support was significantly correlated with social support satisfaction but no other study variable. Those with higher state self-esteem at 2 weeks also had a shorter length of stay in the rehabilitation hospital (P < 0.01). Age was significantly and inversely correlated with functional ability at baseline and 2 weeks. Biserial correlations for examining relationships between continuous and dichotomous variables30 revealed that there were no significant correlations between 3-month functional ability and the dichotomous variables of heart disease, hypertension, diabetes, previous stroke, gender, marital status, and left or right hemisphere stroke.

Linear, stepwise multiple regression was used to determine the variables predicting functional ability at 3 months after admission to a rehabilitation hospital. The variables entered into the equation were baseline and 2-week functional ability, state self-esteem, social support satisfaction, age, marital status, length of stay, trait self-esteem, previous stroke, heart disease, diabetes, hypertension, and left- or right-sided stroke.

Functional ability and state self-esteem at 2 weeks, age, and the presence of heart disease accounted for 55% of the variance in functional ability at 3 months (See Table 2). Further analysis of the functional ability at 3 months was performed to determine the factors predicting each of the 2 MBI subscores of self-care and mobility. The variables accounting for 53% of the variance in self-care MBI at 3 months were self-care functional subscore at 2 weeks, presence of heart disease, and social support satisfaction on admission to the rehabilitation hospital. The variables accounting for 48% of the variance in the mobility functional ability subscore at 3 months were the self-care subscore, state self-esteem, and mobility subscore at 2 weeks.
Multiple regression analysis was also performed to examine the factors influential when functional ability on admission to the rehabilitation unit was ≤80 (that is, more dependent) and when it was >80 (less severe). In the admission MBI of the ≤80 group, 2-week functional ability and state self-esteem, age, and baseline functional ability accounted for 56% of the variance in functional ability at 3 months (See Table 3). For those with an MBI score of ≥81 on admission to the rehabilitation unit, 2-week MBI and state self-esteem, as well as previous stroke, accounted for 53% of the variance in functional ability at 3 months (See Table 3).

In this study, state self-esteem on admission to the rehabilitation hospital, satisfaction with social support at 2 weeks, as well as the length of rehabilitation stay, site of lesion, diabetes, hypertension, and marital status, were not significant factors in predicting functional ability at 3 months.

### Discussion

The findings of this study indicate that the state self-esteem of patients with a stroke contributed significantly to the total variance in a person’s functional ability at 3 months after the stroke. State self-esteem contributed to the variance found in the 3-month functional ability for all patients when the admission MBI was <81 and from 81 to 100, as well as for the 3-month mobility subscore, but not in the 3-month self-care subscore. These findings indicate that state self-esteem may be important in understanding some of the previously unaccounted-for variation in functional outcome in stroke patients. Trait self-esteem, however, did not contribute to the variance found at 3 months for any of the regression equations.

These results support previous findings of correlations between low self-esteem and physical illness as well as depressive symptoms and disability. Similarly, Strauss has reported that patients experience dehumanization following stroke. Thus, the importance of consideration of the self has been found from both quantitative and qualitative methods. Many reports have also highlighted the prevalence of depression in stroke patients and the negative relationship between self-esteem and depression.

It may be that state self-esteem acts in a manner similar to the effect of depression on the level of participation and gain from rehabilitation patients. Thus, further study is needed to distinguish between patients with low state self-esteem and those with depression, as it may be that the interventions for raising state self-esteem will differ from those needed for depression. As can be seen from this study, self-esteem can influence outcome, although the way in which it affects outcome requires clarification. More study is needed to examine the use of psychosocial interventions in ameliorating the threat to self from stroke and the effect on functional outcome. Livneh proposes that intrapersonal psychosocial interventions can help the disabled adjust and improve their self-esteem. Murphy and Berk and Schall have pointed out the lack of attention to the psychosocial component of stroke rehabilitation, with a continuing focus on the physical factors alone.

The 2-week MBI was consistently the main predictor of functional outcome. That the 2-week MBI rather than baseline MBI was more frequently and consistently a significant predictor differs from previous studies in which the best predictor was baseline functional ability. However it may be that the timing for collecting the baseline MBI accounts for the finding that 2-week more often than baseline contributed to predicting 3-month functional outcome. Jongbloed reported that the time of collecting baseline functional ability either has not been clearly stated or varies across studies, thus rendering comparisons unreliable. In this study the baseline measurement of MBI occurred within 48 hours of admission to the rehabilitation hospital, which was on average 1 week after the stroke had occurred.

Age had a significant, negative correlation with functional ability on admission to the rehabilitation hospital and 2 weeks later, as has been found in previous studies. At 3 months the correlation between age and functional ability in this study was not significant. Nevertheless, age was a significant predictor of 3-month functional ability for subjects with a baseline MBI of <81, with older subjects having a lower 3-month functional ability. However, it remains unclear whether this negative correlation between age and functional

### TABLE 2. Predictors of Functional Ability, Self-Care, and Mobility Subscores at 3 Months

<table>
<thead>
<tr>
<th>MBI at 3 mo</th>
<th>$df$</th>
<th>$\beta$</th>
<th>$p$</th>
<th>$R^2$</th>
<th>$F$</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-wk MBI</td>
<td>3, 111</td>
<td>0.63</td>
<td>&lt;0.001</td>
<td>0.55</td>
<td>45.79*</td>
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<tr>
<td>2-wk SSES</td>
<td>0.20</td>
<td>&lt;0.001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heart disease</td>
<td>-0.16</td>
<td>&lt;0.01</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Self-care MBI at 3 mo

<table>
<thead>
<tr>
<th>Self-care MBI</th>
<th>$df$</th>
<th>$\beta$</th>
<th>$p$</th>
<th>$R^2$</th>
<th>$F$</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-wk self-care MBI</td>
<td>3, 111</td>
<td>0.68</td>
<td>&lt;0.001</td>
<td>0.53</td>
<td>41.38*</td>
</tr>
<tr>
<td>Baseline SSES</td>
<td>0.13</td>
<td>&lt;0.05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heart disease</td>
<td>-0.13</td>
<td>&lt;0.05</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Mobility MBI at 3 mo

<table>
<thead>
<tr>
<th>Mobility MBI</th>
<th>$df$</th>
<th>$\beta$</th>
<th>$p$</th>
<th>$R^2$</th>
<th>$F$</th>
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</thead>
<tbody>
<tr>
<td>2-wk self-care MBI</td>
<td>3, 111</td>
<td>0.38</td>
<td>&lt;0.001</td>
<td>0.48</td>
<td>34.41*</td>
</tr>
<tr>
<td>Baseline SSES</td>
<td>0.23</td>
<td>&lt;0.001</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$\beta$ indicates standardized partial regression coefficient; SSES, State Self-Esteem Scale.

*P<0.001.

### TABLE 3. Predictors of Functional Ability at 3 Months According to Rehabilitation Admission Functional Ability

<table>
<thead>
<tr>
<th>Admission MBI ≤80</th>
<th>$df$</th>
<th>$\beta$</th>
<th>$p$</th>
<th>$R^2$</th>
<th>$F$</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-wk MBI</td>
<td>4, 71</td>
<td>0.43</td>
<td>&lt;0.001</td>
<td>0.56</td>
<td>22.54*</td>
</tr>
<tr>
<td>2-wk SSES</td>
<td>0.26</td>
<td>&lt;0.001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age, y</td>
<td>-0.19</td>
<td>&lt;0.05</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Baseline MBI</td>
<td>0.24</td>
<td>&lt;0.05</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Admission MBI ≥81</th>
<th>$df$</th>
<th>$\beta$</th>
<th>$p$</th>
<th>$R^2$</th>
<th>$F$</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-wk MBI</td>
<td>3, 35</td>
<td>0.40</td>
<td>&lt;0.01</td>
<td>0.53</td>
<td>13.01*</td>
</tr>
<tr>
<td>Previous stroke</td>
<td>-0.35</td>
<td>&lt;0.01</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-wk SSES</td>
<td>0.26</td>
<td>&lt;0.05</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$\beta$ indicates standardized partial regression coefficient; SSES, State Self-Esteem Score.

*P<0.001.
ability is due to age alone or to the association between age and a greater incidence of chronic illness.1

The presence of heart disease, which was also a significant predictor in this study, has been found in previous studies45 to significantly influence functional ability after stroke. However, in this study there were only 16 patients who had comorbid heart disease. Although 39 patients had ≥1 previous strokes, this was found to be a significant predictor only for those with an admission MBI of >80. Thirteen (28%) of those with a functional ability of >80 had previous stroke, while 26 (24.5%) of those with an admission functional ability of <80 had a previous stroke. Previous stroke has been reported in other studies1 to adversely affect functional outcome.

Satisfaction with social support was a significant factor contributing to the variance in self-care functional ability at 3 months, where higher levels of self-care MBI were related to higher levels of social support satisfaction. This positive relationship confirms previous findings that social support is beneficial to stroke patients.3,44,45 However, social support did not contribute to the explanation of variance in either the overall functional ability at 3 months or the mobility MBI subscore at 3 months. The absence of correlations between the number of persons providing social support and functional ability further supports the proposal28,46 that satisfaction with the support received is more important than the number.

Acknowledgments

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References

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