The Daily Living Self-Efficacy Scale: A New Measure for Assessing Self-Efficacy
in Stroke Survivors

Annick Maujean¹, Penelope Davis², Elizabeth Kendall¹, Leanne Casey², Natalie Loxton³

¹ Centre for National Research on Disability Rehabilitation Medicine, School of Human Services
and Social Work, Griffith University, Australia

² School of Applied Psychology and Griffith Health Institute, Australia

³ School of Psychology, The University of Queensland, Australia

Abstract

Purpose: To develop and examine the psychometric properties of the Daily Living Self-Efficacy Scale (DLSES) designed to assess stroke survivors' self-efficacy in daily functioning.

Method: Two groups of participants ($N = 424$) were recruited; a stroke survivor group ($n = 259$) who were recruited through two stroke associations in Australia and a non-stroke group ($n = 165$) who were the partners/carers of the stroke survivors ($n = 93$) and members of the community in Queensland, Australia ($n = 72$). Principal Component Analyses (PCA) were used to assess the factor structure of the scale and investigations of internal consistency, test-retest reliability, convergent and discriminant validity were conducted.

Results: The final measure is a 12-item scale comprising two subscales: self-efficacy for psychosocial functioning and self-efficacy for activities of daily living. The scale demonstrated high internal consistency, temporal stability, and convergent validity and it discriminated well between the stroke and non-stroke groups.

Conclusion: the DLSES is a psychometrically sound measure of self-efficacy in psychosocial functioning and self-efficacy in activities of daily living appropriate for stroke survivors, regardless of level of physical impairment.

Keywords: psychosocial functioning, activities of daily living, stroke, Daily Living Self-Efficacy Scale

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Introduction

Stroke has profound and wide-ranging effects on the physical, psychological and social aspects of an individual's daily life [1-3]. The focus of health care professionals, particularly immediately following stroke, is primarily on physical functioning. Difficulties in daily living, and the psychological and social problems experienced following a stroke are often overlooked [1,4,5]. When stroke survivors leave hospital and return to live in the community, they are left to face a new reality which often includes coping with physical and/or cognitive impairments, dependence on others, loss of identity, social isolation, and diminished self-esteem [6,7]. These issues may have devastating implications for the individual's perception of competency and efficacy in daily living.

A key factor in determining outcome once stroke survivors are living in the community may be their belief about their ability to overcome the difficulties they encounter [8]. Self-efficacy is one's belief in the ability to perform in ways that give one control over events that affect one's life [9]. It is not a measure of the skills one has but rather the belief about what one can do under different sets of conditions with whatever skills one possesses [9]. According to Bandura [10], self-efficacy should always refer to the particular task or specific behavior that is being predicted. In other words, he conceptualized self-efficacy as primarily a situation- or domain-specific belief.

Although preliminary research into the relationship between self-efficacy and recovery from stroke indicates that high self-efficacy has a positive influence on an individual's level of physical functioning [11,12], there has been little research to date into the relationship between

self-efficacy and other important domains of functioning; namely, the psychological, social, and instrumental aspects of daily living. Theoretically, the higher the level of self-efficacy in these domains, the better the functioning in daily living and, hence, in the overall adjustment and well-being of the affected individual [1,13].

A recent conceptualization of self-efficacy as global confidence in one's ability across a wide range of demanding or novel situations has generated considerable interest in the literature [14]. The General Self-Efficacy Scale developed by Schwarzer and Jerusalem [15] is a well-known measure that has been found to be particularly useful when assessing global confidence in coping ability when individuals have to adjust to a chronic illness. However, this scale is not as useful a measure when the aim is to measure perceived ability in more specific domains such as the domain of daily functioning. In this situation, a domain-specific self-efficacy measure is more appropriate than a broad general measure as it would provide more detailed information in the specific areas (e.g., psychological, social, activities of daily living) where stroke survivors may need assistance.

There are, currently, two existing measures that assess self-efficacy level in more than one domain of daily functioning ability, namely, the Chronic Disease Self-Management (CDSM) self-efficacy measure [16], and the Stroke Self-Efficacy Questionnaire [17]. However despite the fact that the CDSM self-efficacy scale is a useful measure as it assesses more than just the physical domain, its emphasis is on self-management of chronic illnesses rather than on perceived functional ability in daily living. Although stroke may be classified as a chronic disease, and does have some similarities with other chronic illnesses, stroke is usually associated with significant physical and/or cognitive impairment that renders some items irrelevant. Thus items relating to a person's ability to complete household chores (e.g., *how confident are you to*

complete your household chores, such as vacuuming and yard work, despite your health problems?) or continue with hobbies (e.g., *how confident are you to continue to do your hobbies and recreation?*) may be influenced by the level of physical and cognitive impairment rather than by the level of self-efficacy. Thus, the usefulness of the scale is challenged for this population.

The Stroke Self-Efficacy Questionnaire [17] assesses stroke survivors' perceived self-efficacy in specific domains of functioning (e.g., personal care, mobility activities, and tasks related to self-management). The aim was to gain insight into the functional performance of stroke survivors who were undergoing rehabilitation. However, while this measure could add valuable information to the rehabilitation process, it is still in its developmental stage. The factor structure of the 13-item Stroke Self-Efficacy Questionnaire was established on a very small sample ($n = 40$) which falls well short of the recommended case-to-item ratio [18]. Furthermore, despite its focus on stroke, some items do not differentiate between actual level of physical impairment and lack of confidence in one's ability to complete the actual task (e.g., '*how confident are you to use both hands for eating your food*'). An individual who has lost functioning in one hand as a result of a stroke will not be able to perform such a task due to the physical deficit but may still have confidence in his or her ability to perform the actual task of eating. Such item is not actually measuring self-efficacy.

Given that existing measures of self-efficacy in daily functioning are limited by the failure to take into account the nature and degree of physical impairment that is often present in stroke survivors, a new measure is needed to address this important issue. The first aim of this study was therefore to develop a scale that could be administered to all stroke survivors regardless of the nature and level of physical impairment. This new measure aimed to assess

stroke survivors' self-efficacy in three domains of daily living (i.e., psychological, social, and instrumental aspects of daily living). Furthermore, to establish the ability of this scale to discriminate between stroke-related and non-stroke-related concerns, the measure was administered to both a stroke and a non-stroke sample.

Method

Participants

Four hundred and twenty-four participants were recruited for this study (197 males and 227 females), with a mean age of 65.25 years ($SD = 12.65$; range = 20 – 90 years).

Stroke Group

Participants in the stroke group included 259 stroke survivors (134 males and 125 females), with a mean age of 66.93 years ($SD = 12.37$ years; range = 20 – 89 years), and an average time since stroke of 7.61 years ($SD = 7.29$ years, range = <1- 46.75years). They were recruited through the Stroke Association of Queensland and the Stroke Recovery Association of New South Wales in Australia.

To examine the convergent and discriminant validity of the newly developed measure, eighty of the 259 stroke survivors (40 males and 40 females) with a mean age of 62.77 years ($SD = 11.24$ years; range = 31 – 83 years) completed the DLSES and five other measures.

Control Group

One hundred and sixty-five individuals without stroke (63 males and 102 females) were also recruited (mean age = 62.61 years; $SD = 12.66$; range = 22 – 90 years). Ninety-three of these participants were the partners/carers of the members of the stroke associations and the remaining seventy-two participants were recruited through four bowling clubs from the community in Queensland, Australia.

There was a significant difference in age between the two groups, $t(422) = 3.47, p < .01$, with the control group ($M = 62.61$ years; $SD = 12.66$ years) being somewhat younger than the stroke group ($M = 66.93$ years; $SD = 12.37$ years).

The inclusion criteria for the participants in the stroke group were that the person was formally diagnosed with a stroke when initially admitted to hospital, had since been discharged from hospital to live in the community and displayed no sign of cognitive impairment. The inclusion criteria for the participants in the control group were that the person had not suffered a stroke or any type of brain injury. All participants were fluent in English.

Measures

Construction of the Daily Living Self-Efficacy Scale (DLSES). A pool of 17 items was developed based on a review of the literature, a review of the self-efficacy measures already developed, and clinical experience with individuals who have suffered a stroke.

Of particular importance, all items were worded so as to be universally applicable to both healthy and less healthy individuals, regardless of the degree of physical impairment that may have been experienced as a result of a stroke (e.g., ‘*either do or arrange to have the shopping done*’; ‘*either do or arrange to have the house cleaned*’).

The 17 items (see table 1) were subjected to face validity checks by a panel of brain injury/stroke researchers, a stroke survivor and a member of the community. The panel was asked to comment on format, clarity, and relevance. Five items (Items 13 to 17 in table 1) were removed due to ambiguity, complexity, and/or irrelevance, resulting in a total of twelve items across three domains, namely, activities of daily living, psychological, and social.

Insert table 1 about here

According to Bandura [19], an efficacy scale ranging in 10-unit intervals from 0 to 100 is more sensitive and reliable than a scale using a 1- or 5-unit interval. In keeping with Bandura's recommendation, a Likert scale with 10-unit intervals from 0 (cannot do at all) to 100 (highly certain can do) was used for this new measure. A total score is obtained by summing the scores for each of the 12 items which is then divided by the number of items (i.e., 12) to give an overall score between 0 and 100, with higher scores indicative of higher self-efficacy. Participants were instructed to rate their level of confidence in performing each of the daily living activities/behaviours listed on the DLSES.

Telephone Interview for Cognitive Status – Modified (TICS-M) [20]. The TICS-M, a brief instrument that assesses cognitive function, was used to ensure that stroke survivors participants' responses were not influenced by cognitive impairment. The TICS-M is modeled on the Mini Mental Status Examination (MMSE) and was originally developed to serve as a clinical tool that could be used in the assessment of cognition in the homebound elderly [21]. Although the TICS-M can be administered face to face, it was specifically developed for delivery over the telephone. The 13-item TICS-M includes four domains, (1) orientation; (2) registration, recent memory and delayed recall (memory); (3) attention/calculation; (4) semantic memory, comprehension and repetition (language). It takes approximately 10 minutes to administer. The total score ranges from 0 to 39 with a score below 21 as the cut-off point indicating the presence of cognitive impairment [22]. The TICS-M is highly correlated with the MMSE ($r = 0.86$) [23] and has high test-retest reliability [24]. Barber and Stott [25] examined the properties of the TICS-M in a group of post-stroke individuals with varying levels of

disability and found that the TICS-M is a practical and valid method of assessing cognitive function in community outpatients following stroke.

Generalized Self-Efficacy Scale (GSE) [15]. The GSE is a 10-item self-report measure designed to assess the strength of an individual's belief in his or her own ability to respond to difficult or new situations and to deal with any associated obstacles or setbacks [26]. Items are rated on a Likert scale from 1(not at all true) to 4 (exactly true). The scores for each of the ten items are summed to give a total score between 10 and 40. The scale of the GSE has been shown to have high internal consistency, with Cronbach's α ranging from 0.87 to 0.94 [27] and good test-retest reliability ($r = 0.82$) [15]. Expected positive correlations have been found with measures of self-esteem ($r = 0.52$), internal control beliefs ($r = 0.40$), and optimism ($r = 0.49$). Expected negative correlations were obtained with general anxiety ($r = -0.54$), performance anxiety ($r = -0.42$), and pessimism ($r = -.28$) [15]. Internal consistency in the current study was good (Cronbach's $\alpha = 0.94$).

Barthel Index [28]. The Barthel Index is a 10-item use to assess participants' physical functioning. Eight of the 10 items represent activities related to personal care (i.e., bowel and bladder control, toileting, feeding, dressing, bathing, grooming, and transfer from chair to bed and back) and the remaining two items are related to mobility activities (i.e., walking, ascending and descending stairs). The index yields a total score out of 100, with higher scores representing greater degree of functional independence. The Barthel Index has been shown to have good internal consistency, with Cronbach's α ranging from 0.90 to 0.93 [29] and test-retest reliability of 0.93 [30]. Cohen and Marino [31] provided support for the scale's concurrent validity demonstrating high correlations with the Katz Index ($r = 0.77$) and the Frenchay Activities Index ($r = 0.79$). Cronbach's α in the current study was 0.72.

Patient Competency Rating Scale (PCRS) [32]. The PCRS is a 30-item self-report measure that provides self- and informant-ratings to evaluate competency to perform various behavioural, cognitive, and emotional tasks as well as to assess insight into the level of awareness following head injury [33]. Respondents are asked to judge how easy or difficult it is to perform a variety of tasks. The items in the informants' version are identical to those in the patients' version. Rating is on a 5-point Likert scale from 1 '*can't do*' to 5 '*can do with ease*'. Total score range from 30 to 150, with higher scores indicating greater competency. The PCRS has been shown to have strong internal consistency for both patient ratings (Cronbach's $\alpha = 0.91$) and relatives' ratings of patients (Cronbach's $\alpha = 0.93$) [34]. Test-retest reliability has been reported as high, $r = 0.97$ for patients and 0.92 for relatives [35]. In the current study Cronbach's α for participants and relatives' ratings of participants were 0.92 and 0.95, respectively.

Marlowe-Crowne Scale (MCS) [36]. The MCS is designed to measure the respondent's tendency to respond in a socially favourable manner. This scale consists of 33 true/false items, and total score range from 0 to 33 with high MCS scores indicating an increased tendency for social desirability response bias. The MCS has been shown to have high internal consistency ($r = 0.88$) and good test-retest reliability ($r = 0.89$) [36]. Cronbach's α in the current study was 0.81. A high positive correlation has been found between the MCS and the Edwards Social Desirability Scale, thus demonstrating the scale's convergent validity [36].

Procedure

All participants completed the DLSES. To examine the convergent and discriminant validity of the DLSES, 80 of the 259 stroke participants also completed the Telephone Interview for Cognitive Status, Generalized Self-Efficacy Scale, Barthel Index, Patient Competency Rating

Scale (participants' ratings), and the Marlowe-Crowne Scale. To determine the scale temporal stability, 33 participants in the stroke group completed the DLSES twice. Furthermore, 65 carers/partners of the stroke participants completed the Patient Competency Rating Scale (carers' ratings) to assess stroke survivors' levels of insight when completing the self-report measures.

Thirteen hundred questionnaire packages comprising the questionnaires, consent form, a cover letter, a reply paid envelope, and a covering letter from the president of the two stroke associations were mailed to the members of these two associations and their partners/carers. Three hundred and fifty-two (27%) questionnaires were returned, of which 259 (20%) were completed by stroke survivors and 93 (7%) were completed by the partners/carers of the stroke survivors.

Another seventy-two participants (42 males and 30 females) who had not experienced a stroke or any type of brain injury were recruited through four lawn bowls clubs. Prior to handing the measures to the members of these lawn bowls clubs, they were provided with a brief overview of the research and were reminded that their participation was voluntary and they could withdraw at anytime. Participants who agreed to participate were asked to complete the questionnaire and indicate whether they have experienced a stroke or any other illness or disability before returning it to the researcher.

Statistical Analyses

Statistical analyses were performed using the Statistical Package for Social Sciences (SPSS, version 17.0 for Windows). Principal component analysis was used to explore the factor structure of the DLSES. Three one-way between-group analyses of covariance (ANCOVA) were used to compare scores obtained for the stroke group with scores obtained for the non-stroke group for the overall scale, and the activities of daily living and psychosocial functioning

subscales, while controlling for age. Cronbach's α coefficient was used to calculate the internal consistency of the DLSES. Pearson's Product Moment correlations were used to assess the scale convergent and discriminant validity, and the temporal stability of the overall scale. Intra-class correlation coefficients with absolute agreement (ICCs) were used to estimate the temporal stability of each item on the DLSES, with ICC ratings between .6 and .8 indicating satisfactory stability and ICC ratings above .8 indicating excellent stability [37].

Results

Factor Structure of the DLSES

A principal component analysis (PCA) with oblique rotation was performed on the 12 items ($n = 259$). Kaiser-Meyer Olkin measure of sampling adequacy was .93 and Bartlett's test of Sphericity was significant, $p < .001$. The PCA generated two components with eigenvalues exceeding 1 (eigenvalues = 7.66 and 1.04), accounting for 72.48% of variance. As shown in table 2, all 12 items had loadings of .40 and above on only one of the two components, with eight items loading on Component 1 and four items loading on Component 2.

Component 1 described 'psychosocial functioning' self-efficacy and Component 2 described 'activities of daily living' self-efficacy. Spearman bivariate correlation revealed that the self-efficacy in activities of daily living and self-efficacy in psychosocial functioning subscales correlated strongly with each other, $r = .71$ ($p < .001$). The correlations with the total score were $r = .96$ and $.86$ ($p < .001$) for the psychosocial functioning and activities of daily living subscales respectively.

Based on the present analysis, all 12 items (i.e., eight self-efficacy in psychosocial functioning items and four self-efficacy in activities of daily living items) were retained for the

final version of the DLSES as they loaded exclusively on their respective component with loadings above .40.

Insert table 2 about here

Replication of the Factor Structure of the DLSES¹

A PCA with oblique rotation was then performed on the non-stroke sample ($n = 165$). The Kaiser Meyer Olkin measure of sampling adequacy was .85 and Barlett's test of Sphericity was significant, $p < .001$. Two components were generated with eigenvalues exceeding 1 (eigenvalues = 5.42; 1.58), accounting for 58.29% of variance. All items loaded exclusively on their respective components with loadings above .40 – eight items loaded on Component 1 (i.e., self-efficacy in psychosocial functioning) and four items loaded on Component 2 (i.e., self-efficacy in activities of daily living). As shown in table 2, this factor structure replicated that found in the stroke sample.

Using Spearman bivariate correlation, the self-efficacy in activities of daily living and self-efficacy in psychosocial functioning subscales correlated moderately with each other, $r = .41$ ($p < .001$). The correlations with the total score were $r = .97$ and $.59$ ($p < .001$) for the self-efficacy in psychosocial functioning and self-efficacy in activities of daily living subscales respectively.

¹ Prior to performing a PCA to explore the factor structure of the DLSES, an independent samples t-test was conducted to compare the mean DLSES scores for participants from the community ($n = 72$) and the partners/carers of stroke survivors ($n = 93$). There was no significant difference in scores for participants in the community ($M = 88.71$, $SD = 12.33$) and the partners/carers of the stroke survivors ($M = 86.26$; $SD = 15.55$; $t(163) = -1.10$, $p > .05$). The magnitude of the differences in the means was very small (eta squared = .01). Consequently, both groups of non-stroke participants formed the control group.

Internal Consistency of the DLSES

The internal consistency of the DLSES was calculated using Cronbach's alpha coefficients for the entire sample ($N = 424$), for the stroke ($n = 259$) and non-stroke ($n = 165$) groups. The internal consistency of the overall scale and the two subscales (i.e., psychosocial functioning and activities of daily living) were high, for both the entire sample, $\alpha = 0.95$ (total scale), .94 (psychosocial functioning), .91 (activities of daily living) and for the stroke group, $\alpha = .95$ (total scale), 0.93 (psychosocial functioning), .91 (activities of daily living). For the non-stroke group, Cronbach α was high for the overall scale ($\alpha = .88$) and the psychosocial functioning subscale ($\alpha = 0.90$), and moderate for the activities of daily living subscale ($\alpha = .64$).

Descriptive Data for all the Measures

Table 3 presents the mean, standard deviations, and range for all six measures administered to 80 stroke survivors. As shown in table 3, this sample of stroke survivors had an average score above the cut-off score of 21 on the TICS-M, indicating adequate levels of cognitive functioning. They reported moderate to high self-efficacy in daily functioning as measured by the Daily Living Self-Efficacy Scale. They also demonstrated moderate levels of generalised self-efficacy in controlling and responding to environmental demands and challenges as measured by the Generalized Self-Efficacy Scale. In general, participants had good level of physical functioning as indicated by the mean score of 90.19 on the Barthel Index, as well as adequate ability in performing various behavioural, cognitive, and emotional tasks as measured by the Patient Competency Rating Scale. However, the mean score of 20.16 on the Marlowe-Crowne Scale indicates that this group of participants had a tendency to respond in a socially favourable manner on the self-report measures.

Insert table 3 about here

Social Desirability

The Marlowe-Crowne Scale was used to check for potential bias with respect to participants' responses on the self-report questionnaires. There was a significant correlation between the Marlowe-Crowne and the DLSES, Generalized Self-Efficacy, and Patient Competency Rating Scale (participants' ratings). Because of the non-normality of the distribution, Spearman's bivariate correlation was initially used to explore the relationships between the DLSES and the other measures. However, when Pearson Product Moment correlation was conducted, the differences were minimal and the statistical significance of these correlations was not affected. As a result, it was possible to use partial correlation to explore the relationship between the DLSES and the other measures, while controlling for scores on the Marlowe-Crowne Scale. As shown in table 4, an inspection of the zero order (Pearson) correlation suggested that controlling for socially desirable responding had little effect on the strength of the relationship between the DLSES and the other measures.

Insert table 4 about here

Convergent Validity²

As shown in table 4, there was a high positive correlation between the DLSES and the Patient Competency Rating Scale – participants' ratings ($n = .74$). A moderate positive correlation was found between the DLSES and the Generalized Self-Efficacy Scale ($r = .56$). There was also a

² Given that the bivariate results using nonparametric methods (Spearman's correlations) were very similar to the parametric results (Pearson's correlations), correlations for convergent and divergent validity, and self-awareness are reported using the parametric method.

moderate positive correlation between the DLSES and the Patient Competency Rating Scale – carers’ ratings ($r = .59$). All correlations were significant at $p < .001$.

Discriminant Validity

Given that the constructs of cognitive functioning (TICS-M) and physical functioning (Barthel Index) are not closely related to the concept of self-efficacy, it was expected that there would be a low correlation between the DLSES and these two measures (i.e., TICS-M and Barthel Index). As shown in table 4, there was a non-significant correlation between the DLSES and the TICS-M ($r = .11$). Although there was a significant positive correlation between the DLSES and the Barthel Index ($r = .28$), the relationship between these two measures was very low ($< .3$).

Self-Awareness

There was a significant positive correlation between the Patient Competency Rating Scale – stroke survivors’ ratings and the Patient Competency Rating Scale – carers’ ratings ($r = .64$) (see table 4). A paired-samples t-test was also conducted to compare the mean overall scores for the stroke survivors’ and the carers’ ratings on the Patient Competency Rating Scale. There was no statistically significant difference between the stroke survivors’ ($M = 115.33$, $SD = 17.58$) and carers’ ($M = 112.27$, $SD = 20.20$) ratings on the Patient Competency Rating Scale, $t(62) = 1.55$, $p > .05$.

Test-Retest Reliability

To examine the temporal stability of the 12-item questionnaire, 33 stroke participants (16 males and 17 females) were administered the DLSES twice with a mean time interval of 8.76 days ($SD = 3.53$ days; range = 5 – 20 days) between Time 1 and Time 2. The Pearson Product Moment correlation between scores on the two administrations was $r = .96$, $p < .001$, indicating high temporal stability. Intra-class correlation coefficients were also used to assess the temporal

stability of each item on the DLSES. As shown in table 5, all items had an $ICC_{agreement}$ of above .75 (range = .78 – .98), indicating that all 12 DLSES items demonstrated good to excellent temporal stability.

Insert table 5 about here

Scale Discriminability

Three one-way between-group ANCOVAs were conducted to compare the DLSES overall and subscale scores for the stroke and the non-stroke groups. After adjusting for age, there was a significant difference in scores between the two groups on the overall scale of the DLSES, $F(1, 421) = 112.61, p < .001$, partial eta squared = .21, as well as for the activities of daily living subscale, $F(1, 421) = 104.98, p < .001$, partial eta squared = .20; and the psychosocial functioning subscale, $F(1, 421) = 89.78, p < .001$, partial eta squared = .18. As shown in table 6, the stroke group scored lower when compared to the non-stroke group on the overall scale and on both the activities of daily living and psychosocial functioning subscales of the DLSES.

Insert table 6 about here

Discussion

This study described the development of a new measure of self-efficacy following stroke. Analysis of the responses of a large sample of stroke survivors revealed that the measure assesses self-efficacy in two domains – psychosocial functioning and activities of daily living.

Furthermore, the factor structure of the scale was replicated in a non-stroke sample. Internal consistency was high for the stroke sample and all 12 items demonstrated good to excellent temporal stability. Support for convergent validity was provided by moderate to high correlations between the DLSES and conceptually related measures. Support for discriminant validity was provided by low correlations between measures which did not share substantial overlap with the construct of self-efficacy and, of particular importance, the finding that the DLSES discriminated well between stroke survivors and non-stroke individuals. As expected, the level of self-efficacy was much lower than that of those unaffected by a stroke.

The low correlations between the DLSES with the Barthel Index and the TICS-M provide confirmation that actual physical functioning, specifically in the area of independence in mobility and personal care, and/or cognitive impairments are not strongly associated with individuals' confidence in daily functioning at least in stroke survivors without marked cognitive impairment. This finding is consistent with Lorig et al.'s [16] study which examined the relationship between self-management behaviours and self-efficacy to perform the behaviours. They found only low to moderate correlation between the two measures and concluded that "the scales measuring self-efficacy to perform behaviours are sufficiently independent of the actual behaviours that they can be interpreted as distinct scales" (p.28).

To gain better insight into stroke survivors' confidence in their overall level of functioning in daily living, it is imperative that domains other than physical functioning are also examined. For individuals to be able to function effectively, they also need to have the psychological and social skills and resources to organise and perform activities of daily living that will enable them to handle day-to-day activities and adapt when facing stressful situations.

As a result, in designing the DLSES an attempt was made to include items representing three domains of daily functioning; namely, psychological, social, and activities of daily living. However, the results clearly revealed a broad domain of psychosocial functioning rather than two separate domains of psychological and social functioning. This result is perhaps not surprising given that other research in the stroke area has shown that social factors play an important role in both the frequency and duration of psychological symptoms following stroke [38].

The wording of the items may also have influenced the emergence of one broad psychosocial factor as opposed to two separate factors. For instance, one psychological item was designed to reflect self-efficacy in the ability to cope with loneliness. This item (‘*Contact a friend when I feel lonely*’) included reference to both domains. Another item designed to reflect the social domain (‘*Take part in new hobbies and new activities*’) did not include reference to a social context so may have reflected solitary activities. Changing the wording of such questions (e.g., ‘*Do something to make me feel better when I feel lonely*’ or ‘*Take part in new hobbies and new activities with other people*’) may have resulted in the emergence of two distinct factors.

One limitation of the present research merits brief comment. In recruiting participants for this research, letters were sent to members of two stroke associations and the response rate (20% of stroke survivors) was relatively low. Similar response rates are common in other research using populations with serious medical problems (e.g., 39-41) and it is difficult to know precisely why, though no doubt such factors as cognitive impairment and depression are involved. One implication of this is that the DLSES may not be suitable for all individuals in the aftermath of stroke. Despite this limitation, however, it is clear that the DLSES is a psychometrically sound measure of self-efficacy in two important areas of daily functioning (psychosocial and activities of daily living) that can be administered to many stroke individuals,

regardless of the nature or degree of physical impairment experienced following a stroke. Future research designed to examine its predictive validity in assessing overall adjustment following a stroke is clearly warranted.

Declaration of Interest

The authors report no declarations of interest.

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