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ORIGINAL RESEARCH

Self-Efficacy Predicts Personal and Family Adjustment Among Persons With Spinal Cord Injury or Acquired Brain Injury and Their Significant Others: A Dyadic Approach

Eline W.M. Scholten, MSc,[a] Marjolijn Ketelaar, PhD,[a] Johanna M.A. Visser-Meily, MD, PhD,[a,b] Janneke Stolwijk-Swüste, MD, PhD,[a] Ilse J.W. van Nes, MD, PhD,[c] David Gobets, MD, MSc,[d] POWER Group, Marcel W.M. Post, PhD[a,e]

From the [a]Center of Excellence for Rehabilitation Medicine, UMC Utrecht Brain Center, University Medical Center Utrecht, and De Hoogstraat Rehabilitation, Utrecht, The Netherlands; [b]Department of Rehabilitation, Physical Therapy Science & Sports, UMC Utrecht Brain Center, University Medical Center Utrecht, The Netherlands; [c]Department of Rehabilitation, Sint Maartenskliniek, Nijmegen, The Netherlands; [d]Rehabilitation Centre, Heliomare, Wijk aan Zee, The Netherlands; and [e]University of Groningen, University Medical Center Groningen, Center for Rehabilitation, Department of Rehabilitation Medicine, Groningen, The Netherlands.

Abstract

Objectives: To investigate whether the combination of self-efficacy levels of individuals with spinal cord injury (SCI) or acquired brain injury (ABI) and their significant others, measured shortly after the start of inpatient rehabilitation, predict their personal and family adjustment 6 months after inpatient discharge.

Design: Prospective longitudinal study.

Setting: Twelve Dutch rehabilitation centers.

Participants: Volunteer sample consisting of dyads (N=157) of adults with SCI or ABI who were admitted to inpatient rehabilitation and their adult significant others.

Interventions: Not applicable.

Main Outcome Measures: Self-efficacy (General Competence Scale) and personal and family adjustment (Hospital Anxiety and Depression Scale and McMaster Family Assessment Device General Functioning).

Results: In 20 dyads, both individuals with SCI or ABI and their significant others showed low self-efficacy at baseline. In 67 dyads, both showed high self-efficacy. In the low-self-efficacy dyads, 61% of the individuals with SCI or ABI and 50% of the significant others showed symptoms of anxiety 6 months after discharge, vs 23% and 30%, respectively, in the high-self-efficacy dyads. In the low-self-efficacy dyads, 56% of individuals with SCI or ABI and 50% of the significant others reported symptoms of depression, vs 20% and 27%, respectively, in the high-self-efficacy dyads. Problematic family functioning was reported by 53% of the individuals with SCI or ABI and 42% of the significant others in the low-self-efficacy dyads, vs 4% and 12%, respectively, in the high-self-efficacy dyads. Multivariate analysis of variance analyses showed that the combination of levels of self-efficacy of individuals with SCI or ABI and their significant others at the start of inpatient rehabilitation predict personal ($V=0.12$; $F_{6,302}=2.8$; $P=.010$) and family adjustment ($V=0.19$; $F_{6,252}=4.3$; $P<.001$) 6 months after discharge.

Conclusions: Low-self-efficacy dyads appear to be more at risk for personal and family adjustment problems after discharge. Screening for self-efficacy may help healthcare professionals to identify and support families at risk for long-term adjustment problems.

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Chronic conditions such as spinal cord injury (SCI) or acquired brain injury (ABI) affect not only the persons with SCI (pwSCI) or ABI (pwABI) themselves, but also their significant others (often family members, but a close friend can also be considered a significant other).[1,2] The theory of dyadic illness management suggests that the ways in which dyads appraise the illness of the person as a unit influences the ways in which they engage in behaviors to manage the illness together.[3] Adjustment outcomes are the results of how dyads manage the illness. On a personal level, an often reported negative adjustment outcome among pwSCI or pwABI and significant others is psychological distress (ie, anxiety and depression).[4] On a family level, problems regarding family functioning (eg, when they are not able to support each other) are common.[5]

Previous research among pwSCI and pwABI and their informal caregivers has shown that personal adjustment outcomes such as stress, mental health, and quality of life of persons in a dyad are inter-related.[6-8] Furthermore, it is known that persons with low self-efficacy (ie, the belief about one's ability to cope with a variety of difficult situations in life)[9] are more at risk for later distress.[10,11] Based on the theory of dyadic illness management, it can be supposed that characteristics of both persons within a dyad will influence the adjustment outcomes of both. However, whether self-efficacy of both persons within a dyad contributes to the explanation of personal and family adjustment within the dyad is still unclear. In this study it is hypothesized that the combination of levels of self-efficacy of pwSCI and pwABI and their significant others measured shortly after the start of inpatient rehabilitation predict both personal and family adjustment 6 months after clinical discharge. Additionally, differences with respect to subgroups (SCI, ABI, and partners only) will be investigated. The results provide insight in the dyadic impact between individuals within a dyad in the prediction of adjustment which will help to develop a substantiated family-centered approach. This is in line with the increasing awareness of the need to adopt a family-centered approach to support pwSCI and pwABI and their significant others in rehabilitation care.[2]

Methods

Design

We used data from the cohort part of the POWER study, which was a study conducted in 12 Dutch rehabilitation centers.[12] The overall aim of this cohort study was to identify predictors at the time of admission to inpatient rehabilitation of long-term empowerment and adjustment problems among dyads of pwSCI or pwABI and their significant others (usually the partner, but sometimes a child, parent, sibling, other family member, or close friend). Dyads were recruited between April 2016 and July 2018. The Medical Ethics Committee of the University Medical Center Utrecht declared that this study did not require approval according to the Dutch Law on Medical Research (protocol number 15-617/C). Boards of all study sites granted permission to perform the study.

List of abbreviations:

ABI	**acquired brain injury**
ALCOS-12	**General Competence Scale, the Dutch version of the General Self Efficacy Scale**
FAD-GF	**McMaster Family Assessment Device General Functioning subscale**
HADS	**Hospital Anxiety and Depression Scale**
MANOVA	**multivariate analysis of variance**
pwABI	**persons with ABI**
pwSCI	**persons with SCI**
SCI	**spinal cord injury**
USER	**Utrecht Scale for Evaluation of Rehabilitation**

Participants

Inclusion criteria for pwSCI and pwABI were: first inpatient rehabilitation after onset of injury, expected stay in rehabilitation center of 4 weeks or longer, age of 18 years or older, and ability to name a significant other. Patients were excluded when the level of physical and cognitive functioning was expected to return to the level it was before onset of the recently acquired injury, when no return to home was expected, in case of limited life expectancy (all based on clinical judgement by rehabilitation physicians), or when they were not able to complete the questionnaires because of severe cognitive or intellectual problems. Cognitive or intellectual problems were defined as restrictions in expression or understanding of language and were assessed by nurses based on their clinical view and the Dutch aphasia scale.[13] Significant others had to be 18 years old or older. PwSCI or pwABI and significant others were included as dyads, and both signed informed consent.

Procedure

Shortly after admission to 1 of the participating rehabilitation centers, the pwSCI and pwABI and their significant others completed a self-report questionnaire (print or electronic). Follow-up questionnaires were completed shortly before discharge from inpatient rehabilitation, and again at 3 and 6 months after discharge. Baseline and 6-month follow-up data were used in this study. Diagnosis-specific information was extracted from the patient's file at baseline.

Measures

Dependent

Dependent variables were assessed at 6 months after discharge from inpatient rehabilitation. Personal adjustment was operationalized as psychological distress and measured with the Hospital Anxiety and Depression Scale (HADS),[14] which is considered an effective measure of general psychological distress.[15,16] The HADS consists of 14 items reflecting symptoms of anxiety and depression (7 items each) scored on a 4-point scale ranging 0 (no symptoms) to 3 (maximum impairment). We aimed to focus on personal adjustment in general. Therefore in our assessment of psychological distress, we included anxiety and depression in a combined total HADS score (0-42 points).[15,16] Higher scores indicated greater distress. The HADS has shown good psychometric properties in various populations.[17] The anxiety and depression subscales were strongly correlated and Cronbach's alpha of the total score in the current study was 0.86 and 0.91 for the pwSCI or pwABI and significant others respectively. Because no clear cutoff score exists for the total HADS, we used cutoff scores of the anxiety and depression subscales. Scores of 8 or more indicated symptoms of anxiety or depression.[18]

Family adjustment was measured with the General Functioning subscale of the McMaster Family Assessment Device (FAD-GF),[19] which has been widely used as a brief method of assessing

overall family functioning. The subscale consists of 12 questions rated on a 4-point scale ranging from 1 (strongly agree) to 4 (strongly disagree). An example item is: "In times of crisis we can turn to each other for support." Total mean scores were calculated (1-4), with higher scores indicating worse family functioning. A score of more than2 indicated problematic family functioning.[20,21] The FAD-GF has been shown to be reliable and valid.[22,23] Cronbach's alpha was 0.86 to 0.87 in the current study. Participants only completed the FAD-GF if they did not live alone. They were instructed to answer the questions with their own family in mind.

Independent

Self-efficacy was assessed at baseline with the abbreviated Dutch version of the Sherer's General Self Efficacy Scale (ALCOS-12).[9,24,25] The ALCOS-12 assesses the extent to which someone believes themselves to be able to cope with a variety of difficult situations and consists of 12 questions scored on a 5-point scale ranging from 1 (disagree) to 5 (agree). A total sum score was calculated (range, 12-60), with higher scores indicating higher self-efficacy. Scores were dichotomized in low (≤46) or high (≥47) self-efficacy groups based on a mean score of 46.3 found in a Dutch community study.[26] The ALCOS-12 showed good internal consistency among the elderly.[25] Cronbach's alpha was 0.75 to 0.80 in the current study.

Demographic and injury-specific information

Demographic information was assessed at baseline: sex (male, 0; female, 1), age (y), nationality (Dutch, 0; non-Dutch, 1), and education (low, 0; high, 1 [ie, bachelor degree or higher]). Significant others indicated their relationship with the pwSCI or pwABI (no partner (eg, child, parent, sibling, other family member, or friend, 0; partner, 1).

The cause of disability was assessed (traumatic, 0; nontraumatic, 1). For SCI, a trained physician determined the level (paraplegia vs tetraplegia) and completeness (A-D) according to the International Standards for the Neurological Classification of SCI.[27] For ABI, the location of injury was specified in the left, right, or both hemispheres, or the brainstem. In both SCI and ABI, independence in mobility (eg, sitting, standing) and self-care (eg, eating, dressing) was measured with the 14-item Physical Independence subscale of the Utrecht Scale for Evaluation of Rehabilitation (USER).[28] Items were scored on a 6-point scale (0-5). Higher total sum scores (range, 0-70) represented better physical independence. The USER is a valid, responsive, and reliable scale.[28]

Statistics

Dyads in which the ALCOS-12 and HADS or FAD-GF scores of both persons were available were included. Independent samples t tests and Pearson chi-square tests were conducted to investigate demographic and injury-specific differences between dropped and included dyads and between SCI and ABI. The HADS scores were transformed because of a positively skewed distribution (square root). Descriptive statistics (eg, means) report raw data, and statistical analyses were conducted on transformed data.

The dyads of pwSCI or pwABI and their significant others were divided into 4 groups based on the combinations of their self-efficacy scores (ALCOS-12) at admission: (1) both low self-efficacy (≤46), (2) pwSCI or pwABI low self-efficacy and the significant other high (≥47), (3) pwSCI or pwABI high self-efficacy and the significant other low, or (4) both high self-efficacy. Multivariate analyses of variance (MANOVA) were performed to test differences in HADS and FAD-GF scores 6 months after discharge between these 4 groups. Pillai's trace F-ratio was used to test the overall effect, and Tukey's honestly significant difference post hoc test was used to investigate group differences. Effect sizes of differences between groups were calculated by dividing the differences in means by the standard deviation of the total group. We used Cohen's standards to interpret the effect sizes (0.10 = weak, 0.30 = moderate, 0.50 = strong).[29] MANOVA analyses were repeated for both diagnosis groups (SCI and ABI) separately and for a selection including only dyads in which the significant other was the partner. Data were analyzed with IBM SPSS Statistics 25.[a] A significance level of P less than .05 (2-tailed) was used.

Results

Participants

Figure 1 shows a flowchart of the inclusion of dyads of pwSCI or pwABI and their significant others in the study. Of the 157 dyads that completed the last questionnaire, 155 completed the HADS and 130 completed the FAD-GF. The main reasons for exclusion were: expected stay in inpatient rehabilitation less than 4 weeks (26.0%), limited life expectancy (16.3%), no significant other (15.2%), or severe cognitive or intellectual problems (13.3%). The main reasons to decline participation were "no interest" (45.2%) or "too burdensome" (34.0%). Significant others of dyads included in the analyses were more often men, older, and more often a partner than significant others in dyads that dropped out during the study's follow-up period. PwSCI and pwABI included in the analyses reported higher physical independence and had ABI more often compared with those who dropped out during follow-up. Table 1 lists the demographic and injury-specific information of the included dyads. In half of the cases, the person with a disability had an SCI. The median number of weeks between onset of injury and completing the questionnaire was 5 weeks (for both diagnoses). Most significant others were partners (78.1%), followed by parents (9.3%), children (7.3%), and other family members or friends (5.3%).

Psychological distress, family functioning, and self-efficacy

Of all the pwSCI and pwABI, 34.4% demonstrated symptoms of anxiety and 34.4% demonstrated symptoms of depression 6 months after discharge. Among significant others, 39.6% demonstrated symptoms of anxiety and 34.9% demonstrated symptoms of depression. In total, 16.2% of the pwSCI and pwABI and 23.1% of their significant others reported problematic family functioning. In a minority of the dyads (n = 20; 12.9%), both persons reported low self-efficacy. In 67 (43.2%) dyads, both persons reported high self-efficacy. The percentages of pwSCI or pwABI and significant others per self-efficacy group who reported anxiety or depressive symptoms and problematic family functioning are shown in figures 2 to 4. Score distributions of the independent and dependent variables are shown in table 2.

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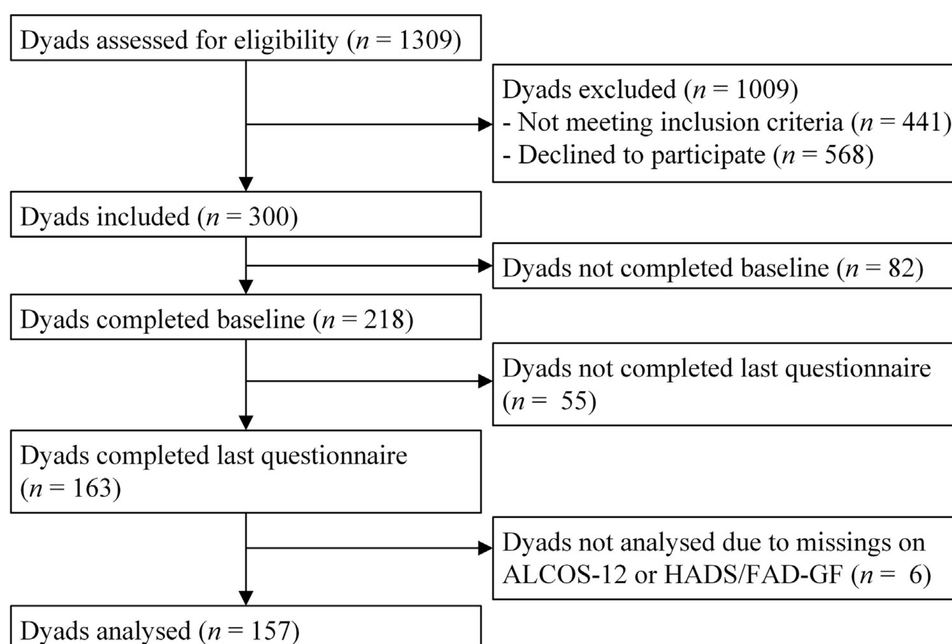

Fig 1 Flowchart inclusion of dyads with pwSCI or pwABI and their significant others.

Self-efficacy as predictor of psychological distress

Psychological distress scores of pwSCI or pwABI and significant others per self-efficacy group are shown in table 3. MANOVA analysis showed significant differences in psychological distress between the 4 self-efficacy groups ($V=0.12$; $F_{6,302}=2.8$; $P=.010$). Results of the post hoc tests investigating which self-efficacy groups differed from each other with the corresponding effect size are shown in table 3.

Repeating the MANOVA analysis in the 2 diagnostic groups separately showed no main effect of self-efficacy on psychological distress (SCI: $V=0.10$; $F_{6,150}=1.4$; $P=.236$; ABI: $V=0.11$; $F_{6,144}=1.4$; $P=.240$), which was also the case when including only dyads with partners ($V=0.10$; $F_{6,226}=2.1$; $P=.058$).

Self-efficacy as predictor of family functioning

Family functioning scores of pwSCI or pwABI and their significant others per self-efficacy group are shown in table 4. MANOVA analysis showed significant differences in family functioning between the 4 self-efficacy groups ($V=0.19$; $F_{6,252}=4.3$; $P<.001$). Results of the post hoc tests investigating which self-efficacy groups differed from each other with the corresponding effect sizes are shown in table 4.

Repeating the MANOVA analysis in the 2 diagnostic groups separately showed a main effect of self-efficacy on family functioning in the SCI-group ($V=0.31$ $F_{6,124}=3.8$, $P=.002$), but not in the ABI-subgroup ($V=0.15$; $F_{6,120}=1.6$, $P=.155$).

Repeating the MANOVA analysis including only dyads with partners showed a similar main effect of self-efficacy on family functioning ($V=0.22$; $F_{6,214}=4.3$; $P<.001$), as was found in the total group.

Discussion

In this study, it was hypothesized that the combination of levels of self-efficacy of pwSCI or pwABI and their significant others measured shortly after the start of inpatient rehabilitation predict personal and family adjustment of both 6 months after clinical discharge. MANOVA results showed a dyadic effect of self-efficacy in the prediction of later psychological distress and family functioning among pwSCI or pwABI and their significant others, supporting our hypothesis. To our knowledge, this is the first study in which the combination of levels of self-efficacy among affected persons and their significant others on adjustment outcomes was investigated.

Two previous reviews demonstrated that self-efficacy is an important predictor of personal adjustment among pwSCI and pwABI.[10,11] Our study adds the insight that there is a combined effect of self-efficacy of pwSCI or pwABI and that of their significant others on personal and family adjustment. These results emphasize the importance of focusing on both individuals in a dyad and to consider dyadic relationships.[8,30,31] Regarding family adjustment, post hoc tests showed that pwSCI or pwABI and their significant others in the low-self-efficacy dyads reported higher levels of problematic family functioning than those in the high-self-efficacy dyads. The effect sizes found were strong. Regarding personal adjustment, only 1 post hoc test showed significant differences in means between the groups. However, the apparently small differences in mean scores hide large differences in the percentages of individuals within the different self-efficacy groups reporting symptoms of psychological distress. These percentages were considerably higher in the low self-efficacy group compared with those in the high self-efficacy group. This appears to indicate that low self-efficacy dyads are more at risk for personal and family adjustment problems 6 months after discharge from inpatient rehabilitation.

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Table 1 Characteristics of pwSCI or pwABI and their significant others at the start of inpatient rehabilitation

Variables	Total (N=157)*		SCI (n=79)		ABI (n=78)	
pwSCI/pwABI	n	n (%) or Mean ± SD, Range	n	n (%) or Mean ± SD, Range	n	n (%) or Mean ± SD, Range
Sex (female)	157	66 (42.0)	79	28 (35.4)	78	38 (48.7)
Age, y	157	56.7±14.9, 18-87	79	55.0±16.8, 18-81	77	58.5±12.4, 29-87
Nationality (non-Dutch)	149	25 (16.4)	76	13 (16.5)	76	12 (15.8)
Education (high)†	151	58 (38.4)	75	25 (33.3)	76	33 (43.4)
Physical independence‡	150	36.8±18.9, 1-70	77	29.5±17.5, 1-70§	73	44.5±17.2, 5-70§
Cause of injury (non-traumatic)	157	107 (68.2)	79	39 (49.4) §	78	68 (87.2) §
AIS (SCI only)‖	—	—	A	9 (11.5)	—	—
	—	—	B	11 (13.9)	—	—
	—	—	C	16 (20.3)	—	—
	—	—	D	43 (54.4)	—	
Level/location	—	—	Paraplegia	35 (44.3)	Left	31 (39.7)
	—	—	Tetraplegia	44 (53.7)	Right	26 (33.3)
	—	—	—	—	Both sides	14 (17.9)
	—	—	—	—	Brainstem	3 (3.8)
	—	—	—	—	Unknown	4 (5.1)
Significant Other						
Sex (female)	157	98 (62.4)	79	55 (69.6)	78	43 (55.1)
Age, y	149	55.9±12.2, 25-82	77	56.4±13.1, 25-82	72	55.5±11.3, 27-75
Nationality (non-Dutch)	149	12 (8.1)	76	6 (7.6)	73	6 (8.2)
Education (high)	149	61 (40.9)	76	30 (39.5)	73	31 (42.5)
Partner of pwSCI/pwABI	151	118 (78.1)	77	58 (75.3)	74	60 (81.1)

Abbreviation: AIS, American Spinal Injury Association Impairment Scale.
* Total overall, N=157; personal adjustment (HADS), n=155; and family adjustment (FAD-GF), n=130.
† Finished bachelor degree or higher.
‡ Utrecht Scale for Evaluation of Rehabilitation (0-70).
§ Independent samples *t* test and Pearson χ^2 tests showed a difference in physical independence of the pwSCI and pwABI ($t(148)=-5.3$; $P<.001$) and cause of injury ($\chi^2(1)=22.8$; $P<.001$) between SCI and ABI.
‖ American Spinal Injury Association Impairment Scale: A, complete SCI; B, sensory incomplete; C, motor incomplete with less than half of key muscle functions below the single neurological level of injury having a muscle grade ≥ 3; D, motor incomplete with at least half of key muscle functions below the single neurological level of injury having a muscle grade ≥ 3.[27]

According to the theory of dyadic illness management, it was assumed that adjustment among pwSCI or pwABI and their significant others is the result of how they appraise and manage the illness together.[3] In theory, it is further described that factors at different levels (eg, individual, dyad, family/social, or cultural) within which the patient and care partner are situated may act as

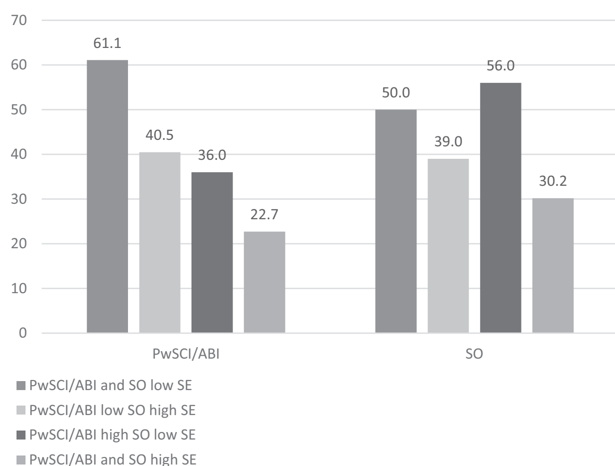

Fig 2 Symptoms of anxiety (%) among pwSCI or pwABI and their significant others at 6 months after discharge by self-efficacy group (n=155). Abbreviations: SE, self-efficacy; SO, significant other.

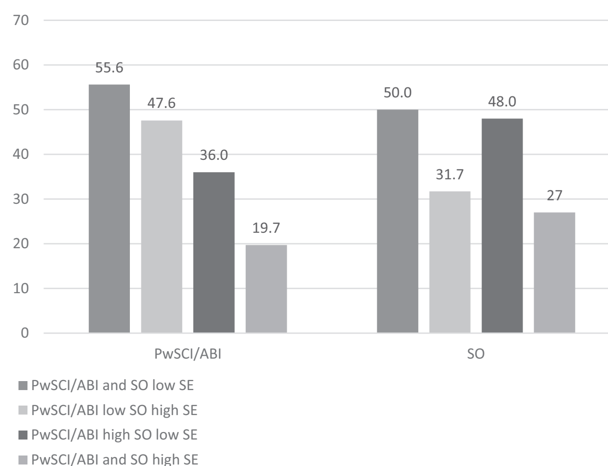

Fig 3 Symptoms of depression (%) among pwSCI or pwABI and their significant others at 6 months after discharge by self-efficacy group (n=155). Abbreviations: SE, self-efficacy; SO, significant other.

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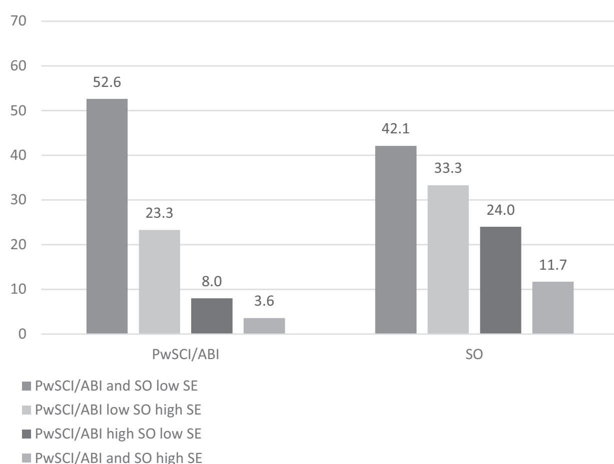

Fig 4 Problematic family functioning (%) among pwSCI or pwABI and their significant others at 6 months after discharge by self-efficacy group (n=130). Abbreviations: SE, self-efficacy; SO, significant other.

risk or protective factors in this dyadic interaction. Our study showed that low self-efficacy could be considered a risk factor at the personal level, which may influence adjustment outcomes among both individuals within a dyad. Theoretically, this effect of self-efficacy on adjustment is caused by the effect of self-efficacy on the dyadic interaction.

When focusing on diagnostic groups separately, or when only partners were included as significant others, significant effects of the combination of levels of self-efficacy scores were found on family adjustment in the SCI group and in the partner dyads. No significant effect of the combination of levels of self-efficacy scores on family adjustment was found in the ABI-group, nor in any of the subgroups regarding personal adjustment. However, patterns of absolute values (mean scores on the HADS and FAD-GF) in the subgroups were highly similar to the values in the total group. This may indicate that the absence of significant effects in the subgroups could probably be explained by the lower number of dyads in the subgroups. Future studies examining larger samples are needed to confirm this.

Study limitations

This study has some limitations. First, regarding the representativeness of our sample, we should note that excluding pwSCI and pwABI with an expected stay in inpatient rehabilitation of less than 4 weeks will have resulted in an overrepresentation of more severely affected pwSCI and pwABI, although the majority of the inpatient rehabilitation trajectories in the Netherlands take longer than 4 weeks.[32] On the other hand, pwSCI and pwABI with severe cognitive or intellectual problems or a limited life expectancy were excluded, which could result in the opposite effect. Furthermore, pwSCI and pwABI with a significant other were over-represented because participants were included as dyads, resulting in the exclusion of pwSCI and pwABI who did not have a significant other. Unfortunately, we do not have any information regarding the excluded dyads, which limits the possibilities to compare their characteristics with the characteristics of the included dyads. We have compared some basic baseline characteristics such as age, sex, and injury-specific information (completeness and level of injury [SCI], physical independence [ABI]) with the characteristics found in the general Dutch SCI and stroke population in an inpatient rehabilitation setting.[33,34] Based on these characteristics, our sample appears to be representative. Furthermore, the prevalence of symptoms of psychological distress found in the present study were highly comparable to results found in earlier research among pwSCI or pwABI and their significant others.[1,35,36] Mean scores of family functioning in the present study were slightly lower compared with the mean score found in a study among caregivers of pwABI in the chronic phase after onset, indicating better family functioning in our sample.[37] However, results of a recent study among pwABI and their partners during inpatient and outpatient rehabilitation were highly comparable to our results.[38] Secondly, no clear cutoff score exists for the ALCOS-12. We pragmatically based our cutoff score of 46 on the mean score of 46.3 found in a Dutch community study.[26] However, mean self-efficacy scores in the present study were slightly higher (48.1-49.6), indicating relatively high self-efficacy in our sample. Because combined self-efficacy was found to be a predictor of later adjustment, our results may underestimate adjustment problems. The relatively high self-efficacy scores could probably be explained by the relatively high educational level of our participants.[9] Third, we decided to use total HADS scores because we wanted to assess general psychological distress instead of anxiety and depression separately. However, because there are no clear cutoff scores for the total scale, we decided to use subscale cutoff scores in the calculation of percentages.[18] Repeating the MANOVA analyses with the anxiety and depression subscales separately, however, revealed the same results as with the total scale. Fourth, participants answered the FAD-GF for their own family. So,

Table 2 Scores and differences in self-efficacy (at the start of inpatient rehabilitation), psychological distress, and family functioning (at 6mo after discharge)

		pwSCI/pwABI	Significant Others
Variable (Range of Scores)	n	Mean ± SD	Mean ± SD
Total group (N=157)			
Self-efficacy (12-60)*	157	48.1±8.1	49.6±6.6
Psychological distress (0-42)†	155	11.6±7.4	10.1±7.2
Family functioning (1-4)‡	130	1.6 ±0.4	1.7±0.5
SCI (n=79)			
Self-efficacy (12-60)*	79	49.1±7.9	48.8±6.6
Psychological distress (0-42)†	79	11.2±7.6	11.4±7.0
Family functioning (1-4)‡	66	1.7±0.4	1.7±0.4
ABI (n=78)			
Self-efficacy (12-60)*	78	47.1±8.3	50.3±6.6
Psychological distress (0-42)†	76	11.9±7.3	8.7±7.3
Family functioning (1-4)‡	64	1.6±0.4	1.7±0.5

* Higher scores indicate higher self-efficacy.
† Higher scores indicate higher psychological distress.
‡ Higher scores indicate worse family functioning.

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Table 3 Psychological distress among pwSCI or pwABI and their significant others at 6 months after discharge based on self-efficacy level at the start of inpatient rehabilitation

Self-Efficacy			Psychological Distress	
pwSCI/pwABI	Significant Other	n (Total n=155)	pwSCI/pwABI	Significant Other
			Mean ± SD	Mean ± SD
Low	Low	20	14.1±7.4	14.5*±8.5
	High	43	12.9±7.5	8.8*±6.9
High	Low	25	12.2±7.3	10.1±6.6
	High	67	9.7±7.1	9.6±7.0

* Indicates significant difference based on Tukey's honestly significant difference post hoc test, effect size=0.79.

Table 4 Problematic family functioning among pwSCI or pwABI and their significant others at 6 months after discharge based on self-efficacy level at the start of inpatient rehabilitation (n=130)

Self-Efficacy			Problematic Family Functioning	
pwSCI/pwABI	Significant Other	n (Total n=130)	pwSCI/pwABI	Significant Other
			Mean ± SD	Mean ± SD
Low	Low	19	1.9*,†±0.5	1.9‡±0.5
	High	30	1.8§±0.4	1.8±0.4
High	Low	25	1.6†±0.4	1.7±0.5
	High	56	1.5*,§±0.4	1.6‡±0.4

NOTE. Significant differences were based on Tukey's honestly significant difference post hoc tests between the groups marked with symbols. The effect sizes were as follows:
* 1.00.
† 0.75.
‡ 0.60.
§ 0.75.

although exceptional, it was possible that individuals within a dyad answered the questions for different families (eg, when the significant other was a friend). Fifth, despite the longitudinal study design, we were not able to rule out confounding or reverse causation. When a certain variable has impact on the dependent and independent variable, this may disrupt study results (ie, confounding). We believe confounding is not likely in our study, because self-efficacy is assumed to be a highly stable characteristic which is not or hardly subjected to the influence of confounders.[39,40] For that reason, reverse causation also appears to be unlikely. Lastly, we are not able to present figures on the psychological care received by pwSCI or pwABI and their significant others because we have not monitored the specific services received by our participants during inpatient and outpatient rehabilitation. In general, pwSCI and pwABI in our study received regular care, which includes psychological assessment and intervention by psychologists (if needed) during inpatient rehabilitation and sometimes also during outpatient rehabilitation. Significant others are usually in contact with social work and only occasionally receive psychological support.

Implications

The main clinical message for healthcare professionals is to recognize the interdependence between pwSCI or pwABI and their significant others.[8] Therefore, in addition to individual attention for pwSCI and pwABI, attention is also required for the dyadic relationships, eg, by introducing a joint anamnesis. Furthermore, because our results indicate that combined self-efficacy scores shortly after the start of inpatient appear to predict later personal and family adjustment, it is advised to implement screening for low self-efficacy of both pwSCI or pwABI and their significant others, for example, by administering a short self-report questionnaire, which is a relatively easy and inexpensive way to quickly assess self-efficacy. Screening may help healthcare professionals to identify and support families that are more at risk at an early stage, which may help to prevent later adjustment problems and related costs. Using the ALCOS-12 as screening tool appears useful, but other measures of self-efficacy are available, and more knowledge is desirable about clear cutoff scores.[10,26]

Research giving more attention for dyadic relationships between people is desirable to obtain more insight into how people interact and influence each other.[31] This information may also help to give direction to the development of family-based interventions, which take the interdependence of individuals into account. Effective family-centered interventions are still limited.[41,42]

Conclusions

There is a dyadic relationship between the self-efficacy of pwSCI or pwABI and that of their significant others at the start of inpatient rehabilitation and personal and family adjustment 6 months after discharge. Low self-efficacy appears to be a risk factor for adjustment problems. It is important to identify and support individuals for whom it is difficult to adjust to changed conditions as a result of disease with a chronic impact.

Keywords

Brain injuries; Mental health; Rehabilitation; Self efficacy; Spinal cord injuries

Corresponding author

Marcel W.M. Post, PhD, De Hoogstraat Rehabilitation, Rembrandtkade 10, 3583 TM, Utrecht, The Netherlands. *E-mail address:* m.post@dehoogstraat.nl.

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The members of the POWER Group are: Rehabilitation Center Adelante: C.C.M. van Laake - Geelen; Rehabilitation Center De Hoogstraat: J. Stolwijk, C.A. Dijkstra, E. Agterhof; Rehabilitation Center Heliomare: D. Gobets; Rehabilitation Center Het Roessingh:

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Supplier

a. SPSS; IBM Corporation.

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