

Is the effect of coping styles disease specific?

Citation for published version (APA):

Brands, I., Bol, Y., Stapert, S., Köhler, S., & van Heugten, C. (2018). Is the effect of coping styles disease specific? relationships with emotional distress and quality of life in acquired brain injury and multiple sclerosis. *Clinical Rehabilitation*, 32(1), 116-126. <https://doi.org/10.1177/0269215517718367>

Document status and date:

Published: 01/01/2018

DOI:

[10.1177/0269215517718367](https://doi.org/10.1177/0269215517718367)

Document Version:

Publisher's PDF, also known as Version of record

Document license:

Taverne

Please check the document version of this publication:

- A submitted manuscript is the version of the article upon submission and before peer-review. There can be important differences between the submitted version and the official published version of record. People interested in the research are advised to contact the author for the final version of the publication, or visit the DOI to the publisher's website.
- The final author version and the galley proof are versions of the publication after peer review.
- The final published version features the final layout of the paper including the volume, issue and page numbers.

[Link to publication](#)

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal.

If the publication is distributed under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license above, please follow below link for the End User Agreement:

www.umlib.nl/taverne-license

Take down policy

If you believe that this document breaches copyright please contact us at:

repository@maastrichtuniversity.nl

providing details and we will investigate your claim.

Is the effect of coping styles disease specific? Relationships with emotional distress and quality of life in acquired brain injury and multiple sclerosis

Clinical Rehabilitation
2018, Vol. 32(1) 116–126
© The Author(s) 2017
Reprints and permissions:
sagepub.co.uk/journalsPermissions.nav
DOI: 10.1177/0269215517718367
journals.sagepub.com/home/cre



Ingrid Brands¹, Yvonne Bol², Sven Stapert^{2,3},
Sebastian Köhler⁴ and Caroline van Heugten^{3,4}

Abstract

Objective: To investigate the use of coping styles and the relationships linking coping to emotional distress and quality of life in patients with acquired brain injury and multiple sclerosis.

Method: Cross-sectional cohort study of 143 patients with acquired brain injury and 310 patients with multiple sclerosis in the chronic stage. Quality of life was measured with the Life Satisfaction Questionnaire (LiSat-9), coping styles with the Coping Inventory for Stressful Situations (CISS-T, task-oriented; CISS-E, emotion-oriented; CISS-A, avoidance), emotional distress with the Hospital Anxiety and Depression Scale (HADS).

Results: Coping styles did not differ between types of multiple sclerosis and varied only little with regard to severity of disease. In both patient groups, task-oriented coping was most used followed by avoidance and emotion-oriented coping. Patients with multiple sclerosis used all styles to a greater extent. In acquired brain injury, lower CISS-E and lower HADS scores were associated with higher LiSat-9 scores. CISS-E had a direct effect on LiSat-9 and an indirect effect via HADS. In multiple sclerosis, next to lower CISS-E and lower HADS scores, higher CISS-A scores were also associated with higher LiSat-9 scores. CISS-E had an indirect effect and CISS-A had a direct and indirect effect on LiSat-9.

Conclusion: In both patient groups, coping patterns are similar, and emotion-oriented coping negatively influences quality of life. Additionally, in multiple sclerosis, seeking emotional support and distraction (CISS-A) was positively associated with quality of life. Interventions to improve adaptive coping could be organized within a neurorehabilitation setting for both patient groups together.

¹Department of Neurorehabilitation, Libra Rehabilitation Medicine and Audiology, Eindhoven, The Netherlands

²Department of Clinical and Medical Psychology, Academic MS Center Limburg, Zuyderland Medical Center, Sittard-Geleen, The Netherlands

³Department of Neuropsychology and Psychopharmacology, Faculty of Psychology and Neuroscience, Maastricht University, Maastricht, The Netherlands

⁴School for Mental Health and Neuroscience, Alzheimer Centre Limburg, Faculty of Health, Medicine and Life Sciences, Maastricht University, Maastricht, The Netherlands

Corresponding author:

Ingrid Brands, Department of Neurorehabilitation, Libra Rehabilitation Medicine and Audiology, P.O. Box 1355, 5602 BJ Eindhoven, The Netherlands.
Email: i.brands@libranet.nl

Keywords

Coping style, quality of life, emotional distress, multiple sclerosis, brain injury

Received: 18 January 2017; accepted 7 June 2017

Introduction

Coping, the cognitive and behavioural efforts to manage stressful situations,¹ plays an important role in adaptation to sudden or progressive onset of disability.² In neurorehabilitation, acquired brain injury and multiple sclerosis are highly prevalent conditions. Given their similarity in symptomatology, the question arises whether coping is different according to the mode of onset of disability. Moreover, coping is considered to be, at least in part, a trait-like phenomenon which means that people prefer certain coping styles over others regardless of contextual factors.³ Some studies comparing the use of coping styles between diseases with both a progressive and non-progressive course and between diseases characterized by uncertainty have reported differences in preferred coping styles,⁴ whereas others did not.^{5–7}

In acquired brain injury, a large body of evidence is available showing that the use of passive, escape-avoidant and emotion-oriented coping styles is associated with worse quality of life and more symptoms of emotional distress.^{8–13} Injury-related factors such as type of brain injury, severity of neurological symptoms and impairment have not been related to choice of coping styles.^{6,8}

In patients with multiple sclerosis, emotion-focused coping styles such as wishful thinking, avoidance and denying have been consistently associated with poor psychological adjustment and lower quality of life.^{14–17} While illness duration did not determine quality of life¹⁸ or choice of coping styles,^{4,15,18} higher levels of physical disability have been related to worse psychosocial adjustment and quality of life.^{19,20} Whether level of physical disability and type of multiple sclerosis are of influence on choice of coping styles remains unclear with conflicting findings.^{15,21–23}

So, the aims of this study were as follows: (1) to examine whether the preference of coping styles

differs (a) between type and severity of multiple sclerosis (this is already shown for acquired brain injury, see above) and (b) between patients with acquired brain injury and multiple sclerosis and (2) to explore interrelations between coping, emotional distress and quality of life in patients with acquired brain injury and in patients with multiple sclerosis.

Methods

Patients

We used two separate historical data sets: a longitudinal cohort study on factors influencing the adaptation process following acquired brain injury^{13,24} including coping, emotional distress and quality of life and a cross-sectional study examining the influence of different coping styles on several complaints and quality of life in patients with multiple sclerosis.²⁵

Patients with acquired brain injury were recruited by rehabilitation physicians and neurologists from two rehabilitation centres and two hospitals in the South of the Netherlands between January 2011 and January 2012. Inclusion criteria were as follows: (1) age ≥ 18 years; (2) newly acquired, non-progressive brain injury of any aetiology confirmed by neurological and/or neuroimaging data; and (3) for patients recruited at the start of outpatient rehabilitation, maximum time since injury was four months. Exclusion criteria were as follows: (1) any premorbid progressive brain disease, (2) insufficient command of the Dutch language, and (3) inability to complete questionnaires based on clinical judgement (aphasia, severe cognitive impairment).

Patients with multiple sclerosis were recruited from the department of Neurology/Academic MS

Centre Limburg of the Zuyderland Medical Centre in Sittard-Geleen by their neurologist from January to December 2011. Inclusion criteria were as follows: (1) age between 18 and 65 years and (2) diagnosed with clinical definite multiple sclerosis (regardless of time since diagnosis). Exclusion criteria were as follows: (1) insufficient command of the Dutch language and (2) inability to complete questionnaires based on clinical judgement (aphasia, severe cognitive impairment).

The medical ethics committees of Maastricht University Medical Centre and Zuyderland-Zuyd and all participating hospitals and rehabilitation centres approved this study. All patients gave written informed consent.

Measures

Coping styles were measured using the Dutch version of the Coping Inventory for Stressful Situations.^{26,27} This 48-item questionnaire has three scales: task-oriented, emotion-oriented and avoidance. The avoidance scale contains two subscales: social diversion and distraction. Item scores (1 = not at all to 5 = very much) are summed per scale; higher scores indicate a greater use of that particular coping style. We previously showed that the Coping Inventory for Stressful Situations has good psychometric properties for use in patients with acquired brain injury.²⁸ As our confirmatory factor analysis showed a three-factor structure (task-oriented, emotion-oriented and avoidance), we did not use the avoidance subscales.²⁸ We found good internal reliability (Cronbach's α acquired brain injury/multiple sclerosis: $T = .91/.86$, $E = .90/.89$, $A = .89/.85$).

The Dutch nine-item Life Satisfaction Questionnaire was used as a generic instrument for measuring *quality of life*.^{29,30} The mean of all item scores (1 = very unsatisfactory to 6 = very satisfactory) is calculated. Higher scores indicate a better general quality of life. We found good internal reliability (Cronbach's α acquired brain injury/multiple sclerosis: $.84/.81$).

The Dutch Hospital Anxiety and Depression Scale was used as a general measure of *emotional distress* and contains two subscales: anxiety and depression.^{31,32} Subscale scores ≥ 8 might indicate

the presence of a depressive disorder or a generalized anxiety disorder.³¹ Reliability and validity are adequate for several clinical populations, including multiple sclerosis and acquired brain injury.^{33,34} We found good internal reliability (Cronbach's α acquired brain injury/multiple sclerosis: anxiety = $.86/.84$, depression = $.86/.81$).

Data on age, sex, type of multiple sclerosis or acquired brain injury, illness duration (defined as time since diagnosis), educational level and recent (less than three months) Expanded Disability Status Scale³⁵ scores measuring disease severity in multiple sclerosis were extracted from the medical files. Level of educational attainment was classified according to a three-level system often used in the Netherlands: primary education (low), junior vocational training (medium) and senior vocational or academic training (high), corresponding to 8.6 ± 1.9 , 11.4 ± 2.5 , and 15.2 ± 3.3 years of full-time education, respectively.³⁶

Procedure

In the acquired brain injury, longitudinal cohort study patients were measured at two points in time: at discharge home from hospital or inpatient neurorehabilitation and one year later.¹³ For this study, we used the one-year follow-up data. Patients had a telephone interview with the first author or research assistant to identify the three most stressful situations that they had encountered as a consequence of their brain injury during the previous two weeks. For each of the three stressful situations, a separate coping questionnaire (Coping Inventory for Stressful Situations) was prepared in which the instruction for completion was made specific: 'How much do you engage in these types of activities when you are confronted with ... (one of three situations)'. After the interview, each patient received three situation-specific coping questionnaires by post along with the Hospital Anxiety and Depression Scale and Life Satisfaction Questionnaire to complete via self-report. If a participant requested a live interview or asked for assistance to complete the questionnaires, a face-to-face appointment with the first author or research assistant was arranged ($n = 26$ (18%)).

In the multiple sclerosis cross-sectional cohort study, after consent, patients received all questionnaires by post to complete via self-report. The standard instruction for the Coping Inventory for Stressful Situations was used: 'How much do you engage in these types of activities when you are confronted with a difficult, stressful or upsetting situation'. No face-to-face appointments were arranged.

Data analysis

For patients with acquired brain injury, the Coping Inventory for Stressful Situations completed for the first stressful situation was used in all analyses reported in this article. The results for the second and third situations (collected for a different research purpose) were not included to avoid problems of intra-person correlation.

One-way analysis of variance (ANOVA) was used to answer our question about differences in coping style between the three types of multiple sclerosis and between levels of severity. Therefore, severity of multiple sclerosis was classified into three categories:²³ Expanded Disability Status Scale ≤ 2.5 , 3.0–6.0 and ≥ 6.5 . Spearman's correlations were also used to investigate the relationship between coping styles and severity scores. Using independent sample *t* tests, we compared the Coping Inventory for Stressful Situations scale scores of patients with acquired brain injury and multiple sclerosis and the scores of each patient group with a Dutch norm group of 683 working adults.²⁷ Likewise, differences in scores on the Hospital Anxiety and Depression Scale, the Life Satisfaction Questionnaire and the Coping Inventory for Stressful Situations scales between patients with acquired brain injury and multiple sclerosis were calculated.

To answer our question about the relationships between coping style and emotional distress and their relationship to quality of life for each patient group, we first selected the variables (illness duration, Hospital Anxiety and Depression Scale scores, task-oriented coping, emotion-oriented coping, avoidance coping and Expanded Disability Status Scale scores (only for multiple sclerosis)) that had an independent effect on quality of life. Then, we conducted five hierarchical multiple regression analyses for each patient group separately. After entering

demographic variables, these variables were tested separately and those showing associations at a $P < .10$ were retained. Next, we tested whether Hospital Anxiety and Depression Scale scores mediated the relationship between the three coping styles and quality of life using structural equation modelling. All demographic and retained variables were included in the structural equation model. A maximum likelihood estimator was used. The final model was determined by removing the variables from the full multivariable structural equation model that did not show a significant total effect on quality of life at a $P < .05$ (backward selection). Standardized total effects, as well as direct and indirect paths, were examined. Evidence for mediation was indicated by a significant indirect pathway between coping style and quality of life. All analyses were carried out in Stata 12.1 (StataCorp, Texas, USA) and SPSS version 23 (IBMCorp, New York, USA), using two-sided hypothesis testing with an alpha level of .05.

Results

Initially, 190 patients with acquired brain injury were approached, 37 refused to participate. Of the 153 patients willing to participate, 5 patients did not meet the inclusion criteria. Ultimately, 143 patients with acquired brain injury participated in the follow-up assessment. Too much burden was the reason for all drop-outs.

A total of 621 patients with multiple sclerosis were initially approached; of the 403 patients who consented, 310 completed the assessment. Reasons for drop-out were not recorded.

Table 1 shows the demographic and disease-related characteristics of both groups. In Table 2, descriptive statistics of quality of life and emotional distress are provided. Depression subscale scores of the Hospital Anxiety and Depression Scale were above cut-off indicative for a depressive disorder in 28.7% ($n=41$) of patients with acquired brain injury and in 33.7% ($n=104$) of patients with multiple sclerosis. For the anxiety subscale of the Hospital Anxiety and Depression Scale, 30.8% ($n=44$) patients with acquired brain injury and 42.5% ($n=130$) patients with multiple sclerosis scored above the cut-off indicative for a generalized anxiety disorder.

Table 1. Patient characteristics (ABI: $n = 143$; MS: $n = 310$).

| | | ABI | | | MS | | |
|---------------------------------------------|--------------------------|----------|------|-----------|----------|------|----------|
| | | Mean | SD | Range | Mean | SD | Range |
| Age (years) | | 56 | 12.4 | 19–84 | 49 | 10.3 | 20–66 |
| Illness duration (ABI: weeks, MS: years) | | 63.8 | 9.2 | 44.1–94.1 | 9.5 | 7.4 | 0.1–36.0 |
| EDSS | | | | | 3.7 | 1.9 | 0.5–8 |
| | | <i>n</i> | % | | <i>n</i> | % | |
| Sex (male) | Male | 91 | 63.6 | | 82 | 26.4 | |
| | Female | 52 | 36.4 | | 228 | 73.6 | |
| Educational level | Low | 40 | 28.0 | | 77 | 24.9 | |
| | Medium | 59 | 41.2 | | 109 | 35.3 | |
| | High | 44 | 30.8 | | 123 | 39.8 | |
| Type | Infarction | 97 | 67.8 | | | | |
| | SAH | 10 | 7.0 | | | | |
| | ICH | 9 | 6.3 | | | | |
| | Diffuse vascular lesions | 2 | 1.4 | | | | |
| | TBI | 12 | 8.4 | | | | |
| | Anoxic encephalopathy | 3 | 2.1 | | | | |
| | Tumour benign | 4 | 2.8 | | | | |
| | Meningitis/encephalitis | 1 | 0.7 | | | | |
| | Other | 5 | 3.5 | | | | |
| | Relapsing remitting | | | | 209 | 67.9 | |
| | Primary progressive | | | | 31 | 10.0 | |
| Secondary progressive | | | | 68 | 22.1 | | |

Abbreviations: ABI: acquired brain injury; MS: multiple sclerosis; EDSS: Expanded Disability Status Scale; SAH: subarachnoid haemorrhage; ICH: intracerebral haemorrhage; TBI: traumatic brain injury.

Table 2. Descriptive data of quality of life (LiSat-9) and emotional distress (HADS).

| | ABI | | MS | | MS vs. ABI |
|---------|------|------|------|------|-----------------|
| | Mean | SD | Mean | SD | <i>P</i> -value |
| LiSat-9 | 4.54 | 0.85 | 4.31 | 0.86 | .008 |
| HADS-A | 5.5 | 3.9 | 6.7 | 4.4 | .004 |
| HADS-D | 5.3 | 4.4 | 6.0 | 4.0 | .087 |
| HADS | 10.8 | 7.7 | 12.7 | 7.4 | .009 |

Abbreviations: ABI: acquired brain injury; MS: multiple sclerosis; LiSat-9: Life Satisfaction Questionnaire; HADS: Hospital Anxiety and Depression Scale; HADS-A: anxiety subscale; HADS-D: depression subscale.

Use of coping styles in acquired brain injury and multiple sclerosis

Table 3 gives an overview of the differences in coping styles between the different types of multiple sclerosis and categories of severity. In Table 4,

differences between multiple sclerosis and acquired brain injury and the comparison with a norm group of working adults²⁷ are displayed.

No difference in coping style was found according to the type of multiple sclerosis. Higher severity scores were only very weakly associated with

Table 3. Relations between coping styles and type of multiple sclerosis and EDSS score.

| | RRMS | | PPMS | | SPMS | | P ANOVA |
|--------|------|------|------|------|------|------|---------|
| | Mean | SD | Mean | SD | Mean | SD | |
| CISS-T | 56.0 | 9.9 | 54.0 | 9.3 | 55.7 | 13.0 | ns |
| CISS-E | 38.7 | 12.0 | 37.0 | 10.7 | 39.6 | 13.4 | ns |
| CISS-A | 46.0 | 10.8 | 42.1 | 11.9 | 45.0 | 13.3 | ns |

| | EDSS ≤ 2.5 | | EDSS = 3.0–6.0 | | EDSS ≥ 6.5 | | P ANOVA |
|--------|-------------------|------|-------------------|------|-------------------|------|---------|
| | Mean | SD | Mean | SD | Mean | SD | |
| CISS-T | 56.7 | 8.7 | 55.5 | 11.3 | 52.5 | 13.5 | ns |
| CISS-E | 36.5 ^a | 11.8 | 39.6 | 12.0 | 42.0 ^a | 14.0 | .04 |
| CISS-A | 47.4 ^a | 9.9 | 43.4 ^a | 11.3 | 45.0 | 11.4 | .03 |

Abbreviations: EDSS: Expanded Disability Status Scale; RRMS: relapsing–remitting multiple sclerosis; PPMS: primary-progressive multiple sclerosis; SPMS: secondary-progressive multiple sclerosis; CISS-T: Coping Inventory for Stressful Situations task-oriented scale; CISS-E: Coping Inventory for Stressful Situations emotion-oriented scale; CISS-A: Coping Inventory for Stressful Situations avoidance scale; ANOVA: analysis of variance.

^aComparison of these values significantly differs.

Table 4. Descriptive data of coping (CISS).

| | ABI | | MS | | ABI vs. MS | | Norm | | Norm vs. ABI | | Norm vs. MS | |
|--------|------|------|------|------|------------|------|-------|-------|--------------|------|-------------|------|
| | Mean | SD | Mean | SD | P-value | d | Mean | SD | P-value | d | P-value | d |
| CISS-T | 49.3 | 12.4 | 55.6 | 10.7 | <.001 | 0.54 | 60.31 | 8.65 | <.001 | 1.03 | <.001 | 0.48 |
| CISS-E | 33.6 | 11.7 | 38.7 | 12.2 | <.001 | 0.43 | 38.29 | 10.52 | <.001 | 0.42 | .61 | |
| CISS-A | 41.1 | 12.1 | 45.3 | 11.6 | <.001 | 0.35 | 45.16 | 10.11 | <.001 | 0.35 | .85 | |

Abbreviations: ABI: acquired brain injury; MS: multiple sclerosis; Norm: Dutch norm group of working adults;²⁷ d: effect size (Cohen's d); CISS: Coping Inventory for Stressful Situations; CISS-T: Coping Inventory for Stressful Situations task-oriented scale; CISS-E: Coping Inventory for Stressful Situations emotion-oriented scale; CISS-A: Coping Inventory for Stressful Situations avoidance scale.

higher emotion-oriented coping scores ($r=.14$, $P=.03$) and lower avoidance coping scores ($r=-.18$, $P=.003$). No significant correlation was found with task-oriented coping scores. The high severity category used significantly more emotion-oriented coping compared with the low severity category. The mid severity category used significantly less avoidance coping than the low severity category. Patients with acquired brain injury made significantly less use of all coping styles compared with both multiple sclerosis patients and the Dutch norm group of working adults.²⁷ Patients with multiple sclerosis only made less use of task-oriented coping strategies compared with the Dutch norm group of working adults.²⁷

The relationship between coping, emotional distress and quality of life in acquired brain injury

In the selection of variables, illness duration, task-oriented coping and avoidance coping scores showed non-significant associations with quality of life scores when tested separately. So, only emotion-oriented coping scores and Hospital Anxiety and Depression Scale scores were entered into the structural equation model. In Figure 1, the final structural equation model obtained for patients with acquired brain injury is shown. By combining the estimates of direct and indirect pathways in the final model, the total effect of each variable on

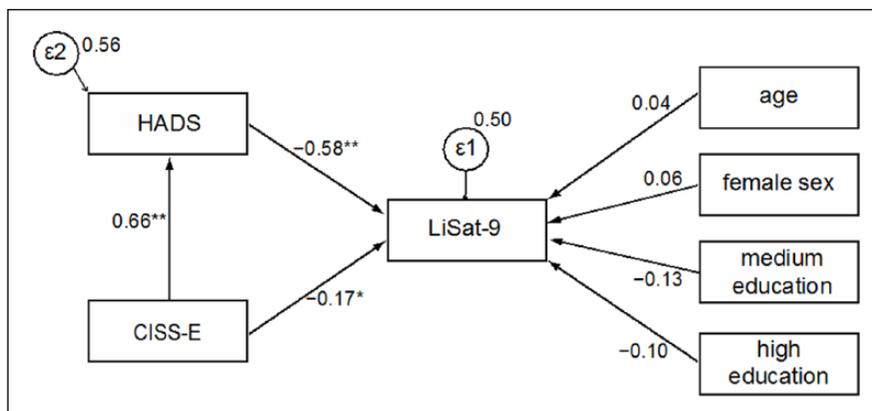


Figure 1. Structural equation model of direct and indirect effects of coping and emotional distress on quality of life in acquired brain injury: final reduced model showing standardized regression coefficients for direct paths. ϵ : error variance; HADS: Hospital Anxiety and Depression Scale; LiSat-9: Life Satisfaction Questionnaire; CISS-E: Coping Inventory for Stressful Situations emotion-oriented scale. * $P < .05$; ** $P \leq .001$.

quality of life was calculated, revealing significant total effects for Hospital Anxiety and Depression Scale scores ($\beta = -.58$, $P < .001$) and emotion-oriented coping scores ($\beta = -.55$, $P < .001$). Testing for effect mediation showed that emotion-oriented coping scores had a direct effect on quality-of-life scores ($\beta = -.17$, $P = .04$) as well as an indirect (mediated) effect via its association with Hospital Anxiety and Depression Scale scores ($\beta = -.38$, $P < .001$). Emotion-oriented coping and Hospital Anxiety and Depression Scale scores, together with the demographic variables accounted for 50% of explained variance in quality-of-life scores (Figure 1).

The relationship between coping, emotional distress and quality of life in multiple sclerosis

In the selection of variables, only illness duration showed a non-significant association with quality-of-life scores when tested separately and therefore was the only variable not included in the structural equation model. Next, to obtain the most parsimonious model, task-oriented coping was removed because of its non-significant total effect on quality-of-life scores. Figure 2 displays the final, most parsimonious structural equation model for patients

with multiple sclerosis. By combining the estimates of direct and indirect pathways, the final model showed significant total effects for Expanded Disability Status Scale scores ($\beta = -.33$, $P < .001$), Hospital Anxiety and Depression Scale scores ($\beta = -.38$, $P < .001$), emotion-oriented coping scores ($\beta = -.28$, $P < .001$) and avoidance coping scores ($\beta = .26$, $P < .001$) on quality-of-life scores. Testing for effect mediation revealed that avoidance coping scores had both a direct effect on quality-of-life scores ($\beta = .18$, $P = .001$) and an indirect (mediated) effect via its association with Hospital Anxiety and Depression Scale scores ($\beta = .08$, $P = .001$). In contrast, emotion-oriented coping scores only had an indirect (mediated) effect on quality-of-life scores via its association with Hospital Anxiety and Depression Scale scores ($\beta = -.24$, $P < .001$) (Figure 2).

Emotion-oriented coping, avoidance coping, Hospital Anxiety and Depression Scale scores, together with the demographic variables accounted for 25% of explained variance in quality-of-life scores.

Discussion

We studied the associations between coping styles, emotional distress and demographics with quality

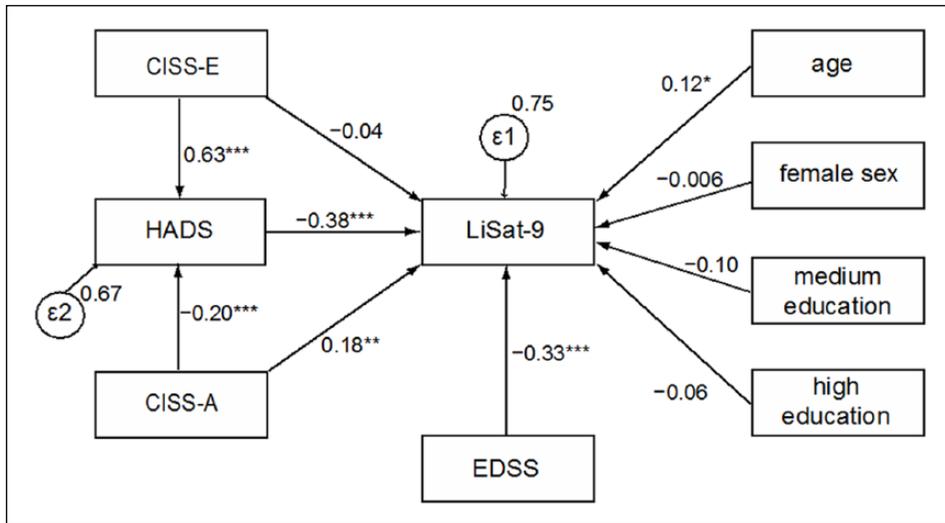


Figure 2. Structural equation model of direct and indirect effects of coping and emotional distress on quality of life in multiple sclerosis: final reduced model showing standardized regression coefficients for direct paths. ϵ : error variance; HADS: Hospital Anxiety and Depression Scale; LiSat-9: Life Satisfaction Questionnaire; CISS-E: Coping Inventory for Stressful Situations emotion-oriented scale; CISS-A: Coping Inventory for Stressful Situations avoidance scale. * $P < .05$; ** $P = .001$; *** $P < .001$.

of life in two clinical cohorts of patients with multiple sclerosis or acquired brain injury. Results showed that less reliance on emotion-oriented coping was associated with higher quality of life in acquired brain injury and multiple sclerosis. Further testing showed that this was predominantly due to the fact that these patients also experienced lower levels of emotional distress, which in turn was strongly related to quality of life. In addition, in patients with multiple sclerosis, greater reliance on avoidance coping also contributed to lower levels of emotional distress and higher quality of life. Coping styles did not differ between the patients with relapsing–remitting, primary–progressive, and secondary–progressive forms of multiple sclerosis. Coping styles varied very little with regard to severity of disease in patients with multiple sclerosis. Patients with acquired brain injury made less use of all types of coping strategies and reported higher quality of life and less emotional distress than patients with multiple sclerosis.

The present findings are generally in accordance with previous research in both multiple sclerosis and acquired brain injury showing that a greater

reliance on emotion-focused coping strategies is related to poor psychosocial adjustment, depression and anxiety.^{8,37–40} Interestingly, however, we found that patients with multiple sclerosis who make more use of avoidance coping experienced lower levels of emotional distress and higher quality of life. At first glance, these findings appear contradictory. Yet, avoidance measured with the Coping Inventory for Stressful Situations refers to actively seeking social support and distraction, whereas in most other coping questionnaires, avoidance is associated with a passive, non-productive attitude. In that sense, our findings are in line with a study by Mikula et al.⁴¹ showing that problem-focused coping as well as coping focusing on getting emotional support and stopping unpleasant thoughts contribute to successful adaptation in multiple sclerosis. Since there was no such association in acquired brain injury, one could hypothesize that this particular strategy is of importance to face illness uncertainty. Many studies have shown that illness uncertainty is associated with worse adjustment and depressive symptoms in multiple sclerosis.⁴² Also, in our study, patients with multiple sclerosis

displayed lower quality of life than those with acquired brain injury.

Furthermore, patients with multiple sclerosis and acquired brain injury showed a similar coping pattern. Task-oriented coping was most used followed by avoidance coping and least used was emotion-oriented coping. The only difference is that patients with acquired brain injury use all coping styles to a lesser extent.

In line with previous studies, the influence of type and severity of multiple sclerosis on coping was limited.^{15,22} However, Montel and Bungener²¹ found that patients with secondary-progressive multiple sclerosis used more emotion-focused strategies, whereas patients with primary-progressive multiple sclerosis used more problem-focused strategies. Furthermore, Rommer et al.²³ showed that patients with a medium level of disability were using both emotion-focused and problem-focused coping strategies more extensively than the lesser or stronger impaired patients.

With regard to clinical practice, we think that systematic screening of coping styles might be helpful to identify patients at risk for worse outcome. Because we found more similarities than differences, we suggest that interventions to promote coping can be organized for both patient groups together within a neurorehabilitation setting. Both groups will benefit from therapeutic attempts to minimize the use of emotion-oriented coping. Moreover, especially in multiple sclerosis patients, it seems of importance to stimulate a broad spectrum of coping strategies directed towards actively seeking support and distraction. Cognitive behavioural therapy has shown to be effective in increasing the ability to implement adaptive coping strategies and reduce emotional distress.⁴³⁻⁴⁶

Some limitations of our study have to be acknowledged. Our acquired brain injury and multiple sclerosis study sample showed a large difference in illness duration, which could be of influence in choice of coping responses. Yet, we corrected for illness duration in our analyses. Coping was measured with the Coping Inventory for Stressful Situations in both samples, but we used a situation-specific instruction in acquired brain injury versus

the general instruction in multiple sclerosis. Because coping styles did not vary significantly across situations in patients with acquired brain injury²⁴ and both versions of the questionnaire have the same factor structure,²⁸ we assume that the difference in instructions is of limited influence. Our cross-sectional design does not allow for testing of reciprocal relationships between coping and emotional distress, although a bidirectional influence seems a more appropriate reflection of reality. Response rate of patients with multiple sclerosis (50%) was much lower which might have resulted in a selection bias. Furthermore, our acquired brain injury sample was mostly composed of men, whereas for the multiple sclerosis sample, the majority was female. We corrected for sex in our analyses, but it is known that in the general population, women more frequently use emotion-focused coping styles than men.²⁷ The same is true for female patients with acquired brain injury,^{9,47} but it has not been shown for women with multiple sclerosis.²⁷ The fact that we did not find a difference in coping between types of multiple sclerosis must be interpreted with some caution because sample sizes were different between groups.

In contrast to the population with multiple sclerosis, we did not have a measure of severity of disease for acquired brain injury. In a post hoc analysis, we have compared the structural equation model for multiple sclerosis with and without the Expanded Disability Status Scale. We found a minor difference, most notably a conversion to non-significance for the age variable in the model without the severity measure, and therefore decided to retain the Expanded Disability Status Scale in the model.

In conclusion, we showed that coping patterns are quite similar, and higher quality of life is associated with less reliance on emotion-oriented coping in both patient groups. The latter is partly mediated by symptoms of emotional distress. In addition, in patients with multiple sclerosis, making more use of avoidance coping contributed to lower emotional distress and higher quality of life. Disease-related factors are of limited influence on coping in multiple sclerosis, which is also the case in acquired brain injury.

Clinical Messages

- Patients with acquired brain injury and multiple sclerosis show a similar pattern of coping. Patients with multiple sclerosis use all styles to a greater extent.
- Coping styles do not differ according to type of multiple sclerosis.
- Severity of multiple sclerosis is of little influence on choice of coping styles.
- Higher quality of life is associated with less reliance on emotion-oriented coping, which is partly mediated by depressive symptoms in both patient groups.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work received support from CZ Fonds grant AFVV11-045.

References

1. Folkman S, Lazarus RS, Gruen RJ, et al. Appraisal, coping, health status, and psychological symptoms. *J Pers Soc Psychol* 1986; 50: 571–579.
2. Brands IM, Wade DT, Stapert SZ, et al. The adaptation process following acute onset disability: an interactive two-dimensional approach applied to acquired brain injury. *Clin Rehabil* 2012; 26: 840–852.
3. Ptacek JT and Pierce GR. Issues in the study of stress and coping in rehabilitation settings. *Rehabil Psychol* 2003; 48: 113–124.
4. Aarstad A, Lode K, Larsen J, et al. Choice of psychological coping in laryngectomized, head and neck squamous cell carcinoma patients versus multiple sclerosis patients. *Eur Arch Otorhinolaryngol* 2011; 268: 907–915.
5. Krakow K, Haltenhof H and Buhler K-E. Coping with Parkinson's disease and refractory epilepsy. A comparative study. *J Nerv Ment Dis* 1999; 187: 503–508.
6. Herrmann M, Curio N, Petz T, et al. Coping with illness after brain diseases – a comparison between patients with malignant brain tumors, stroke, Parkinson's disease and traumatic brain injury. *Disabil Rehabil* 2000; 22: 539–546.
7. McInnis OA, Matheson K and Anisman H. Living with the unexplained: coping, distress, and depression among women with chronic fatigue syndrome and/or fibromyalgia compared to an autoimmune disorder. *Anxiety Stress Coping* 2014; 27: 601–618.
8. Anson K and Ponsford J. Coping and emotional adjustment following traumatic brain injury. *J Head Trauma Rehabil* 2006; 21: 248–259.
9. Wolters G, Stapert S, Brands I, et al. Coping styles in relation to cognitive rehabilitation and quality of life after brain injury. *Neuropsychol Rehabil* 2010; 20: 587–600.
10. Wolters G, Stapert S, Brands I, et al. Coping following acquired brain injury: predictors and correlates. *J Head Trauma Rehabil* 2011; 26: 150–157.
11. Gregorio GW, Gould KR, Spitz GBA, et al. Changes in self-reported pre- to postinjury coping styles in the first 3 years after traumatic brain injury and the effects on psychosocial and emotional functioning and quality of life. *J Head Trauma Rehabil* 2014; 29: E43–E53.
12. Dawson DR, Schwartz ML, Winocur G, et al. Return to productivity following traumatic brain injury: cognitive, psychological, physical, spiritual, and environmental correlates. *Disabil Rehabil* 2007; 29: 301–313.
13. Brands I, Kohler S, Stapert S, et al. Influence of self-efficacy and coping on quality of life and social participation after acquired brain injury: a 1-year follow-up study. *Arch Phys Med Rehabil* 2014; 95: 2327–2334.
14. Arnett PA, Barwick FH and Beeney JE. Depression in multiple sclerosis: review and theoretical proposal. *J Int Neuropsychol Soc* 2008; 14: 691–724.
15. Haase C, Lienemann M and Faustmann P. Neuropsychological deficits but not coping strategies are related to physical disability in multiple sclerosis. *Eur Arch Psychiatry Clin Neurosci* 2007; 258: 35–39.
16. McCabe MP, McKern S and McDonald E. Coping and psychological adjustment among people with multiple sclerosis. *J Psychosom Res* 2004; 56: 355–361.
17. Lode K, Klevan G, Myhr KM, et al. Coping with multiple sclerosis: a 5-year follow-up study. *Acta Neurol Scand* 2010; 122: 336–342.
18. McCabe MP, Stokes M and McDonald E. Changes in quality of life and coping among people with multiple sclerosis over a 2 year period. *Psychol Health Med* 2009; 14: 86–96.
19. Benedict RHB, Wahlig E, Bakshi R, et al. Predicting quality of life in multiple sclerosis: accounting for physical disability, fatigue, cognition, mood disorder, personality, and behavior change. *J Neurol Sci* 2005; 231: 29–34.
20. Chalk HM. Mind over matter: cognitive – behavioral determinants of emotional distress in multiple sclerosis patients. *Psychol Health Med* 2007; 12: 556–566.
21. Montel SR and Bungener C. Coping and quality of life in one hundred and thirty five subjects with multiple sclerosis. *Mult Scler* 2007; 13: 393–401.
22. Bianchi V, De Giglio L, Prosperini L, et al. Mood and coping in clinically isolated syndrome and multiple sclerosis. *Acta Neurol Scand* 2014; 129: 374–381.

23. Rommer PS, Suhnel A, König N, et al. Coping with multiple sclerosis—the role of social support. *Acta Neurol Scand* 2017; 136: 11–16.
24. Brands I, Köhler S, Stapert S, et al. How flexible is coping after acquired brain injury? A 1-year prospective study investigating coping patterns and influence of self-efficacy, executive functioning and self-awareness. *J Rehabil Med* 2014; 46: 869–875.
25. Moors M, Stapert S, Hupperts R, et al. Coping styles and quality of life in patients with multiple sclerosis and their caregivers. In: *Proceedings of the ECTRIMS 2013*, Copenhagen, 2013, p.1314, <https://onlinelibrary.ectrims-congress.eu/ectrims/2013/copenhagen/34615/yvonne.bol.coping.styles.and.quality.of.life.in.patients.with.multiple.html>
26. Endler NS and Parker JD. *Coping inventory for stressful situations (CISS): manual*. Toronto, ON, Canada: Multi-Health Systems, 1999.
27. De Ridder DTD and Van Heck GL. *Coping inventory for stressful situations. CISS handleiding*. Lisse: Swets Test Publishers, 2004.
28. Brands IMH, Köhler S, Stapert SZ, et al. Psychometric properties of the coping inventory for stressful situations (CISS) in patients with acquired brain injury. *Psychol Assess* 2014; 26: 848–856.
29. Fugl-Meyer AR, Branholm IB and Fugl-Meyer KS. Happiness and domain-specific life satisfaction in adult northern Swedes. *Clin Rehabil* 1991; 5: 25–33.
30. Boonstra AM, Reneman MF, Stewart RE, et al. Life satisfaction questionnaire (LiSat-9): reliability and validity for patients with acquired brain injury. *Int J Rehabil Res* 2012; 35: 153–160.
31. Spinhoven P, Ormel J, Sloekers PPA, et al. A validation study of the Hospital Anxiety and Depression Scale (HADS) in different groups of Dutch subjects. *Psychol Med* 1997; 27: 363–370.
32. Zigmond AS and Snaith RP. The hospital anxiety and depression scale. *Acta Psychiatr Scand* 1983; 67: 361–370.
33. Honarmand K and Feinstein A. Validation of the Hospital Anxiety and Depression Scale for use with multiple sclerosis patients. *Mult Scler* 2009; 15: 1518–1524.
34. Bjelland I, Dahl AA, Haug TT, et al. The validity of the Hospital Anxiety and Depression Scale. An updated literature review. *J Psychosom Res* 2002; 52: 69–77.
35. Kurtzke JF. Rating neurologic impairment in multiple sclerosis: an expanded disability status scale (EDSS). *Neurology* 1983; 33: 1444–1452.
36. De Bie SE. *Standaardvragen 1987: Voorstellen voor uniformering van vraagstellingen naar achtergrondkenmerken en interviews* [Standard questions 1987: proposal for uniformization of questions regarding background variables and interviews]. Leiden: Leiden University Press, 1987.
37. Curran CA, Ponsford JL and Crowe S. Coping strategies and emotional outcome following traumatic brain injury: a comparison with orthopedic patients. *J Head Trauma Rehabil* 2000; 15: 1256–1274.
38. Finset A and Andersson S. Coping strategies in patients with acquired brain injury: relationships between coping, apathy, depression and lesion location. *Brain Inj* 2000; 14: 887–905.
39. Pakenham KI. Adjustment to multiple sclerosis: application of a stress and coping model. *Health Psychol* 1999; 18: 383–392.
40. Lode K, Bru E, Klevan G, et al. Depressive symptoms and coping in newly diagnosed patients with multiple sclerosis. *Mult Scler* 2009; 15: 638–643.
41. Mikula P, Nagyova I, Krokavcova M, et al. Coping and its importance for quality of life in patients with multiple sclerosis. *Disabil Rehabil* 2014; 36: 732–736.
42. Dennison L, Moss-Morris R and Chalder T. A review of psychological correlates of adjustment in patients with multiple sclerosis. *Clin Psychol Rev* 2009; 29: 141–153.
43. Backhaus SL, Ibarra SL, Klyce D, et al. Brain injury coping skills group: a preventative intervention for patients with brain injury and their caregivers. *Arch Phys Med Rehabil* 2010; 91: 840–848.
44. Bedard M, Felteau M, Marshall S, et al. Mindfulness-based cognitive therapy reduces symptoms of depression in people with a traumatic brain injury: results from a randomized controlled trial. *J Head Trauma Rehabil* 2014; 29: E13–E22.
45. Lawrence M, Booth J, Mercer S, et al. A systematic review of the benefits of mindfulness-based interventions following transient ischemic attack and stroke. *Int J Stroke* 2013; 8: 465–474.
46. Simpson R, Booth J, Lawrence M, et al. Mindfulness based interventions in multiple sclerosis – a systematic review. *BMC Neurol* 2014; 14: 15.
47. Tomberg T, Toomela A, Pulver A, et al. Coping strategies, social support, life orientation and health-related quality of life following traumatic brain injury. *Brain Inj* 2005; 19: 1181–1190.