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Body Concept, Disability, and Depression in Patients with Spasmodic Torticollis

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Eighty-five patients with idiopathic spasmodic torticollis were compared with an equally chronic group of 49 cervical spondylosis sufferers in terms of body concept, depression, and disability. The torticollis patients were significantly more depressed and disabled and had a more negative body concept. Depression had different determinants in the two groups. Extent of disfigurement was a major predictor of depression in torticollis. Neuroticism accounted for the greatest proportion of the variance of depression in cervical spondylosis.

Introduction

In a previous paper (Jahanshahi and Marsden, 1988*a*), it was established that patients with spasmodic torticollis were more depressed than a control group of cervical spondylosis patients who had suffered from an equally chronic disorder involving the neck. More detailed analysis revealed that a negative view of the self was the component of depression that differentiated the two groups. It was suggested that the unsightly, visible postural abnormality of the head gives rise to a negative body concept, which may partly explain the higher prevalence of depression in torticollis patients.

The present report tested this hypothesis by examining differences in body concept in torticollis and cervical spondylosis and assessed the contribution of this and other factors such as disability to depression in these chronic and disabling disorders.

Method

Subjects

1. *Torticollis group* This group consisted of 85 patients with idiopathic, refractory torticollis, diagnosed according to the criteria of Marsden and Harrison (1974). Forty-seven (55·3%) were male and 38 (44·7%) female. Their mean age was 49·8 years (SD = 13·4, range of 17 to 78 years). The mean duration of illness was 9·9 years (SD = 9·4, range of 13 months to 54

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years). The mean age of onset of torticollis was 39·86 years (SD = 15·4, range of 1 to 69 years).

2. *Cervical Spondylosis group* Twenty (40·8%) of the 49 patients with cervical spondylosis were male and 29 (59·2%) were female. Their average age was 59·3 years (SD = 10·3, range of 34 to 75 years). The mean age of onset of cervical spondylosis was 49·1 years (SD = 10·5, range of 24 to 70 years). The average duration of illness was 9·9 years (SD = 7·5, range of 1·9 to 36 years). The diagnosis of cervical spondylosis was based on radiological evidence of osteo-arthritis of the neck as well as clinical examination. All patients were symptomatic at the time of study, as revealed by their reports of current experience of cervical pain.

The sex distribution in the two groups was not different (Chi-square = 2·6, df = 1, $p = 0{\cdot}11$). The cervical spondylosis group was significantly older ($t = 4{\cdot}3$, df = 132, $p < 0{\cdot}001$), and had an older age of onset of their disorder ($t = 3{\cdot}6$, df = 131, $p < 0{\cdot}001$) than the torticollis patients. The duration of illness in the two groups did not differ (Mann-Whitney $Z = 0{\cdot}61$, $p = 0{\cdot}55$). All of the 49 cervical spondylosis patients, as opposed to 68 (80%) of the 85 torticollis patients had current pain in the neck/shoulder area (Chi-square = 11.22, df = 1, $p < 0{\cdot}001$).

Procedure

The procedure was described in detail in the previous paper (Jahanshahi and Marsden, 1988*a*). Briefly, a booklet of questionnaires was mailed to a sample of patients with spasmodic torticollis and a group of cervical spondylosis sufferers. The response rates were respectively 68% and 40%. As previously noted (Jahanshahi and Marsden, 1988*a*), differences in the response rate of the torticollis and cervical spondylosis groups are probably due to variations in the clinical management of the two conditions, resulting in regular updating of addresses of the torticollis and not the cervical spondylosis patients. Furthermore, the responders and non-responders were not different in terms of demographic and clinical features in either group (Jahanshahi and Marsden, 1988*a*).

Material

The following questionnaires were completed:

1. *The Body Concept Scale (BCS)* The BCS consisted of 22 semantic differential scales. "My Body" was the concept to be rated at the top of the series of 7-interval semantic scales. An 11 point rating scale (0 = not at all disfigured, 10 = extremely disfigured) was also included in the BCS, on which patients were asked to indicate the degree of self-perceived physical disfigurement (see the Appendix).

The internal consistency (coefficient alpha = 0·95) and test–retest reliability of the BCS over a 1 month interval ($r = 0{\cdot}87$, $p < 0{\cdot}001$) was high. The

Pearson correlation coefficients between the BCS total score, the disfigurement rating and scores on item 14 of the BDI pertaining to body image were respectively 0·44 ($p<0·001$) and 0·40 ($p<0·001$), suggesting a moderate degree of concurrent validity.

A principal components analysis with varimax rotation on the BCS, yielded four factors with eigenvalues greater than 1 (See Appendix 1). The four factors accounted for 67·5% of the variance and were respectively labelled "speed/strength", "postural/movement-related", "evaluative/aesthetic" and "tension". On each subscale higher factor scores indicate a more negative body concept.

2. *The Functional Disability Questionnaire (FDQ)* A 27 item scale was developed to measure disability in daily functioning. Patients were instructed to indicate the extent to which their particular problem affected their engagement in performance or enjoyment of the listed activities, by rating each on a four point scale (1: "not at all affected", 4: "severely affected"). A "not applicable" response category (scored 0) was also included (see the Appendix 2).

The internal consistency (coefficient alpha = 0·92) and test–retest reliability of the FDQ over a 1 month interval ($r=0·93$, $p<0·001$) were found to be high. The construct validity of the FDQ was examined using principal components analysis. A solution where four factors were obtained and subjected to varimax rotation was considered to be the most interpretable. The four factors accounted for 63% of the variance, and were respectively labelled "social disability", "physical activity", "self-care", and "leisure activities". Subscores were derived by summation of the raw scores of items loading on each factor. On each subscale higher scores signify greater degrees of functional disability. The results of the principal component analysis of the FDQ are also briefly presented in the Appendix.

3. *The Beck Depression Inventory* (BDI, Beck *et al.*, 1961). The 21 items of the BDI cover affective/motivational, cognitive, and somatic symptoms of depression. Subjects are instructed to indicate how they have generally felt during the previous week by selecting one of four statements which represent increasing severity of depression for each item.

The presence, severity and frequency of current pain in the neck/shoulder area were also indicated by all patients. A rating of the degree of self-perceived control over head position (0 = no control, 10 = complete control) was also obtained from the torticollis patients.

Results

1. *Group differences in body concept*

The torticollis patients had a more negative body concept as indicated by their higher mean scores on the "postural/movement-related", "aesthetic",

and "tension" factor scores, and on the disfigurement rating (Table 1). For the "strength/speed" factor score, however, the cervical spondylosis patients had higher mean scores.

Differences between the two groups and sexes were examined through a two way (group by sex) MANOVA on the four factor scores, and the disfigurement rating. Neither the group by sex interaction (Multivariate $F(5,86)=0{\cdot}89$, $p=0{\cdot}49$) nor the sex main effect (Multivariate $F(5,86)=0{\cdot}53$, $p=0{\cdot}76$) were significant. The main effect of group was, however, significant (Multivariate $F(5,86)=6{\cdot}45$, $p<0{\cdot}001$). This difference was a consequence of more negative self-perceptions on the "postural/movement-related" aspects of body concept (Univariate $F(1,90)=11{\cdot}85$, $p<0{\cdot}001$), and the higher disfigurement ratings (Univariate $F(1,90)=28{\cdot}41$, $p<0{\cdot}001$) of the torticollis patients. The differences between the two groups in the "strength/speed" (Univariate $F(1,90)=1{\cdot}32$, $p=0{\cdot}25$), "evaluative/aesthetic" (Univariate $F(1,90)=0{\cdot}41$, $p=0{\cdot}53$), and the "tension" (Univariate $F(1,90)=0{\cdot}65$, $p=0{\cdot}42$) aspects of body concept were not significant.

Among the variables on which the groups differed, (age, age of onset, presence/absence of neck pain, depression, disfigurement), a stepwise multiple regression analysis identified disfigurement as the significant predictor of the postural aspects of body concept ($F(1,132)=24{\cdot}55$, $p<0{\cdot}001$). Therefore, group differences in body concept factor score 2 were re-examined through an analysis of covariance (ANCOVA) with disfigurement as the covariate. Once differences in disfigurement were controlled, torticollis/spondylosis differences in "postural/movement-related" aspects of body concept were no longer significant ($F(1,91)=1{\cdot}88$, $p=0{\cdot}17$).

On the basis of a similar regression analysis, the "postural/movement-related" factor score, age of onset, and depression were identified as the significant covariates for disfigurement ($F(3,130)=18{\cdot}43$, $p<0{\cdot}001$). A one-

TABLE 1. *Mean and standard deviation scores (in parentheses) of the torticollis patients and the cervical spondylosis group on the four factor scores derived from the Body Concept Scale (BCS) and the disfigurement rating*

	Torticollis (n=85)	*Cervical spondylosis (n=49)*
BCS factor scores:		
1. Speed/strength	−·11 (1·04)	·18 (·83)
2. Postural/movement-related	·21 (·97) [a]	−·54 (·83)
3. Evaluative/aesthetic	·06 (1·06)	−·12 (·98)
4. Tension	·03 (·97)	−·16 (1·14)
Disfigurement rating (0–10)	4·86 (2·98) [a]	1·61 (2·18)

Higher scores imply more negative body concept and greater disfigurement.
[a] Group differences significant (see text)

way ANCOVA was carried out on the disfigurement ratings using these covariates. The differences in the disfigurement ratings between the torticollis patients and the cervical spondylosis groups remained significant even after controlling for the effects of age of onset, the "postural/movement-related" factor score, and depression ($F(1,87) = 11{\cdot}09$, $p < 0{\cdot}001$).

2. *Group differences in functional disability*

The torticollis patients had higher mean "social disability", "leisure activities", and "self-care" disability scores (Table 2). A two way (group by sex) MANOVA was performed on the four factor scores to examine group and sex differences in functional disability. The group by sex interaction effect was not significant ($F(4,102) = 0{\cdot}37$, $p = 0{\cdot}83$). The main effect of sex was significant (Multivariate $F(4,115) = 7{\cdot}09$, $p < 0{\cdot}001$). Examination of the univariate F tests revealed the significant sex effect to be due to higher disability in self-care reported by males compared to females in both groups (Univariate $F(1,105) = 9{\cdot}76$, $p < 0{\cdot}002$). There were no sex differences in social disability (Univariate $F(1,105) = 1{\cdot}72$, $p = 0{\cdot}19$), in leisure activities (Univariate $F(1,105) = 0{\cdot}28$, $p = 0{\cdot}59$, or in physical activity (Univariate $F(1,105) = 0{\cdot}49$, $p = 0{\cdot}49$). There were significant differences in functional disability between the torticollis and spondylosis groups (Multivariate $F(4,102) = 19{\cdot}77$, $p < 0{\cdot}001$). This significant group main effect was due to the higher disability of the torticollis group in social (Univariate $F(1,105) = 51{\cdot}97$, $p < 0{\cdot}001$), and leisure activities (Univariate $F(1,105) = 7{\cdot}17$, $p = 0{\cdot}009$). The differences between the groups in disability in self-care (Univariate $F(1,105) = 2{\cdot}54$, $p = 0{\cdot}11$), and physical activity (Univariate $F(1,105) = 0{\cdot}14$, $p = 0{\cdot}71$) were not significant.

TABLE 2. *Mean and standard deviation scores (in parentheses) of the torticollis and cervical spondylosis patients on the Functional Disability Questionnaire (FDQ)*

	Torticollis (n=85)		*Cervical spondylosis (n=49)*	
	Male	*Female*	*Male*	*Female*
FDQ components:				
1. Social disability [a]	18·67 (5·98)	17·03 (7·19)	9·46 (3·69)	8·35 (6·14)
2. Leisure activities [a]	6·84 (2·96)	6·84 (2·97)	4·92 (2·63)	5·61 (3·37)
3. Physical activity	14·70 (5·75)	14·79 (6·31)	13·69 (6·01)	15·09 (5·98)
4. Self-care	9·96 (4·42)	7·49 (3·50)	8·85 (4·39)	5·96 (3·47)

On each scale higher scores imply greater disability
[a] Group differences significant (see text).

From amongst the variables on which the two groups differed, depression and disfigurement emerged as the significant covariates for both the social and leisure components of functional disability (respectively, $F(2,131) = 30{\cdot}5, p < 0{\cdot}001$; $F(2,131) = 15{\cdot}8, p < 0{\cdot}001$), in two separate multiple regression analyses. Once the effects of depression and disfigurement were taken into account, torticollis/spondylosis differences in leisure activity were no longer significant ($F(1,103) = 2{\cdot}65$, $p = 0{\cdot}11$), although group differences in social disability remained significant ($F(1,103) = 21{\cdot}91$, $p < 0{\cdot}001$).

3. *Predictors of depression in the two groups*

The mean BDI scores of the torticollis patients was 13·4 (SD = 9·9), compared to an average of 9·5 (SD = 6·8) in the cervical spondylosis group. There were no differences in BDI scores between males and females in either the torticollis (Mann-Whitney $Z = 0{\cdot}29$, $p = 0{\cdot}77$) or cervical spondylosis (Mann-Whitney $Z = 0{\cdot}42$, $p = 0{\cdot}67$) groups. The torticollis patients were significantly more depressed than the cervical spondylosis group (Mann-Whitney $Z = 2{\cdot}1$, $p = 0{\cdot}03$).

In each group, the association of depression with functional disability, body concept, disfigurement, pain severity, neuroticism, extraversion, and demographic characteristics was examined through a series of Pearson correlation coefficients. The extraversion and neuroticism measures were derived from the Eysenck Personality Questionnaire (Eysenck and Eysenck, 1975), and have been the subject of a previous report (Jahanshahi and Marsden, 1988*b*).

Exploratory stepwise multiple regression analyses effectively isolated the variables which had zero order Pearson correlations above 0·32 ($p < 0{\cdot}05$) with the total depression score (i.e. 10% or more shared variance with depression), as the suitable variables for building a model of depression in the two groups. For the torticollis patients these variables were self-rated control over head position ($r = -0{\cdot}37$), the functional disability total score ($r = 0{\cdot}58$), disfigurement rating ($r = 0{\cdot}39$), the body concept total score ($r = 0{\cdot}51$), cervical pain severity ($r = 0{\cdot}43$), EPQ neuroticism ($r = 0{\cdot}54$) and extraversion ($r = -0{\cdot}42$) scores. Disability in physical activity ($r = 0{\cdot}39$), the total body concept score ($r = 0{\cdot}68$), pain severity ($r = 0{\cdot}43$), and neuroticism ($r = 0{\cdot}70$) were the relevant variables for the cervical spondylosis group. As the association of duration of illness, age of onset, and age with depression were also of interest, the former two variables were also included in both analyses. As age is a linear product of the sum of duration of illness and age of onset, to prevent multicollineraity and singularity between variables, a statistical assumption which should be met in regression analysis, age was not included.

The results of the hierarchical multiple regression analyses are presented in Table 3. In each analysis the illness-related and demographic variables (pain severity, control over head position, age of onset, duration of illness) were considered as so-called "nuisance" factors (Tabachnick and Fidell,

TABLE 3. *Results of the hierarchical multiple regression analyses performed to identify the best set of predictors of the total depression score in the torticollis and the cervical spondylosis group*

Torticollis

Step	*Variable*	*Standardized regression coefficient*	R^2	R^2 *change*
1.	Disfigurement	0·12		0·135
2.	Extraversion	−0·17		0·136
3.	Neuroticism	0·37		0·13
4.	Functional disability	0·19		0·08
5.	Body concept	0·08	0·48	0·004
6.	Pain severity	0·21		0·06
7.	Self-rated head control	−0·06	0·55	0·01
8.	Duration of illness	−0·16		0·05
9.	Age of onset	0·18	0·63	0·03
				Multiple $R=0{\cdot}79$ $F(9,75)=14{\cdot}32$, $p=0{\cdot}0001$ $R^2=0{\cdot}63$ adjusted $R^2=0{\cdot}59$

Cervical Spondylosis

Step	*Variable*	*Standardized regression coefficient*	R^2	R^2 *change*
1.	Neuroticism	0·48		0·398
2.	Physical disability	0·14		0·049
3.	Body concept	0·15	0·45	0·01
4.	Pain severity	0·20	0·489	0·03
5.	Age of onset	0·05		0·003
6.	Duration of illness	−0·01	0·49	0·00003
				Multiple $R=0{\cdot}70$ $F(5,43)=6{\cdot}79$, $p=0{\cdot}0001$ $R^2=0{\cdot}49$ adjusted $R^2=0{\cdot}42$

1983) and entered into the analysis last, so that the amount of variance in depression accounted for by the psychosocial variables of interest could be identified uncontaminated by shared variance with these factors. The order of entry of the psychosocial variables was not preset but rather determined in a stepwise fashion by the regression procedure, such that the relative importance of these psychosocial variables to predicting depression is reflected.

In the torticollis group, 63% of the variance in the depression scores was explained by the nine variables entered into the analysis. Disfigurement,

extraversion, neuroticism, functional disability and body concept entered the regression in that order and respectively accounted for 14, 14, 13, 8 and less than 1% of the variance of depression. The contribution of body concept to the explanation of depression was minimal once the effects of disfigurement had been taken into account. Similarly, as control over head position had a proportion of shared variance with disfigurement, disability, and body concept (respective correlations of −0·39, −0·45, −0·38), after the entry of these factors, control over head position accounted for a further 1% of the variance in depression scores. The severity of cervical pain, duration of illness, and age of onset of torticollis explained 6%, 5%, and 3% of the variance in depression at their point of entry into the equation.

For the patients with cervical spondylosis, neuroticism, disability in physical activity, and body concept entered the hierarchical regression analysis in descending order and respectively accounted for about 40%, 5%, and 1% of the variance in depression. Following the entry of this set of three variables, pain severity accounted for a further 3% of the variance in depression. With the above four variables in the regression equation, the contribution of age of onset and duration of illness to the explanation of depression in cervical spondylosis was not noteworthy. Cumulatively, these variables explained 49% of the variance of depression in cervical spondylosis.

Discussion

In summary, the results showed that besides being more depressed, the torticollis patients were also more disabled by their disorder, and had a more negative body concept than the patients with cervical spondylosis.

The hierarchical multiple regression analysis further suggested that depression may have different determinants in these two chronic illnesses.

Except for the greater disability in self-care activities reported by male patients in both groups, there were no sex differences in either group in any of the aspects of depression, body concept, or functional disability; which suggests that the effects of chronic disorder on well-being are not selective with regards to gender.

1. *Body concept*

Increased bodily tension and reduced speed/strength were the major components of negative body concept in cervical spondylosis which reflect the nature of the disorder and the significantly older age of these sufferers. The negative body concept of the torticollis patients centered around perception of deformity, and lowered aesthetic evaluations of the body, thus reflecting the postural disfigurement.

The negative body concept of the torticollis patients was specifically related to the postural abnormality of the head and did not involve a generalized negative evaluation of the body, since the two groups only differed significantly on the postural aspects of the BCS and self-rated

disfigurement and not on the speed/strength, aesthetic, or tension factor scores derived from the BCS. Furthermore, when the effects of disfigurement were statistically controlled, the torticollis/cervical spondylosis differences in the postural aspects of body concept were no longer significant. On the other hand, even when the effects of the relevant covariates (age of onset, postural factor score, depression) were statistically controlled, differences in disfigurement ratings between the torticollis and cervical spondylosis groups remained significant. This suggests that the self-perceived disfigurement ratings are not simply a function of the torticollis patients' negative mood or negative attitudes towards the body, but also reflect objective degrees of postural abnormality.

2. *Functional disability*

The types of disability most characteristic of each group were different. For the torticollis patients social disability prevailed, whereas disability in physical activities was the prominent feature of cervical spondylosis.

Torticollis resulted in greater functional disability in activities of daily living, specifically in social and leisure activities, than cervical spondylosis. Differences between the groups in terms of disfigurement and depression accounted for the torticollis/cervical spondylosis differences in leisure activities. The higher social disability of torticollis patients could not, however, be fully explained in terms of group differences in depression and disfigurement. This suggests that in the course of their disorder, torticollis patients have developed well-established patterns of social avoidance behaviour which have become partly independent of their postural abnormality and mood state, although still related to these factors. Such an interpretation is in accord with the findings in other groups of chronically ill patients such as headache sufferers who have been shown to have an extensive repertoire of avoidance including social avoidance behaviours which have become partly independent of actual pain experience but appear to be anticipatory of pain experience (Philips and Jahanshahi, 1985, 1986).

3. *Depression*

Depression had different determinants in torticollis and cervical spondylosis. In cervical spondylosis, neuroticism was the single most important factor, explaining 40% of the variance in depression. With neuroticism taken into account, disability in physical activity, pain severity, and body concept respectively explained 5%, 3%, and 1% of the variance in depression. In torticollis, disfigurement, extraversion, and neuroticism each accounted for 13% of the variance in depression, while a further 8% and 6% of the variance were respectively explained by disability and pain severity. Once the contributions of the psychosocial and illness-related parameters were taken into account, 5% and 3% of the variation in depression were respectively attributable to the duration of illness and age of onset of torticollis.

The contribution of demographic factors such as sex, marital status, and social class, which are commonly studied risk factors for depression (Surtees *et al.*, 1983) was also investigated. No statistically significant differences in depression on the basis of these factors were found and they failed to make a major contribution to depression in preliminary exploratory regression analysis.

Disfigurement emerged as the most important predictor of depression in torticollis. Higher depression in torticollis patients may be partly a function of low self-esteem resulting from the disfigured body and partly reflect mourning the loss of the old and "unflawed" body. The present results support previous research on the profound psychosocial impact of physical deformity (Harris, 1982; Green *et al.*, 1984) and further demonstrate that such physical deformity (torticollis) gives rise to more debilitating effects in body concept, daily functioning, and mood, over and above the psychosocial costs of a chronic physical illness (cervical spondylosis).

The effects of physical disfigurement on psychological health and social adjustment can be understood in light of the evidence from a large body of research that physical appearance has profound interpersonal consequences and that attractiveness has a "halo" effect on social perception such that what is beautiful is also perceived as good (Lacey and Birtchnell, 1986). The self-depreciation characteristic of torticollis suggests that this halo effect of physical attractiveness on social perception may also extend to self-perception.

From the perspective of a reactive model, depression in torticollis may be considered a consequence of the disfigurement, negative body concept, and functional disability that torticollis can give rise to in patients predisposed to depression by their personality traits of neuroticism and intraversion. Conversely, it can be argued that current depression and its associated biased and selective processing of negative self-related information (Bradley and Mathews, 1983) can enhance self-perceived disfigurement and result in negative body concept, reduce the functional capabilities of the individual, and inflate neuroticism scores on personality scales. Therefore, although depression was selected as the dependent variable of interest in the regression analyses, the direction of causality can not be conclusively established from cross-sectional data and requires confirmation by longitudinal evaluation of the mutual impact of depression, disfigurement, and disability in torticollis.

In neurological consultations, patients do not always spontaneously report that they are depressed and clinicians do not always detect depression in their patients (Bridges and Goldberg, 1984). The results of this study revealed moderate to severe depression in about 30% of the torticollis patients, with concomitant functional disability and social avoidance and isolation. Clinicians therefore need to be alert to the possibility of depression in torticollis patients. The fact that a negative view of the self was the major element of depression in torticollis (Jahanshahi and Marsden, 1988*a*), and that these patients had a negative body concept and exhibited high levels of functional disability, singles out a cognitive-behavioural intervention as the

most suitable approach for the management of depression, negative body concept and disability in torticollis.

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APPENDIX 1. *Body Concept Scale*

On the next page is a list of adjectives that can describe the physical body. The adjectives at each end of a scale are opposites. Please place a cross on each scale at the point that best describes your own body.

Example:

If you feel that your body is *very well described* by the adjective at the end of the scale, place the cross as follows:

Strong ___X___:___:___:___:___:___:___ Weak

OR

Strong ___:___:___:___:___:___:___ Weak

If you feel that your body is *fairly well described* by the adjective at the end of the scale, place a cross as follows:

Strong ___:___X___:___:___:___:___:___ Weak

OR

Strong ___:___:___:___:___:___X___:___ Weak

If you feel that your body is *only slightly described* by the adjective at the end of the scale, place the cross as follows:

Strong ___:___:___X___:___:___:___:___ Weak

OR

Strong ___:___:___:___:___X___:___:___ Weak

If you consider both adjectives to be *equally descriptive* of your body *or* both to be *completely irrelevant* to your description of your body then place the cross in the middle space as follows:

Strong ___:___:___:___X___:___:___:___ Weak

PLEASE REMEMBER

1. Place the cross in the middle of spaces, not on the boundaries.
2. Do not forget to put a cross on every scale.
3. Do not put more than one cross on a single scale.

Make each scale a separate and independent judgement. Work at fairly high speed and do not worry or puzzle over individual scales.

Results of Principal Components Analysis of BCS:
Item 12 which had small and non-significant associations with 18 of the 21 other items was removed. The items that loaded on each factor are given in descending order of loadings. All items had loadings above .45.

MY BODY

Graceful	___:___:___:___:___:___:___	Awkward
Lethargic	___:___:___:___:___:___:___	Energetic
Swift	___:___:___:___:___:___:___	Sluggish
Calm	___:___:___:___:___:___:___	Agitated
Ugly	___:___:___:___:___:___:___	Beautiful
Rigid	___:___:___:___:___:___:___	Flexible
Fit	___:___:___:___:___:___:___	Unfit
Unbalanced	___:___:___:___:___:___:___	Balanced
Steady	___:___:___:___:___:___:___	Unsteady
Weak	___:___:___:___:___:___:___	Strong
Relaxed	___:___:___:___:___:___:___	Tense
Masculine	___:___:___:___:___:___:___	Feminine
Slow	___:___:___:___:___:___:___	Fast
Poised	___:___:___:___:___:___:___	Unpoised
Healthy	___:___:___:___:___:___:___	Sick
Clumsy	___:___:___:___:___:___:___	Well-coordinated
Straight	___:___:___:___:___:___:___	Twisted
Mobile	___:___:___:___:___:___:___	Immobile
Flawed	___:___:___:___:___:___:___	Perfect
Uncontrollable	___:___:___:___:___:___:___	Controllable
Active	___:___:___:___:___:___:___	Passive
Delicate	___:___:___:___:___:___:___	Robust

Please indicate how disfigured you believe you appear to others as a result of your condition, by circling the appropriate number on the scale below.

0	1	2	3	4	5	6	7	8	9	10
Not disfigured at all										Extremely disfigured

	Eigen value	*% Variance*
Factor 1, Speed/Strength: 22,10,7,13,3,21,15	10.2	48.7
Factor 2, Postural/movement-related: 9,16,8,17,20,1,18,6	1.6	7.8
Factor 3, Evaluative/aesthetic: 5,19,2,14	1.3	6.1
Factor 4, Tension: 4,11	1.1	4.9

APPENDIX 2. *The Functional Disability Questionnaire*

Below is a list of activities. Please indicate the extent to which your condition affects your engagement in, your performance or enjoyment of these activities *at the present time.* Answer each question by circling the appropriate number.

0 Not applicable; for example, if you have never driven, your answer to question 14, driving, would be 0
1 Not at all affected
2 Mildly affected
3 Moderately affected
4 Severely affected

	Not applicable	*Not at all affected*	*Mildly affected*	*Moderately affected*	*Severely affected*
1. Dressing/undressing yourself	0	1	2	3	4
2. Doing housework (vacuuming, washing, dusting, ironing etc.)	0	1	2	3	4
3. Watching television	0	1	2	3	4
4. Running	0	1	2	3	4
5. Use of public transport	0	1	2	3	4
6. Writing	0	1	2	3	4
7. Having a face-to-face conversation	0	1	2	3	4
8. Carrying objects	0	1	2	3	4
9. Going to restaurants or pubs	0	1	2	3	4
10. Brushing teeth	0	1	2	3	4
11. Reading	0	1	2	3	4
12. Walking	0	1	2	3	4
13. Having sexual intercourse	0	1	2	3	4
14. Driving a car	0	1	2	3	4
15. Washing face	0	1	2	3	4
16. Eating, using knife and fork	0	1	2	3	4
17. Going to or giving dinner parties	0	1	2	3	4
18. Typing	0	1	2	3	4

	Not applicable	*Not at all affected*	*Mildly affected*	*Moderately affected*	*Severely affected*
19. Engagement in hobbies (knitting, sewing, carpentry, gardening, painting etc.)	0	1	2	3	4
20. Crossing roads	0	1	2	3	4
21. Shaving face if male, and putting make-up on, if female	0	1	2	3	4
22. Drinking from a cup	0	1	2	3	4
23. Riding a bicycle	0	1	2	3	4
24. Going to the theatre/cinema/concerts	0	1	2	3	4
25. Activities requiring visual/manual coordination such as pouring tea, using a screwdriver	0	1	2	3	4
26. Engagement in sports (tennis, squash, jogging, swimming, golf, table tennis etc.)	0	1	2	3	4
27. Walking up or down stairs	0	1	2	3	4

Results of Principal Components analysis of the FDQ:
Items 14, 18, 23, 26 were removed as 30% or more considered them not applicable.
The items that loaded on each factor are given in descending order of loadings.

All items had loadings above 0·45.	*Eigen value*	% *Variance*
Factor 1, Social disability: 17, 9, 7, 24, 16, 22, 20, 5	9·4	40·8
Factor 2, Physical activity: 8, 2, 4, 12, 27, 13, 19	2·3	10·2
Factor 3, Self-care: 10, 15, 1, 21, 25	1·4	6·3
Factor 4, Leisure activity: 11, 3, 6	1·3	5·7