ORIGINAL REPORT

PERCEIVED FUNCTIONING AND DISABILITY IN ADULTS WITH MYOTONIC DYSTROPHY TYPE 1: A SURVEY ACCORDING TO THE INTERNATIONAL CLASSIFICATION OF FUNCTIONING, DISABILITY AND HEALTH

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Objective: **The purpose of this study was to describe and analyse self-rated perceived functioning, disability and environmental facilitators/barriers with regard to disease severity, using the International Classification of Functioning, Disability and Health (ICF) checklist, in adults with myotonic dystrophy type 1.**

Design: **Cross-sectional design.**

Subjects: **Forty-one women and 29 men with myotonic dystrophy type 1.**

Methods: **A modified ICF checklist was used for self-rating of perceived problems in 29 body-function categories, difficulties in 52 activity and participation categories, and facilitators/barriers in 23 environmental-factor categories according to the verbal anchors of the ICF qualifiers. Disease severity classification was based on the muscular impairment rating scale.**

Results: **Of the persons with myotonic dystrophy type 1, 80% perceived problems of excessive daytime sleepiness, 76% of muscle power, and 66% of energy and drive functions, while over 59% perceived difficulties in physically demanding mobility activities. Disabilities in mobility, self-care and domestic life were more frequently reported by persons with severe disease. Support from the immediate family, medicines and social security services were perceived as facilitators for 50–60% of the participants.**

Conclusion: **Disabilities and important environmental facilitators in adults with myotonic dystrophy type 1 were identified, and this clinically-relevant information can be used for developing health services for people with this condition.**

Key words: myotonic dystrophy, neuromuscular diseases, classification, health-status measures, rehabilitation, physical therapy.

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INTRODUCTION

Myotonic dystrophy type 1 (DM1), with an estimated European prevalence of 5–20/100,000, is a slowly-progressive multi-system disease (1). It is inherited in an autosomally dominant pattern and with anticipation, i.e. progressively younger onset and increasing severity in successive generations in a family. The genetic basis is a mutation on chromosome 19 with an unstable expansion of a trinucleotide (CTG) repeat (2). Four forms are described; congenital, childhood, classic adult and mild adult. They are based on age at onset, clinical symptoms and CTG expansion size (1, 3).

As it is a multisystem disease, DM1 affects several body functions and structures. In the DM1 population, symptoms vary in both presentation and severity (1). Characteristic features are muscular weakness and wasting, and myotonia. Distal limb, facial and neck flexor muscles are affected first, but as the disease progresses proximal muscles become involved (4). A disease-specific rating scale, the muscular impairment rating scale (MIRS), has been developed for DM1 (5). The scale tallies with the usual distal-to-proximal progression of the muscular involvement and can be used to describe disease severity (5). Impairments in the ocular, cardiovascular, respiratory, digestive, metabolic and endocrine systems and in the central nervous system can also occur (1). Furthermore, disrupted life habits have been reported in mobility, domestic life, leisure and work (6). Nevertheless, information on self-perceived health aspects is limited and sparse (7).

One way to describe how people experience their health is to use the International Classification of Functioning, Disability and Health (ICF) (8). This classification system provides a common international language, a standardized coding system and a framework for describing health and health-related states from the perspectives of body, individual and society. In the ICF, "functioning" is an umbrella term indicating non-problematic or neutral aspects of health. "Disability", on the other hand, indicates problems and summarizes body function and structure impairments, activity limitations and participation restrictions. Contextual factors, i.e. personal and environmental factors, influence both the health state and the health perception of individuals. In the ICF, environmental factors can be described as facilitators of, or barriers to, functioning (8).

The ICF is used both in clinical practice and in research for assessment, intervention and evaluation purposes (8). The ICF checklist (9) has been developed to facilitate the use of ICF in clinical practice and consists of a selection of 123 of the clas-

sification system's approximately 1400 categories. While the ICF checklist is not a psychometric measure, an individual's functioning and/or disability is classified using qualifiers on a 5-point ordinal scale. Usually the disability is classified or quantified by health professionals. However, knowledge of the patients' own perception of functioning and disability, and of environmental facilitators or barriers, is of significant value and can assist in the development of health services. Thus, the aim of the present study was to describe and analyse self-rated perceived functioning, disability and environmental facilitators/barriers with regard to disease severity, using the ICF checklist, in adults with DM1.

METHODS

Participants

For recruitment of participants, all the major hospitals and private practitioners with neurological speciality in Stockholm County Council were contacted and informed about the study. This resulted in a list of 128 persons, mainly from the outpatient clinic at the Department of Neurology at the Karolinska University Hospital, Stockholm, Sweden. The inclusion criteria were: diagnosed DM1, 18 years of age or older, and living in the Stockholm County Council area. Twenty-one of the 128 persons did not fulfil the inclusion criteria (14 had other muscular dystrophies or myotonic disorders, 5 lived outside the area, one had died and one was younger than 18 years) and we failed to contact 4. Of the remaining 103 persons, 33 declined to participate, and thus 70 persons with DM1 were included. The diagnosis was genetically confirmed either in participants ($n=69$) or in a first-degree family member ($n=1$). The participants were grouped by DM1 form by 2 independent neurologists. Fifty-eight were classified as having adult-onset forms and 12 the childhood form.

The study was approved by the Regional Ethical Review Board in Stockholm, and all participants gave their signed informed consent before enrolment.

Measures and procedures

Disease severity was classified by the first author and was based on the disease-specific MIRS (5), an ordinal 5-point scale, where 1 is no muscular impairment, 2 minimal signs, 3 distal weakness, 4 mild-to-moderate proximal weakness and 5 severe proximal weakness. MIRS grades 1–3 were defined as mild and MIRS grades 4–5 as severe disease.

A structured interview was used to collect information on disease-related factors and demographic characteristics, i.e. contextual factors. Thereafter the ICF checklist, in a modified version (see Appendix I), was used for self-rating of functioning, disability and environmental facilitators/barriers according to the verbal anchors of the ICF qualifiers. The main modifications were that body-structure impairments were not rated and that additional categories in the domains mobility and self-care were added. Functioning or disability within activities and participation can be described either as a person's capacity or, as in the present study, as performance. The latter indicates what a person does in his or her current environment, with assistive devices if needed. We used a single list for activities and participation domains and did not distinguish between activities and participation in the coding of functioning and disability. The categories of the modified ICF checklist were presented to each participant in colloquial language and, if necessary, the meaning of a category was explained in more detail. Participants were asked if they had any body-function problems, any activity and participation difficulties, and any environmental facilitators/barriers. Perceived problems in 29 body-function categories and difficulties in 52 activity and participation categories were rated by the participants with the following qualifiers: 0=no problem/difficulty, 1=mild problem/difficulty, 2=moderate problem/difficulty, 3=severe problem/difficulty and 4=complete (*sic*) problem/difficulty. Twenty-

three environmental-factor categories were rated either as perceived facilitators or barriers, using the following qualifiers: 0=no facilitator/barrier, +1=mild facilitator, +2=moderate facilitator, +3=substantial facilitator, +4=complete facilitator, 1=mild barrier, 2=moderate barrier, 3=severe barrier and 4=complete barrier.

Statistical methods

Drop-out analyses were performed with a χ^2 test for gender and with an unrelated *t*-test for age.

Descriptive statistics were used for disease-related and demographic characteristics. Each person's total number of body-function disabilities and of activity and participation disabilities was calculated by adding up the categories that were rated as a problem or difficulty.

In the frequency presentation of self-ratings in all ICF categories, the 0–4 qualifier scale was transformed to a 3-graded scale (10). Categories for which less than 20% of the participants rated problems/difficulties/facilitators were considered of less relevance and are therefore not reported.

Differences in disability with regard to disease severity were analysed using the Mann-Whitney *U* test and the Fisher's exact test. The qualifier scale was dichotomized as no problem/difficulty (qualifier 0) and problem/difficulty (qualifier 1–4). Due to the large number of outcome variables, the level of significance was set to $p \le 0.001$.

In the description of different disabilities in relation to environmental facilitators, body-function categories were reduced to represent 8 domains, activity and participation categories to represent 9 domains, and environmental-factor categories to represent 3 domains. A domain was coded as a disability or facilitator if any of the categories within that domain was rated as a problem/difficulty or facilitator, respectively. All the analyses were performed using SPSS for Windows (release 15.0).

RESULTS

Forty-one women and 29 men with DM1, with a mean age of 45 years (standard deviation (SD) 13, age range 19–70 years) participated in the study. There were no significant differences in age or gender between the 33 persons who declined to participate and the 70 who participated. Disease-related factors and demographic characteristics, i.e. contextual factors, from the structured interview are presented in Table I. Thirty-seven were classified as having mild disease and 33 as having severe. The median number of self-rated disabilities was 10 (interquartile range (IQR) 6–13, range 1–18) for body-function categories and 10 (IQR 3–19, range 0–38) for activity and participation categories.

Body-function categories for which 20% or more of the persons with DM1 rated problems are presented in Fig. 1. Eighty percent perceived problems of excessive daytime sleepiness, 76% of muscle power, and 66% of energy and drive functions. Thirty percent rated severe or complete problems of muscle power functions, 23% of defecation functions and 23% perceived pain as a severe or complete problem.

Activity and participation categories for which 20% or more of the participants rated difficulties are presented in Fig. 2. Between 59% and 74% perceived difficulties in physically demanding mobility activities, such as lifting and carrying heavy objects, running, walking on different surfaces or long distances, and climbing stairs. Fifty-four percent perceived severe-to-complete difficulty in running, 40% in lifting and carrying heavy objects and 34% in walking on different surfaces.

Environmental-factor categories rated by 20% or more of the persons with DM1 as facilitators are presented in Fig. 3.

Table I. *Disease-related factors and demographic characteristics of persons with myotonic dystrophy type 1 (DM1) (n = 70). The total percentage may exceed 100 due to rounding to whole numbers*

	n	*%*
Form of DM1		
Mild adult	2	3
Classic adult	56	80
Childhood	12	17
MIRS grade		
1 No muscular impairment	3	4
2 Minimal signs	13	19
3 Distal weakness	21	30
4 Mild-moderate proximal weakness	13	19
5 Severe proximal weakness	20	29
CNS-stimulant drugs		
Modafinil/methylphenidate	17/9	24/13
Aids		
ADL and/or orthotic aids	42	60
Mobility aids	25	36
Home adaptations	31	44
Personal care assistance	18	26
Education level		
University	19	27
Civil status		
Cohabiting with partner	31	44
Employment status		
Working part-/full-time	26	37

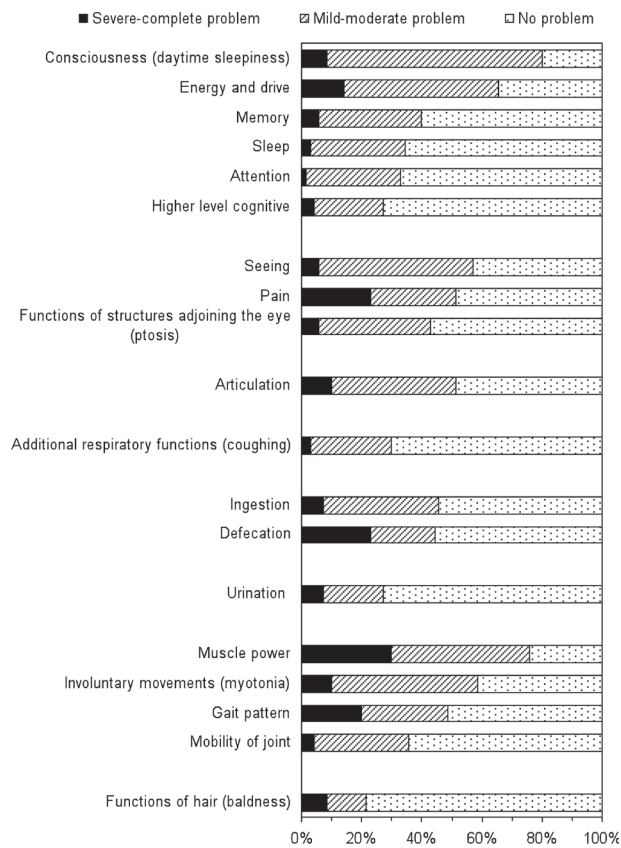MIRS: muscular impairment rating scale; CNS: central nervous system; ADL: activities of daily living.

Between 50% and 60% perceived support from the immediate family, medicines, social security services, and aids for personal use in daily living, as facilitators. Thirty-nine percent rated support from the immediate family, 37% transport services, 29% medicines and 29% social security services as a substantial or complete facilitator. Categories that no-one rated as facilitators included support from health professionals and all categories from the domain attitudes. None rated the 23 environmental factors as barriers to functioning.

Persons with severe disease reported more disabilities than did those with mild disease ($p \leq 0.001$); especially activity and participation disabilities, where the median value was 3 (IQR 1–9, range 0–27) for those with mild disease and 19 (IQR 12–29, range 3–38) for those with severe disease (Fig. 4). Differences in self-rated functioning and disability with regard to disease severity were found in 4 of 29 body-function categories and in 25 of 52 activity and participation categories ($p \leq 0.001$), see Table II. Disability in neuromusculoskeletal and movement-related functions, and in mobility, self-care and domestic life domains, were more frequently reported by persons with severe disease. Between 60% and 100% of the

Fig. 1. Body-function categories for which 20% or more of the persons with myotonic dystrophy type 1 (DM1) (*n* = 70) rated problems.
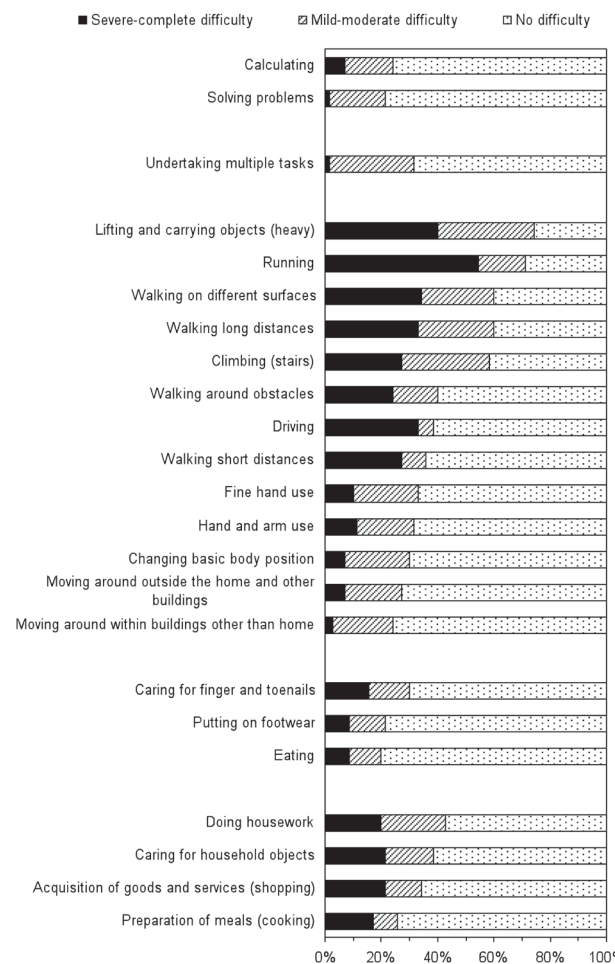

Fig. 2. Activity and participation categories for which 20% or more of the persons with myotonic dystrophy type 1 (DM1) (*n* = 70) rated difficulties.
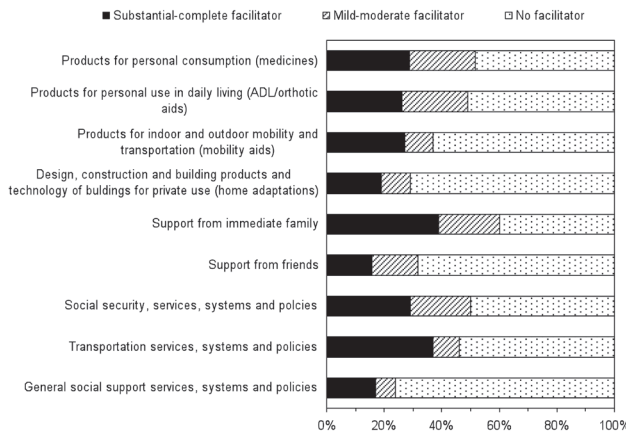
Fig. 3. Environmental-factor categories that 20% or more of the persons with myotonic dystrophy type 1 (DM1) (*n* = 70) rated as facilitators.
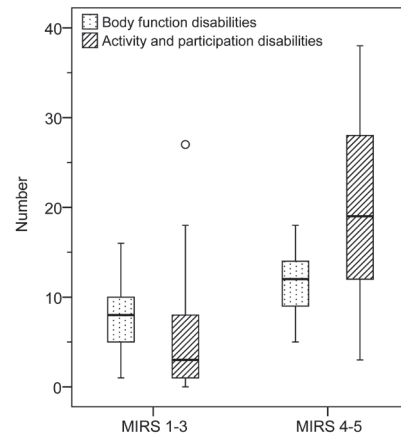

Fig. 4. Reported total number of body-function disabilities and of activity and participation disabilities with regard to mild (MIRS 1–3) and severe (MIRS 4–5) disease. The box-plots show median, quartiles and min-max non-outliers, and an outlier (o). MIRS: muscular impairment rating scale.

Table II. *Disability (problem/difficulty) and functioning (no problem/difficulty) reported by persons with myotonic dystrophy type 1 (DM1) for which significant differences were found between mild (MIRS 1–3, n = 37) and severe (MIRS 4–5, n = 33) disease*

	Disability		Functioning		
	MIRS 1–3 *n* (%)	MIRS 4–5 *n* (%)	MIRS 1–3 *n* (%)	MIRS 4–5 *n* (%)	*p*-value
Body functions					
Respiratory muscle	0 (0)	11 (33)	37 (100)	22 (67)	<0.001
Mobility of joint	6 (16)	19 (58)	31 (84)	14 (42)	<0.001
Muscle power	21 (57)	32 (97)	16 (43)	1 (3)	<0.001
Gait pattern functions	9 (24)	25 (76)	28 (76)	8 (24)	<0.001
Activities and participation					
Mobility					
Changing basic body position	1 (3)	20 (61)	36 (97)	13 (39)	<0.001
Lifting and carrying objects (heavy objects)	20 (54)	32 (97)	17 (46)	1 (3)	<0.001
Hand and arm use	3 (8)	19 (58)	34 (92)	14 (42)	<0.001
Walking short distances	2 (5)	23 (70)	35 (95)	10 (30)	<0.001
Walking long distances	12 (32)	30 (91)	25 (68)	3 (9)	<0.001
Walking on different surfaces	10 (27)	32 (97)	27 (73)	1 (3)	<0.001
Walking around obstacles	1 (3)	27 (82)	36 (97)	6 (18)	<0.001
Climbing (stairs)	11 (30)	30 (91)	26 (70)	3 (9)	<0.001
Running	17 (46)	33 (100)	20 (54)	0 (0)	<0.001
Moving around within buildings other than home	1 (3)	16 (48)	36 (97)	17 (52)	<0.001
Moving around outside the home and other buildings	1 (3)	18 (55)	36 (97)	15 (45)	<0.001
Using transportation	0 (0)	11 (33)	37 (100)	22 (67)	<0.001
Driving	7 (19)	20 (61)	30 (81)	13 (39)	<0.001
Self-care					<0.001
Washing whole body	0 (0)	13 (39)	37 (100)	20 (61)	<0.001
Drying oneself	0 (0)	10 (30)	37 (100)	23 (70)	<0.001
Caring for hair	0 (0)	8 (24)	37 (100)	25 (76)	0.001
Putting on clothes	0 (0)	12 (36)	37 (100)	21 (64)	<0.001
Taking off clothes	0 (0)	12 (36)	37 (100)	21 (64)	<0.001
Putting on footwear	0 (0)	15 (45)	37 (100)	18 (55)	<0.001
Taking off footwear	0 (0)	10 (30)	37 (100)	23 (70)	<0.001
Eating	0 (0)	14 (42)	37 (100)	19 (58)	<0.001
Drinking	0 (0)	8 (24)	37 (100)	25 (76)	0.001
Domestic life					
Acquisition of goods and services (shopping)	5 (14)	19 (58)	32 (86)	14 (42)	<0.001
Doing housework	7 (19)	23 (70)	30 (81)	10 (30)	<0.001
Caring for household objects	7 (19)	20 (61)	30 (81)	13 (39)	0.001

MIRS: muscular impairment rating scale.

Table III. *Number of persons with myotonic dystrophy type 1 (DM1) (n = 70) with self-rated disabilities who perceived environmental domains as facilitators*

		Environmental domains		
	Disabilities *n* (%)	Products and technology *n* (%)	Support and relationships *n* (%)	Services, systems and policies *n* (%)
Body functions				
Mental functions	66 (94)	51 (77)	48 (73)	44 (67)
Sensory functions and pain	59 (84)	45 (76)	42 (71)	42 (71)
Voice and speech functions	39 (56)	32 (82)	31 (79)	30 (77)
Functions of the cardiovascular, haematological, immunological and respiratory systems	36 (51)	28 (78)	24 (67)	26 (72)
Functions of the digestive, metabolic and endocrine systems	45 (64)	38 (84)	35 (78)	31 (69)
Genitourinary and reproductive functions	19 (27)	18 (95)	13 (68)	15 (79)
Neuromusculoskeletal and movement-related functions	63 (90)	49 (78)	46 (73)	43 (68)
Functions of the skin and related structures	15 (21)	12 (80)	12 (80)	9 (60)
Activities and participation				
Learning and applying knowledge	24 (34)	19 (79)	21 (88)	20 (83)
General tasks and demands	25 (36)	21 (84)	23 (92)	22 (88)
Communication	5 (7)	4 (80)	5 (100)	4 (80)
Mobility	60 (86)	48 (80)	47 (78)	45 (75)
Self-care	27 (39)	26 (96)	25 (93)	26 (96)
Domestic life	38 (54)	35 (92)	36 (95)	35 (92)
Interpersonal interactions and relationships	14 (20)	12 (86)	14 (100)	13 (93)
Major life areas	13 (19)	11 (85)	13 (100)	12 (92)
Community, social and civic life	6 (9)	5 (83)	6 (100)	6 (100)

participants with self-rated disabilities perceived environmental domains as facilitators (Table III). Twenty-one of 26 participants who reported use of prescribed central nervous system stimulants against excessive daytime sleepiness rated medicines as a facilitating environmental factor. Thirty-three of 42 persons who used aids to activities of daily living and/or orthotic aids, all 25 who had mobility aids, 20 of 31 who had home adaptations, and 17 of 18 who had personal care assistance rated these environmental factors as facilitators.

DISCUSSION

The main finding in the present study was the identification of commonly occurring self-rated disabilities and environmental facilitators in persons with DM1.

The body functions for which over half our study sample perceived problems reflect impairments that are often-described symptoms of DM1 (1). Excessive daytime sleepiness was the most common impairment, with 80% perceiving problems to some extent, which is higher than previously reported (11–14). This could be due to different assessment methods. Whereas we described self-rated perceived problems, others have reported the proportion of persons scoring over a cut-off point in various standardized questionnaires. This might have led to an underestimation of the problem. The causes of excessive daytime sleepiness are not fully understood; however, a central mechanism has been proposed and psychostimulants are used to increase alertness. Given the extent of the problem, other non-pharmacological approaches might be worth considering, for example physical exercise. Daytime sleepiness is associated with low physical activity levels in patients with sleep apnoea (15), and in older adults (16). Participation in a tai chi exercise

programme reportedly reduces daytime sleepiness in older adults (17). The effect of physical exercise on daytime sleepiness in persons with DM1 has not, however, yet been studied.

Impairments in muscle power were expected, and muscle weakness has been documented in several studies (4, 18, 19). However, even minor reductions could be rated as major problems, indicating that the perception of an impairment is relative and highly individual. Myotonia is a cardinal symptom of DM1 and occurs more frequently in mildly affected persons, reportedly as a problem of less extent (1). Nonetheless, our results show that 59% of the participants, including both those with mild and severe disease, perceived impairments. Knowledge of the individual's perception of problems is therefore important, so that individually-tailored health services can be offered. Pain has been recognized as a common problem for many persons with slowly-progressive neuromuscular diseases (20), and the fact that 23% of our study sample perceived pain as a severe or complete problem emphasizes the importance of developing strategies for management of pain in clinical practice.

In agreement with previous findings, activity and participation difficulties were reported mainly in physically demanding mobility and domestic-life activities (6, 14, 21–23). That the most frequently reported disabilities seemed to be related to muscle strength indicates the need for interventions. The role of exercise in DM1 has been debated, since it is unclear how exertion affects the diseased neuromuscular system. Moderate-intensive strength training seems to do no harm (24), but further research is needed to establish whether exercise programmes are beneficial.

Very few participants with mild disease and surprisingly few with severe disease perceived difficulties in self-care. This could be because performance, and not capacity, was rated.

The use of aids or assistance in self-care activities was, however, not fully understood in our study, since the participants did not rate environmental factors in relation to activity and participation categories. On the other hand, the use of devices and techniques, aids or assistance, as well as a high level of satisfaction with self-care activities, have been reported in persons with muscular dystrophies, including DM1 (21), and in adults with DM1 only (6).

Only 3% of our study sample perceived difficulties in recreation and leisure pursuits, in contrast to reports from Gagnon et al. (6), who found that participation in the recreation category was restricted for at least 23% of their sample of 200 adult-onset DM1 participants. Direct comparisons might, however, be complicated, due to different assessment methods and to difficulties in addressing the role of participants' choices and preferences in ratings. Reports of satisfaction with recreation and leisure activities are contradictory. Low satisfaction was observed in the study of Gagnon et al. (6), whereas Nätterlund & Ahlström (21) state that their study sample seemed satisfied. Even though many of their respondents with muscular dystrophies reported that they did not have a leisure activity, few wished for a improved situation (21). Whether persons with DM1 perceive activity limitations and/or participation restrictions in the domain community, social and civic life needs further study.

Integration of environmental factors in a person's description of their health condition has been highlighted and is considered to play a central role (25). Our participants did not rate environmental factors as barriers. This is in contrast to the study by Gagnon et al. (14), in which 17–51% reported various types of environmental barrier to participation. The difference could lie in the varying provision of aids, assistance, government services, etc. between countries, or that we did not elicit the effect of a specific environmental factor on a specific activity. The fact that none of the persons with DM1 in our study rated support from health professionals, and less than 20% rated health services, systems and policies as facilitators, highlights possible areas for improvements in health services.

ICF codes without qualifiers have no inherent meaning according to the ICF (8). However, information on the validity, reliability and sensitivity of the qualifier measurement system is scarce. We have found only 5 studies, all exploring reliability, which reported low-to-moderate agreement (10, 26–29). Improved reliability was shown by Uhlig et al. (10) when the scale was reduced from 5 grades to 3. Consequently we used a 3-grade scale for descriptive purposes and dichotomized the categories for analysis.

The ICF checklist was altered on the basis of findings presented in the literature, clinical experience, and the fact that we were going to use it for self-assessment. However, redundant information was collected in the mobility and self-care domains and fewer categories should be selected for use in clinical practice. Specific core sets, i.e. lists of ICF categories considered relevant for describing a disease, have been formulated for other disorders (30, 31) and settings (32). Even if a DM1-specific core set was developed, a potential barrier to clinical use is the ICF language. We found that it was sometimes difficult to understand, and we had to translate categories into everyday language to be able to use the checklist. Maybe these difficulties can be overcome by developing specific ICF assessment tools or by "translating" existing outcome measures to ICF, for which linking rules have been developed (33). We agree with Stucki (34), that the ICF can be used to identify "what?", but not "how", to measure.

Assessment of human functioning, disability and health is a unique feature in physical and rehabilitation medicine, and is used to understand a person's experience of disability, so that health services can be selected aiming at optimizing function (35). We have used the ICF checklist for self-assessment, and thus described functioning and disability from an individual's point of view. That our participants showed such varied disabilities stresses the importance of comprehensive evaluations and implies that a multi-professional approach is needed for optimal care. The next step will be to describe and analyse how self-rated perceived function and disability, quantified by the ICF qualifiers, correlates with data from clinical examinations, functional assessments and established questionnaires. Such information could be used to identify rehabilitation strategies.

In conclusion, disabilities and important environmental facilitators in adults with DM1 have been identified, and this clinically-relevant information can be used for developing health services for people with this condition.

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APPENDIX I. Modified checklist

List of 29 Body Functions

b1.	*Mental functions*
b110	Consciousness (Daytime sleepiness)
b114	Orientation
b130	Energy and drive functions
b134	Sleep
b140	Attention
b144	Memory
b164	Higher-level cognitive functions
b2.	*Sensory functions and pain*
b210	Seeing
b215*	Functions of structures adjoining the eye (ptosis)
b230	Hearing
b280	Pain
b3.	*Voice and speech functions*
b310	Voice
b320*	Articulation functions
b4.	*Functions of the cardiovascular, haematological, immunological, and respiratory systems*
b410	Heart
b435	Immunological (allergies, hypersensitivity)
b440	Respiration (breathing)
b445*	Respiratory muscle functions
b450*	Additional respiratory functions (coughing, blowing)
b5.	*Functions of the digestive, metabolic and endocrine systems*
b510*	Ingestion functions (chewing, swallowing)
b515	Digestive
b525	Defecation
b540*	General metabolic functions (diabetes, insulin resistance)
b555	Endocrine glands (hormonal changes)
b6.	*Genitourinary and reproductive functions*
b620	Urination functions

b7.	*Neuromusculoskeletal and movement- related functions*
b710	Mobility of joint
b730	Muscle power
b765	Involuntary movements (myotonia)
b770*	Gait pattern functions
b8.	*Functions of the skin and related structures*
b850*	Functions of hair (baldness)

List of 52 Activities and Participation

d1.	*Learning and applying knowledge*
d166*	Reading
d170*	Writing
d172*	Calculating
d175	Solving problems
d2.	*General tasks and demands*
d210	Undertaking a single task
d220	Undertaking multiple tasks
d230*	Carrying out daily routine
d3.	*Communication*
d310–329	Communicating – receiving
d330–349	Communicating – producing
d4.	*Mobility*
d410*	Changing basic body position
d415*	Maintaining a body position
d430	Lifting and carrying objects, light objects
d430	Lifting and carrying objects, heavy objects
d440	Fine hand use (picking up, grasping)
d445*	Hand and arm use
d4500*	Walking short distances
d4501*	Walking long distances
d4502*	Walking on different surfaces
d4503*	Walking around obstacles
d4551*	Climbing
d4552*	Running
d4600*	Moving around within the home
d4601*	Moving around within buildings other than home
d4602*	Moving around outside the home and other buildings
d465	Moving around using equipment (wheelchair, walker, etc.)
d470	Using transportation (car, bus, train, plane)
d475	Driving (riding bicycle and motorbike, driving car, etc.)
d5.	*Self-care*
d5100*	Washing body parts
d5101*	Washing whole body
d5102*	Drying oneself
d5201*	Caring for teeth
d5202*	Caring for hair
d5203–d5204*	Caring for finger and toenails
d530	Toileting
d5400*	Putting on clothes
d5401*	Taking off clothes
d5402*	Putting on footwear
d5403*	Taking off footwear
d550	Eating
d560	Drinking
d6.	*Domestic life*
d620	Acquisition of goods and services (shopping)
d630	Preparation of meals (cooking etc.)
d640	Doing housework (cleaning house, washing dishes laundry, ironing, etc.)
d650*	Caring for household objects
d7.	*Interpersonal interactions and relationships*
d710	Basic interpersonal interactions
d720	Complex interpersonal interactions

d8.	*Major life areas*
d820	School education
d830	Higher education
d850	Remunerative employment
d860	Basic economic transactions
d870	Economic self-sufficiency
d9.	*Community, social and civic life*
d910	Community life
d920	Recreation and leisure

List of 23 Environmental Factors

e1.	*Products and technology*
e110	For personal consumption (food, medicines)
e115	For personal use in daily living
e120	For personal indoor and outdoor mobility and transportation
e125	Products for communication
e155	Design, construction and building products and technology of buildings for private use
e3.	*Support and relationships*
e310	Immediate family
e320	Friends
e325	Acquaintances, peers, colleagues, neighbours and community members
e340	Personal care providers and personal assistants
e350*	Domesticated animals
e355	Health professionals
e4.	*Attitudes*
e410	Individual attitudes of immediate family members
e420	Individual attitudes of friends
e425*	Individual attitudes of acquaintances, peers, colleagues, neighbours and community members
e440	Individual attitudes of personal care providers and personal assistants
e450	Individual attitudes of health professionals
e460	Societal attitudes
e5.	*Services, systems and policies*
e525	Housing services, systems and policies
e540	Transportation services, systems and policies
e570	Social security, services, systems and policies
e575	General social support services, systems and policies
e580	Health services, systems and policies
e590	Labour and employment services, systems and policies

Omitted categories from the original ICF checklist

b117	Intellectual
b152	Emotional functions
b156	Perceptual functions
b167	Language
b235	Vestibular
b420	Blood pressure
b430	Haematological
b530	Weight maintenance
b640	Sexual functions
b735	Muscle tone
d110	Watching
d115	Listening
d140	Learning to read
d145	Learning to write
d150	Learning to calculate
d350	Conversation
d450	Walking
d510	Washing oneself
d520	Caring for body parts
d540	Dressing
d570	Looking after one's health

d660	Assisting others	e225	Climate
d730	Relating with strangers	e240	Light
d740	Formal relationships	e250	Sound
d750	Informal social relationships	e330	People in position of authority
d760	Family relationships	e360	Health related professionals
d770	Intimate relationships	e455	Individual attitudes of health related professionals
d810	Informal education	e465	Social norms, practices and ideologies
d930	Religion and spirituality	e535	Communication services, systems and policies
d940	Human rights	e550	Legal services, systems and policies
d950	Political life and citizenship	e585	Education and training services, systems and policies
e150	Design, construction and building products and technology of buildings for public use		

*Categories added to the International Classification of Functioning, Disability and Health (ICF) checklist by the authors.