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ORIGINAL REPORT

EXPLORATION OF SOME PERSONAL FACTORS WITH THE INTERNATIONAL CLASSIFICATION OF FUNCTIONING, DISABILITY AND HEALTH CORE SET FOR STROKE

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Objective: **The aim of this study was to explore the influence of personal factors (i.e. age, gender, place of residence and time since onset of stroke) on self-perceived functioning and environmental factors, using the International Classification of Functioning, Disability and Health (ICF) Core Set for Stroke (extended version) as a framework.**
Design: **Cross-sectional study.**
Participants: **A total of 243 community-dwelling persons (53% men) with prior stroke (6 months to 13 years) with a mean age of 68 years (age range 24–95 years).**
Methods: **Regression analysis of 4 personal factors (age, gender, place of residence, and time since onset of stroke) was used to explore their influence on different components, domains and categories of functioning and environmental factors, evaluated with the extended version of the Comprehensive ICF Core Set for Stroke.**
Results: **The personal factors had statistically significant predictive values for almost all the categories, domains and components of functioning and environmental factors examined in this study. These factors influence self-perceived functional outcome and environmental factors in terms of being barriers or facilitators in various ways.**
Conclusion: **Personal factors, such as age, gender, place of residence and time since onset of stroke, influence self-perceived functioning and environmental factors.**

Key words: ICF; personal factors; stroke.

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INTRODUCTION

According to the World Health Organization (WHO), approximately 15 million people (1) have a stroke each year, defined as acute neurological dysfunction of vascular origin with sudden or rapid occurrence of symptoms and signs corresponding to the involvement of focal areas in the brain (2). Of these, 5 million die and another 5 million are left with permanent disability (1). Among adults, stroke, along with ischaemic heart disease, is a leading cause of both death and disability-adjusted life years (DALY) worldwide (3, 4). The capacity and performance of persons with stroke is poorer than in other chronic conditions (5). Furthermore, frequency of stroke, along with other non-communicable diseases, is predicted to increase, especially in rapidly developing regions (6), and therefore disability will be a growing problem.

Disability is the umbrella term for impairments, activity limitations and participation restrictions, referring to the negative aspects of interaction between an individual and his or her contextual factors (7). Disability following stroke affects all levels of functioning (8–10) and appears not to change significantly over time (11).

Data on all aspects of functioning and disability are important for constructing a thorough picture of persons with different health conditions. However, approaches to measuring disability and data collection methods vary between countries, which influences results (6). The International Classification of Functioning, Disability and Health (ICF) was developed (12) to enable the description not only of disabilities, but also of functioning. However, since the ICF encompasses more than 1,400 categories and is not practical for clinical use, the ICF Core Sets were developed (13). The extended version of the ICF Core Set for Stroke has 166 categories (59 body functions, 11 body structures, 59 activities and participation, and 37 environmental factors) (10, 14).

Personal factors (PF) (the particular background of an individual's life and living, comprising features of the individual that are not part of the health condition) (12) play a very important role in a patient's functioning and health (15) and are not yet classified by the ICF (12). It is assumed that PF can influence disability at any level (12). PF represent the differences that will always exist between people (16), and a better understanding of PF may therefore enable improvement in person-centred rehabilitation (17).

The aim of this study was to investigate whether PF, such as age, gender, place of residence and time since onset of stroke, can influence self-perceived functioning and predict barriers and facilitators perceived in dealing with environmental factors in the framework of the ICF for persons in the chronic stage of

stroke who live in Sweden. The PF selected for study relate to a basic background for living with permanent disability and it is possible to categorize or measure them, compared with factors such as coping styles or social background, which require deeper knowledge and specific measurement instruments.

MATERIAL AND METHODS

Participants

Data from 243 persons were included in the study. Inclusion criteria were: diagnosis of stroke (ICD-10 codes I60–I67), clinically determined by specialists at stroke units according to WHO criteria (2) and confirmed by computed tomography (CT); age at least 18 years; having given written informed consent (or consent given by next to kin); time from onset of stroke of at least 6 months. The persons were a convenience sample of those with prior stroke living in the community. They were either former patients of a stroke unit or of a rehabilitation clinic, who were in contact with physical therapists in the community or recruited through a patient organization. The aim was to include people of different ages, with different social situations and levels of impairments.

Methods

Interviews were carried out between 6 months and 13 years after the onset of stroke, with a mean of 33.3 months. There were 5 interviewers, all of whom were trained prior to the study. Participants were interviewed at home using semi-structured questions based on the extended version of the Comprehensive ICF Core Set for Stroke, which includes 166 categories of second-level classification of the ICF (10). The Core Set was completed using all the information received and the researcher's impressions of the interviewed patient.

The study conformed to the ethical principles of the Declaration of Helsinki and was approved by the ethics committee of the University of Gothenburg (numbers T129-05/Ad 419-04 and 390-05).

Data analysis

Statistical analyses were carried out using SPSS (version 20.0). Descriptive statistics were used for demographic and clinical characteristics of the study population. The qualifier scale of the ICF categories was dichotomized to avoid analysing data that would not represent actual changes in components of the ICF. The qualifier 0 (no problem) was maintained for body functions and structures and activities and participation, qualifiers 1–4 were re-coded to 1 (problem), response option 8 (not specified) was treated as missing, and response option 9 (not applicable) was re-coded to 0 (no problem). For facilitators of environmental factors, qualifiers 1–4 (facilitators) recoded as 1, 0 (neither/nor) were maintained, response option 8 (not specified) was treated as missing, and response options 9 (not applicable) and –1 to –4 (barriers) were re-coded as 0 (neither/nor). For barriers of environmental factors, qualifiers –1 to –4 (barriers) recoded as 1, 0 (neither/nor) was maintained, response option 8 (not specified) was treated as missing, and response option 9 (not applicable) and 1–4 (facilitators) were re-coded as 0 (neither/nor). The problems were counted under different components of functioning, and facilitators and barriers were counted according to the domains of environmental factors included in the extended ICF Core Set for Stroke.

Table I. *Baseline characteristics of study population*

Characteristics	Males (n=129, 53.1%)	Females (n=114, 46.9%)	Total (n=243, 100%)
Age, years			
Mean (min–max)	67.7 (31–92)	71.3 (24–95)	69.4 (24–95)
Median	68	74	71
IQR	60.2–77	63–83	62–80
Time since onset of stroke, months			
Mean (min–max)	33.9 (6–144)	32.7 (6–157)	33.3 (6–157)
Median	18	12	14
IQR	12–42.5	11–46	12–44
Place of residence, *n* (%)			
Country	37 (28.7)	30 (26.3)	67 (27.6)
City	92 (71.3)	84 (73.7)	176 (72.4)
Diagnosis, ICD-10, *n* (%)			
I60	7 (5.4)	7 (6.1)	14 (5.8)
I61	19 (14.7)	7 (6.1)	26 (10.7)
I63	70 (54.3)	85 (74.6)	155 (63.8)
I64	33 (25.6)	15 (13.2)	48 (19.8)
Affected side of body, *n* (%)			
None	8 (6.2)	12 (10.5)	20 (8.2)
Right	40 (31.0)	39 (34.2)	79 (32.5)
Left	66 (51.2)	52 (45.6)	118 (48.6)
Both	7 (5.4%)	6 (5.3)	13 (5.3)
No data	8 (6.2)	5 (4.4)	13 (5.3)
Modified Rankin scale, *n* (%)			
0 – no disability	5 (3.9)	5 (4.4)	10 (4.1)
1 – no significant disability	35 (27.1)	20 (17.5)	55 (22.6)
2 – slight disability	36 (27.9)	32 (28.1)	68 (28.0)
3 – moderate disability	25 (19.4)	30 (26.3)	55 (22.6)
4 – moderately severe disability	25 (19.4)	25 (21.9)	50 (20.6)
5 – severe disability	2 (1.5)	1 (0.9)	3 (1.2)
No data	1 (0.8)	1 (0.9)	2 (0.8)

IQR: interquartile range; ICD-10: International Classification of Diseases 10th revision.

The same independent variables were used in both the standard multiple regression analysis and the direct logistic regression analysis: age, gender, place of residence (rural or city) and time since onset of stroke. Preliminary analyses were conducted to assess the assumptions of normality, linearity, multicollinearity and homoscedasticity, to ensure that they are adequately fulfilled.

Standard multiple regression was used to assess the ability of selected factors to predict the number of problems in functioning (in the components of body functions and activities and participation) and the number of barriers and facilitators in environmental factors divided into 5 domains ("products and technology"; "natural environment and human rights"; "support and relationships"; "attitudes"; and "services, systems and policies").

Direct logistic regression was used to assess the impact of PF on the perception of selected components of activities and participation and environmental factors in the context of the ICF: "Moving around in different locations" (d469); "Toileting" (d530); "Dressing" (d540); "Doing housework" (d640); "Recreation and leisure" (d920); "Physical geography" (e210); and "Immediate family" (e310). These domains were selected on the basis of their properties for reflecting the need for assistance, previous reports of their being common problems (18–20), and according to clinical judgment.

RESULTS

The majority of the study population (176 subjects (72.4%), mean age 69.4 years, 95 males (52%)) lived in the city. Sixty-seven subjects (27.6%), mean age 73.5 years, 37 males (55%), lived in rural settings. The baseline characteristics of the study population are shown in Table I.

The most commonly reported problems of functioning were related to mobility, but visual and memory problems were also common (Table II). Relationships with other human beings were important as facilitators (Table II). "Physical geography" (e210), along with "design, construction and building products and technology of building for public use", were the most common barriers (Table II). Descriptive statistics for 12 outcome variables used in the multiple linear regression analysis are shown in Table III, and for 7 outcome variables used in the direct logistic regression analysis in Table V.

Higher age indicated a greater number of problems in functioning. Age also had an influence on most of the areas in the environmental factors. Reports of restrictions in "activities and participation" were more typical in older patients (Tables IV and VI). Time since onset was found to be a factor that influences "activities and participation" and from "environmental factors", the perception of attitudes was influenced (Table IV). Living in a rural setting was associated with perceiving facilitators in "natural environment and human-made changes in the environment". On the other hand, those who lived in the city reported facilitators in "support and relationships" and "attitudes" to a higher degree than those who lived in a rural setting (Tables IV and VI). The results of the complete analyses of the regression analyses are shown in Tables IV and VI, where only independent variables with a p-value of less than 0.1 are included. The beta value in Tables IV and VI is reported for the model including all 4 PF.

Table II. *Commonly reported problems of functioning and facilitators and barriers of environmental factors*

		n (%)
Body functions		
b730	Muscle power functions	165 (67.9)
b455	Exercise tolerance functions	147 (60.5)
b770	Gait pattern functions	143 (58.8)
b210	Seeing functions	134 (55.1)
b144	Memory functions	125 (51.4)
b740	Muscle endurance functions	118 (48.6)
b130	Energy and drive functions	114 (46.9)
b755	Involuntary movement reaction functions	106 (43.6)
b710	Mobility of joint functions	106 (43.6)
b760	Control of voluntary movement functions	98 (40.3)
b735	Muscle tone functions	85 (35)
b140	Attention functions	81 (33.3)
b280	Sensation of pain	78 (32.1)
b134	Sleep functions	77 (31.7)
b235	Vestibular functions	76 (31.3)
Activities and participation		
d455	Moving around	205 (84.4)
d845	Acquiring, keeping and terminating a job	183 (75.3)
d450	Walking	181 (74.5)
d850	Remunerative employment	169 (69.5)
d460	Moving around in different locations	166 (68.3)
d640	Doing housework	166 (68.3)
d465	Moving around using equipment	159 (65.4)
d855	Non-remunerative employment	154 (63.4)
d230	Carrying out daily routine	153 (63)
d475	Driving	153 (63)
d430	Lifting and carrying objects	147 (60.5)
d240	Handling stress and other psychosocial demands	143 (58.8)
d440	Fine hand use	132 (54.3)
d445	Hand and arm use	130 (53.5)
d920	Recreation and leisure	130 (53.5)
Body structures		
s110	Structure of brain	97 (39.9)
s750	Structure of lower extremity	78 (32.1)
s730	Structure of upper extremity	68 (28)
s410	Structure of cardiovascular system	54 (22.2)
s720	Structure of shoulder region	46 (18.9)
Environmental factors as barriers		
e150	Design, construction and building products and technology of buildings for public use	23 (9.5)
e210	Physical geography	23 (9.5)
e155	Design, construction and building products and technology of buildings for private use	20 (8.2)
e250	Sound	19 (7.8)
e460	Societal attitudes	18 (7.4)
e450	Individual attitudes of health professionals	17 (7)
Environmental factors as facilitators		
e310	Immediate family	193 (79.4)
e320	Friends	173 (71.2)
e315	Extended family	149 (61.3)
e355	Health professionals	149 (61.3)
e325	Acquaintances, peers, colleagues, neighbours, and community members	118 (48.6)
e110	Products or substances for personal consumption	113 (46.5)
e120	Products and technology for personal indoor and outdoor mobility and transportation	113 (46.5)
e580	Health services, systems and policies	113 (46.5)
e410	Individual attitudes of immediate family members	112 (46.1)
e540	Transportation services, systems and policies	106 (43.6)
e570	Social security services, systems and policies	106 (43.6)

Table III. *Descriptive statistics for outcome variables used in the multiple linear regression analysis*

	Males ($n=129$)			Females ($n=114$)			Total ($n=243$)		
	Mean	Median	IQR	Mean	Median	IQR	Mean	Median	IQR
Sum of problems in body functions (0–59)	12.6	12	7–16	15.2	14	10–18	13.8	13	8–17
Sum of problems in activities and participation (0–59)	19.6	18	10–27	22.4	21.5	13.8–30.2	20.9	20	12–29
Products and technology (0–8)									
Facilitators	1.6	1	0–3	2.2	2.0	0.8–4	1.9	2	0–3
Barriers	0.2	0	0	0.3	0	0	0.3	0	0
Natural environment and human-made changes to environment (0–3)									
Facilitators	0.2	0	0	0.2	0	0	0.2	0	0
Barriers	0.2	0	0	0.2	0	0	0.2	0	0
Support and relationships (0–7)									
Facilitators	3.7	4	2–5	3.8	4	3–5	3.78	4	3–5
Barriers	0.2	0	0	0.1	0	0	0.2	0	0
Attitudes (0–9)									
Facilitators	2.4	1	0–4	1.7	1	0–3	2.1	1	0–3
Barriers	0.4	0	0	0.3	0	0	0.5	0	0
Services, systems and policies (0–10)									
Facilitators	2.2	1	0–4	3.1	3	1–5	2.6	2	0–4
Barriers	0.4	0	0	0.2	0	0	0.3	0	0

IQR: interquartile range.

DISCUSSION

These results suggest that PF, such as age, gender, place of residence and time since onset of stroke, can influence self-perceived functioning and predict barriers and facilitators perceived in dealing with environmental factors defined in the framework of the ICF. Age and gender as socio-demographic environmental factors are mentioned in the definition of PF in the framework of the ICF. Although they are not classified in the ICF, they may influence the domains, as shown in this study. However, factors such as place of residence and time since onset are not mentioned in a review dealing with PF (17), although they are not classified under any other components of the ICF.

The PF model chosen for this study showed an impact on functioning and environmental factors. The 2 highest R^2 values in this model were for environmental factors (facilitators of "products and technology" and "support and relationships") and number of restrictions in "activities and participation". All other groups analysed also showed statistically significant predictive values. These results may be due to a separation of different domains of environmental factors (because of their diversity), but problems reported in "body functions" and "activities and participation" were counted together under each of these components. Nevertheless, these results are supported by other studies in terms of emphasizing that modifying environmental factors can be beneficial for stroke patients in the chronic phase, while approaches at other levels of individuals' problems are more likely to fail to achieve any satisfactory goal (21–23).

"Physical geography" and "design, construction and building products and technology of building for public use" were

Table IV. *Results of standard multiple regression analysis*

				Beta	p**
Sum of problems in body functions	R^2 0.045 p* 0.026		Males vs females	0.156	0.016
Sum of problems in activities and participation	R^2 0.102 p* <0.0005		Time Age Males vs females	0.219 0.134 0.110	0.001 0.036 0.077

	Facilitators				Barriers				
Environmental factors			Beta	p**				Beta	p**
Products and technology	R^2 0.214 p* <0.0005	Age Males vs females	0.401 0.131	<0.0005 0.025	R^2 0.049 p 0.017	Age Rural vs city living		–0.137 –0.199	0.036 0.006
Natural environment and human-made changes to environment	R^2 0.042 p* 0.038	Rural vs city living	–0.159	0.026	R^2 0.053 p 0.012	Age		–0.224	0.001
Support and relationships	R^2 0.119 p* <0.0005	Rural vs city living	0.320	<0.0005	R^2 0.076 p 0.001	Age		–0.274	<0.0005
Attitudes	R^2 0.094 p* <0.0005	Time Age Rural vs city living	0.194 –0.199 0.127	0.005 0.002 0.068	R^2 0.090 p <0.0005	Time Age		0.137 –0.271	0.045 <0.0005
Services, systems and policies	R^2 0.098 p* <0.0005	Age Male vs Females	0.243 0.152	<0.0005 0.016	R^2 0.049 p 0.017	Age		–0.189	0.004

*statistical significance of the model; **statistical significance of each variable of the model.

Table V. *Descriptive statistics for 7 outcome variables used in the direct logistic regression analysis (5 items of "activities and participation" and 2 of "environmental factors")*

ICF code	ICF category title	Males (n=129) n	Females (n=114) n	Total (n=243) n
d460	Moving around in different locations	81	85	166
d530	Toileting	32	24	56
d540	Dressing	49	47	96
d640	Doing housework	81	85	166
d920	Recreation and leisure	64	66	130
e210	Physical geography'			
	Facilitators	2	3	5
	Barriers	11	12	23
e310	Immediate family			
	Facilitators	101	92	193
	Barriers	4	2	6

the most commonly recognized barriers, notwithstanding that neither reached the 10% threshold in this study. These results are unexpected for the category "physical geography", firstly because of the hilly characteristics of the region in which most of the study population lived and, secondly, because the patients in this study mainly come from the same part of Sweden as in the study of Algurén et al. (20), which reported different results. In Algurén et al.'s study of self-reported changes in barriers and facilitators of environmental factors in a similar population of stroke patients in Sweden, 3 months after the stroke more than half of the patients reported that "physical geography" was a problem. However, this cohort of patients had lived longer with their condition after the stroke and, as the environment is persistent and not changeable, after a while patients no longer recognize it as a problem. New experiences and changes in expectations during the post-acute period of stroke can lead to reprioritization, recalibration and reconceptualization, called response shift, of a set of problems that a person meets in his/her daily life. This, at least, seems to be implied in changes in self-perceived physical function among stroke patients (24).

Seven selected categories were analysed in this study: 5 in the components of "activities and participation" and 2 in environmental factors. The model of PF was found to have highly significant relations to all 5 domains of "activities and participation". For environmental factors, this model was seen to be significant only for barriers in "physical geography" and facilitators for "immediate family", which is understandable, since both "immediate family" as a barrier and "physical geography" as a facilitator are considered only in exceptional cases.

Although this model of PF showed an influence of all the components, domains and categories that were used for analysis, the influence of each single factor and the interaction of these factors differed widely between different components, domains and categories. For example, the domain "moving around in different locations" was found to be influenced only by age, whereas "doing housework" was influenced by a combination of all the factors studied. Also, explained variance between models differed and was rather low for components such as "body functions" and "natural environment and human-made changes to environment". This result is not unexpected, as most variance in functioning is explained by underlying health condition and its impairments.

Age was found to have the greatest influence of all the components, domains and categories of the ICF studied. While the most common problems in "body functions" and "activities and participation" were related to mobility, components of functioning reach beyond that. Age was shown to influence a number of problems and all of the chosen categories of "activities and participation" and almost all the domains of

Table VI. *Results of direct logistic analysis for 7 chosen domains of the ICF (5 items of "activities and participation" and 2 of "environmental factors")*

ICF code	ICF category title		p*		Beta	p**	OR	95% CI for OR Lower	95% CI for OR Upper
d460	Moving around in different locations		<0.0005	Age	0.054	0.000	1.056	1.031	1.082
d530	Toileting		<0.0005	Time	0.011	0.033	1.011	1.001	1.021
				Age	0.047	0.002	1.048	1.017	1.080
				Males vs females	–0.583	0.090	0.558	0.285	1.094
				Rural vs city living	–0.817	0.033	0.442	0.208	0.938
d540	Dressing		<0.0005	Time	0.010	0.049	1.010	1.000	1.019
				Age	0.036	0.003	1.013	1.013	1.062
				Rural vs city living	–1.038	0.003	0.354	0.177	0.709
d640	Doing housework		<0.0005	Time	0.018	0.022	1.018	1.003	1.033
				Age	0.036	0.003	1.036	1.013	1.060
				Males vs females	0.660	0.043	1.935	1.021	3.669
				Rural vs city living	–1.036	0.013	0.241	0.078	0.740
d920	Recreation and leisure		<0.0005	Age	0.029	0.008	1.029	1.007	1.052
				Rural vs city living	–1.027	0.023	0.358	0.148	0.867
e210	Physical geography'	Facilitators	0.054						
		Barriers	0.016	Rural vs city living	–1.519	0.004	0.219	0.079	0.608
e310	Immediate family	Facilitators	0.001	Age	0.039	0.022	1.042	1.040	1.075
				Rural vs city living	2.110	0.000	8.251	2.860	23.801
		Barriers	0.470						

*statistical significance of the model; **statistical significance of each variable of the model.
ICF: International Classification of Functioning, Disability and Health; OR: odds ratio; CI: confidence interval.

environmental factors, except for the reporting of a "physical geography" as a barrier. Reporting restrictions in "activities and participation" was more typical in older patients, while reporting barriers in "natural environment and human-made changes to environment", "support and relationships" and both facilitators and barriers in "products and technology" and "attitudes" were more common among younger patients. Several studies have shown the importance of age as a factor in the functional outcome of stroke (25–27).

Some studies explain gender differences in stroke outcome by a greater mean age in women who have a first-ever stroke (28, 29) and by a lower level of consciousness on admission (29). However, there are findings in studies based on the Swedish stroke population that suggest that there are certain differences that might be explained by biological, epidemiological and clinical differences (30). It is worth mentioning that most of the differences considered to be gender-specific are assessed using self-perceived questionnaires (31, 32). In our study, gender has shown some relation to functioning, where more problems are reported by males, unlike the studies mentioned above (28–32) in which men had been prone to have a better outcome. One possible explanation for this association of "doing housework" and gender, where every woman reported this as a problem, while only two men reported the same, could be that gender plays a role in social distinction.

Rural and urban disparities have been underlined for stroke management (33) because of the accessibility of healthcare (34), although there is evidence that differences in functional outcome are related to receiving organized stroke care rather than any other reason (35). Still, according to data in the Swedish Stroke register, nearly all persons who require treatment in a stroke unit do receive that treatment (36). It may be thought that living in a rural region or in a city makes a great difference in daily living, society and the physical environment, and can offer unique previous experience that can lead to a different treatment of a person's condition, skills and environment. This can greatly affect functioning at different levels (37). Nevertheless, having facilitators in "natural environment and human-made changes in environment" was reported more often by those living in a rural setting, but facilitators in "support and relationships" and "attitudes" reported by those living in a city is not an expected result. Categories in "activities and participation" ("toileting", "dressing", "doing housework" and "recreation and leisure") were influenced by place of residence, indicating that those who lived in the city more often recognized this as a problem, which also indicates a diversity that is related to subjective reasons (such as self-image and demands) rather than to objective barriers in the environment. The odds of perceiving "physical geography" as a barrier was 4.6 times higher among people who lived in the city. This phenomenon could be explained by differences in the objective geography of the place of residence, or by different personal attitudes to the environment. "Immediate family" as a facilitator was mentioned much more often by those who lived in a rural setting. In rural areas, a person could be much more closely connected to the family than may be the case in the city when the family does not live in the near vicinity or where other care providers are available.

Time since onset was found to be a factor that influences only two groups analysed in this study, where the longer the time that had elapsed since the stroke event, the smaller was the possibility to recognize "activities and participation" as a problem or "attitudes" as facilitators or barriers. However, this factor showed some influence on "dressing", "toileting" and "doing housework", which tended to increase with time. Most of the existing evidence shows that the most effective time for rehabilitation is the first 6 months after the stroke, although it is reported that some patients can also gain skills after this period (38). As mentioned above, there is some evidence that the domains that persons with disabilities report as being problems can change with time (24, 39). The results of this study suggest that time since onset of stroke of longer than 6 months can influence activities and participation. As this is a cross-sectional study, there is a probability that this is either due to a shift in perception or to results reported by chance.

Participants were included in this study using convenience sampling for people who were connected to rehabilitation facilities and had received rehabilitation at some time after their stroke. The study population was approximately 5 years younger than the stroke population in Sweden at that time (40). Both of these facts indicate limitations in the representativeness of the population. A further limitation is that, for the ICF, qualifiers are intended to denote the extent of the problem, but this does not satisfy the criteria for reliable measurement. To avoid analysing data that would not represent actual changes in components of the ICF, the data were dichotomized. Thus, the results show the possibility of having or of not having a problem in a certain domain of functioning by the facilitators or barriers that are reported, or of having a number of problems below these levels. This does not say anything about the extent of the problem. Country of birth, as an aspect of PF, was expected to play a role in the perception of functioning and environmental factors. The number of persons born outside Sweden was lower in this cohort than one would expect and was insufficient for reliable statistical analysis.

All 4 of the socio-demographic factors selected in this study contribute to the conditions that make up individual experience based on assigned social roles. These were shown to have an influence on functioning and environmental factors. There are probably many other PF, that have not yet been investigated, that will be found to play an important role in functioning and in different aspects of rehabilitation. The identification of more factors will enhance possibilities for improving patient-centred care.

In conclusion, PF, such as age, gender, place of residence and time since onset of stroke, have a predictive value for functioning and environmental factors in the chronic phase after stroke. These influence self-perceived functional outcome and environmental factors in terms of being barriers or facilitators. Further research is required to elucidate the interaction between different parts of the ICF (functioning and contextual factors), and in particular to investigate other PF that may have a signifficant impact on functioning.

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