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ORIGINAL ARTICLE

ความตรงเชิงเนื้อหาของรายชื่อหัวข้อเฉพาะโรคแบบขยายตามบัญชีสากลเพื่อการจำแนกการทำงาน ความพิการ และสุขภาพสำหรับผู้ป่วยโรคหลอดเลือดสมอง

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บทคัดย่อ

รายชื่อหัวข้อเฉพาะโรคแบบขยายตามบัญชีสากลเพื่อการจำแนกการทำงาน ความพิการ และสุขภาพสำหรับผู้ป่วยโรคหลอดเลือดสมองเป็นเครื่องมือประเมินเพื่ออธิบายภาวะสุขภาพที่เกี่ยวข้องกับโรคหลอดเลือดสมอง และได้รับการนำไปใช้ในงานฟื้นฟูสภาพผู้ป่วยในหลายประเทศ แต่ยังไม่มีรายงานการใช้แบบประเมินนี้อย่างเป็นระบบในประเทศไทย ก่อนที่จะนำรายชื่อหัวข้อเฉพาะโรคนี้ไปใช้กับประชาชนไทยจำเป็นต้องมีการตรวจสอบคุณสมบัติของเครื่องมือวัดก่อน การศึกษานี้มีวัตถุประสงค์เพื่อประเมินความตรงเชิงเนื้อหาของรายชื่อหัวข้อเฉพาะโรคดังกล่าวในประชาชนไทย อาสาสมัครคือผู้ป่วยโรคหลอดเลือดสมองที่อาศัยอยู่ในอำเภอหนึ่งของจังหวัดสุรินทร์ จำนวน 43 ราย (ชาย 27 ราย หญิง 16 ราย อายุเฉลี่ย 65.6±10.6 ปี) นักกายภาพบำบัดรายหนึ่งประเมินอาสาสมัครด้วยรายชื่อหัวข้อเฉพาะโรคนี้โดยให้คะแนนแต่ละหัวข้อด้วยระดับคะแนนสากลจาก 0 (ไม่เป็นปัญหา/สิ่งเกื้อหนุน/อุปสรรค) ถึง 4 (เป็นปัญหา/สิ่งเกื้อหนุน/อุปสรรคอย่างสมบูรณ์) หรือคะแนน 8 กรณีที่ข้อมูลไม่เพียงพอ และ 9 กรณีที่ไม่เกี่ยวข้องกับหัวข้อนั้น ๆ ซึ่งในการให้คะแนนใช้ข้อมูลจากการสัมภาษณ์อาสาสมัครและผู้ดูแล และการสังเกตและการตรวจประเมินพื้นฐานทางกายภาพบำบัดในอาสาสมัคร วิเคราะห์ความตรงเชิงเนื้อหาด้วยการคำนวณความถี่ของอาสาสมัครที่แสดงถึงการมีปัญหา/สิ่งเกื้อหนุน/อุปสรรคในแต่ละหัวข้อ โดยคะแนน 1-4 จะรวมเป็น “เป็นปัญหา/สิ่งเกื้อหนุน/อุปสรรค” ซึ่งหัวข้อใดที่มีอาสาสมัครที่แสดงถึงการมีปัญหา/สิ่งเกื้อหนุน/อุปสรรคความถี่เป็นจำนวนอย่างน้อยร้อยละ 20 จะถือว่าหัวข้อนั้นมีความตรงเชิงเนื้อหา ผลการศึกษาพบว่าจากหัวข้อทั้งหมดของรายชื่อหัวข้อเฉพาะโรคนี้จำนวน 166 หัวข้อ มีจำนวน 107 หัวข้อ (ร้อยละ 64.5) ที่มีความตรงเชิงเนื้อหา สรุปว่าหัวข้อส่วนใหญ่ของรายชื่อหัวข้อเฉพาะโรคแบบขยายสำหรับผู้ป่วยโรคหลอดเลือดสมองมีความตรงเชิงเนื้อหาเมื่อประเมินในผู้ป่วยโรคหลอดเลือดสมองในชุมชน อย่างไรก็ตาม ควรพิจารณาปรับปรุงหัวข้อในหมวดปัจจัยด้านสิ่งแวดล้อมให้เข้าใจง่ายขึ้น เพื่อช่วยเพิ่มประสิทธิภาพในการใช้รายชื่อหัวข้อเฉพาะโรคนี้

คำสำคัญ: บัญชีสากลเพื่อการจำแนกการทำงาน ความพิการ และสุขภาพ, รายชื่อหัวข้อเฉพาะโรค, ผู้ป่วยโรคหลอดเลือดสมองในชุมชน, ความตรง

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ORIGINAL ARTICLE

Content validity of the extended international classification of functioning, disability and health core set for stroke

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Abstract

The extended International Classification of Functioning, Disability and Health (ICF) core set for stroke is an assessment tool for describing stroke-related health. It was applied to rehabilitation settings in a number of countries but there was no a report of its systematic use in Thailand. Before this core set could be used with Thai population, there was a need to investigate its quality of measurement. This study aimed to evaluate content validity of the extended ICF core set for stroke in Thai population. Participants were 43 persons with stroke (27 males and 16 females, mean age ± SD 65.6±10.6 years) who were living in a district of Surin Province. A physical therapist filled in the core set with a universal qualifying scale ranging from 0 (no problem/facilitator/barrier) to 4 (complete problem/facilitator/barrier) or the qualifiers 8 (not specified) and 9 (not applicable). The ratings were based on information obtained through interviews with the participants and their caregivers and observations as well as routine physical therapy examinations on the participants. Content validity was analyzed by using frequency of the participants who had a problem/facilitator/barrier for individual categories. The qualifiers 1-4 were collapsed under the definition of "some problem/facilitator/barrier". A threshold of 20% of the participants was applied to specify the content validity of the categories. The results showed that of 166 ICF categories, 107 (64.5%) were considered valid for the participants. In conclusion, most categories of the extended ICF core set for stroke had content validity when assessing in community-dwellers with stroke. However, simplification of the "environmental factors" categories should be considered in order to improve the efficient use of this core set.

Key words: ICF, Core set, Community-dwellers with stroke, Validity

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Introduction

The International Classification of Functioning, Disability and Health (ICF)is used as a common language for describing the components of individuals' function, disability and health in order to enable a comprehensive, holistic and multidisciplinary approach and improve communication between different users such as health personnel, researchers, policy makers and the public.[1] An ICF book of the World Health Organization was translated into Thai language in 2004 by the Ministry of Public Health.[2] The ICF was applied in Thailand as an assessment tool for several purposes such as to determine functions, needs of rehabilitation and environmental barriers of persons with disabilities[3-5] and to plan rehabilitation services.[6,7] To provide the practical application of the ICF, developments of ICF core sets for various health conditions, e.g. stroke, spinal cord injury, diabetes, arthritis, heart disease, pulmonary disease, have been conducted.[8] Effective uses of ICF core sets in clinical rehabilitation should provide benefits in setting rehabilitation goals, distributing interventions and evaluating the effectiveness of rehabilitation interventions.[9] In the area of neurorehabilitation, stroke is the most commonly neurologic disease with a high incidence and prevalence among the world population.[10] To describe stroke-related health, the extended ICF core set for stroke can be applied as a uniform and comprehensive clinical assessment tool.[11]

The extended ICF core set for stroke was developed in 2005 to be applicable in the chronic as well as the early post-stroke phases.[12] It is a combination of 3 ICF core sets in neurorehabilitation field, namely the comprehensive ICF core sets for stroke and the ICF core sets for patients with neurological conditions in acute care hospitals and in early post-acute care rehabilitation facilities.[13,14] The extended ICF core set for stroke consists of 166 categories[15] including 59 categories of the "body functions" component, 11 categories of the "body structures" component, 59 categories of the "activities and participation" component and 37 categories of the "environmental factors" component. This core set was tested for its validity and reliability by several researchers[12-17] and was applied to rehabilitation settings in a number of countries[11,18,19] but there was no a report of its systematic use in Thailand. Before the extended ICF core set for stroke could be applied as a practical tool in Thai population, however, the content validation and the test of reliability of this core set still needed to be examined in different cultures.[17] The investigators were thus interested in studying content validity and rater reliability of the extended ICF core set for stroke in Thai community-dwellers with stroke. The research has been carried out in a community as after discharged from the hospitals, most of stroke survivors in our country have to live and continue their rehabilitation programs at home. At present, the reliability study is still in the process of data analysis. This report exhibits only the findings of the validity study. The underlying objective of this

report was to evaluate content validity of the extended ICF core set for stroke in Thai population.

Methods

Participants

Forty-three persons with stroke who were living in Kap Choeng District, Surin Province were recruited to the study. This sample size was based on the calculation for reliability study, the other part of our research. The power of 80% with an estimated alpha level of 0.05, the hypothesized Intraclass Correlation Coefficient of 0.75 and the null value of 0.50[20] was chosen to determine the appropriate sample size. The following inclusion criteria were applied: male or female aged 18 years or older, having stable medical conditions and an ability to understand and follow verbal instructions and willing to cooperate with the study procedures. The patients were excluded if they had nonvascular conditions that could present with stroke-like symptoms, secondary wound healing after surgery, poor communication or severe cognitive problem (MMSE-Thai < 23 for high school education and higher, < 18 for elementary school education and < 15 for no formal education or illiterate persons).[21]

Research tool

In this study, the extended ICF core set for stroke in Thai language was used as a research tool. Thai phrases presented in this version of the core set were extracted from the ICF book translated into Thai language by the Ministry of Public Health.[2]

Data collection procedures

With the approval of the Khon Kaen University Ethics Committee for Human Research (HE592029), data collection was thoroughly processed by a physical therapist of Kabchoeng Hospital who had 10 years of experience in neurorehabilitation. Prior to operating the data collection, the physical therapist was trained to administer the extended ICF core set for stroke by an expert from Khon Kaen University by using the core set with 5 persons with stroke who were not involved in the current study. A comprehensive assessment guideline was also established.

To recruit 43 persons with stroke, the physical therapist accessed the database of Kabchoeng Hospital, under the permission of the hospital director, to gather names and addresses of persons with stroke. Then, she visited the patients at their residences to determine study eligibility. The patients were interviewed about their demographic variables and disease characteristics. Their disability level was evaluated by using the Modified Rankin Scale.[22] Eligible patients and their main caregivers were invited to participate in the study and signed informed consents.

After the process of participant recruitment, the physical therapist visited the participants at their residences. The core set was filled in on the basis of all information obtained through interviews with the participants and their main caregivers, observations on the participants and home environments, and/or routine physical therapy examinations for individuals with neurological

disorders. The universal qualifying scale ranging from 0 (no problem/facilitator/barrier) to 4 (complete problem/facilitator/barrier) or the qualifier 9 (not applicable) was specified for each ICF category.[1] The qualifier 8 (not specified) was used for the categories that needed information from medical records containing the results of standardized examinations. Additionally, the qualifier of the "environmental factors" component was denoted by facilitator and barrier (the extent of positive and negative effects of the environment, respectively).[1] The plus (+) sign indicated a facilitator; meanwhile its absence indicated the category was a barrier. The qualifier 0 referred to "neither a facilitator nor a barrier".[1] For categories of the "activities and participation" component, only the performance indicating what a person did in his/her actual environment was assessed.[17] Capacity which indicated an ability of a person to perform a task in a standard environment without assistive device or assistance of an individual[1] was not assessed.

Data analysis

Descriptive statistics were applied to analyze the demographic data. Data obtained from the assessment of the physical therapist were analyzed for the content validity of the core set by using frequency and percentage of the participants who had a problem for the components of body functions, body structures, and activities and participation.[17] The qualifiers 1-4 were collapsed under the definition of "some problem", the qualifiers 0 and 9 as "no problem" and the qualifier 8 as "not specified". For the environmental factors, the frequency and percentage of the participants who reported the category as a facilitator or a barrier were calculated for each ICF category. The qualifiers +1-+4 and 1-4 were collapsed under the definition of "facilitator" and "barrier", respectively. In addition, the qualifier 0 was regarded as "neither a facilitator nor a barrier", the qualifier 8 as "not specified" and the qualifier 9 as "not applicable".A threshold of 20% of the participants who reported some degree of problem/facilitator/barrier in them was applied to specify the content validity of individual categories.[17] All analyses were performed using the SPSS version 20.0. The EpiData software was used for data entry and verification.

Results

Of 43 participants, 27 (62.8%) were male and 24 (55.8%) had left hemiplegia. The age range of the participants was 35-83 years old with an average age of 65.6±10.6 years. The average length of time after stroke was 28.1±29.0 months (range 4-123 months). All of them were living with caregivers who were their relatives. About half (53.5%) of the participants had slight to moderate disability (Modified Rankin Scale grades 2 and 3). Further information about the demographic and stroke-related data of the study sample is described in **Table 1**.

Table 1 Demographic characteristics of participants (n=43)

Characteristics	Data
Gender [n (%)]	
male	27 (62.8)
female	16 (37.2)
Age (years) [mean (standard deviation)]	65.6 (10.6)
Body mass index (kg/m^2) [mean (standard deviation)]	22.0 (4.2)
Marital status [n (%)]	
single	2 (4.7)
married	35 (81.4)
widowed/separated	6 (13.9)
Educational level [n (%)]	
high school	2 (4.7)
elementary school (primary or secondary)	28 (65.1)
no formal education	13 (30.2)
Occupation [n (%)]	
farmer	3 (7.0)
grocer	3 (7.0)
none	37 (86.0)
Main caregiver -- relatives [n (%)]	43 (100.0)
Time post stroke [n (%)]	
< 6 months	3 (7.0)
6-12 months	12 (27.9)
> 12 months	28 (65.1)
Stroke type [n (%)]	
ischemic	36 (83.7)
hemorrhagic	7 (16.3)
Affected side [n (%)]	
left	24 (55.8)
right	19 (44.2)

Table 1 Demographic characteristics of participants (n=43) (Cont.)

Characteristics	Data
Other disabilities [n (%)] (answer more than one item)	
aphasia/dysarthria	19 (44.2)
dysphagia	5 (11.6)
incontinence	3 (7.0)
none	16 (37.2)
Co-morbidities [n (%)] (answer more than one item)	
hypertension	29 (67.4)
other (diabetes, heart disease, gouty arthritis, inguinal hernia)	4 (9.2)
none	10 (23.2)
MMSE-Thai [mean (standard deviation)]	
overall (n=43)	23.2 (3.2)
high school (n=2)	29.5 (0.7)
elementary school (primary or secondary) (n=28)	23.6 (2.4)
no formal education (n=13)	21.3 (3.3)
Walking ability [n (%)]	
independent walking without gait aid	10 (23.3)
independent walking with gait aid	22 (51.2)
walking with some assistance	3 (7.0)
unable to walk	8 (18.6)
Level of ability to perform daily life and outdoor activities [n (%)]	
1: total dependence	4 (9.3)
2: need moderate help	6 (13.9)
3: need minimal help	7 (16.3)
4: independence within appropriate facilities for PWDs	18 (41.9)
5: total independence	8 (18.6)

MMSE: Mini-Mental State Examination, PWDs: persons with disabilities

Table 1 Demographic characteristics of participants (n=43) (Cont.)

Characteristics	Data
Modified Rankin Scale [n (%)]	
0: no symptoms at all	0 (0.0)
1: no significant disability despite symptoms	9 (20.9)
2: slight disability	12 (27.9)
3: moderate disability	11 (25.6)
4: moderately severe disability	7 (16.3)
5: severe disability	4 (9.3)

Table 2 presents the content validity analysis for the components of body functions, body structures, and activities and participation of the extended ICF core set for stroke. The analysis for the component of environmental factors is depicted in **Table 3**. Of 166 ICF categories, 59 (35.5%) were considered not valid for the participants. These categories consisted of 20 (33.9%), 10 (90.9%), 12 (20.3%) and 17 (46.0%) categories of the components of body functions, body structures, activities and participation, and environmental factors, respectively. Most of validated categories of the "body functions" component were related to the following chapters: b1 (mental functions), b2 (sensory functions and pain), b3 (voice and speech functions), b6 (genitourinary and reproductive functions) and b7 (neuromusculoskeletal and movement-related functions). The category b730 (muscle power functions) was a typical impairment for all participants **(Table 2)**. Only the s720 (structure of shoulder region) was considered as a validated category in the "body structures" component. In the "activities and participation" component, the categories were likely to be valid in all chapters except the chapter d7 (interpersonal interactions and relationships). All validated categories of the "environmental factors" component were expressed as facilitators by the participants **(Table 3)**. Most of them were related to the chapters e1 (products and technology), e3 (support and relationships) and e4 (attitudes).

Table 2 Frequency of participants with "some problem", "no problem" and "not specified" in the components of body functions, body structures and activities and participation of the extended ICF core set for stroke (n=43) (Data were presented as n (%).)

ICF code	ICF category title	Some problem	No problem	Not specified
Body functions				
b110	Consciousness functions	1 (2.3)	42 (97.7)	0 (0.0)
b114	Orientation functions	1 (2.3)	42 (97.7)	0 (0.0)
b117	Intellectual functions	0 (0.0)	43 (100.0)	0 (0.0)
b126*	Temperament and personality functions	20 (46.5)	23 (53.5)	0 (0.0)
b130*	Energy and drive functions	10 (23.3)	33 (76.7)	0 (0.0)
b134*	Sleep functions	9 (20.9)	34 (79.1)	0 (0.0)
b140	Attention functions	6 (14.0)	37 (86.0)	0 (0.0)
b144*	Memory functions	29 (67.4)	14 (32.6)	0 (0.0)
b147*	Psychomotor functions	28 (65.1)	25 (58.1)	0 (0.0)
b152*	Emotional functions	9 (20.9)	34 (79.1)	0 (0.0)
b156*	Perceptual functions	14 (32.6)	29 (67.4)	0 (0.0)
b160*	Thought functions	21 (48.8)	22 (51.2)	0 (0.0)
b164*	Higher-level cognitive functions	15 (34.9)	28 (65.1)	0 (0.0)
b167*	Mental functions of language	11 (25.6)	32 (74.4)	0 (0.0)
b172*	Calculation functions	28 (65.1)	15 (34.9)	0 (0.0)
b176*	Mental functions and sequencing complex movements	13 (30.2)	30 (69.8)	0 (0.0)
b180	Experience of self and time functions	3 (7.0)	40 (93.0)	0 (0.0)
b210*	Seeing functions	32 (74.4)	11 (25.6)	0 (0.0)
b215*	Functions of structures adjoining the eye	25 (58.1)	18 (41.9)	0 (0.0)
b230	Hearing functions	8 (18.6)	35 (81.4)	0 (0.0)
b235*	Vestibular functions	26 (60.5)	27 (62.8)	0 (0.0)

*Validated category

Table 2 Frequency of participants with "some problem", "no problem" and "not specified" in the components of body functions, body structures and activities and participation of the extended ICF core set for stroke (n=43) (Data were presented as n (%).) (Cont.)

ICF code	ICF category title	Some problem	No problem	Not specified
Body functions (Cont.)				
b240*	Sensations associated with hearing and vestibular functions	15 (34.9)	28 (65.1)	0 (0.0)
b260*	Proprioceptive functions	9 (20.9)	33 (76.7)	1 (2.3)
b265*	Touch functions	35 (81.4)	8 (18.6)	0 (0.0)
b270*	Sensation function related to temperature and other stimuli	26 (60.5)	17 (39.5)	0 (0.0)
b280*	Sensation of pain	31 (71.1)	12 (27.9)	0 (0.0)
b310	Voice functions	5 (11.6)	38 (88.4)	0 (0.0)
b320*	Articulation functions	20 (46.5)	23 (53.5)	0 (0.0)
b330*	Fluency and rhythm of speech functions	26 (60.5)	17 (39.5)	0 (0.0)
b340*	Alternative vocalization functions	27 (62.8)	16 (37.2)	0 (0.0)
b410	Hearth functions	2 (4.6)	41 (95.4)	0 (0.0)
b415	Blood vessel functions	1 (2.3)	34 (79.1)	8 (18.6)
b420	Blood pressure functions	8 (18.6)	35 (81.4)	0 (0.0)
b430	Hematological system functions	0 (0.0)	0 (0.0)	43 (100.0)
b435	Immunological system functions	0 (0.0)	0 (0.0)	43 (100.0)
b440	Respiration functions	2 (4.6)	41 (95.4)	0 (0.0)
b450	Additional respiratory functions	1 (2.3)	42 (97.7)	0 (0.0)
b455*	Exercise tolerance functions	41 (95.4)	2 (4.6)	0 (0.0)
b510*	Ingestion functions	41 (95.4)	2 (4.6)	0 (0.0)
b515	Digestion functions	0 (0.0)	0 (0.0)	43 (100.0)
b525*	Defecation functions	19 (44.2)	24 (55.8)	0 (0.0)

*Validated category

Table 2 Frequency of participants with "some problem", "no problem" and "not specified" in the components of body functions, body structures and activities and participation of the extended ICF core set for stroke (n=43) (Data were presented as n (%).) (Cont.)

ICF code	ICF category title	Some problem	No problem	Not specified
Body functions (Cont.)				
b530	Weight maintenance functions	1 (2.3)	42 (97.7)	0 (0.0)
b535	Sensations associated with the digestive system	7 (16.3)	36 (83.7)	0 (0.0)
b540	General metabolic functions	0 (0.0)	0 (0.0)	43 (100.0)
b545	Water, mineral and electrolyte balance functions	0 (0.0)	0 (0.0)	43 (100.0)
b550*	Thermoregulatory functions	11 (25.6)	31 (72.1)	1 (2.3)
b620*	Urination functions	18 (41.9)	25 (58.1)	0 (0.0)
b630*	Sensation associated with the urinary functions	10 (23.6)	33 (76.7)	0 (0.0)
b640*	Sexual functions	42 (97.7)	1 (2.3)	0 (0.0)
b710*	Mobility of joint functions	31 (72.1)	12 (27.9)	0 (0.0)
b715*	Stability of joint functions	32 (74.4)	11 (25.6)	0 (0.0)
b730*	Muscle power functions	43 (100.0)	0 (0.0)	0 (0.0)
b735*	Muscle tone functions	40 (93.0)	3 (7.0)	0 (0.0)
b740*	Muscle endurance functions	42 (97.7)	1 (2.3)	0 (0.0)
b750*	Motor reflex functions	36 (83.7)	7 (16.3)	0 (0.0)
b755*	Involuntary movement reactions	35 (81.4)	8 (18.6)	0 (0.0)
b760*	Control of voluntary movement functions	17 (39.5)	26 (60.5)	0 (0.0)
b770*	Gait pattern functions	41 (95.4)	2 (4.6)	0 (0.0)
b810	Protective functions of the skin	3 (7.0)	40 (93.0)	0 (0.0)
Body structures				
s110	Structure of brain	0 (0.0)	0 (0.0)	43 (100.0)
s120	Spinal cord and related structure	0 (0.0)	43 (100.0)	0 (0.0)
s130	Structure of meninges	0 (0.0)	0 (0.0)	43 (100.0)

* Validated category

Table 2 Frequency of participants with "some problem", "no problem" and "not specified" in the components of body functions, body structures and activities and participation of the extended ICF core set for stroke (n=43) (Data were presented as n (%).) (Cont.)

ICF code	ICF category title	Some problem	No problem	Not specified
Body structures (Cont.)				
s410	Structure of cardiovascular system	1 (2.3)	42 (97.7)	0 (0.0)
s430	Structure of respiratory system	0 (0.0)	43 (100.0)	0 (0.0)
s530	Structure of stomach	0 (0.0)	43 (100.0)	0 (0.0)
s710	Structure of head and neck region	2 (4.6)	41 (95.4)	0 (0.0)
s720*	Structure of shoulder region	14 (32.6)	29 (67.4)	0 (0.0)
s730	Structure of upper extremity	0 (0.0)	43 (100.0)	0 (0.0)
s750	Structure of lower extremity	5 (11.6)	38 (88.4)	0 (0.0)
s810	Structure of areas of skin	2 (4.6)	41 (95.4)	0 (0.0)
Activities and participation				
d110	Watching	5 (11.6)	38 (88.4)	0 (0.0)
d115	Listening	3 (7.0)	40 (93.0)	0 (0.0)
d120*	Other purposeful sensing	9 (20.9)	34 (79.1)	0 (0.0)
d130*	Copying	18 (41.9)	25 (58.1)	0 (0.0)
d135*	Rehearsing	21 (48.8)	20 (46.5)	2 (4.6)
d155*	Acquiring skill	28 (65.1)	15 (34.9)	0 (0.0)
d160	Focusing attention	1 (2.3)	42 (97.7)	0 (0.0)
d166*	Reading	12 (20.9)	31 (72.1)	0 (0.0)
d170*	Writing	22 (51.2)	21 (48.8)	0 (0.0)
d172*	Calculating	28 (65.1)	15 (34.9)	0 (0.0)
d175*	Solving problem	26 (60.5)	17 (39.5)	0 (0.0)
d177*	Marketing decision	20 (46.5)	23 (53.5)	0 (0.0)
d210*	Undertaking a single task	11 (25.6)	32 (74.4)	0 (0.0)
d220*	Undertaking a multiple task	28 (65.1)	15 (34.9)	0 (0.0)
d230*	Carrying out daily routine	21 (48.8)	22 (51.2)	0 (0.0)
d240	Handling stress and other psychological demands	8 (18.6)	35 (81.4)	0 (0.0)

*Validated category

Table 2 Frequency of participants with "some problem", "no problem" and "not specified" in the components of body functions, body structures and activities and participation of the extended ICF core set for stroke (n=43) (Data were presented as n (%).) (Cont.)

ICF code	ICF category title	Some problem	No problem	Not specified
Activities and participation (Cont.)				
d310*	Communication with receiving spoken messages	12 (27.9)	31 (72.1)	0 (0.0)
d315*	Communication with receiving nonverbal messages	13 (30.2)	30 (69.8)	0 (0.0)
d325*	Communication with receiving written messages	13 (30.2)	30 (69.8)	0 (0.0)
d330*	Speaking	13 (30.2)	30 (69.8)	0 (0.0)
d335*	Producing nonverbal messages	12 (27.9)	31 (72.1)	0 (0.0)
d345*	Producing messages in formal sign messages	19 (44.2)	24 (55.8)	0 (0.0)
d350*	Conversation	10 (23.4)	33 (76.7)	0 (0.0)
d360*	Using communication devices and techniques	31 (72.1)	12 (27.9)	0 (0.0)
d410*	Changing basic body position	14 (32.6)	29 (67.4)	0 (0.0)
d415	Maintaining a body position	0 (0.0)	43 (100.0)	0 (0.0)
d420*	Transferring oneself	13 (30.2)	30 (69.8)	0 (0.0)
d430*	Lifting and carrying objects	42 (97.7)	1 (2.3)	0 (0.0)
d440*	Fine hand use	23 (53.5)	20 (46.5)	0 (0.0)
d445*	Hand and arm use	25 (58.1)	18 (41.9)	0 (0.0)
d450*	Walking	25 (58.1)	18 (41.9)	0 (0.0)
d455*	Moving around	42 (97.7)	1 (2.3)	0 (0.0)
d460*	Moving around in different locations	21 (48.8)	22 (51.2)	0 (0.0)
d465*	Moving around using equipment	12 (27.9)	31 (72.1)	0 (0.0)
d470*	Using transportation	27 (62.8)	16 (37.2)	0 (0.0)
d475*	Driving	40 (93.0)	3 (6.9)	0 (0.0)
d510*	Washing oneself	14 (32.6)	29 (67.4)	0 (0.0)

*Validated category

Table 2 Frequency of participants with "some problem", "no problem" and "not specified" in the components of body functions, body structures and activities and participation of the extended ICF core set for stroke (n=43) (Data were presented as n (%).) (Cont.)

ICF code	ICF category title	Some problem	No problem	Not specified
Activities and participation (Cont.)				
d520*	Caring for body parts	38 (88.4)	5 (11.6)	0 (0.0)
d530*	Toileting	13 (30.2)	30 (69.8)	0 (0.0)
d540*	Dressing	19 (44.2)	23 (53.5)	1 (2.3)
d550	Eating	3 (7.0)	40 (93.0)	0 (0.0)
d560	Drinking	3 (7.0)	40 (93.0)	0 (0.0)
d570*	Looking after one's health	22 (51.2)	21 (48.8)	0 (0.0)
d620*	Acquisition of goods and services	29 (67.4)	14 (32.6)	0 (0.0)
d630*	Preparing meals	40 (93.0)	3 (7.0)	0 (0.0)
d640*	Doing house work	40 (93.0)	3 (7.0)	0 (0.0)
d710	Basic interpersonal interactions	3 (7.0)	40 (93.0)	0 (0.0)
d750	Informal social relationships	2 (4.6)	41 (95.4)	0 (0.0)
d760	Family relationships	2 (4.6)	41 (95.4)	0 (0.0)
d770	Intimate relationships	3 (7.0)	40 (93.0)	0 (0.0)
d845*	Acquiring, keeping and terminating a job	43 (100.0)	0 (0.0)	0 (0.0)
d850*	Remunerative employment	41 (95.4)	2 (4.6)	0 (0.0)
d855*	Non-remunerative employment	43 (100.0)	0 (0.0)	0 (0.0)
d860*	Basic economic transaction	19 (44.2)	24 (55.8)	0 (0.0)
d870*	Economic self-sufficiency	19 (44.2)	24 (55.8)	0 (0.0)
d910*	Community life	37 (86.0)	6 (14.0)	0 (0.0)
d920*	Recreation and leisure	12 (27.9)	31 (72.1)	0 (0.0)
d930*	Religion and spiritually	24 (55.8)	19 (44.2)	0 (0.0)
d940	Human rights	1 (2.3)	42 (97.7)	0 (0.0)

*Validated category

Table 3 Frequency of participants to whom the component of environmental factors of the extended ICF core set for stroke were facilitators, barriers or some other qualifiers (n=43) (Data were presented as n (%).)

ICF code	ICF category title	Facilitator	Barrier	Neither a facilitator nor a barrier	Not specified	Not applicable
e110*	Products or substances for personal consumption	39 (90.7)	0 (0.0)	4 (9.3)	0 (0.0)	0 (0.0)
e115*	Products and technology for personal use in daily living	21 (48.8)	0 (0.0)	22 (51.2)	0 (0.0)	0 (0.0)
e120*	Products and technology for personal indoor and outdoor mobility and transportation	26 (60.5)	2 (4.6)	15 (34.9)	0 (0.0)	0 (0.0)
e125*	Products and technology for transportation	9 (20.9)	5 (11.6)	29 (67.4)	0 (0.0)	0 (0.0)
e135	Products and technology for employment	2 (4.6)	5 (11.6)	23 (53.5)	0 (0.0)	11 (25.6)
e150*	Design, construction and building products and technology for building of public use	32 (74.4)	7 (16.3)	4 (9.3)	0 (0.0)	0 (0.0)
e155*	Design, construction and building products and technology for building of private use	24 (55.8)	4 (9.3)	15 (34.9)	0 (0.0)	0 (0.0)
e165*	Assets	41 (95.4)	2 (4.6)	0 (0.0)	0 (0.0)	0 (0.0)
e210	Physical geography	0 (0.0)	2 (4.6)	41 (95.4)	0 (0.0)	0 (0.0)
e240	Light	0 (0.0)	1 (2.3)	42 (97.7)	0 (0.0)	0 (0.0)
e250	Sound	0 (0.0)	1 (2.3)	42 (97.7)	0 (0.0)	0 (0.0)
e310*	Immediate family	43 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

*Validated category

Table 3 Frequency of participants to whom the componentof environmental factors of the extended ICF core set for stroke were facilitators, barriers or some other qualifiers (n=43) (Data were presented as n (%).) (Cont.)

ICF code	ICF category title	Facilitator	Barrier	Neither a facilitator nor a barrier	Not specified	Not applicable
e315*	Extended family	39 (90.7)	0 (0.0)	4 (9.3)	0 (0.0)	0 (0.0)
e320*	Friends	24 (55.8)	0 (0.0)	19 (44.2)	0 (0.0)	0 (0.0)
e325*	Acquaintance, peers, colleagues, neighbours and community members	38 (88.4)	0 (0.0)	5 (11.6)	0 (0.0)	0 (0.0)
e340	Personal care providers and personal assistants	2 (4.6)	0 (0.0)	0 (0.0)	1 (2.3)	40 (93.0)
e355*	Health professionals	41 (95.4)	0 (0.0)	2 (4.6)	0 (0.0)	0 (0.0)
e360	Other professionals	1 (2.3)	0 (0.0)	42 (97.7)	0 (0.0)	0 (0.0)
e410*	Individual attitudes of immediate family members	42 (97.7)	0 (0.0)	1 (2.3)	0 (0.0)	0 (0.0)
e415*	Individual attitudes of extended family members	41 (95.4)	0 (0.0)	2 (4.6)	0 (0.0)	0 (0.0)
e420*	Individual attitudes of friends	37 (86.0)	0 (0.0)	6 (14.0)	0 (0.0)	0 (0.0)
e425*	Individual attitudes of acquaintance, peers, colleagues, neighbours and community members	39 (90.7)	1 (2.3)	3 (7.0)	0 (0.0)	0 (0.0)
e440	Individual attitudes of personal care providers and personal assistants	1 (2.3)	0 (0.0)	2 (4.6)	1 (2.3)	39 (90.7)
e450*	Individual attitudes of health professionals	43 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
e455	Individual attitudes of health-related professionals	1 (2.3)	0 (0.0)	42 (97.7)	0 (0.0)	0 (0.0)

*Validated category

Table 3 Frequency of participants to whom the componentof environmental factors of the extended ICF core set for stroke were facilitators, barriers or some other qualifiers (n=43) (Data were presented as n (%).) (Cont.)

ICF code	ICF category title	Facilitator	Barrier	Neither a facilitator nor a barrier	Not specified	Not applicable
e460*	Societal attitudes	30 (69.8)	0 (0.0)	13 (30.2)	0 (0.0)	0 (0.0)
e465	Social norms, practices and ideologies	1 (2.3)	0 (0.0)	42 (97.7)	0 (0.0)	0 (0.0)
e515	Architecture and construction services, systems and policies	0 (0.0)	0 (0.0)	43 (100.0)	0 (0.0)	0 (0.0)
e525	Housing services, systems and policies	0 (0.0)	0 (0.0)	43 (100.0)	0 (0.0)	0 (0.0)
e535	Communication services, systems and policies	0 (0.0)	0 (0.0)	43 (100.0)	0 (0.0)	0 (0.0)
e540	Transportation services, system and policies	2 (4.6)	0 (0.0)	41 (95.4)	0 (0.0)	0 (0.0)
e550	Legal services, systems and policies	0 (0.0)	0 (0.0)	43 (100.0)	0 (0.0)	0 (0.0)
e555	Associations and organization services, system and policies	0 (0.0)	0 (0.0)	43 (100.0)	0 (0.0)	0 (0.0)
e570*	Social security support services, systems and policies	37 (86.0)	0 (0.0)	6 (14.0)	0 (0.0)	0 (0.0)
e575	General social support services, systems and policies	1 (2.3)	0 (0.0)	42 (97.7)	0 (0.0)	0 (0.0)
e580*	Health services, systems and policies	39 (90.7)	0 (0.0)	4 (9.3)	0 (0.0)	0 (0.0)
e590	Labour and employment services, systems and policies	0 (0.0)	0 (0.0)	43 (100.0)	0 (0.0)	0 (0.0)

*Validated category

Discussion

In this study, individual ICF categories of the extended ICF core set for stroke were considered valid if at least 20% of the participants reported some degree of problem/facilitator/barrier (qualifiers 1-4) in them. The results showed that of 166 ICF categories, 59 (20, 10, 12 and 17 of the components of body functions, body structures, activities and participation, and environmental factors, respectively) were considered not valid for community-dwellers with stroke. These frequencies were slightly greater than those reported in a previous study in Brazil[17] which could not demonstrate content validity for 27 ICF categories: 14 for body functions, 6 for body structures, 4 for activities and participation and 3 for environmental factors. Such an inconsistent finding probably resulted not only from different cultures between the 2 countries but also from different study settings. The study of Riberto and colleagues[17] was an institutional-based research with stroke outpatients under rehabilitation; meanwhile the current study was conducted in community-dwellers with stroke. It was possible that stroke survivors living with their family in the community had adjusted themselves to a new situation so that a lot of difficulties, problems or barriers could be relieved, particularly in the component of environmental factors.

Several possible reasons could be given to the non-validated categories of this study. First, some categories were not identified as problems in the participants because this study included only the patients with stroke who had stable medical conditions and an ability to understand and follow verbal instructions. Examples of such categories were b110 (consciousness functions), b114 (orientation functions), b117 (intellectual functions), b140 (attention functions) and s430 (structure of respiratory system). Second, 7 categories (b430: hematological system function, b435: immunological system functions, b515: digestion functions, b540: general metabolic functions, b545: water, mineral and electrolyte balance functions, s110: structure of brain and s130: structure of meninges) had to be rated with the qualifier 8 (not specified) because the available information was not sufficient in the community to make a judgment. Furthermore, as in this study the main caregivers of all participants were their relatives, the categories relating to personal care providers and personal assistants (e340 and e440) were rated with the qualifier 9 (not applicable) for most of the participants. Third, apart from the brain, other body structures of stroke survivors, especially in the chronic stage, were rarely impaired.[17] Most categories of the component of body structures were thus considered not valid. The category s720 (structure of shoulder region) was considered valid as shoulder subluxation or dislocation was a common complication of persons with stroke.[23] Fourth, all of the participants were living with their relatives in a rural district. Due to a typically rural Thai culture of having close relationships within the family and community,[24] the categories regarding interpersonal interaction and relationships (d710: basic interpersonal interactions, d750: informal

social relationships, d760: family relationships and d770: intimate relationships) or even the human rights (d940) were not identified as problems of the participants. Fifth, because the elderly was the largest proportion of the study sample, the categories relating to the employment (e135, e590), natural environment (e2XXs) and various services, systems and policies (e5XXs) were not common facilitators or barriers among the participants. Finally, it was sometimes difficult to assess the environmental factors because several categories of this component were relatively broad compared with other components and used technical terms which might be unfamiliar to the elderly, especially the categories e465 (social norms, practices and ideologies) and e5XXs. It was possible that the participants might have difficulty understanding and expressing how they perceived the meanings of these categories in their daily lives; hence, they reported no facilitators or barriers on such categories to the assessor.

In the component of body functions, 39 of 59 (66.1%) categories were identified as problems in the participants. Five categories related to motor impairments (b455: exercise tolerance functions, b730: muscle power functions, b735: muscle tone functions, b740: muscle endurance functions and b770: gait pattern functions) were considered as a problem in more than 90% of the participants. These impairments could lead to the restriction of activities and participation as shown in 47 of 59 (79.7%) categories of this component. For the environmental factors, all validated categories in this component were expressed as facilitators by the participants. The facilitators expressed by more than 90% of the participants were mostly related to support and relationships (e3) and attitudes (e4). This indicated the importance of relatives as well as health personnel in promoting health status of community-dwellers with stroke.

In the current study, the participants consisted of both middle-aged and older persons, right and left paretic sides, and sub-acute and chronic conditions. Additionally, there were various ability levels of walking and daily activities among this group of participants. Therefore, it should be possible to apply the current research finding to several different kinds of stroke survivors in the community. Physical therapists might apply the ICF categories which had content validity for evaluating an individual's level of functions and designing a treatment plan for improving the functions. Nevertheless, prior to using the ICF core sets, physical therapists should be trained and comprehensive assessment guidelines should be established. Such training courses may be organized by physical therapy schools, Physical Therapy Association of Thailand or Physical Therapy Council.

However, this study was operated in persons with stroke who were able to participate in the interviews and follow verbal instructions. All of the participants had their relatives as the main caregivers. Therefore, the findings might not be extrapolated to stroke survivors who had severe cognitive problem, poor communication or other personal care providers. Further studies in

these kinds of patients are recommended. In addition, owing to the budget limitation, this study was carried out only in a small community. Generalization of the findings to other settings may be limited as different environmental contexts can affect functional ability and severity of impairments of persons with stroke.[18] Thus, future investigations in other areas with greater sample size are suggested. Further content validity studies of the core set rated by health care professionals of different specializations, e.g. nurse, public health technical officer, are also recommended as different specialists will have different focus on and awareness for individual ICF categories.[25] These future studies would be able to clearly explain content validity of the extended ICF core set for stroke in Thai culture. Enhancing its quality of measurement probably increases the wide use of the core set to guide and provide data source for implementing public services and other social/environmental supports for individuals with stroke.

In conclusion, when assessing in Thai community-dwellers with stroke and with the help of the comprehensive assessment guideline as well as a short period of training for the assessor, most categories of the extended ICF core set for stroke had content validity. Simplification of the“environmental factors” categories should be considered in order to improve the efficient use of this core set.

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