

What are the most relevant environmental factors in relation to health?

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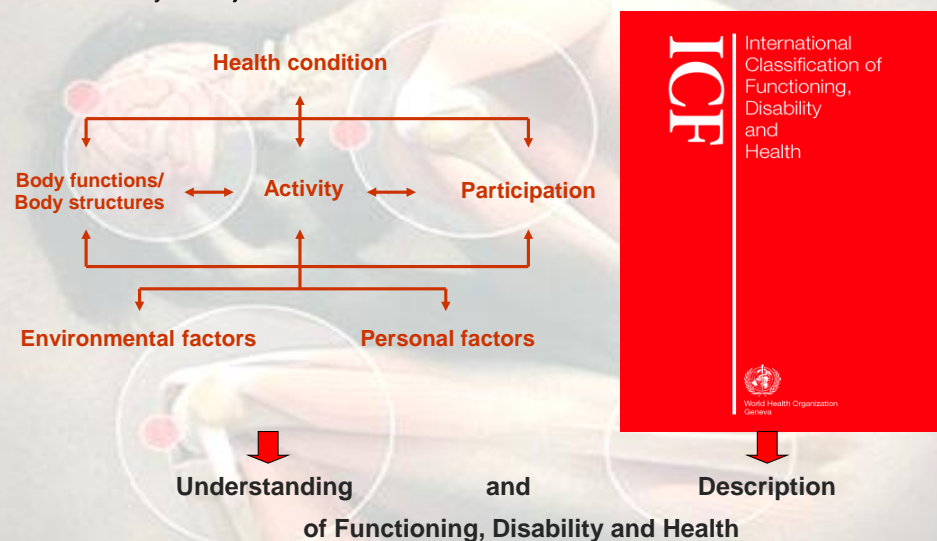
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Outline

- Background
- Objectives
- Data
- Methods
- Results
- Conclusion

Background

- The impact of Musculoskeletal Conditions and Chronic Widespread Pain in terms of disability is major.



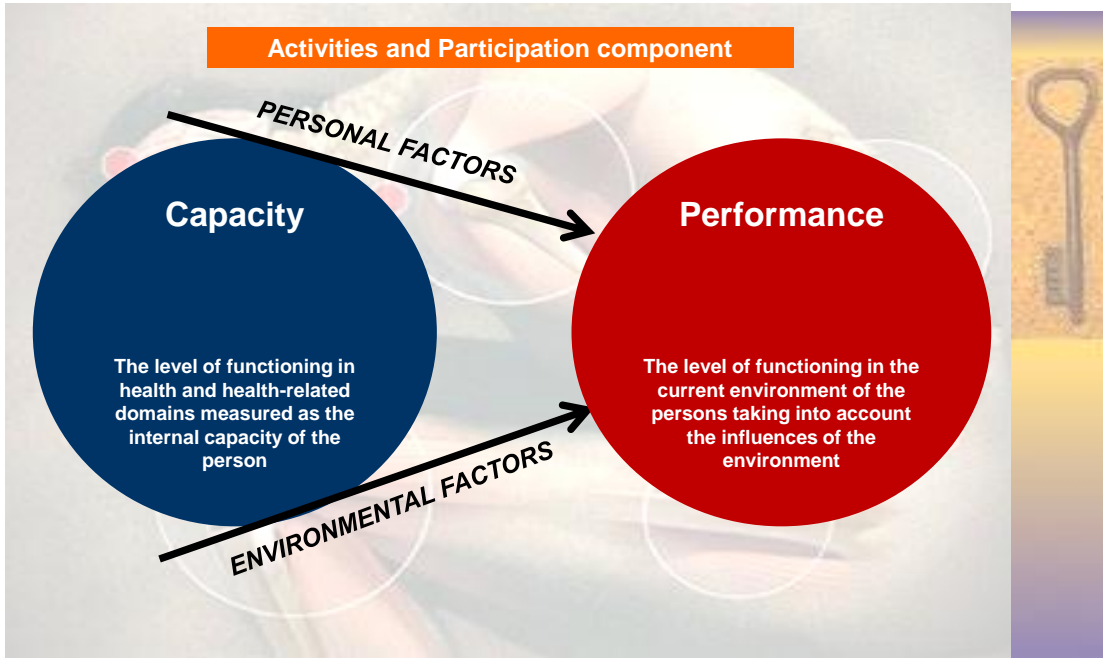
Background

- The International Classification of Functioning, Disability and Health (ICF) proposed by World Health Organization (WHO) provides a useful basis for understanding disability and its determinants.

Functioning and disability



= is the result of the interaction between a health condition and the contextual factors



To answer the question which are the relevant environmental factors explaining the differences between performance and capacity as defined in the ICF.

Data collection

- in a cross-sectional survey conducted within 'Measuring Health and Disability in Europe: supporting policy development' (MHADIE)
- 297 patients from which:
 - ❖ Low Back Pain (LBP): N= 118
 - ❖ Osteoporosis (OP): N= 87
 - ❖ Osteoarthritis (OA): N= 15
 - ❖ Rheumatoid Arthritis (RA) : N= 24
 - ❖ Chronic Widespread Pain (CWP) : N= 48
- Two rehabilitation clinics from Italy and Germany for LBP and OP; this German clinic recruited also patients with CWP, OA and RA.

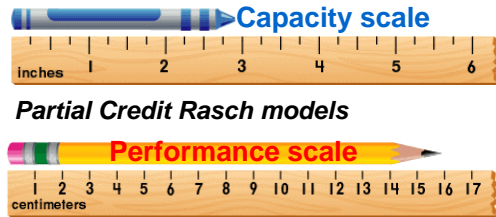
Measures

- ICF Checklist which includes categories from all four ICF components
 - 29 *body functions* (b),
 - 16 *body structures* (s)
 - 48 *Activity and Participation* (d)
 - 32 *environmental factors* (e)
- for *d* categories, information on
 - Capacity
 - Performance
 was recorded separately
- The qualifier rating scale from 0 to 4 was used

Short List of A&P domains	Performance Qualifier	Capacity Qualifier
d1. LEARNING AND APPLYING KNOWLEDGE		
4110 Watching		
4115 Listening		
4140 Learning to read		
4145 Learning to write		
4150 Learning to calculate (arithmetic)		
4175 Solving problems		
d2. GENERAL TASKS AND DEMANDS		
4210 Undertaking a single task		
4220 Undertaking multiple tasks		
d3. COMMUNICATION		
4310 Communicating with - receiving -> spoken messages		
4315 Communicating with - receiving -> non-verbal messages		
4330 Speaking		
4335 Producing non-verbal messages		
4350 Conversation		
d4. MOBILITY		
4430 Lifting and carrying objects		
4440 Fine hand use (picking up, grasping)		
4450 Walking		
4465 Moving around using equipment (wheelchair, skates, etc.)		
4470 Using transportation (car, bus, train, plane, etc.)		
4475 Driving (riding bicycle and motorcycle, driving car, etc.)		
d5. SELF CARE		
4510 Washing oneself (bathing, driving, washing hands, etc.)		
4520 Caring for body parts (brushing teeth, shaving, grooming, etc.)		
4530 Toileting		
4540 Dressing		
4550 Eating		
4560 Drinking		
4570 Looking after one's health		
d6. DOMESTIC LIFE		
4620 Acquisition of goods and services (shopping, etc.)		
4630 Preparation of meals (cooking, etc.)		
4640 Doing housework (cleaning house, washing dishes, laundry, ironing, etc.)		
4660 Assisting others		
d7. INTERPERSONAL INTERACTIONS AND RELATIONSHIPS		
4710 Basic interpersonal interactions		
4720 Complex interpersonal interactions		
4730 Relating with strangers		
4740 Formal relationships		
4750 Informal social relationships		
4760 Family relationships		
4770 Intimate relationships		
d8. MAJOR LIFE AREAS		

Methods

Step 1



- Body Functions
- Body Structures
- Capacity
- Body Functions
- Body Structures
- Performance

Partial Credit Rasch models

There were examined:

- 1) unidimensionality - items contribution to the measurement of capacity and performance, respectively;
- 2) the structure of the response scale was studied with reference to the ordering of the threshold parameters for each individual ICF's response scale;
- 3) the targeting of the scales;
- 4) reliability using Person Separation Reliability;
- 5) differential item functioning (DIF) for health conditions and disease severity.

Results

Step 1

Mean and standard deviation (SD) of the locations of the persons and items and the index of person separation (IPS).

	Capacity scale	Performance scale
Persons location	-1.80 (1.65)	-3.37 (1.65)
Fit Residual	-0.23 (1.02)	-0.24 (0.97)
Index of Person Separation	0.90	0.85



Results

Step 1

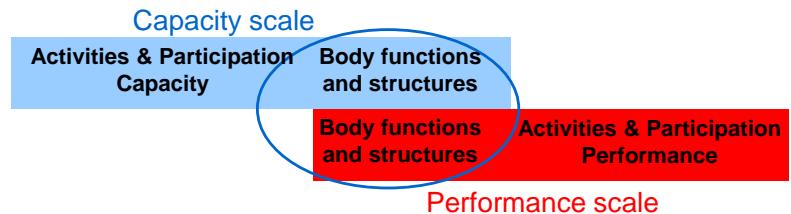
Capacity Scale – 22 ICF categories

Performance Scale – 22 ICF categories

	Capacity Scale	Performance Scale
b152 - Emotional functions	✓	✓
b710 - Mobility of joint functions	✓	✓
b740 - Muscle endurance functions	✓	✓
b780 - Sensations related to muscles and movement functions	✓	✓
s770 - Additional musculoskeletal structures related to movement	✓	✓
d410 - Changing basic body position	✓	✓
d415 - Maintaining a body position	✓	✓
d430 - Lifting and carrying objects	✓	✓
d445 - Hand and arm use	✓	✓
d450 - Walking	✓	✓
d455 - Moving around	✓	✓
d470 - Using transportation	✓	✓
d475 - Driving	✓	✓
d510 - Washing oneself	✓	✓
d530 - Toileting	✓	✓
d540 - Dressing	✓	✓
d570 - Looking after one's health	✓	✓
d620 - Acquisition of goods and services	✓	✓
d630 - Preparing meals	✓	✓
d640 - Doing housework	✓	✓
d660 - Assisting others	✓	✓
d710 - Basic interpersonal interactions	✓	✓
d760 - Family relationships	✓	✓
d770 - Intimate relationships	✓	✓
d910 - Community life	✓	✓
d920 - Recreation and leisure	✓	✓

Methods

Step 2



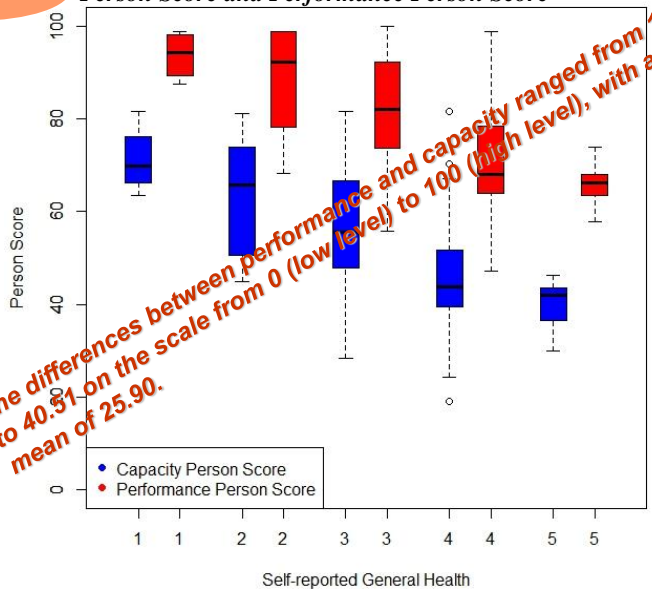
Item Response Theory Calibration (Separated IRT Calibration) was used to calibrate both scales of step 1 on a single scale ranging from 0 (low level) to 100 (high level):

- a scale transformation was performed on the common items;
 - $\theta = A\theta + B$, A is the slope, and B is the intercept and θ is the location of capacity items
- scale "transformation constants" are calculated and used to place items parameters on the common metric scale.
 - $a_j^* = \frac{a_j}{A}$ and $b_j^* = Ab_j + B$, where a_j and a_j^* are the slope parameters, b_j and b_j^* are the location or threshold parameters.

Results

Step 2

Relation between Self-reported General Health and Capacity Person Score and Performance Person Score



Methods

Step 3

Group Lasso method was used to identify those environmental factors that explain the difference between performance and capacity.

Why Group Lasso regression?

- The ICF categories are:
 - measured on an ordinal scale
 - are highly correlated
- a ranking of the ICF Categories can be established.

Results

Step 3

- e340 - Personal care providers and personal assistants
 - e355 - Health professionals
 - e360 - Other professionals
 - e455 - Individual attitudes of health-related professionals
 - e575 - General social support services, systems and policies
- When they act as **facilitator**
- e110 - Products or substances for personal consumption
 - e310 - Immediate family
 - e360 - Other professionals
 - e455 - Individual attitudes of health-related professionals
- When they act as **barrier**

Conclusion

- It is the first time that a measure of capacity and a measure of performance has been calibrated in the same scale so that they can be compared
- Differences between capacity and performance can be assessed when using the ICF qualifiers to rate the extent of the problem
- Environmental factors of all ICF chapters but chapter 2 (natural environment) are relevant to explain the difference between capacity and performance

Thank you

People Reading Report and Taking Action

