

Analysis Of Capacity And Performance Of Activities & Participation In Patients With Diabetes: A Pilot Study

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Abstract: Background: Diabetes increases the risk of disabling disorders including cardiovascular disease, retinopathy, renal failure, and peripheral vascular disease. ICF is the WHO recommended framework for assessing functioning and disability in various health conditions. It measures health and disability at both individual and population levels. The aim of this study is to analyse the impact of diabetes on Capacity and Performance of activities and participation. Material And Methods: This observational study conducted in tertiary care hospital at Ahmednagar consisted of 60 patients with Diabetes recruited through the parent hospital. A questionnaire based on ICF related to Activities of Daily Living was administered on these patients. Capacity and Performance of patients while performing activities was documented as per their perception. Basic demographic data was also collected. Activities included were Fine hand use, Walking, Moving around, Driving, Caring for body parts, Looking after ones health, Preparing meals, Sports, Hobbies, Socializing. Result: The study consisted of 26 females and 34 males. The range of patient's age was from 17years to 85 years. The mean of capacity and performance of patients was calculated of different categories like Fine hand use (C:0.15,P:1.15), Walking(C:0.22,P:1.18), Moving around(C:0.02,P:0.88) and Looking after one's health(0.05,P:0.38). Conclusion: Moderate to severe difficulty during performance as compared to capacity opens a new area of research to explore the causes and taking remedial measures to reduce the gap between capacity and performance. [Sancheti P Natl J Integr Res Med, 2023; 14(4):16-20, Published on Dated: 8/07/2023]

Key Words: Diabetes Mellitus, ICF-CS, Activity and Participation

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Introduction: Diabetes mellitus is a metabolic condition characterized by hyperglycaemia due to defects in insulin action or secretion or both, resulting in end-organ damages such as ischemic heart disease, chronic kidney disease, strokes, peripheral neuropathy and peripheral vascular disease. Diabetes may lead to disability either via one of the above mentioned pathways or independently¹. The prevalence of diabetes worldwide has more than doubled over the past three decades, with an estimated 347 million adults living with diabetes in 2008. Diabetes increases the risk of disabling disorders including cardiovascular disease, retinopathy, renal failure, and peripheral vascular disease².

The International Classification of Functioning, Disability and Health, (ICF) is a classification of health and health related domains. ICF is the WHO recommended framework for assessing functioning and disability in various health conditions. It measures health and disability at both individual and population levels. The domains of ICF are body function and body structure, activities and participation and

environmental factors. It not only relates function and disability to physical and psychological factors, but also to an individual's life situation and social role. WHO developed ICF-core set (ICF-CS) of DM by tailoring it from 2nd and 3rd level of ICF hierarchy. ICF-CS of DM addresses features within all the categories of body functions, body structure, activity and participation and environmental factors.

Management of symptoms depends on assessing the patient's problems, setting of treatment goals, choosing appropriate intervention strategies and evaluation of intervention outcomes. ICF-CS of DM can be used as an assessment tool for identifying problems in individuals with DM³.

Although the terms "physical activity" and "exercise" are often used interchangeably, they do carry distinct meanings. The World Health Organization and Caspersen describe physical activity as although the terms "physical activity" and "exercise" are often used interchangeably, they do carry distinct meanings. The World

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Health Organization and Caspersen describe physical activity as any bodily movements that are done as part of work, play, transport, housework and/or recreational activities.

Exercise is a subcategory of physical activity and is defined as structured, planned and purposeful activity to improve or maintain components of fitness. In addition to general health benefits, physical activity has been shown to reduce insulin requirements, reduce cardiovascular risk, improve well-being and reduce all-cause mortality in those living with T1D⁴.

ICF has been used extensively in subjects with diabetes, to investigate the common areas of affection. In spite of widespread research using different codes included in core set, the qualifiers of capacity and performance are rarely used to quantify the impairment. Hence this study is taken up to quantify the relative impairment in capacity and performance in patient with diabetes.

Material & Methods: It was a cross sectional observational study conducted between January 2022 to December 2022. Convenient samples of 60 subjects were recruited for the study. Inclusion criteria consisted of subjects above 18 years of age, subjects who were willing to participate and who were pre-diagnosed with Diabetes. The exclusion criteria consisted of subjects with known Musculoskeletal or Neurological disorders.

Procedure: Ethical clearance was obtained from the Institutional Ethical Committee, DVVPFs COPT, and Ahmednagar before starting the study.

Participants were given a consent form (English or Marathi version according to participant's preferred language) explaining their rights as research subject along with the details of the study. Medical records of the participants were obtained from participants.

First demographic information such as name, age, gender, height, weight, body mass index (BMI) and Diabetic history (duration of Diabetes, Blood glucose level, HBA1C reports) was collected. The Familiarization session was given about the study being conducted. After the session, the subjects were interviewed using ICF-CS of DM to find out whether the participants had experienced any problems associated with

the 10 categories of 'Activities and Participation' of the ICF-CS of DM.

Participants were assessed for Activities and Participation of daily living such as Fine hand use, Walking, Moving around, Driving, Caring for body parts, and looking after ones Health, Preparing meals, Sports, Hobbies and Socializing. It took about 30 minutes, per subject, in data collection process which included evaluation, testing and other formalities.

Subjects answered each question with "yes" or "no" followed by detailed explanations. For example, in category "d440 Fine hand use", subjects were asked "do you have any difficulty in doing fine hand activities after you diagnosed with diabetes?" If the subject answered: yes: we further interviewed solicited details about problems; for example how much difficulty you felt while doing fine hand activities?

All the categories were asked in the same manner as above and to evaluate the extent of the patient's problem in each of the ICF categories in the comprehensive ICF-CS of DM. The qualifier scale of activities and participation has 7 response categories, each ranging from 0 to 4: no/mild/moderate/severe/complete impairment or difficulty, 8: not specified and 9: not applicable quantified with the WHO Qualifier of ICF-CS of DM.

Results: There were 60 subjects included in the study.

The sample characteristics are mentioned in table no.1. The number of subjects (mean) with included areas of ICF categories and its association with Diabetes Mellitus is given in table no.2 along with the age ranges.

Table 1: Mean Duration Of Diabetes In Months According To Different Age Groups

Age Ranges	No. Of Participants	Duration Of Diabetes (In Months)
11-20	2	132
21-30	1	36
31-40	6	31.83
41-50	16	41.78
51-60	15	44.73
61-70	14	67.95
71-80	5	133.4
81-90	1	24

Graph 1: Histogram Showing Age And Gender Wise Distribution Of Participants

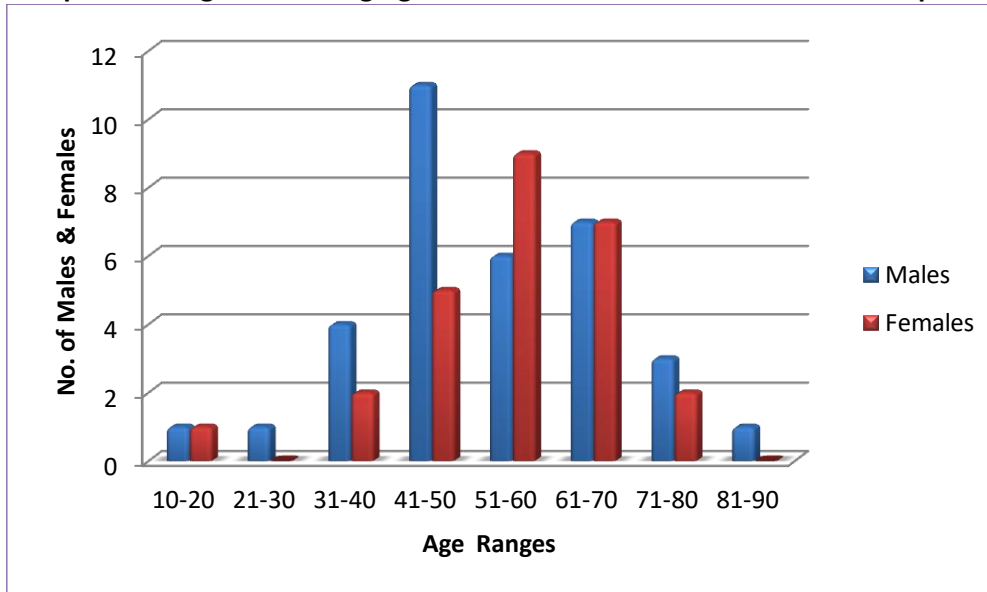


Table 2: Capacity And Performance Qualifier Of Activity Limitation According To Different Age Groups (A)

Age Ranges (In Years)	Fine Hand Use (D440)		Walking (D450)		Moving Around (D455)		Driving (D475)		Caring For Body Parts (D520)	
	Capacity	Performance	Capacity	Performance	Capacity	Performance	Capacity	Performance	Capacity	Performance
11-20	0	1	0	0	0	0	9	9	0	0
21-30	0	0	0	1	0	1	0	0	0	0
31-40	0	1.17	0.17	1.5	0	1	1.5	3.5	0.17	1.67
41-50	0	0.69	0	0.75	0	0.63	3.38	3.75	0	0.06
51-60	0	0.93	0.6	1.67	0	1	6	6.33	0	0.53
61-70	0.64	2.07	0.14	1.14	0	1.07	6.29	6.57	0.29	0.57
71-80	0	0.6	0.2	1.2	0.2	0.8	6.8	7.2	0	0.4
81-90	0	4	0	2	0	2	8	8	0	3

Table 3: Capacity And Performance Qualifier Of Activity Limitation According To Different Age Groups (B)

Age Ranges (In Years)	Looking For Ones Health (d570)		Preparing Meals (d630)		Sports (d9201)		Hobbies (d9204)		Socializing (d9205)	
	Capacity	Performance	Capacity	Performance	Capacity	Performance	Capacity	Performance	Capacity	Performance
11-20	0	0	0	0	0	0.5	0	0	0.5	1.5
21-30	0	0	0	0	9	9	0	0	0	0
31-40	0	0.5	2.83	2.83	3.67	5	0.17	0.83	0	0.33
41-50	0	0.06	1.13	1.25	2.81	3.38	0	0.06	0	0.06
51-60	0	0.4	1.2	1.67	8.87	8.87	0	0.4	0	0
61-70	0.21	0.57	1.86	2.43	6.43	6.57	0.29	1.29	0	0.5
71-80	0	0.2	3.4	4.2	7	7.4	0	0.4	0	0
81-90	0	3	0	4	0	3	0	3	0	3

Discussion: As per ICF core set for Diabetes Mellitus, 18 categories of the component activities and participation at 2nd level and 3 categories at the 3rd level of classification are included. This primarily includes mobility, community social and civil life, and recreation and leisure aspects³.

The concept of capacity describes the level of difficulty a person may reach in a standard environment without assistance. In turn the concept of performance describes how well a person is coping with disability in real life situations.

A study done on patients with stroke, comparing FIM and ICF to document patient impairments have used capacity and performance qualifier and have reported that ICF is better in capturing patient limitations owing to the concept of capacity and performance.

Mohd Faudzi Abdullah has validated ICF CS of Diabetes in 100 Malaysian participants and has reported that – Intimate relationship (d770), handling stress and other psychological demands (d240) and Moving around (d455) appears to be frequent problems in these categories. However, these codes were not quantitatively graded using the qualifiers to estimate the extent of affection¹³.

In the present study, perception of patients is used to grade capacity and performance which is a subjective method. However future studies can be done to choose appropriate performance based outcome measures to quantify capacity and performance.

The difference can be attributed to availability of resources, infrastructure, variety of tools, psychological factors. It is often difficult for patients to accept the diagnosis is psychologically worried about the outcome.

Conclusion: Moderate to severe difficulty during performance as compared to capacity opens a new area of research to explore the causes and taking remedial measures to reduce the gap between capacity and performance in activities and participation in patients with diabetes.

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