ICF AND GAS AS EVALUATION AND TEACHING TOOLS IN CORRELATION WITH DIABETES

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Abstract: Diabetes mellitus (DM) is chronic disease associated with impaired body structure and functions including all organs. Organ impairments often lead to limitations of physical activities and restrictions in daily activities and social participation, including work.

Methodology: The methodology of this paper is reviewing literature for ICF and GAS as teaching and evaluation tools in correlation with Diabetes mellitus. The ICF is International Classification of Functioning, Disability and Health, and GAS (Goal Attainment Scaling) is the method to present personalized rating scales, determining the amount of progress towards set goals.

Literature review: The ICF reflects functioning and disability which are prerequisite connected to each health condition. Provides detailed and systematic information about all bio-psycho-social aspects of consequences of illnesses and disorders in consideration of the relevant contextual factors. The ICF organizes information regarding human functioning and its limitations in two parts, dealing with functioning and disability divided into Body Functions (b) and Body Structures (s) as well as Activities and Participation (d). In the second part the Contextual Factors included Environmental Factors (e) and Personal Factors. GAS is an instrument that enables individual goals to be measured.GAS appears to be a viable solution for improving collaborative goal setting to enhance self-care for patients with diabetes. The primary benefit of the GAS tool was patient involvement. The GAS method is a reliable and useful tool for the development of self-care goals in diabetes when the patients are ready to act in self-care.

Recommendations: The International Classification of Functioning, Disability and Health (ICF) as multipurpous classification tool and GAS (Goal attainment Scaling) methodology are useful tools in evaluation and teaching while assessing and measuring the results of rehabilitation in Diabetic patients.

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1. Introduction

Diabetes is a serious, chronic disease that occurs either when the pancreas does not produce enough insulin (a hormone that regulates blood sugar, or glucose), or when the body cannot effectively use the produced insulin **(World Health Organization, 2016).**

Diabetes is a critical public health concern in entire World, and diabetic patients seek care at an increasing rate **(Washington, 2013).** Diabetes is an important public health problem, one of four priority noncommunicable diseases (NCDs) targeted for action by world leaders. Both the number of cases and the prevalence of diabetes have been steadily increasing over the past few decades. Globally, an estimated 422 million adults were living with diabetes in 2014, compared to 108 million in 1980. The global prevalence (age-standardized) of diabetes has nearly doubled since 1980, rising from 4.7% to 8.5% in the adult population **(World Health Organization, 2016).** The incidence and prevalence of diabetes has risen and is projected to increase in the future. It is estimated that diabetes affects approximately 25.8 million Americans (8.9 percent of the population), and its incidence continues to rise annually **(Washington, 2013).** Since 1980, age-standardized diabetes prevalence in adults has increased, or at best remained unchanged, in every country. Together with population growth and ageing, this rise has led to a near quadrupling of the number of adults with diabetes worldwide. The burden of diabetes, both in terms of prevalence and number of adults affected, has increased faster in low-income and middle-income countries than in high-income countries **(NCD Risk Factor Collaboration (NCD-RisC), 2016).**

More than 60% of worldwide deaths from cardiovascular diseases, chronic kidney disease, and diabetes in 2010 were attributable to four preventable cardiometabolic risk factors, with high blood pressure having the largest effect **(Global Burden of Metabolic Risk Factors for Chronic Diseases Collaboration, 2014).**

2. Methodology

The methodology of this paper is reviewing in the literature ICF and GAS as evaluation and teaching tools in corelation with Diabetes mellitus. International Classification of Functioning, Disability and Health (ICF), which is based on discussion of its relevance as a conceptual framework for nursing **(Kearney, 2004)** and GAS- Goal Attainment Scaling as the method presenting personalized rating scales,determining the amount of progress towards set goals **(Caceres, 2015).**

3. Literature review

Reviewing the literature, Health conditions, diseases and disorders are basically represented in the worldwide well-known tenth revision of 17 International Classification of Diseases (ICD-10) to schedule them and to provide a diagnosis which is used as a diagnostic implement for health management, clinical purposes and epidemiology **(World Health Organization, 2011).** Complementary to the ICD-10, the ICF reflects functioning and disability which are indispensable connected to each health condition. The ICF provides detailed and systematic information about all bio-psycho-social aspects of consequences of illnesses and disorders in consideration of the relevant contextual factors. To describe sufficiently health states and the need of rehabilitation resulting from all different disorders the ICF complements the ICD-10. Using both classifications, the health status of the population can be specified and compared at national and international levels **(Müller, 2014).**

54 World Health Assembly, heald on May 2001, in Assembly Resolution 54.21, ICF was officially Endorsed by 191 Members (States) as the international standard to describe and measure health and disability **(World Health Organization, 2001, 2002).**

The ICF organizes information regarding human functioning and its limitations in two parts. The first part deals with functioning and disability which is divided into Body Functions (b) and Body Structures (s) as well as Activities and Participation (d). In the second part the Contextual Factors are included which are split in two parts Environmental Factors (e) and Personal Factors. Regarding their association with social and cultural variety Personal Factors in the ICF such as gender, habits, coping style, age or education are not classified yet. The component Body Functions refers to the physiological and psychological alterations of the body, whereas Body Structures describe changes in the anatomical parts like organs or extremities. Both components are created to work together side by side **(Müller, 2014).**

The Goal Attainment Scale (GAS) method, was initially used and successful in mental health for improving self-care activities by Newton, in 2013 and it appears to be a viable solution for improving collaborative goal setting to enhance self-care for patients with diabetes.

The level of provider engagement and motivation in goal setting varied; however, the patients who developed GAS goals demonstrated a commitment to caring for their diabetes. The primary benefit of the GAS tool was patient involvement. The GAS method is a reliable and useful tool for the development of self-care goals in diabetes when the patients are ready to act in self-care **(Mickel, 2020).**

Goal attainment scaling is a mathematical technique for quantifying the achievement (or otherwise) of goals set, and it can be used in rehabilitation. Because several different approaches are described in the literature, this article presents a simple practical approach to

encourage uniformity in its application. It outlines the process of setting goals appropriately, so that the achievement of each goal can be measured on a 5-point scale ranging from -2 to +2, and then explains a method for quantifying the outcome in a single aggregated goal attainment score. This method gives a numerical T-score which is normally distributed about a mean of 50 (if the goals are achieved precisely) with a standard deviation of around this mean of 10 (if the goals are overachieved or underachieved). If desired, the approach encompasses weighting of goals to reflect the opinion of the patient on the personal importance of the goal and the opinion of the therapist or team on the difficulty of achieving the goal. Some practical tips are offered, as well as a simple spreadsheet (in Microsoft Excel) allowing easy calculation of the T-scores **(Turner-Stokes, 2009)**.

In retrospective study they found that achievement of quality goals were generally comparable (HbA1c, weight loss/body mass index [BMI], systolic blood pressure [SBP]), including maintaining HbA1c, between patients with type 2 diabetes mellitus (T2DM) treated with two different medicaments an actual practice setting **(Wysham, 2018)**.

Organ impairments often lead to limitations of physical activities and restrictions in daily activities and societal participation, including paid work **(Kirchberger, 2009)**.

Imogene King's Theory of Goal Attainment provides a schema for nurses interested in functional status. GAS- Goal Attainment Scaling as the method, to present personalized rating scales, to determine the amount of progress towards set goals. GAS is an instrument that enables individual goals to be measured **(Caceres, 2015)**.

Raggi et al in their study shows the applicability of an extended list of ICF categories to describe functioning and disability of obese patients, and provide a preliminary indication to expanding the ICF Core Set for obesity **(Raggi, 2009)**.

Wildeboer et al. in their work emphasizes that specialized nurses taking care patients with Diabetes mellitus partially supported content validity of the ICF core set for Diabetes Mellitus, they predominantly reached agreement on biomedical categories. Content validity of categories derived from environmental factors received little support **(Wildeboer, 2020)**.

Awareness of the nursing profession in chronic care, and nurses specialized in diabetic care and a multidisciplinary approach enables members to learn from each other's perspectives, including from those of patients **(Wildeboer, 2020)**.

A formal consensus process integrating evidence and expert opinion based on the ICF framework and classification led to the definition of ICF Core Sets for diabetes mellitus. Both the Comprehensive ICF Core Set and the Brief ICF Core Set were defined **(Ruof, 2004)**.

It is a paper which specific examples from the developing country of Cambodia, illustrating population-based use of the ICF. A framework based on the ICF for analyzing relationships between particular impairments and environmental factors that impede or enable activity and participation **(Vanleit, 2008)**.

The researchers observed the differences between subjects having diabetes with and without peripheral neuropathy on the scores of ICF-CS (International Classification of Functioning, Disability and Health Core Set or ICF- CS) and suggested that, people with DPN (diabetic peripheral neuropathy) faces more problems in health and function. These people should be targeted with more intensive care for improving the health standards **(Fatma, 2020)**.

The preliminary results of training courses on the International Classification of Functioning, Disability and Health (ICF) prepared by Italian WHO FIC CC and reports, emphasizes the strategies for ICF dissemination among primary health care (PHC) workers in Mavalane Health Area, Maputo, Mozambique. They concluded that the project indicates that the use of the ICF checklist is feasible also in a crowded and busy environment like some PHC units of a developing country. However, data collection requires a simpler and lighter to use data compilation tool. The proposed new checklist, which includes a PEIC (person-environment interaction classification) tree, makes easier the compilation and the collection of data **(Borgnolo, 2009).**

They have been investigation and they summarize the literature on the validation of international classification of functioning, disability and health (ICF) core sets from 2001 to 2019 and explore what research methods have been used when validating ICF core sets. They were included, 66 scientific articles included, of which 23 ICF core sets were validated. The results of the current study show that only 66% of the existing ICF core sets are validated. Many of the validation studies are conducted in a European context and from a single perspective. They summarize more validation studies of ICF core sets from the perspective of both patients and professionals are needed **(Karlsson, 2021).**

In the Swiss study, where they evaluated the International Classification of Functioning, Disability and Health (ICF) and applied in many policy contexts, including education as tool for knowledge representation and creation, in the context of the Swiss education system highlight ways in which the classification can be used to assist multidisciplinary teams in acquiring and mapping existing knowledge, in creating new knowledge and in applying it for specific purposes. The conceptual analysis illustrates that "disability in education" is a hybrid conceptual world that needs to bridge disability-related information with information relevant for learning and education. In their conclusion, the ICF can be used to adequately map such knowledge in complex social settings **(Hollenweger, 2013).**

In the self-management program, during a 3-year period, 488 patients participated with a total set of 2,133 goals. Hispanic patients and those with depression were as successful as others at setting and attaining goals. Goals focusing on medications and healthy eating were more often successfully attained. Successful goal attainment was independently associated with achieving or maintaining an A1C value of $< 7.0\%$. Underserved, largely Spanish-speaking patients successfully set and attained specific goals, with a preference for those focused on healthy eating and medication taking. This evaluation suggests an association between the successful achievement of individual goals and glycemic control **(Anderson, 2010).**

They are conclusions that the ICF contributed to the development of research on functioning and on disability in clinical, rehabilitation as well as in several other contexts, such as disability eligibility and employment. Diffusion of ICF research and use in a great variety of fields and scientific journals is a proof that a cultural change and a new conceptualization of functioning and disability is happening **(Cerniauskaite, 2010).**

It is a study that aimed to analyze the influence of environmental factors on the ICF activity-participation outcome, controlling for body function and personal factor dimensions of 75 diabetes patients. They confirmed that the functional consequences of diabetes mellitus to be complex and multifactorial. An approach that considers the interaction between individual and environmental attributes is necessary due to the disabling nature of this health condition **(Alcantara, 2018).**

The Master program of Advanced Nursing Practice (MANP) educates nurses to become a nurse practitioner. Nurse practitioners are health care professionals focusing on the intersection of cure and care. However, a clear model covering that area is lacking. The use of the International Classification of Functioning, Disability and Health (ICF) may be considered for incorporation in curricula due to its focus on the integration of cure and care. The positive influence of the ICF training on perceived usefulness of the ICF is relevant for including ICF in MANP curriculum (**Stallinga, 2018**).

People may suffer from diseases and a variety of health conditions, but a full understanding of the experience of their health condition also requires comprehensive information about the impact of the disease or the health condition on the person. In their article, operationalizes the impacts of health conditions as classified in the International Classification of Diseases (ICD) in terms of the concept of functioning as found in the International Classification of Functioning, Disability and Health (ICF). They concluded that the joint use of the ICD and the ICF through the list of functioning properties and in the context of ICD-11 development captures the valuable synergy of the two classifications. It enhances patient management, intervention design and the reporting of health. It also enables us to distinguish severity of disease from its impacts. The ICD–ICF joint use creates a shared formal representation across the continuum of care for health information system implementation (**Kostanjsek, 2011**).

They are conclusions that findings supported hypothesis that persons with both mobility limitations and minority status experience greater health disparities than do adults with minority status or mobility limitations alone. Their results also indicate an urgent need for standing community-based health promotion programs and interventions that, from the onset of planning, reflect human diversity that includes various cultures and disabilities. Living well with a Disability is a community-based intervention that was originally designed to improve the health of adults with mobility impairments. The ICF presents innovative opportunities to convey standardized disability and health information across disciplines and nationalities, but it can be vastly improved by adding personal factor demographic codes and providing more specificity for activity and participation codes (**Jones, 2008**).

It is reported a case incorporating goal attainment scaling into a telenursing system for type 2 diabetic patients was effective in continuing self-management behavior, suggesting that it is effective in providing continued home nursing care in diabetic patients (**Higano, 2015**).

The researchers in assessment of patient knowledge of diabetic goals, self-reported medication adherence, and goal attainment, they concluded that the majority did not reach goals and were unknowledgeable of goals; however, most were provided prescriptions to treat these parameters. Goal parameters should be revisited often amongst multidisciplinary team members with frequent and open communications. Additionally, it is imperative that practitioners discuss the importance of medication adherence with every patient at every visit (**Whitley, 2006**).

In the research in the city of Fortaleza, Ceará state, Brazil, it was possible to conclude the feasibility of using Theory of Goal Attainment in the positive aspects for adherence to diabetes treatment and improvement of quality of life (**Araújo, 2018**).

Social media–enabled web-based platforms assist health goal management via both social interaction and personal discipline. Study extends the understanding of web-based patient communities by investigating the effects of both social and cognitive factors on goal

attainment. In particular, our study advocates that health goals relating to chronic conditions can be better managed when patients use the facilities of web-based health communities strategically **(Song, 2020).**

The ICF Practical Manual provides information on how to use ICF. People interested in functioning and disability and seeking ways to apply the ICF should find the contents of this Practical Manual helpful. Indeed, the Practical Manual provides a range of information on how to apply ICF in various situations. It is built on the acquired expertise, knowledge and judgement of users in their respective areas of work, and is designed to be used alongside the ICF itself, which remains the primary reference **(World Health Organization, 2013).**

4. Recommendations

The International Classification of Functioning, Disability and Health (ICF) as multipurpous classification tool and GAS (Goal attainement Scaling) methodology are useful tools in evaluation and teaching while assessing and measuring the results of rehabilitation in Diabetic patients.

Author contributions

FTH and AU contributed to design the final version of the Manuscript after analyzing the literature. AFH have searched and collected the literature for this topic.

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