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Technology in the Determination of People Health Level: Design of a Computational Tool

Sara Herrero Jaén[ab], Marta Fernández Batalla[ac], Alexandra González Aguña[ad], Adriana Cercas Duque[ae], José Mª Santamaría García[ac], Sergio Martínez Botija[f], Niurka Vialart Vidal[g], Sylvia Claudine Ramírez Sánchez[g], Daniel Flavio Condor Camara[g]

[a] Research Group MISKC, University of Alcalá (Spain). [b] Hospital Universitary Severo Ochoa (SERMAS), Spain. [c]Centro de Salud Meco (SERMAS), [d]Hospital Universitary Príncipe de Asturias (SERMAS), [e] Hospital Universitary La Zarzuela (SANITAS) [f] Lapicero Blanco [g] International Network of Latin American and Caribbean Informatics Nursing

Abstract

The health concept has evolved throughout history. The people health level is determined by the perception that each individual has of it. It is a dynamic process over time, so the variations can be see from one moment to another. In this way, knowing the health of the patients you care for will facilitate decision-making in the treatment of care. To know the level of health of the people, a technological tool is presented that calculates the people health level through the Health Variables and Nursing Outcomes Classification (NOC) labels.

Keywords:

Health Care Technology, Population Health, Health

Introduction

The present study starts from the following research aim: Design an application for calculate the people health level based on the health variables.

Today in Spain, the so-called "Health Indicators" are used to establish the health level of a population. These indicators can be found in the health indicators document “Evolution of the indicators of the state of health in Spain and its magnitude in the context of the European Union” [1]. However, no tools have been found that determine the level of health of people, understanding that health goes beyond the absence of the disease, as proposed by WHO [2].

The objective of the research presented in this article is to design a computational tool that determines the level of health of a person at a given time. For this, a study has been carried out in which the logical formalization of the WHO Health concept takes place. This formalization allows to represent all those potential health states of a person [3].

Methods

The present study used deductive type methodology and was developed in four phases:

1. Extraction and representation of knowledge.
2. Design and development of the prototype tool.
3. Specification of Soft-ware Engineering Requirements through the Standard “IEEE Recommended Practice for Software Requirements Specification ANSI/IEEE 830-1998”.
4. Verification of the tool by group of experts of the MISKC Research Group, Alcalá University.

Results

Definition of Health Variables

The first result obtained derives from the extraction and description of the variables that constitute the concept of Health proposed by the WHO. This set of 11 variables has been called health variables.

- Physical Functioning: Functioning of the apparatuses and corporative systems of the person. It has a reversible character.
- Mental Functioning: In order to determine the mental functioning, the state of consciousness, spacetime orientation, behavior and language will be valued. It is reversible.
- Social Functioning: To determine the social functioning of a person will be assessed the ability to communicate and interact with other people. It is reversible.
- Confort Status: The welfare of the person, their tranquility, personal security, adaptation to the environment will be valued.
- Material Resources: Set of material goods needed to live [4].
- Time Resource: Temporary availability to carry out your care [4].
- Sings Presence: Sign measurable and valuable by the healthcare professional.
- Symptoms Presence: Manifestations of each person.
- Physical Condition: Sequel of irreversible character in the functioning of the body.
- Mental Condition: Sequel of irreversible character in mental functioning.
- Social Condition: Sequel of irreversible character in social functioning.

Tool Design

The computational tool will collect information about the health status of the person through NOC indicators. For its development, each one of the 11 variables of health were correlated with a label of the Taxonomy of NOC Result Criteria (Nursing Outcomes Classification) [5].

Health Variables	NOC Related
Physical Functioning	Personal Health Status (2006)
Mental Functioning	Personal Health Status (2006)
Social Functioning	Personal Health Status (2006)
Confort Status	Estado de comodidad (2008)
Material Resources	Health Belief: Resources Perception (1703)
Time Resource	Health Belief: Resources Perception (1703)
Signs Presence	Knowledge: Disease Process(1803)
Symptoms Presence	Knowledge: Disease Process(1803)
Physical Condition	Personal Health Status (2006)
Mental Condition	Personal Health Status (2006)
Social Condition	Personal Health Status (2006)

Figure 1 – Relationship between Health Variables and NOC Related

In this way, when relating the variables of health with NOC labels, they are related to their scale of measurement, being said scales those used to determine the people health level.

IEEE 830 Requirements Specification Interface

The application (app) is intended for all healthcare professionals. Then, this is the last of the results, the Specification of Software Engineering Requirements through the Standard "IEEE Recommended Practice for Software Requirements Specification ANSI/IEEE 830-1998", through the developed interface. The start screen of the app is shown in Figure 2.

Figure 2–Principal APP Interface

Once the user has accessed the app, an information screen appears in which clicking on each one of the health variables will show its definition. Finally, Figure 3 shows what the health calculation tool would look like, in which health variables are identified along with the Likert-type scale based on the NOC taxonomy.

Figure 3 – Health Level Calculator

Discussion

7 out of 10 Spaniards consider that their state of health is good[6]. These data are based on the results obtained after the National Health Survey, in which the section of the health status module asks the population of the type: "Would you say that your health has been very good, good, regular, bad, very bad?", "Do you have any chronic or long-term illness or health problem?" or "What type of problem is the cause of its difficulty in carrying out the activities that people usually do?" [7]. However, no tools have been found that determine the level of health of people who go beyond the impact that health problems have on the individual.

Conclusions

The analysis of the data obtained will draw a graph where one can observe how the level of health of each participant is modified throughout a certain process. Determining the level of health of a given population facilitates the establishment of assessment criteria and health management, allowing prediction and prioritization of different health care strategies.

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Address for correspondence

Sara Herrero Jaén. Research Group MISKC, University of Alcalá, Alcalá de Henares, Madrid (Spain).

Email: sara_herrerojaen@yahoo.es