

Chapter 13

Business Intelligence for Nutrition Therapy

Rita Reis

University of Minho, Portugal

Ana Mendonça

University of Minho, Portugal

Diana Lisandra Azevedo Ferreira

University of Minho, Portugal

Hugo Peixoto

University of Minho, Portugal

José Machado

University of Minho, Portugal

ABSTRACT

The assessment of health status in communities throughout the world is a massive information technology challenge. Data warehousing provides a flexible environment to support the business management and serve as an integrated repository for data. With the addition of models and analytic tools that have the potential to provide actionable information resources and support effective problem identification, critical decision-making, and strategy formulation, implementation, and evaluation. Of particular interest are the factors of influence like the patient's height or weight and its impact on processes and results. A multidimensional process is a way to discover health care processes according to certain factors of influence. This study aims to implement a data warehousing environment for decision support, in the context of nutrition evaluation, to integrate data obtained from a health care facility. This paper highlights the implementation of Business Intelligence in health care settings allows searching and interpreting stored information to support decisions concerning people's life.

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INTRODUCTION

Identifying the risk of malnutrition in patients from predictive variables is the first step towards an adequate nutritional control. Given its prevalence, the traceability and monitoring of nutritional status should be available in the hospital environment to prevent, treat and improve its prognosis. With this, morbidity, mortality, as well as hospitalization time and hospital costs will be reduced, enhancing the quality of life. Given this reality, the nutritionist plays a crucial role, since it's able to identify early cases of nutritional risk. In this way, the nutritionist can interfere with the control of patient's clinical status and, consequently, prevent and control its malnutrition, as well as infer the improvement of its clinical state. Thus, each health institution should identify the most common nutritional risk factors that affect the population and develop its instrument of nutritional tracking.

Malnutrition refers to both overnutrition and undernutrition. People are malnourished if their diet doesn't provide enough calories and protein for growth and maintenance or they are incapable of utilizing the food they eat due to illness (undernutrition). They are also malnourished if they consume too many calories (overnutrition) (UNICEF, 2006).

According to the World Health Organization (WHO), undernutrition is an individual nutritional status characterized by the insufficient intake of energy and nutrients, the body's inability to absorb nutrients or the abnormal body loss of nutrients. This results from the complex interaction between diet, health status, and, socioeconomic and social conditions in which the individual lives, being a common health problem in hospital admission (Amaro et al., 2016). Everyone is vulnerable to undernutrition, but certain groups of people are at greater risk. This is the case of the elderly, children, pregnant women and individuals who are sick. Examples of the most common symptoms observed in undernourished individuals are the loss of body fat, reduced appetite, fatigue and poor concentration (Correia et al., 2014).

Overnutrition is defined as the overconsumption of nutrients and food owing to the unlimited amounts of food available to eat. Most of the industrialized and prosperous communities have a great percentage of individuals that eat too much, to the point at which health is adversely affected. Overnutrition can be developed into obesity, which increases the risk of serious health conditions, including cardiovascular disease, hypertension, cancer and type-2 diabetes (White et al., 2012).

Malnutrition in children can be classified into three types: stunted, wasted and overweight. Stunting refers to a child who is too short for his age, and it's related to the failure of growing both physically and cognitively. It results of chronic or recurrent malnutrition. Wasting, or acute malnutrition, refers to a child who is too thin for his height, and it's related to a rapid weight loss or to the failure to gain weight. Overweight refers to a child who is too heavy for his height due to the consumption of too many calories that enhances the risk of diseases later in life (UNICEF, WHO, & The World Bank Group, 2016).

All around the world, disease-related malnutrition is common and costly. The hospitalization itself is often associated with the risk of worsening the patient's nutritional status which, in turn, can lead to delayed recovery and functional decline. Although several clinical guidelines specify care processes, malnutrition is still overlooked and undertreated (Aquino & Philippi, 2011).

Through the statistics presented in Figure 1, it is possible to note that, in 2015, Africa and Asia had the greatest share of all forms of children's malnutrition.

Over the last years, health organizations have been developing new means of response for citizens and, new ways of communication and information transmission, supported by technological systems. Business intelligence tools are now used in public health fields for financial and administrative purposes,

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