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A Review on Malnutrition Detection Approaches

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ABSTRACT: Malnutrition is an extremely debilitating and highly problematic occurrences that need to be eliminated with regard to infants and neonates. This is because the first five years of a baby or one of the most important and essential years require effective and balanced nutrition for the overall growth in terms of physical as well as mental growth. This is necessary as this year's define the integrity of these individuals in their future as they are the future of the nation and need to be effectively protected as such. For maintaining effective nutrition of a baby there is a need for effective evaluation of this nutrition for which a number of researches have been effectively studied in this literature survey article. These approaches have been elaborated and identified to contain various inaccuracies which need to be improved significantly for effective and useful implementation. These studies have been effective in reaching our approach that utilizes an ensemble technique for the purpose of clustering through K Means Clustering, Fuzzy C Means, and Linear Clustering along with the implementation of Decision Tree and Pearson Correlation. This approach will be for the undefined in the future editions of this research.

KEYWORDS: *k means clustering, fuzzy c means, and linear clustering, Pearson correlation, Decision Tree*

I. INTRODUCTION

Nutrition is elaborated as the intake of useful ingredients and the development of nutrients into the body for the purpose of fulfilling its requirements. Nutrition needs to be effectively balanced to achieve overall growth and development of the body in a balanced and error-free manner. This requires having a balanced diet with various groups of Nutrition such as fats carbohydrates proteins fiber as well as the trace elements such as vitamins and minerals in our diet. This is an essential and non-replaceable aspect that requires constant vigilance to be balanced effectively in our body to reduce any side effects due to deficiency.

But it has been found that a large number of individuals in developing countries roughly half of them have been diagnosed with malnutrition or undernutrition due to achieving a non-balanced diet.

This is a highly problematic occurrence that needs to be resolved effectively to achieve study and useful growth in the health of the individuals that is paramount to a country than anything else. Lower nutrition results in a lot of problems with higher incidences of diseases and rapid spread of pandemics and other epidemics which can be controlled just with a properly balanced diet. These scenarios are highly preventable with the introduction of nutritional evaluation of the individual as well as the diet.

Moreover, most of these deficiencies have been noticed in infants wear in the nutritional imbalance has caused various problems marasmus and kwashiorkor. These are highly debilitating painful diseases that can be fatal if not corrected on time. These diseases in infants significantly reduce their ability for growth and mental activity that can lead to a large number of disorders later in their life. These problems are highly dangerous and lead to the erosion of young individuals and the reduction in the actual performance of young individuals in the country which can lead to disastrous results on the international platform.

There have been several techniques that have been designed to facilitate the nutritional evaluation of infants and individuals. It is a highly complex process that requires extensive knowledge and a large number of tests to accurately determine the nutritional status. Especially infants as it is highly difficult to determine the amount of Nutrition on the nutritional status of an infant with invasive procedures. Therefore most of the approaches have utilized anthropometry as their evaluation methodology for determining the nutritional status of the baby.

There have been a number of techniques that have been proposed for the accurate and useful evaluation of the nutritional status of infants but most of them have been found out to be highly inaccurate in their results. This is due to the fact that most of these researches concentrated on the paradigm of achieving evaluation through the utilization of data mining approaches. These researches have been effectively outlined in our survey article which has been useful for the determination of our approach will be defined significantly in the upcoming editions of this research.

This literature survey paper dedicates section 2 for analysis of past work as a literature survey, and finally, section 3 concludes the paper with traces of future enhancement.

II. RELATED WORKS

A. Martinez-Millana [1] explain that there is a need for an adequate amount of Nutrition for an individual to stay healthy and also produce the incidences of disease and other ailments. Due to various reasons and the inability of individuals to understand nutrition there is a lot of malnutrition that is been happening across the world. Therefore to reduce the defect and effectively analyze the nutritional assessment of individuals the authors have proposed a mobile application for this purpose. The mobile app contains a questionnaire that is provided to elderly individuals in old age homes to determine their nutritional status accurately.

R. Putranto [2] elaborates on the concept of effective realization of nutritional status of individuals especially infants and nursing mothers. This is due to the fact that the early used in the infant's age are the most important and require effective nutrition for healthy growth of the mind and body. Therefore there is a need for an effective technique that can determine the nutritional status of the infant accurately. For this purpose the author is a proposed utilization of cloud computing platform that can effectively assess the nutritional status of an infant through the utilization of medical records and anthropometry indices.

W. Fahrozi [3] expresses that the main determining factor for the quality of life and growth of an individual is dependent on the nutrition that is provided to it. A good nutrition can provide the individual with effective and useful growth of the body that can be necessary in the early ages. There are very few techniques that can accurately calculate the nutritional status of an individual through various different indices. The authors in this approach has proposed an effective technique for the diagnosis of malnutrition through Dempster shafer reasoning and recommendation of Nutrition to individuals that are skinny.

A. Miller [4] discusses that nutrition is one of the most important aspects of human growth and development. This is due to the fact that the human body keeps developing over the years and requires adequate minerals and other building blocks to achieve effective and useful growth. There is a need to achieve effective nutrition as majority of the countries across the world especially the developing countries has been known to have more than 50% of their population that is malnutrition. Therefore there is a need for an effective technique that can determine the nutrition level of the individuals effectively. For this purpose the authors propose and effective technique of utilization of near infrared spectroscopy to determine the nutrition status of infants.

G. Agapito [5] introduces the concept of proper nutrition and a balanced diet it is a main aspect for leading a fulfilling and healthy life. The World health organization has stated that a lot of individuals across the word are not getting proper nutrition some are undernutrition on malnutrition where as other is over nutrition leading to obesity and excessive amount of weight gain. Both the scenarios are highly undesirable as it can be quite problematic for undernutrition people to achieve healthy life as well as the obese people which can be problematic to lose weight and lead a normal life. Therefore for this purpose the authors propose an effective and useful recommendation system that recommends diet plans and monitoring for individuals for providing effective suggestions for food.

S. Winiarti [6] narrates that having a good nutrition is one of the most essential aspects that is mostly overlooked by a large number of individuals. Having proper nutrition is one of the basic tenets of having a fulfilling and useful life as an individual. Therefore there is a need for or an effective techniques that can monitor and also provide effective and useful nutrition for an individual based on their particular attributes. The authors have proposed an effective approach that provides good nutrition based on the nutritional state of the individual through the utilization of Fuzzy c means technique.

Z. Valero-Ramon [7] explains that the issue of malnutrition is a major problem that has led to a lot of difficulties and deficiencies in individuals in their growing phase. Malnutrition is highly prevalent across the world

with majority of these instances happening in third world countries with large populations. The reduction in the nutritional value of a person's meal needs to be evaluated to reduce the problem of malnutrition and improve the quality of health of individuals across the world significantly. Therefore the authors in this approach have proposed and effective and useful technique that dynamically provides assessment of Nutrition of individuals through the utilization of process mining.

D. Ferreira [8] expresses that nutrition therapy is one of the most important and useful therapies that is required to effectively identify the nutritional status of an individual and improve it significantly. This is due to the fact that malnutrition can be highly problematic occurrence which can lead to a lot of difficulties and growth defects in large number of individuals. Therefore an effective approach is needed to determine the health condition and the nutritional status of individuals before performing the nutrition therapy. For this purpose the authors have proposed the utilization of machine learning approaches through Weka in achieving nutritional evaluation effectively through the utilization of classification algorithms.

Z. Markos [9] elaborate the concept of infant mortality a lot of malnutrition that is being seen in African states that are highly poor. This is due to the fact that most of the infants and other children do not have access to nutritional food which can lead to nutritional deficiencies and malnutrition and growth deficiencies. Therefore this study has focused on Ethiopian children that are under the age of five and evaluated their nutritional status for the purpose of effective and useful prediction of malnutrition. The authors have effectively utilize knowledge discovery process effectively achieve the data set for the nutritional status of the individuals. The authors then implemented data mining approaches for the purpose of effective and useful prediction of nutrition in children below the age of 5.

Z. Momand [10] discusses that having a proper nutrition is one of the most vital and essential component for the development survival and growth of children in society. A lot of individuals have a lot of problems in growth that usually stems from the low nutritional value of their meals. This is a problematic occurrence due to the fact that the nutrition value of children's meal has been a problematic phenomenon across the world. Malnutrition for children under the age of five leads to a lot of development problems as well as mental health issues in the long run. Therefore the authors have effectively utilized a survey data set for the purpose of determination of nutritional values of the meals given to children in Afghanistan. The effective prediction of the nutritional status of the children is achieved through implementation of data mining.

I. Kurniastuti [11] introduces the concept of nutritional value assessment of an infant as one of the most required assessment for an infant. This is due to the fact that the early stages of development require master modes of Nutrition with the balance diet that can provide the optimum growth physically and mentally for the child. This is essential as it allows for or an effective growth which will lead to a fulfilling and complete life as the baby grows up. There are various techniques for the detection of the growth and the nutritional status of the baby but most of them require extensive tests and other invasive procedure. Therefore the authors in this procedure has proposed a utilization of anthropometric for the purpose of nutritional status determination of a baby through the utilization of Macromedia flash platform.

III. CONCLUSION AND FUTURESCOPE

The methodology for effective and useful malnutrition analysis of infants and neonates has been realized in this literature survey article effectively. Malnutrition is one of the greatest evil of society that has been lurking in our country for a large number of years. There has been particular neglect that has been noticed towards infants and units in our country due to the extreme poverty of the individuals. This has led to various growth abnormalities and mental illnesses that have been prevalent in the large number of infants that have malnutrition. This can be effectively monitored through the utilization of anthropometry in infants for effective nutritional status determination. A large number of related researches have been effectively studied to determine our approach which has been realized as an and symbol clustering approach that utilizes k means clustering, fuzzy c means, and linear clustering along with the utilization of decision tree and Pearson correlation to achieve highly accurate malnutrition analysis. This approach will be further elaborated on in the next edition.

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