

# KNOWLEDGE AND NUTRITIONAL FACTORS OF OSTEOPOROSIS IN HOUSEHOLDS IN DIFFERENT PROVINCES OF ECUADOR

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## ABSTRACT

Osteoporosis represents one of the most prominent pathologies for the skeletal system determined mainly by a decrease in bone mass reaching the detriment of the micro architecture of the bone tissue. The objective of the present research is to analyze the knowledge that people have about osteoporosis and its nutritional factors. The research was descriptive of transversal cohort, a validated survey was applied for which a population of 359 people between men and women was extracted, concluding that dietary intake is one of the main factors that induces osteoporosis.

**Key words:** nutrition, osteoporosis, calcium, pathology.

## INTRODUCTION

Osteoporosis is a disease characterized by a decrease in bone strength that predisposes to the risk of fractures. Bone strength reflects the integration of two factors, bone density and bone quality. It is important to note that osteoporosis remains silent until a fracture occurs. The most common osteoporotic fractures are vertebral, wrist and hip fractures, and are accompanied by loss of independence and a heavy economic burden for the patient, his family and for society. (G, 2021)

The epidemiology of osteoporosis is called a silent epidemic because it does not manifest symptoms until bone loss, the statistics reported by the WHO are alarming, it affects approximately

200 million people (2.6% of the population), nine million people have osteoporotic fractures and 1.4 million correspond to fractures of vertebral bodies, the process of bone remodeling remains in a constant balance until some factors such as advanced age and menopause alter it, the incidence of fractures increases exponentially and becomes an alarming problem in the population. (H, 2017)

Nutritional factors in bone health and in the treatment of osteoporosis has a close relationship with food, the nutrients consumed in the daily diet make up an important part of the bone structure. Among the main nutrients related to bone formation processes are calcium, phosphorus and vitamin D, as well as magnesium, sodium, potassium, fat-soluble vitamins (A, D, E, K), the group of B vitamins (B complex), folic acid (vitamin B9), vitamin C and proteins. (Diaz Rizo V, 2018).

Knowing that a large part of the nutrients and components of the foods we consume in the daily diet act on the metabolism and structure of bone, through endocrine and paracrine actions and modifying the homeostasis of calcium, or other bioactive mineral elements of bone have a positive or negative effect. (Diaz Rizo V, 2018)

Calcium plays a primary role in bone formation, low intake of this mineral has been related to the presence of osteoporosis, another important factor is sun exposure, as it promotes the synthesis of at least 90% of vitamin D, the rest is ingested through the diet. (Navarra, 2019)

Having clarified this, the present study was developed in order to analyze the level of knowledge that people have about osteoporosis and its nutritional factors.

## **MATERIALS AND METHODS**

The research was descriptive of cross-sectional cohort, a validated survey of the Autonomous University of Nueva Leon (UANL) was applied, and a database was used in the SPSS application where 359 people were surveyed of female and male sex in an age range of 18 to 55 years and older, who were assigned a group of 3 sociodemographic questions and 29 multiple choice questions of knowledge about osteoporosis using materials, tools (Google form) or resources necessary to carry out the development of the present research.

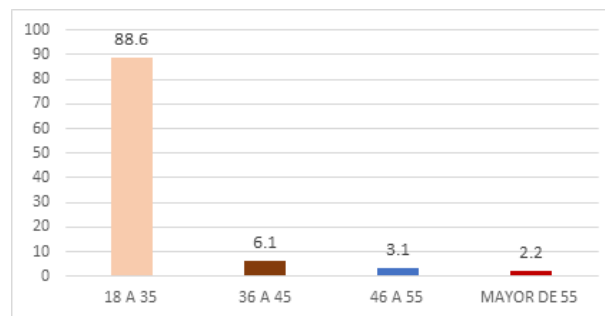
In addition, the bibliographic resources for the scope of the results should be indicated. The generic theories based on these answers should also be presented and the ones applied to the study should be argued, with the aim of assessing the knowledge that this population has on the subject of osteoporosis and its nutritional factors, thus allowing us to verify the answers proposed on the basis of our article.

Once the data were obtained and organized, the statistical and descriptive analysis of the surveys was carried out, as well as the specification of the tabulation of the questions posed in order to determine the appropriate study for the case. In order to determine whether the surveyed population knows their nutritional status to prevent osteoporosis.

Applying a probabilistic sampling technique to determine the percentage of the results through surveys to a certain number of population.

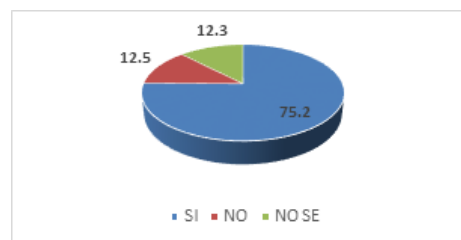
## RESULTS

After tabulation of the responses from the population of 359 people, the following results were obtained:



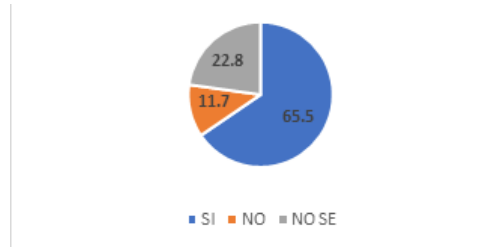
**Graph 1.** Frequency by age group.

Among the surveyed population, 88.6% are between 18 and 35 years of age, 6.1% are between 36 and 45 years of age, 3.1% are between 46 and 55 years of age, and 2.2% of the people are older than 55 years of age.



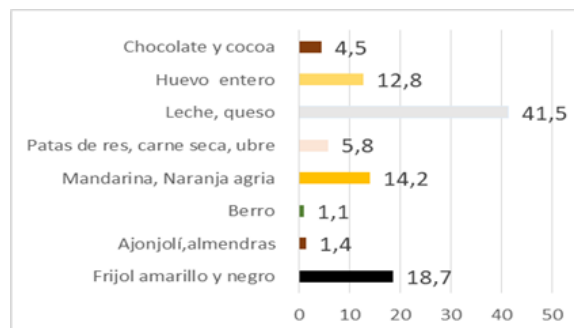
**Graph 2.** Knowledge of the relationship between nutrition and osteoporosis.

Among the population surveyed, 75.2% were found to be aware of the relationship between diet and osteoporosis; 12.5% did not know and 12.3% had no knowledge. Osteoporosis causes bones to weaken and become brittle, this appears when the body breaks down more bone tissue than it can replenish, making it more likely to fracture or break. (Gonzalez Pinto G, 2016).



**Graph 3.** Knowledge about the consumption of foods that are sources of calcium and osteoporosis.

Among the population surveyed it was found that 65.5% are aware that eating foods with low calcium content is related to osteoporosis, 22.8% do not know that these foods are related and finally 11.7% consider that foods rich in calcium are not related to osteoporosis. A diet low in calcium contributes to decreased bone density, early bone loss, and an increased risk of fractures. (J, 2019)



**Graph 4.** Daily consumption of calcium-rich foods.

Among the foods consumed daily, 41.5% corresponded to milk and cheese, 18.7% to yellow and black beans, followed by 14.2% to mandarin oranges and bitter oranges, then 12.8% to whole eggs. Among the foods of low consumption we have with 5.8% beef feet, beef jerky and udder, 4.5% chocolate and cocoa, 1.4% sesame and almonds and finally 1.1% watercress. It is important that this nutrient should come from a variety of foods (Mendoza S, 2018).

## DISCUSSION

When human beings reach a delicate age generally after the age of 50 years there is an imbalance both biologically and physically where diseases begin to elucidate, one of them osteoporosis. In this study, 88.6% of the young population between 18 and 35 years of age participated. When a woman goes through menopause her concentrations of estrogen and other hormones decrease drastically, influencing the maintenance of bone density and causing a loss of bone density. In addition, in men, age leads to fatigue and tiredness, making it impossible to maintain an active life,

which contributes to the loss of calcium in the bones and thus to osteoporosis. (Asturiana, 2021).

In the course of age the decrease in bone mass is imminent. In relation to this, 75.2% of the surveyed population knows that there is a relationship between diet and osteoporosis. 65.5% know that the consumption of food sources of calcium prevents osteoporosis, however there is an important counterpart of 22.8% who do not know that these foods do not influence the disease.

The food factor is a central issue for the bone structure of the individual from birth to senescence, highlighting the importance of consuming foods rich in calcium and vitamin D as nutritional elements that make up the osteological health throughout life, thus preventing this disease and its serious consequences, The bone mass is formed by living tissues that are constantly rebuilt until after the age of 30, where bone loss is perceived faster than your body takes to generate bone, which weakens the bones and makes them more prone to break so that, to achieve peak bone mass, and to prevent its loss with age, a balanced diet should be provided. (J, Q. G. 2019) 41.5% of people stated that their primary source of calcium is milk and cheese, if we do not maintain an adequate intake of foods rich in calcium, vitamins and other minerals, bones demineralize and become brittle so the ideal in the daily diet of an average adult is to consume between 1000 mg and 1200 mg of calcium per day. This figure rises to 1300 mg daily in the case of children and adolescents, since it is in these early stages is where the highest bone density is achieved. (Quesada M, 2017)

## **CONCLUSIONS**

With the research it is concluded that more than 50% of the people surveyed have adequate knowledge about osteoporosis and its nutritional factors.

However, the consumption of foods rich in calcium is very low, reflected in the consumption of sesame and almonds by 1.4% of the study population. Therefore, it is advisable to prevent osteoporosis by ensuring a good intake of calcium and vitamin D, modifying lifestyle and increasing physical exercise. Pharmacological therapy has its main indication in the treatment of osteoporosis, although it can also be used preventively in patients selected for risk factors, it is essential to avoid the consumption of alcohol and tobacco, avoid toxic habits, maintain the ideal body weight or close to it, as a way of keeping the bones healthy and strong, delaying the onset of the disease and bone fractures due to this cause.

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