



ORIGINAL

Nutritional status in women aged 60 and older, living in a private asylum in the City of Guadalajara, Jalisco. México

Estado nutricional en mujeres de 60 años o más, que viven en un asilo privado en la ciudad de Guadalajara, Jalisco. México

Anani Dueñas Santillán¹, Erik Misael Peña Cisneros¹, Patricia Sánchez Rivera², Raquel Balderrama Díaz³, Miriam Selene Hernández Medina³, Beatriz Garnica Guerrero⁴, Jesús Carlos Ruvalcaba Ledezma⁵

¹ Masters in Clinical Nutrition, UNIVA Atemajac Valley University, Zapopan Jalisco, Mexico.

² Researcher Professor in UNIVA, Zapopan Jalisco, Mexico.

³ Masters in Public Health [UAEH] University of the State of Hidalgo, Mexico.

⁴ Student of the Degree in Nutrition [UAD] University of Durango, México.

⁵ Department of Medicine and Public Health. [UAEH] University of the State of Hidalgo, Mexico.

* Corresponding Author.

e-mail: dcsjcarlos@gmail.com (Jesús Carlos Ruvalcaba Ledezma).

Received 9 august 2020; accepted 16 September 2019.

How to cite this paper:

Dueñas Santillán A, Peña Cisneros EM, Sánchez Rivera P, Balderrama Díaz R, Hernández Medina MS, Garnica Guerrero B, Ruvalcaba Ledezma JC. Nutritional status in women aged 60 and older, living in a private asylum in the City of Guadalajara, Jalisco. México. JONNPR. 2020;6(5):745-64. DOI: 10.19230/jonnpr.3952

Cómo citar este artículo:

Dueñas Santillán A, Peña Cisneros EM, Sánchez Rivera P, Balderrama Díaz R, Hernández Medina MS, Garnica Guerrero B, Ruvalcaba Ledezma JC. Estado nutricional en mujeres de 60 años o más, que viven en un asilo privado en la ciudad de Guadalajara, Jalisco. México. JONNPR. 2020;6(5):745-64. DOI: 10.19230/jonnpr.3952



This work is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License

La revista no cobra tasas por el envío de trabajos, ni tampoco cuotas por la publicación de sus artículos.

Abstract

Aim. To determine the nutritional status of women 60 years and older, private nursing home residents in the city of Guadalajara issued under different diagnostic methods and risk indicators and nutritional assessment and propose the most suitable for prevalence of use in future research.



Material and Methods. An Study Descriptive, transversal, In 52 women 60 years and more residents of a private asylum in Guadalajara Jalisco Nutritional assessment: 1) indirect and subjective status and nutritional risk by the questionnaire "Mini Nutritional Assessment (MNA). direct and objective anthropometric and Tables by percentiles.

Results. Nutritional status, according to the MNA, is distributed: satisfactory nutritional status in 7.7%, at risk of malnutrition at 71.2% and malnutrition in 21.2%. By Body Mass Index (BMI) in women > 60 years and more; 25.3 ± 6.8 , 42.3% prevalence associated with malnutrition problems in old age.

Conclusions. Nutritional status is not encouraging, as the trend is towards malnutrition in the short and medium term if not done timely nutritional intervention. The most useful indicators of prevalence in the diagnosis of nutritional status were kg/m^2 BMI, % CB and percentiles (P) for the current weight kg, and MNA for nutritional risk.

Keywords

Nutritional status; Mini Nutritional Assessment; women 60 years and older; nutritional risk

Resumen

Objetivo. Determinar el estado nutricional de mujeres de 60 años y más, residentes de un asilo de ancianos privado de la ciudad de Guadalajara bajo diferentes métodos de diagnóstico e indicadores de riesgo y valoración nutricional y proponer los más adecuados para la prevalencia de uso en futuras investigaciones.

Material y métodos. Estudio descriptivo, transversal, en 52 mujeres de 60 años y más residentes de un asilo privado en Guadalajara Jalisco Evaluación nutricional: 1) estado indirecto y subjetivo y riesgo nutricional mediante el cuestionario "Mini Evaluación Nutricional (MNA). directo y objetivo antropométrico y tablas por percentiles.

Resultados. El estado nutricional, según el MNA, se distribuye: estado nutricional satisfactorio en 7,7%, a riesgo de desnutrición en 71,2% y desnutrición en 21,2%. Por índice de masa corporal (IMC) en mujeres > 60 años y más; $25,3 \pm 6,8$, 42,3% de prevalencia asociada a problemas de desnutrición en la vejez. riesgo nutricional mediante el cuestionario "Mini Evaluación Nutricional (MNA). directo y objetivo antropométrico y tablas por percentiles.

Conclusiones. El estado nutricional no es alentador, ya que la tendencia es a la desnutrición a corto y mediano plazo si no se realiza una intervención nutricional oportuna. Los indicadores de prevalencia más útiles en el diagnóstico del estado nutricional fueron kg / m^2 de IMC, % CB y percentiles (P) para el peso actual kg, y MNA para riesgo nutricional.

Palabras clave

Estado nutricional; Mini Evaluación Nutricional; mujeres de 60 años o más; riesgo nutricional



Introduction

Older adults (AM) are the group of fastest growing population worldwide⁽¹⁾. The population over 60 years advances in a 2% worldwide each year⁽²⁾. It is expected that by 2050 one in 4 Mexico is more than 60 years⁽³⁾. AM are considered a group at risk for problems nutricionales⁽⁴⁾. Is currently little information on the characteristics of the environment in AM at home, your health profile and nutritional status, especially in care institutions AM (asylum). This highlights the need for data actualizados⁽⁵⁾. Is becoming a priority to identify factors that determine or help the aging process can be lived healthy and active way; the results will help direct future researchs⁽⁶⁾ essential to understanding health and nutrition AM⁽⁷⁾, and prevent further deterioration of the nutritional status from the moment of diagnosis and during your stay in a asylum^(8,9,10).

Anthropometric measurements are very useful for the assessment of nutritional status, because they are readily available and are inexpensive, especially when applied to people of AM youth, street and healthy, while its initially simple preparation is complicated in AM sick, fragile and bedridden. Anthropometric indicators represent a fundamental pillar in the nutritional assessment of individual^(9,11).

The intrinsic quality of anthropometric markers has been questioned by some researchers, and authors differ on their objectivity. For example, in France epidemiological studies using these markers, compared to studies in the United States where they are most widely they are very few used⁽¹¹⁾.

In the case of AM may have a lower value due to various circumstances. Including lower intra and inter observer reliability. Also the custom modifications in the physical structure of the subject, especially those related to changes in the size (alterations vertebrae, intervertebral discs and changes in posture) and body composition (water / fat), redistribution of subcutaneous fat and skin changes. Likewise, it should take into account, as individual variability and greater difficulties in collaboration, for example it can be difficult to weigh or carve AM. And finally, the difficulties in finding appropriate reference values. A point of interest is the need for reference tables obtained from local data (appropriate to our ethnic reality) as a normal pattern⁽⁹⁾.



International reports provide information related anthropometric AM groups, particularly in developed countries characteristics. One of the most comprehensive works in relation to nutrition and AM is the study Seneca Euronut that took place in six European cities. In US and the United Kingdom, studies with representative samples of AM give information related to anthropometric measurements and body composition. However, in Latin America there is scarce information on the nutritional status of groups of AM, a few anthropometric studies of AM in México^(12,13).

Among others, the tables by percentiles⁽¹⁵⁾ made in urban Mexican population aged 60 and older were published in the Journal of Nutrition, Health & Aging, 2004. The purpose of the study was to obtain the anthropometric measurements of Mexican men and women 60 years old and provided useful information on the anthropometric assessment of people over Mexico City and other urban areas of the country. It was a cross-sectional study shows the Mexican Social Security Institute (IMSS) and requesting identification cards of people over National Institute (INSEN) using standardized protocols record anthropometric measurements. The group examined included 1091 people, 484 men and women 607. The average age of the population was 66.1 years.

The collected data were divided into five age groups in years, each at an interval of five years. Inclusion criteria: age 60 or older and men, able to walk on their own, targeted and independent living (not belonging to a nursing) women. Exclusion criteria: people with serious chronic illnesses (heart, kidney or liver failure, diabetes II), major infectious diseases during the past two weeks, recent weight loss > 5 kg or more, people who had been hospitalized for more than a week in the past six months, people living in nursing homes. Examiners were previously standardized according to the method of Habicht, and specifications of Lohman⁽¹³⁾. At present little information on the national level in this population and demographic transition point to the need for updated data^(12,14). **The anthropometric indicators** can differentiate into two groups. Firstly, the weight and height, and tied them the body mass index (BMI), which is often used as a gold standard for diagnosing obesity or protein calorie malnutrition. Secondly all those half related folds, circumferences or measurements carried out in different parts of our anatomy.

Less than <24.0 kg / m² BMI is usually taken as a marker of malnutrition especially as a risk indicator (morbidity and mortality) in the AM, while may be associated with risk or cardiovascular disease (morbidity and mortality) with BMI values > 29.0 kg / m², especially when they reach or exceed 30 kg / m². By weight, more than the current based on percentiles, is its variation in time with respect to the usual weight (percentage loss), this is an important



marker of nutritional problem. Malnutrition indicate a loss (without voluntary diet) 10% in 6 months, 7% in 3 months, 5% within 1 month or 2% in a week. When there impossibility can be calculated indirectly by measuring the heel-knee distance by a formula^(7,15).

A restriction on the IMC as a nutritional parameter is the lack of qualitative information on serum levels of micronutrients or the degree of hydration of the individual aspects with an important diagnostic and prognostic significance in many clinical situations. Skinfold are a good index of body fat mass to the extent that 50% of the fat is in the subcutaneous space. The fold Most Used triceps skinfold^(7,15).

Arm circumference and arm muscle circumference are useful parameters for estimating muscle mass. The former is measured at the same point and triceps fold circumstances. The second was calculated from the above two measurements according to a formula: $PMB = CB - (PCT \times 0.314)$ ⁽⁹⁾.

Assessment of nutritional status in older adults with subjective method: Mini Nutritional Assessment (MNA). Proposed and developed Guigoz, Vellas et al Toulouse⁽¹¹⁾. It was included as a "global nutritional evaluation" in the Dietary Guidelines for AM^(11,14). Designed in France and validated in 1993 in Albuquerque, New Mexico, healthy to identify the risk of malnutrition in AM patients^(7,15). The purpose of this scale is to determine if there is a risk of malnutrition and allow early nutritional intervention and approach their causes, allowing the establishment of multidimensional interventions to correct risk factors, improve the nutritional and health status of the AM evaluated. Its use is particularly recommended in the case of AM frail, ill or disabled. This test can be performed in approximately 10 minutes and includes: anthropometric assessment, condition of the patient, dietary survey and a brief self-assessment questionnaire⁽¹¹⁾.

It is divided into two phases: the first phase of screening or screening and the second evaluation.

Phase 1 (screening or screening) is composed of 6 sections that measure: 1 dietary parameter, 2 and 3 anthropometric overall assessment. Measuring weight and height prior to the start of this phase, which can be completed in 3 to 4 minutes is suggested patient. Adding the individual results of each item a total result will be obtained. The value of 14 is the highest score possible in this phase. Those with MNA score greater than or equal to 12 have a satisfactory nutritional state, so it is not necessary to continue the test. Less than or equal to 11 likely result suggests malnutrition; in this case it is to be administered the assessment phase.



Phase 2 (evaluation) consists of 12 parameters: 2 anthropometric parameters, overall evaluation 3 5 2 dietary and subjective assessment. The maximum score is 16 points. Once they have to join the results of both phases (final test result)⁽¹¹⁾. In total consists of 18 questions, each question has several possible answers, each one associated to a particular numerical value. The total amount of points for each response enables global assessment of nutritional status of the AM. The maximum score is 30, which corresponds to an optimal nutritional status. A value of between 23.5 and 17 suggests a risk of malnutrition and a score below 17 indicative of nutritional status deficient⁽¹¹⁾.

The variables studied in the MNA are grouped into 4 sections; 1) parameters and anthropometric indicators: body mass index, arm circumference, calf circumference, weight, height, knee and heel height magnitude of weight loss over time. 2) General condition or overall assessment: issues relating to lifestyle, mobility and medication. 3) Dietary Survey: questions related to the number of meals that are made daily intake of foods like milk, cheese, yogurt, beans, eggs, meat, fish, fruits, vegetables, ingested liquids and food autonomy. 4) Subjective assessment (self-assessment): personal perception of the respondent on nutrition and health in <http://www.mna-eldery.com>.^(11, 28)

The Mini Nutritional Assessment (MNA) has been recently validated in 3 studies that include more than 600 individuals AM; from very fragile to other highly active living at home and also to AM in elderly long-term care, although some aspects of validation are still subject to scientific studies⁽¹¹⁾. No doubt that this instrument can become an important tool for the nutritional evaluation of AM, if integrated in comprehensive geriatric assessment programs, because their validity in research^(11,26,28). Were highly correlated with the clinical diagnosis and objective indicators of nutritional status as albumin. A low MNA can predict hospital stay and is used to track changes in nutritional status. In more than 10,000 AM, the prevalence of malnutrition MNA is determined by the 1% - 5% in people older outpatients and community-dwelling, in hospitalized elderly is 20% and 37% in institutionalized patients^(11,28). There are studies linking malnutrition assessed by the MNA with increased mortality, so say their systematic use would help reduce the number of deaths and health costs and improve the quality of life⁽⁷⁾.

In a study of the nutritional status relating the MNA and Subjective Global Assessment (SGA) to predict mortality in elderly patients in Stockholm Sweden, they concluded that less than half of the patients had a normal nutritional status according EGS and reduced by applying the MNA^(11,17,28).



In a study applied the MNA in geriatric long-term care hospital in an Italian population, they confirmed: the total MNA predictive value of 85.4%, specificity 25%, sensitivity of 98.1%^(11,27,18,28).

In a study of reliability of institutionalized people MNA in two geriatric units in Barcelona Spain, I conclude that the MNA has good levels of reliability, according to its internal consistency and reproducibility. But he warns that some improvements can still be made, refining the classification and content of some items with low reliability^(11,19,28).

International agencies classified as AM to people aged 60 and over age⁽¹⁾. Population aging population is the most important challenge we face in the new millennium⁽²⁾, is one of the phenomena with the greatest impact⁽³⁾ concomitantly, the welfare of the AM population is one of the main priorities of the OMS⁽²⁾. In purely demographic terms, the concept of demographic transition refers to the increase in people aged 60 and over, referring to changes in the population structure produced by the reduction in the birth rate, fertility and mortality, with a consequent increase life expectancy at birth⁽⁴⁻⁶⁾. The demographic transition indicates decline in the young population and increase adult and AM⁽²⁾. The demographic phenomenon of aging is an undeniable reality that has long predicted time^(7,8).

Today, in the world more than 600 million AM. By 2025, people over 60 years will be 12% of the planet's inhabitants. Of this total number of AM, 72% live in developing countries⁽⁴⁾. It is expected that life expectancy at birth in Latin America, increases of 64.1 years that were taken during 1985, to 71.8 years by 2025⁽⁴⁾. Figure already surpassed today⁽⁹⁾.

The demographic and epidemiological transition in which our country is immersed, has contributed to the life expectancy at birth of 34 years in the thirties, more than 75 years in 2000⁽²⁾ and has been well maintained until 2009⁽¹⁰⁾. In Mexico national life expectancy at birth in 1930, for female persons was 35 years for males and 33; in 2010 to 77.8 and 73.1 years, respectively⁽¹¹⁾. A fact of great importance in the demography of aging, is that women occupy the highest percentage in aging populations. In developed countries, women can have a life expectancy at birth up to seven years longer than men.

The aging index, defined as the number of people over 60 years old for every 100 under 15 was, in our country, 17 in 1997 and will be 50 in the year 2025⁽³⁾. This significant extension of survival, It has led to a gradual process of aging in the population, which will worsen in coming years. It is expected that by 2050 one in four Mexicans is more than 60 years^(1,2). In Mexico and the world group is the fastest growing segment over 85 years^(3,12). According to the action plan:



attention to aging, prepared by the Secretariat of Health, Mexico is in seventh place among the countries of accelerated aging with 8.9% of the population aged 60 and over^(1-7, 9,12)

In the census of 2010 found 112 336 538 000 Mexicans, including 10, 055 379 000 (8.9%) are over 60 years old⁽⁹⁾ is predicted that in 30 years in developing countries, the population of this age group is cuadruplicará.3 is estimated that this figure will approach 20 million by 2050. These numbers point to the need to study the aging process, and the characteristics of the AM in Mexico⁽¹³⁾.

According to the Conference on Aging of the United Nations, held in April 2002, the geriatric population was increasing alarmingly. Each month, one million individuals reach 60 years of age and 80% of them live in the nations in the process of development⁽³⁾. In our country, in every population and housing census conducted in Mexico by INEGI, this phenomenon is observed population^(9,10-12). In many places in our country, the AM are a marginal group in society⁽¹³⁾, many live alone and poor, and that, even in rich countries, the vast majority live those extra years, depending on someone and need health services long-term^(4,13). Usually most AM are functional and independent; however, dependent AM absorb a significant portion of health expenditures and often require long-term care, trained and experienced personnel. AM dependent high risk of institutionalization in nursing extended stay, due to the loss of physical, mental capacities, and decreasing their autonomy and adaptability⁽¹⁵⁾.

The growth of the age group over 60 years - especially the number of "older" inside that category-, carries a high prevalence of diseases crónicas.16 The physiological, physical, social and economic changes occurring in the aging process, predisposes to nutritional problems AM⁽³⁾. Extensive testing point to the importance of nutrition in the development, susceptibility and alleviation of these conditions^(16,17).

AM are considered a group at risk for nutritional problems⁽³⁾, and increasing this population represents a serious impact on the ability of health services, by the number of diseases and disabilities that are associated with aging⁽⁶⁾. While This is not a new finding, only recently beginning to understand the extent and magnitude of the problem⁽¹⁷⁾. Current models of health care, need to adapt to this demographic and epidemiological change⁽⁷⁾.

Numerous studies have highlighted the need for early diagnosis of malnutrition, especially in states of malnutrition AM⁽³⁾. Early identification of AM that have greater nutritional risk, carry out work on their nutritional status and may be possible to provide food aid adequate and immediate, to prevent further deterioration from the first arrival at a health facility or residential care (nursing) -A adult inadequate nutrition mayor^(16,17,18). Always impact negatively



on the health of the individual- ⁽⁴⁾ highlighting then that a good nutrition and certain lifestyle factors, such as proper diet and reasonable exercise, are vital to ensure that more AM to continue with a healthy, active and independent life within the family and the community^(16,18).

Research has shown that nutritional assessment should be an integral part of the clinical evaluation of AM with chronic diseases that require nutritional support to decrease the risk of morbidity and mortality secondary to malnutrition⁽¹⁹⁾. The assessment of nutritional status is a clinical concept supported by direct and indirect indicators⁽⁷⁾.

Currently, there are several direct methods and objectives to estimate the nutritional status in humans, including: clinical and anthropometric assessments, dietary, hematological, immunological techniques, metabolic⁽¹³⁾. Unfortunately about techniques not found any analytical parameter that individually it can be considered a marker or indicator (gold standard), which is sufficiently valid, sensitive and specific the nutritional status of the PM, especially in malnourished⁽²⁰⁾; There are problems for diagnosis, due to various physical and biochemical changes that are part of the normal aging process⁽³⁾. For the best marker of nutritional status in the AM, research is needed to be able to identify the most useful⁽¹⁾. Therefore, it is imperative to study this population holistically, anticipating and identifying their needs⁽⁷⁾.

Several international reports provide information related to the anthropometric characteristics of AM groups, particularly in developed countries. One of the most comprehensive works in relation to nutrition and AM is the study Seneca Euronut that took place in six European cities. In US and the United Kingdom, studies with representative samples of AM give information related to anthropometric measurements and body composition. However, in Latin America there is little published information on the nutritional status of groups AM. There are a few anthropometric studies of AM in Mexico⁽¹³⁾.

With the lacking information and especially a single analytical marker of nutritional status AM⁽²⁰⁾. In recent years there have been several proposals for geriatric assessment instruments as indirect indicators of nutritional status, which does not raise costs, and simple application especially some of them validated; pretending to be a good proposal for early detection of AM at risk of malnutrition⁽²¹⁾. Obviously using a validated instrument in ideal situations in the area of geriatric nutritional evaluation can provide a gold standard to follow, reduce bias, detect ambiguities and misunderstandings to a minimum to avoid any research in this field. Use a non-validated instrument to assess nutritional status, is simply a waste of time and money, providing unreal profile of health and nutrition AM^(14,22).



There are different questionnaires for nutritional assessment of AM⁽²⁾. Among others, one can mention the most widely used is the "Mini Nutritional Assessment (MNA)" which was included as "global nutritional evaluation" in the Dietary Guidelines for AM^(2,3). Designed in France by Guigoz, Vellas and colleagues provide a tool, valid, useful, fast, simple way to diagnose the nutritional status of patients in clinics, hospitals and nursing homes. The scale was validated in 1993 in Albuquerque, New Mexico, in healthy patients to identify the risk of malnutrition in the AM^(17,23). Together as a good proposal, the Mini Nutritional Assessment (MNA) and various anthropometric parameters, can be a tool to know the diagnosis of the nutritional status of AM, detect and treat early signs of malnutrition and design interventions to improve the nutritional status^(6,18). Therefore this study, we selected as subjective indirect indicator of nutritional status, the Mini Nutritional Assessment (MNA) Nestlé, 1994, Revision 2006. validated and internationally recognized tool that provides a comprehensive assessment the health of AM of over 60 years; It considers cognitive function, functional and dietary state of the patient, along with an indicator for taking nutritional measures^(17,23,28). Instrument allowed provides an inexpensive, practical, simple and fast method of identifying the AM at risk of malnutrition or malnutrition who already had or were in a satisfactory nutritional status (normal)^(18,28).

This research sought to answer the following mystery:

What is the nutritional status of women aged 60 and over a private asylum in Guadalajara, according to different diagnostic methods and risk indicators and nutritional assessment?

Aim

Determine the nutritional status of women aged 60 and older, living in a private asylum in Guadalajara according to different diagnostic methods and risk indicators and nutritional assessment; prevalence propose the most suitable for use in future research.

Material and Methods

Research design

Descriptive, transversal, retrospective in 60 women aged 60 and more residents of a private asylum in Guadalajara Jalisco with N = 63. For non-probability sampling, census, subject type.



Equipment

Lange caliper (metallic, opening 70 mm 1 mm accuracy..), Brand Rosscraft metal anthropometric tape with scale 0-150 cm, dry mechanical scale mark (load capacity of 220kg, division column: 50g, transport wheels, stadimeter includes: measuring range: 60 -200cm division: 1mm), to calibrate the scale tare and aluminum Anthropometer Lafayette mark 30 and 60 cm (LA-01290 model range to 60 cm and LA-01291, range 30 cm.

Measuring instrument

1 format for identification sheet, 2 formats for basic anthropometric data and five formats for nutritional assessment and diagnosis of women asylum AM 35 reagents: various formats for data collection were designed. The complete data record with 54 total reactive counted corresponding to direct and objective indicators of nutritional status and risk.

Indirect and subjective nutritional status and risk assessment was performed using the questionnaire "Mini Nutritional Assessment (MNA)" Nestlé, 1994, Revision 2006⁽¹⁾ The test specifically designed for fast, effective assessment of status and nutritional risk population integrated geriatric healthy living in the community, living in a geriatric institution or is admitted to a hospital, for use by a health professional^(2,3). The chosen test is divided into two phases: the first phase screening or screening and the second evaluation. For purposes of research group the 18 reagents in the 4 parameters that evaluates the MNA together with the aim to assess in full to women asylum AM without losing the sample to remove PM by screening.

Methods and techniques

Direct indicators of nutritional status and objectives. anthropometry, weight, Carving height heel-knee, calf circumference, mid-arm circumference, body mass index (Quetelet)^(5,6), Carving by knee height, weight by knee height^(7,8).

Indirect and subjective indicators of nutritional status. The Mini Nutritional Assessment (MNA) Nestlé, 1994, Revision 2006^(7,9). The instrument allowed provides an inexpensive, practical, simple and fast method of identifying the AM at risk of malnutrition or who already they had malnutrition⁽¹⁰⁾. For application, previously received training from COSAEN Jalisco Secretary of Health, based on the Guide to complete the form Mini Nutritional Assessment MNA [Online]. Available Nov. 24, 2011: http://www.mna-elderly.com/forms/mna_guide_spanish.pdf.



Selection criteria

Inclusion criteria	Exclusion Criteria	Elimination criteria
Women who are age 60 and older. ⁽¹¹⁾	Women who are under 60 years.	AM women who died during the study.
AM Women who wanted to enter the study voluntarily.	AM women who refused to collaborate with serious or severe hearing loss, dementia or severe cognitive impairment, with different neuropsychological disorders to senile dementia.	AM women were discharged for asylum exit before valuation tools are applied.
AM asylum women belonging to the Holy Trinity: freshmen or have seniority in their stay.	AM Alzheimer women in situation of coma, presenting deformations or column members that hindered obtaining anthropometric measurements, with amputations of lower or upper limbs, with severe behavioral disorder and confusional state.	AM women who refused to continue working.
AM women without severe cognitive impairment. If you have pathology that this is stable or controlled.		AM women in whom had difficulty in applying the questionnaire clinical instability.

Bioethical considerations

Although the study represented minimal risk for residents of asylum AM women, it was held in compliance with the guidelines and ethical principles of the Declaration of Helsinki of the World Medical Association and the Regulations of the General Health Law in research for health, that it considers the notification by the letter of informed consent, both the AM and their families. The information will be handled in strict confidence and the results were announced to the Mother Superior of asylum.

Statistical analysis

Concentration information was processed as follows: a database in Microsoft Excel 2007 for capture, statistical analysis of data was created. It is reported that weighs about the design of this research, the database used to present results was retrospective for 2012, since the data obtained and collected corresponding to 2004. This represented the conclusions reached in the work they are a Reflecting the reality of those days.

Results

The study population $n = 52$, mean age: 82.7 ± 7.9 (64-99), as to the anthropometric parameters, the results of the values are: Weight kg; 54.4 ± 13.3 (20.8-80.5) cm size; $147.6 \pm$



6.3 (128-161) cm arm circumference; 26.4 ± 5.4 (17.5-43), triceps skin fold mm; 15.1 ± 7.2 (2-30), arm muscle area cm²; 32 ± 15.2 (13-99) (Table 1).

Table 1. Anthropometric parameters in the studied sample.

Settings	Minimum - Maximum	average	standard deviation
weight	20.8-80.5	54.4	± 13.3
Size	128-161	147.6	± 6.3
Arm Circumference	17.5-43	26.4	± 5.4
Skin triceps fold	2-30	15.1	± 7.2
Muscular arma rea cm ²	13-99	32	± 15.2

Source; Direct-The study population n = 52, with a minimum age of 64 and maximum of 99 years, average age: 82.7 with a standard deviation of ± 7.9

Nutritional status, according to the MNA, is distributed in satisfactory nutritional status in 7.7% (4); at risk of malnutrition in 71.2% (37) and malnutrition in 21.2% (11) (Table 2).

Table 2. Nutritional status by MNA

nutritional status	frequency	%
satisfactory	4	7.7
Risk of malnutrition	37	71.2
malnutrition	11	21.2

Source; Direct-The study population n = 52, with a minimum age of 64 and maximum of 99 years, average age: 82.7 with a standard deviation of ± 7.9

By Body Mass Index (BMI) in women > 60 years and older; 25.3 ± 6.8 42.3% prevalence (22) associated with malnutrition problems in old age morbidity and mortality (Table 3).

Table 3. Body Mass Index (BMI) in women > 60 years and more

	IMC	DE	Prevalencia
Women > 60 and over	25.3	± 6.8	42.3%

Source; Direct-The study population n = 52, with a minimum age of 64 and maximum of 99 years, average age: 82.7 with a standard deviation of ± 7.9

In anthropometric measurements; % Of Total Muscle Mass; 32.4 ± 7.8 (23.9-59.9), % fat; 26 ± 8.9 (3.7-39.1), Arm Circumference%; 98.5 ± 25 (54.9-170.6) prevalence 46.2% (24) > 100% high energy reserves and static protein, triceps cutaneous fold%; 99.2 ± 60.8 (8.3-315.8) prevalence 46.2% (24) > 100% high excess fat deposits, % Arm Muscular Area; 117.4 ± 76.3 (33.6-449.8) prevalence 51.9% (27) > 100% high excess fat deposits (Table 4).



Table 4. Anthropometric measurements.

	Parámetro	DE	Prevalencia
Total Muscle Mass	32.4	± 7.8	-
% Fat	26	± 8.9	-
% Arm Circumference	98.5	± 25	42.2%>100%
% Skin triceps fold	99.2	± 60.8	46.2%>100%
% Muscular Arm area	117.4	± 76.3	51.9%>100%

Source; Direct-La población estudiada $n= 52$, con edad mínima de 64 y máxima de 99 años, una media de la edad: 82.7 y con una desviación estándar de ± 7.9

Regarding location Percentile (P) to: Present kg weight; Normal 32.7% prevalence, size cm: normal size prevalence 34.6%, BMI kg / m²; 28.8% average prevalence, arm circumference (CB) cm; prevalence of 32.7% nutritional risk, triceps cutaneous fold (PCT) Current mm; Malnutrition prevalence normal and 23.1-25%, AMB cm²; normal prevalence and risk of malnutrition 21.2% (Table 5).

Table 5. Location percentile, diagnosis and percentage.

settings	Location	percentage
Current weight in kg.	Normal prevalence	28.8%
Cm arm circumference	Prevalence of nutritional risk	32.7%
Skin triceps fold	Prevalence normal and malnutrition	23.1%
AMB cm²	Normal prevalence of malnutrition risk	21.2%

Source; Direct-The study population $n = 52$, with a minimum age of 64 and maximum of 99 years, average age: 82.7 with a standard deviation of ± 7.9

Discussion

Substantial evidence shows that aging is associated with changes in anthropometric characteristics and nutritional status. During the aging process, height and weight tend to decrease and there are significant changes in body composition⁽²⁾. Within results of anthropometric indicators and Size cm Weight kg, we highlight that the lowest values correspond to 11.5% of AM where Chumlea formula for weight and height for heel-knee height was used. These variations in the actual values, could interfere with the nutritional diagnosis of some women in asylum, placing them in any other classification. Although the AM receiving medical care and with the participation of an expert in nutrition, efforts to preserve their nutritional status can not fail and halt the deterioration in the quality of



life of the inmates institutionalized in the private asylum in Guadalajara. The MNA, allows the joint assessment of areas such as anthropometry, overall assessment, self-assessment diet and subjective. Identifies or reclassify AM at nutritional risk, which must be modified, and in some instances, to pass an additional assessment to include some other anthropometric parameters or biochemical that helps to confirm the diagnosis.

Ilana Feldblum and col.⁽¹⁾ In 2007 published a study in AM using the MNA to describe the characteristics of this population group with the circumstance which gives the instrument, found that of 259 adults over 18.5% malnourished and 81.5% were found at risk of malnutrition. In this regard we found in our study that MPs have a prevalence of 71.2% nutritional risk not for the 21.2% of the AM which is already undernourished.

Facing the diagnosis issued by the MNA for nutritional risk, prevalence of satisfactory nutritional status was higher by BMI kg / m² > 65, which may suggest that the MNA may have a greater sensitivity to detect nutritional risk especially in our asylee aging population. Although there is no clear agreement in the literature as to what is considered "normal" BMI range of the aging population, the US Committee the Council Diet and Nutrition Health and Food suggests that the range of 25-29 BMI could be considered the "Normal" to limit the elderly population⁽²⁾.

With regard to malnutrition, BMI kg / m² > 65, AM diagnosis with 42.3% who were in the nutritional status, compared to the 21.2% MNA. These values indicate that BMI kg / m² > 65, diagnosed faster AM malnutrition MNA.

Shamah-Levy T and col.⁽⁴⁾ AM They studied 5480 men and women > 60 years, and describe the health and nutrition of AM in Mexico. The results were part of a national probability survey. The results of this study show that older adults in Mexico have a health and inadequate nutrition, which is urgent to address in order to optimize their quality of life.

According to the level of malnutrition presented in the AM private asylum, the PCT%% WBA and CB had a similar prevalence, highlighting the severe deterioration degree to those found malnourished. In them, action is needed to compensate as far as possible the effects of this circumstance, because malnutrition is associated with high morbidity and mortality in the elderly as regards Pirlich et al. 2001⁽³⁸⁾. For those who are institutionalized malnutrition becomes 30% and up to 60% if a disease occurs and requires hospital care and the average age is 85 years⁽¹⁶⁾.

The energy reserve (fat) and protein in the AM, was found in a high prevalence in those anthropometric indicators that measured. Some of the trends observed in the elderly population is a reduction in fat-free mass and increased fat mass. In addition to a redistribution of body



fat⁽²⁾, pudios not see what so openly in the study. Studies have found that arm muscle area decreased with increasing age. This is consistent with studies of body composition showed significant changes with age. It was established that the lean body mass and decreases fat mass increases during the aging process⁽¹⁵⁾.

BMI is affected by the reduction in height. It is well known that height is one of the measures of the body is altered as a result of the change in the structure of the musculoskeletal system in relation to age. Changes in the height of 2.5 cm due to compression and changes in turgor and joint between vertebral discs. In addition, osteoporosis, vertebral compression fractures, expanding the pelvis, the exaggeration of the curvatures of the lower extremities, are some of the factors determining a low to high level compared with the stages of his youth. 2Kg on weight and height cm evaluated percentiles anthropometric tables, find our normal population prevalence AM as for BMI kg / m² (P25-75). The most interesting nutritional diagnosis by this method is that the vast majority of the variables within it (CB, WBA PCT), diagnosed a normal population prevalence of asylee. We emphasize then that if our population is compared with a Mexican population, we can get a true picture of their nutritional status, but to assert this regard would have to be checked by a comparative study with randomized and statistically aimed at checking this regard . We also suggest checking the classifieds for malnutrition and severity as mentioned studies that the older, the tendency is directly proportional to nutritional deterioration⁽²⁴⁻²⁷⁾.

However, placing the study variables in tables and figures that exemplified the diagnostic prevalence for each of the nutritional status by coursing our AM, we observed the following:

By using direct and indirect indicators to assess malnutrition, we observed that the highest prevalence of diagnosis was% 44.2% CB AM, followed by BMI kg / m²> 65 years 42.3%. The nutritional risk, 71.2% MNA AM in satisfactory nutritional status, 61.5% PCT P25-75 AM, followed by the actual weight in kg for the same percentiles with the same percentage. For overweight the actual weight Kg CB and P90 with 5.8% for AM equally diagnosed. The diagnosis of obesity, BMI kg / m²> 65 years 26.9% AM.

By looking at these distributions in the prevalence of the nutritional status of the AM seekers, highlights the nutritional deterioration (malnutrition) and risk compared to T study Shamah-Levy and col.⁽⁴⁾ which they say that women suffer from overweight and obesity with higher prevalence⁽²⁴⁻²⁶⁾. According to the age distribution, higher prevalence was detected in the age range over 80 years, with 71.2% of AM, referring to the population at large proportion



asylee he found aging. The AM of over 90 years of age spend most of the time lying down or sitting, physical activity is substantially decreased which determines total dependence on third parties in these care facilities (nursing homes)^(27,28,29). In the study "Assessment of the nutritional status of the elderly and its correlates of 360 elderly persons, 15% were found to be malnourished and 55% were at risk of malnutrition. The association between nutritional status and older age group, female gender, dependent functional status, dependent financial status and inadequate calorie intake was found to be significant"⁽³⁰⁾ This could be due to the socio-economic and nutritional conditions, or to the sample size, which in our case is much smaller, but the n = 52 corresponds to the total of older adults in the asylum, also denoting inadequate caloric intake in our study and A limitation of the study is that It is reported that weighs about the design of this research, the database used to present results was retrospective for 2012, since the data obtained and collected corresponding to 2004. This represented the conclusions reached in the work they are a Reflecting the reality of those days, therefore, the previously mentioned work is recognized⁽³⁰⁾.

Conclusions

According to the survey results, the overall picture of women > 60 years and more, especially in the age group 80 years and residents of private asylum, is not encouraging, as the trend is towards malnutrition in the short and medium term, if a timely nutritional intervention is not performed, the prevalence is 71.2% at risk of malnutrition MNA. The most useful indicators for prevalence in the diagnosis of nutritional status were BMI kg / m², % CB and Percentile (P) for the current weight kg, and MNA for nutritional risk.

Not paying attention to the nutritional status of older adults based on these indicators is still today the possibility of continuing with non-positive results in their health, it is important to pay attention to the conditions in which they live in the asylum to avoid negative results .

Acknowledgements

The authors of the present research article would like to acknowledge and truly thank the collaboration of *Yesenia Elizabeth Ruvalcaba Cobián* who has a B.A in Teaching English as



a Foreign Language, for her contributions on the revision and translation of the article; situation which allows the possibility to increase the transferring and modification of scientific knowledge.

Conflict of interests

The authors declare that there is no conflict of interests for the publication of this research paper.

Referencias

1. Bernal MF, Vizmanos B, Celis de la Rosa JA. La nutrición del anciano como un problema de salud pública. *Antropo*. 2008; (16): 43-55.
2. Shamah-Levy T, Cuevas-Nasu L, Mundo-Rosas V, Morales-Ruán C, Cervantes-Turrubiates L, Villalpando-Hernández S. Estado de salud y nutrición de los adultos mayores en México: resultados de una encuesta probabilística nacional. *Salud Pública Mex*. 2008; 50:383-389.
3. Araujo Mendoza GJ, Ávila Jiménez L, y Jerónimo Benítez V. Escala para identificar desnutrición energético-proteica del adulto mayor hospitalizado. *Rev Med IMSS*. 2004; 42 (5): 387-394.)
4. Secretaria de salud. Manual del envejecimiento /programa nacional de salud (2001-2006). Programa de atención al envejecimiento. México DF.
5. Shamah-Levy T, Cuevas-Nasu L, Mundo-Rosas V, Morales-Ruán C, Cervantes-Turrubiates L, Villalpando-Hernández S. Estado de salud y nutrición de los adultos mayores en México: resultados de una encuesta probabilística nacional. *Salud Pública Mex*. 2008; 50:383-389.
6. Ricart J, Pinyol M, Elvirab B, Devant M, Benavides A. Desnutrición en pacientes en atención domiciliaria. *Aten Primaria*. 2004; 34(5):238-43
7. Ortiz-Hernández L, Valle-Arcos RI, y Nieto-Ramírez A. Evaluación antropométrica de los ancianos de tres asilos de la ciudad de México. *Nutrición Clínica* 2002; 5 (1): 7-14.
8. Gómez Ramos MJ, González Valverde FM y Sánchez Álvarez C. Estudio del estado nutricional en la población anciana hospitalizada. *Nutr Hosp* 2005, 20:286-292.



9. A Guide to Completing the Mini Nutritional Assessment. Nestle clinical nutrition. [Online], p. 2. Available Noviembre 22, 2011: http://www.mna-elderly.com/practice/user_guide/mna_guide.pdf
10. Velázquez MDC, Rodríguez SG, Hernández ML. Desnutrición en las personas de edad avanzada. *Nutrición Clínica*. 2003; 6 (1):70-79.
11. Velázquez-Alva MC, Irigoyen ME, Zepeda M, Sánchez VM, García MP, Castillo LM. Anthropometric measurements of a sixty-year and older mexican urban group. *J. Nutr. Health Aging*. 2004 Nov 5; 8:350-4
12. Bernal MF, Vizmanos B, Celis de la Rosa JA. La nutrición del anciano como un problema de salud pública. *Antropo*. 2008; (16): 43-55.
13. Shamah-Levy T, Cuevas-Nasu L, Mundo-Rosas V, Morales-Ruán C, Cervantes-Turrubiates L, Villalpando-Hernández S. Estado de salud y nutrición de los adultos mayores en México: resultados de una encuesta probabilística nacional. *Salud Pública Mex*. 2008; 50:383-389.
14. López y cols. Validación de la Escala de Bienestar Subjetivo en cuidadores familiares de adultos mayores. *Psicología y Salud*. 2010; 20 (1): 13-22.
15. Velázquez MDC, Rodríguez SG, Hernández ML. Desnutrición en las personas de edad avanzada. *Nutrición Clínica*. 2003; 6 (1):70-79.
16. Esteban M, Tena MC, Serrano P, Romero R, Martín C, Martínez A. Valoración del estado nutricional en una consulta de geriatría: aportaciones preliminares. *Rev Esp Geriatr Gerontol*. 2004; 39(1):25-8.
17. Ricart J, Pinyol M, Elvirab B, Devant M, Benavides A. Desnutrición en pacientes en atención domiciliaria. *Aten Primaria*. 2004; 34(5):238-43
18. Calderón ME, Ibarra F, García J, Gómez C, Rodríguez AR. Evaluación nutricional comparada del adulto mayor en consultas de medicina familiar. *Nutr Hosp*. 2010; 25(4):669-675.
19. Vallejo JM, Rodríguez M, Valverde MDM. Valoración enfermera geriátrica. Un modelo de registro en residencias de ancianos. *GEROKOMOS* 2007; 18 (2): 72-76
20. Alemán H, Pérez FA. Los indicadores del estado de nutrición y el proceso de envejecimiento. *Nutrición Clínica*. 2003; 6 (1):46-52.
21. Secretaria de salud. Manual del envejecimiento /programa nacional de salud (2001-2006). Programa de atención al envejecimiento. México DF.



-
22. Papalia D. Desarrollo humano (4a ed). Santafé de Bogotá, Colombia: Ed Mc Graw Hill. 1992: 564-570.
 23. Kathleen-Mahan L, y Escote-Stump S. Nutrición y dietoterapia de, Krause (10^a ed.). México: Ed. Mc Graw Hill. 2001:313-330
 24. Sandoval L, Varela L. Evaluación del estado nutricional de pacientes adultos mayores ambulatorios. Rev Med Hered. 1998; 9 (3): 104-108.
 25. Gómez Ramos MJ, González Valverde FM y Sánchez Álvarez C. Estudio del estado nutricional en la población anciana hospitalizada. Nutr Hosp. 2005; 20:286-292.
 26. Shamah-Levy T, Cuevas-Nasu L, Mundo-Rosas V, Morales-Ruán C, Cervantes-Turrubiates L, Villalpando-Hernández S. Estado de salud y nutrición de los adultos mayores en México: resultados de una encuesta probabilística nacional. Salud Pública Mex. 2008; 50:383-389.
 27. INEGI. Esperanza de vida al nacer por género. Indicadores Sociodemográficos de México. (1930-2010). (2010)
 28. Vellas B.) AS Part of the Geriatric Assessment. In: Mini Nutritional P. J. Garry, Y. Guigoz (eds). The Mini Nutritional Assessment (MNA Assessment (MNA): Research and practice in elderly (pp. 7). Nestlé Clinical and Performance Nutrition Workshop Series, Vol. 1. Philadelphia: Lippincott-Raven.)
 29. Vellas B, Villars H, Abellan G, Soto M.E, Rolland Y., Guigoz Y, Morley J.E, Chumlea W, Salva A, Rubenstein L.Z, Garry P. Overview Of The Mna – Its History And Challenges The Journal of Nutrition, Health & Aging. 2006; 10 (6): 456-465
 30. Rashmi Agarwalla, Anku Moni Saikia, and Rupali Baruah. Assessment of the nutritional status of the elderly and its correlates. J. Family Community Med. 2015 Jan-Apr; 22(1): 39–43 doi: 10.4103/2230-8229.149588