



## HEALTH CONDITIONS AND ELDERLY LIFESTYLE: METHODS AND STUDY DEVELOPMENT

CONDICIONES DE SALUD Y ESTILO DE VIDA DE LAS PERSONAS MAYORES: MÉTODOS Y DESARROLLO DEL ESTUDIO

CONDIÇÕES DE SAÚDE E ESTILO DE VIDA DE IDOSOS: MÉTODOS E DESENVOLVIMENTO DO ESTUDO

Cezar Augusto Casotti <sup>1</sup>  
Claudio Bispo de Almeida <sup>2</sup>  
Lucas dos Santos <sup>3</sup>  
Paulo da Fonseca Valença Neto <sup>4</sup>  
Thaís Barros do Carmo <sup>5</sup>

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### Abstract

The present manuscript aims to describe the method used in the planning and data collection of the population-based research, "Health conditions and lifestyle of elderly residents in Aiquara-BA". This is an epidemiological study, a dynamic cohort type, conducted with elderly people living in the urban area of Aiquara-BA, a small population municipality. Data from the baseline study were collected in the year 2013. Through visits

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<sup>1</sup> Doctor in Preventive and Social Dentistry from Universidade Estadual Paulista Júlio de Mesquita Filho. Professor at the Postgraduate Program in Nursing and Health at the State University of Southwest Bahia. Member of the Research Group on Epidemiology and Health.

ORCID: <http://orcid.org/0000-0001-6636-8009>

E-mail: [cacasotti@uesb.edu.br](mailto:cacasotti@uesb.edu.br)

<sup>2</sup> Doctor of Health Sciences at the Graduate Program in Nursing and Health Southwest Bahia State University. Professor at the Postgraduate Program in Teaching, Language and Society at the University of the State of Bahia. Member of the International Center for Studies in Human Rights, Education, Culture and Health.

ORCID: <http://orcid.org/0000-0001-9486-7163>

E-mail: [cbalmeida@uneb.br](mailto:cbalmeida@uneb.br)

<sup>3</sup> Doctoral Student in Health Sciences at the Postgraduate Program in Nursing and Health at the State University of Southwest Bahia. Member of the Center for Studies in the Epidemiology of Aging.

ORCID: <https://orcid.org/0000-0002-8195-8856>

E-mail: [lsantos.ed.f@gmail.com](mailto:lsantos.ed.f@gmail.com)

<sup>4</sup> Doctoral student in Public Health at the Federal University of Bahia. He works in the General Coordination of Non-Communicable Diseases and Conditions of the Department of Health Analysis and Surveillance of Non-Communicable Diseases, Secretariat of Health Surveillance, Ministry of Health.

ORCID: <https://orcid.org/0000-0001-9777-5774>

E-mail: [paulo.neto@saude.gov.br](mailto:paulo.neto@saude.gov.br)

<sup>5</sup> Master in Health Sciences from the Postgraduate Program in Nursing and Health at the State University of Southwest Bahia. Professor at the Technical Center for Professional Education.

ORCID: <https://orcid.org/0000-0002-5063-8067>

E-mail: [thais\\_barros12@hotmail.com](mailto:thais_barros12@hotmail.com)



to all households in the urban area, residents aged 60 years or older were identified. The data were obtained in three stages. In the first, through face-to-face interviews conducted at home, standardized interviewers obtained biosociodemographic information, access to health services, self-reported health conditions, and Validated instruments to measure quality of life (WHOQOL-BREF and OLD), physical activity level (IPAQ), functionality (Katz and Lawton scales) and tracking mental disorder (GDS-15 and SRQ-20). In the second stage, after scheduling, blood pressure, anthropometric measurements and motor performance tests were performed. In the third, biochemists collected, stored and processed blood samples, in a clinical analysis laboratory. The data obtained were entered in duplicate, and after the corrections were analyzed in different statistical programs. The results allowed to know the impact of unfavorable lifestyle on the health condition of elderly people living in Aiquara, Bahia, Brazil.

**Keywords:** Epidemiologic Studies; Methodology; Population Dynamics; Health of the Elderly; Life Style.

### Resumen

El presente manuscrito tiene como objetivo describir el método utilizado en la planificación y recopilación de datos de la encuesta basada en la población, "Condiciones de salud y estilo de vida de las personas mayores que viven en Aiquara-BA". Se trata de un estudio epidemiológico, tipo cohorte dinámico, realizado con personas mayores que viven en el área urbana de Aiquara-BA, un municipio de pequeña población. Los datos del estudio de línea de base se recopilaban en el año 2013. A través de visitas a todos los hogares del área urbana, se identificaron residentes de 60 años o más. Los datos se obtuvieron en tres etapas. En el primero, a través de entrevistas presenciales realizadas en el domicilio, los entrevistadores estandarizados obtuvieron información biosociodemográfica, acceso a servicios de salud, condiciones de salud autoinformadas e instrumentos validados para medir la calidad de vida (WHOQOL-BREF y OLD), actividad física nivel (IPAQ), funcionalidad (escalas de Katz y Lawton) y seguimiento del trastorno mental (GDS-15 y SRQ-20). En la segunda etapa, luego de la programación, se realizaron pruebas de presión arterial, medidas antropométricas y de desempeño motor. En el tercero, los bioquímicos recolectaron, almacenaron y procesaron muestras de sangre, en un laboratorio de análisis clínicos. Los datos obtenidos se ingresaron por duplicado, y luego de las correcciones se analizaron en diferentes programas estadísticos. Los resultados permitieron conocer el impacto del estilo de vida desfavorable en el estado de salud de las personas mayores que viven en Aiquara, Bahía, Brasil.

**Palabras claves:** Estudios Epidemiológicos; Metodología; Dinámica Poblacional; Salud del Anciano; Estilo de Vida.

### Resumo

O presente manuscrito objetiva descrever o método empregado no planejamento e coleta de dados da pesquisa de base populacional, "Condições de saúde e estilo de vida de idosos residentes em Aiquara-BA". Trata-se de um estudo epidemiológico, tipo coorte dinâmica, realizado com idosos residentes na zona urbana de Aiquara-BA, município de pequeno porte populacional. Os dados do estudo linha de base foram coletados no ano de 2013. Por meio de visita a todos os domicílios da zona urbana foram identificados os residentes com 60 anos ou mais. Os dados foram obtidos em três etapas. Na primeira, por meio de entrevistas face a face realizada no domicílio, entrevistadores padronizados obtiveram as informações biosociodemográficas, de acesso aos serviços de saúde, condições de saúde auto referidas, e Instrumentos validados para mensurar qualidade de vida (WHOQOL- BREF e OLD), nível de atividade física (IPAQ), funcionalidade (Escalas de Katz e Lawton) e rastrear transtorno mental (GDS-15 e SRQ-20). Na



segunda etapa, após agendamento, foram mensuradas pressão arterial, medidas antropométricas e realizados os testes de desempenho motor. Na terceira, bioquímicos coletaram, armazenaram e processaram amostras sanguíneas, em um laboratório de análises clínicas. Os dados obtidos foram digitados em duplicata, e após as correções analisados em diferentes programas estatísticos. Os resultados permitiram conhecer o impacto do estilo de vida desfavorável na condição de saúde de idosos residentes em Aiquara, Bahia, Brasil.

**Palavras-chave:** Estudos Epidemiológicos; Metodologia; Dinâmica Populacional; Saúde do Idoso; Estilo de Vida.

## INTRODUCTION

The research project “Health conditions and lifestyle of the elderly population” arose at the end of 2011, when the candidate for a place in the selection process of the Graduate Program in Nursing and Health at the State University of Southwest Bahia, presented the pre-project of a cross-sectional epidemiological study to assess the impact of the level of physical activity on the mental health of the elderly person. At the time, I agreed with the possible orientation and the only suggestion was that the study could be conducted in a small population size municipality.

The candidate was approved and, during 2012, he elaborated the research project, and new variables and validated instruments for data collection were added under guidance, so as to enable other works by the other members of the Study and Research Group in Epidemiology of the State University of Southwest Bahia to be developed using the data from the study. Upon completion of the research project, it was submitted to the Ethics Committee for Research with Human Beings of the State University of Southwest Bahia, approved through opinion nº 1.575.825/2016 and CAAE nº 56017816.2.0000.0055.

The choice of the municipality of Aiquara - BA was intentional and considered the population size (<5,000 inhabitants), proximity to the headquarters of the program (40km), adherence of municipal management to the study proposal, presence of low social and economic indicators (HDI: 0.583, 47% Poverty incidence). The receptivity, welcoming and partnership established with the municipal management was crucial for the selection of the municipality.



After obtaining approval from the Ethics Committee for Research with Human Beings, a meeting was scheduled with the municipal mayor and the Municipal Secretary of Health of the municipality of Aiquara-BA, in order to present the project and establish the necessary partnerships for its accomplishment.

Subsequently, the research group began to devote itself to planning the data collection. Since it is a small population size municipality, the option was to develop a population-based study. Nevertheless, when analyzing the size of the territory and the low population density of the rural area, we found that it would be financially unfeasible to assess all the elderly citizens living in the municipality. Accordingly, we decided to cut down and include in the study only the elderly citizens living in the urban perimeter.

In the urban perimeter of the municipality, there is a Family Health Team (FHT), to which all residents in the urban area of the municipality are assigned. The list of elderly people registered at the FHT was searched; however, the data did not reflect the reality, since there were three micro-areas that had been without the presence of Community Health Workers for more than a year. In view of this, we decided to conduct a home visit to all the households in the urban area of the municipality to identify the residents aged 60 or older who slept at least four times a week in the household in which they were identified in the urban area of the municipality.

Meanwhile, the research group planned and accomplished theoretical and practical workshops to standardize the interviewers (graduate students and Scientific Initiation scholarship holders) and procedures that would be adopted in data collection. Due to the characteristics and specificities of the variables that would be analyzed, it was necessary to carry out the collection in three stages.

In the first stage, during home visits, the elderly individuals were informed about the purpose of the study, and then invited to participate; those who agreed signed the Free and Informed Consent Form. Then, by means of a face-to-face interview held at the homes of these elderly people, they answered the script from a semi-structured questionnaire. In the second step, anthropometric measurements were measured, motor performance tests were performed, and blood pressure was measured. Finally, in the third stage, blood samples were collected.



Thus, the present study aims to describe the method used in planning and collecting data from the population-based survey, “Health conditions and lifestyle of elderly people living in Aiquara-BA”.

## METHOD

This section describes the methods and procedures adopted by the researchers during the three stages of data collection. All researchers involved in data collection were health professionals or undergraduate students, scientific initiation holders in undergraduate courses in the health area.

Due to the characteristics of the variables, we found it convenient to divide data collection into three stages. In the first, home interviews took place; in the second, anthropometric measurements were taken and motor performance tests were performed; and in the last, blood samples were collected. The procedures, materials and research instruments used in the three stages of data collection are described below.

### 1) Interview

It was carried out at the home where the elderly person said he/she slept for at least four nights during the week. Upon entering the home, the elderly person was asked to identify the place in the home where he/she felt most comfortable to answer the interview. We tried to guarantee the interviewee's privacy, and other people living at home were not allowed to help in the answers. The data collection instrument, the interview script, was divided into the following sections:

#### - Cognitive assessment

It was assessed by the Mini Mental State Examination, which was developed by Folstein, Folstein and Mchugh (1975) and validated in Brazil by Almeida (1998). This instrument allows the identification of possible cognitive deficits in elderly



individuals (Almeida, 1998). The cutoff point  $\leq 13$  was adopted to define the elderly citizens with cognitive deficit, considering the influence of the level of education (CARMO, 2020). The identified elderly individuals who were classified as having cognitive deficits were excluded from this study.

#### - Interview

Due to the size and specificities of the various instruments that make it up, the interview script was divided into sections. In the first section, in order to obtain biosociodemographic data, we used questions adapted from the “Elderly Health Assessment Tool”, validated by Pedreira et al. (2016). This instrument was chosen because it has acceptable psychometric qualities to be used in a population of elderly people with low education. We selected questions that allowed us to obtain the biosociodemographic characteristics of the elderly citizens.

Through this script, biosociodemographic and economic information was obtained; the use of and access to health services; self-reported diseases; medication consumption; functionality (Katz and Lawton scales); level of physical activity (IPAQ); quality of life (WHOQOL: BREF and OLD); lifestyle; diet, medications used; sleep characteristics; depression; and anxiety.

The sociodemographic and economic characteristics surveyed were: age in years, where elderly individuals were categorized into age groups (60 to 69, 70 to 79 and 80 years or more); sex (male and female); marital status (with and without a partner); family arrangement (lives alone, lives together); education level (educated and uneducated); author-referred race/color (white and non-white); monthly income; characteristics of the house; perception of general health condition and presence of self-reported diseases (diabetes, high cholesterol, hypertension, heart disease, pulmonary embolism, stroke, cancer, arthritis/arthrosis, Parkinson’s disease, Alzheimer’s disease, kidney disease, parasitological diseases, myocardial infarction, malaria, thyroid disease, cataract, urinary incontinence, history of falling). These questions were adapted from the questionnaire “Health, Well-Being and Ageing in Latin America and the Caribbean Project – SABE” (LEBRÃO et al., 2003).



The use and access to health services was assessed by means of the questionnaire used in a study conducted by Pedreira et al. (2016). The information obtained was related to access to health services (public or private) and difficulties faced when accessing or using such services.

In the part referring to medications, we used the seven-day recall prior to the interview, as contained in the instrument proposed by Pedreira et al. (2016). In order to know the classes of medications consumed, the elderly patient was asked to present to the interviewer the medications consumed in the last seven days prior to the interview. The name of the medication consumed was noted. In this study, polypharmacy was considered to be the consumption of five or more medications in the last seven days (SECOLI, 2010).

The sleep characteristics were obtained by dichotomized answers almost in their entirety by yes/no, except for the last answer referring to daytime napping that had the answer options: “absent or less than 90 minutes” and “greater than or equal to 90 minutes”.

The Self-Reporting Questionnaire (SRQ-20) was used to screen for non-psychotic mental disorders. This instrument was proposed by Harding et. al in 1980, after receiving encouragement from the World Health Organization (WHO, 1975), having been validated for use in Brazil. Originally, it consists of 30 questions, but the Brazilian version has 20 questions (GONÇALVES et al., 2008). The cutoff point to indicate the suspicion of the presence of a non-psychotic mental disorder was the same used in the study by Carmo (2020). Thus, seven or more positive answers serve to identify suspicion for Common Mental Disorder (ROCHA et. al, 2010).

The Basic Activity of Daily Living (BADL) scales proposed by Sidney Katz et al. (1963), with cross-cultural adaptation for Brazil (LINO et al., 2008), and the Instrumental Activities of Daily Living Scale (IADL), developed by Lawton and Brody (1969) and adapted for the Brazilian context (SANTOS; VIRTUOSO JÚNIOR, 2008), were used to assess the functionality of elderly patients. The classification for the two scales was given as: independent in all six functions in the BADL and seven in the IADL; or dependent on one to seven functions.



Quality of life was measured using WHOQOL-ABREVIADO (BREF) (Fleck; Chachamovich; Trentini, 2003); and the WHOQOL-OLD (Fleck; Chachamovich; Trentini, 2006), both validated for the Brazilian population. The WHOQOL-BREF is composed of 26 questions, distributed in four domains: physical; psychological; social relationships; and environment (FLECK; CHACHAMOVICH; TRENTINI, 2003). In turn, the WHOQOL-OLD aims to assess the quality of life with more specificity for the elderly population, and consists of 24 questions, arranged in six domains: sense functioning, autonomy, past, present and future activities, social participation, death and dying, and intimacy (FLECK; CHACHAMOVICH; TRENTINI, 2006).

GDS-15 Geriatric Depression Scale. It was used to screen for cases of depressive symptomatology among elderly patients, and was composed of 15 questions (ALMEIDA; ALMEIDA, 1999).

In order to assess lifestyle (alcohol and tobacco consumption), a question from the AUDIT (Alcohol Use Disorders Identification Test) (SANTOS et al., 2012) was used, respectively, “has used alcohol in the last 30 days” and one of the Alcohol, Smoking and Substance Involving Screening Test (ASSIST) (HENRIQUE et al., 2004) “has smoked in the last 30 days”. For both tobacco and alcohol consumption, the questions above presented as answer options “yes” or “no”.

The International Physical Activity Questionnaire (IPAQ) was used to assess the level of habitual physical activity. This instrument was developed by an international group in Geneva in the year 1998 (CRAIG et al., 2003). In this study, we used the version adapted for elderly individuals, which assesses the level of physical activity of the elderly subject at home and outside it, which are characterized as moderate and vigorous (BENEDETTI et al., 2007; BENEDETTI; MAZO; BARROS, 2004). We considered physically active the elderly patients who performed physical activities with moderate to vigorous intensity in a sum  $\geq 150$  minutes/week and inactive those who did not meet this classification (Bull et al., 2020).



## 2) Physical assessment

### - Hemodynamic measurements

The measurement of systolic and diastolic blood pressure and resting heart rate were performed using semi-automatic devices (HEM 742 Omron®). Both variables were measured twice with a time interval of five minutes (ISSA et al., 2021). The measurements were performed after the elderly individuals remained at rest for at least 10 minutes.

### - Anthropometric measurements

**Body mass:** this was measured using a Plenna® brand digital scale with a maximum load capacity of 180 kg, positioned in a regular (horizontal) and firm location. Before the measurements, the device was calibrated using an object of known mass. In order to perform the measurement, the elderly person remained static in an erect position, wearing light clothing and barefoot, with arms extended to the side of the body (FRISANCHO, 1984).

**Height:** this was measured using a portable stadiometer (WiSO®), with the elderly person standing, with bare feet together, in addition to the heels, buttocks and shoulder girdle in contact with the wall, and the gaze fixed on the Frankfurt plane (FRISANCHO, 1984).

**Skinfold thickness (ST):** these were measured using an adipometer (Lange, Santa Cruz, California®), with 1 mm precision, duly calibrated. The perimeters (P) were measured using an anthropometric tape (2 m), inelastic and flexible with a precision of 1 mm (Sanny®), complying with the following recommendations of the International Society for Advancement in Kinanthropometry (LOPES; DOS SANTOS RIBEIRO, 2013):

**Bicipital ST:** vertically, on the anterior face of the right arm (relaxed), at a midpoint between the lateral border of the acromion and the radial head.



Tricipital ST: vertically, on the posterior face of the right arm (relaxed), at a midpoint between the lateral border of the acromion and the radial head.

Subescapular ST: obliquely (45° angle) two centimeters below the inferior angle of the right scapula.

Iliac ST: three centimeters above the right iliac crest, aligned with the axillary line axis, horizontally.

Abdominal ST: vertically, five centimeters to the right of the umbilical scar.

Anterior thigh ST: at a midpoint between the inguinal fold and the upper border of the patella, longitudinally, in the direct lower limb.

Medial calf ST: longitudinally, at the point of greatest protuberance of the right medial calf, with the knee flexed at 90°.

Neck P: at the point of greatest volume of the neck, immediately above the laryngeal prominence.

Arm P: at a midpoint between the lateral border of the acromion and the head of the radius, on the right upper limb (relaxed).

Waist P: at the point of smallest volume between the lower margin of the tenth rib and the upper border of the iliac crest, at the end of a normal expiration.

Abdominal P: at the point of greatest volume of the abdominal region, at the end of a normal expiration.

Hip P: in the right hemisphere, with the point of greatest protuberance of the gluteal musculature as reference.

Calf P: at the point of greatest protuberance of the triceps surae of the right lower limb (with the knee extended).

- Functional performance

Handgrip strength was measured by means of a hydraulic dynamometer (SH5002; Saehan Corporation, 973, Yangdeok-Dong, MasanHoewon-Gu, Changwon 630-728, South Korea), in the limb in which the participant indicated having more strength (dominant). The elderly subjects were positioned comfortably seated, with the shoulder adducted, elbow flexed at 90°, and forearm in a



neutral position. The dynamometer was adjusted according to the size of the elderly hand, so that the first and second joints of the fingers were in flexion. During the test, the surveyed subjects were encouraged to press the dynamometer handle as hard as possible for five seconds (FIGUEIREDO et al., 2007). The test was performed twice, with an interval of one minute.

Senior Fitness Test Battery. In this battery, the following tests are performed: standing and sitting from a chair; elbow flexion; standing, walking and sitting; sitting and reaching feet; reaching behind the back; and stationary walking (RIKLI; JONES, 1999).

Standing up and sitting down from a chair: it is performed on a chair with a backrest (without arms), with a seat height of approximately 43 cm. The execution consisted of the act of standing up and sitting down as many times as possible within 30 seconds of execution.

Elbow flexion: it is performed with the elderly individual seated on a chair supported by the wall. The test consisted of flexing the dominant forearm in a period of 30 seconds as many times as possible, holding a dumbbell (2.0 kg for women and 4.0 kg for men), starting from a full extension of the elbow, with the wrist in neutral position, until complete flexion (wrist in supination).

Standing up, walking and sitting (2.44 m): in order to perform the test, a chair with backrest (without arms) at a height of approximately 43 cm, a stopwatch, a measuring tape and a cone were used. Upon the assessor's command, the participant got up from the chair (with permission to give a push on the thighs or on the chair), walked as fast as possible for 1.22 m, went around a cone, returned to the chair and sat down. The time to perform the test was saved in seconds.

Sitting down and reaching the feet: it is performed on an armless chair with a backrest at a height of approximately 43 cm to the seat. To this end, the participant started with the leg extended, spine erect, head aligned to the spine, and hand over hand. Accordingly, gradually, the participant tried to touch the tip of his/her feet, without flexing the knee. After the elderly individual reached their maximum points, the



distance was measured with a ruler. The distance (cm) observed before reaching the fingertips was recorded negatively (-) and the one reached beyond, positively (+).

Reach behind the back: it is conducted with the subject standing up, who was instructed to place the dominant hand over the shoulder toward the middle of the back, with palm down and fingers extended. Subsequently, the hand of the other arm is placed under and behind, palm facing up, trying to reach as far as possible in an attempt to touch (or overlap) the middle fingers of both hands. The overlap distance, or the distance between the middle fingers was measured in centimeters. Negative results (-) represent the shortest distance between the middle fingers, while positive results (+) are characterized by overlapping middle fingers.

Stationary walking: The maximum number of knee elevations the elderly individuals were able to perform in two minutes (without running) was counted. The minimum knee height appropriate in the stride was leveled at a midpoint between the patella and the anterior superior iliac spine.

Before each of the tests of the Senior Fitness Test battery, the assessor demonstrated how they should be performed. The assessed individuals performed the tests once, previously, in order to become familiar with the movement patterns. The final performance (which was recorded) was done twice, with a two-minute interval.

### 3) Biochemical markers

We obtained the venous blood samples for laboratory analysis, under guidance of a 12h night fast before the collection, which is considered an ideal time for the reduction of interferences in biochemical dosages. The blood collection took place in a room provided by the Municipal Secretariat of Health in Aiquara, adequately cleaned and air-conditioned, and was performed by nursing technicians, clinical analysis technicians and biochemists according to biosafety standards (SBP/ML, 2010), wearing personal protective equipment (PPE), such as impermeable white lab coats, caps, goggles and gloves.



The elderly individuals were comfortably positioned, seated, with the arm in a horizontal position at a 90° angle for venipuncture, where we prioritized the middle cubital vein in the cubital fossa, with a tourniquet for less than 1.5 minutes, preceded by asepsis of the site with 70% alcohol in a circular motion and from the center in a centrifugal direction (LORENZI, 2003). In to reduce losses in the number of elderly people, those who had difficulties in moving around had the collection carried out in their own homes, respecting the biosafety standards, in order to guarantee the integrity of everyone involved.

A typical vacuum tube collection system was used, made of plastics, polyethylene, transparent, colorless, sterile, dimensions 13 x 75 mm, aspiration volume from 3 to 10 ml, with a siliconized rubber stopper with a protective plastic cap, containing product identification data in Portuguese, manufacture date, type of sterilization, expiration date and registration with the Brazilian Ministry of Health, which varied in color according to the type of additive present intended for each analysis. Two tubes were collected from each elderly patient, being one tube with a gray rubber stopper, with fluoride and EDTA K3 for glycemic tests and a dry tube with a red rubber stopper, in order to obtain serum for the other biochemical and hormonal tests. The tubes containing the samples collected from each elderly patient were properly packed in refrigerated thermal boxes with reusable ice at a temperature of +2°C to +8°C without direct contact with the ice and sent to the responsible Laboratory for processing and analysis.

The following biochemical determinations were performed: fasting blood glucose, total cholesterol and fractions (High Density Lipoproteins - HDL-c; Low Density Lipoprotein - LDL-c and Very Low Density Lipoproteins - VLDL-c) and triglycerides, through SELLECTRA II® automated technology 36, using the enzymatic colorimetric method, with HDL-c differing only in the method, as direct precipitation was used and LDL-c was defined based on the Friedewald equation. In addition, the following hormonal determinations were performed: Thyrostimulating Hormone (TSH), free thyroxine (T4L) and vitamin D (25-hydroxy), through the chemiluminescence method, using the ARCHTECT® equipment. As for biochemical (except for blood glucose) and hormonal determinations, samples collected in a dry tube were centrifuged to obtain serum.



After the accomplishment of the analysis, all participants received a copy of the test results, and those with altered parameters received recommendations to seek the reference health service. During data collection and during the delivery of test results, the elderly individuals identified with some health problem were referred to the FHT of their neighborhoods.

The results of these three stages were typed in duplicate, compiled, and organized in the database of the research project entitled "Health Conditions and Lifestyle of Elderly People Living in a Small-Sized City". These data, after corrections, were analyzed in different statistical programs. Thus, by describing the method employed in the planning and data collection of this population-based research, we became able to know the impact of unfavorable lifestyle on the health condition of elderly citizens living in Aiquara, Bahia, Brazil.

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