Multivariate Analysis Of The Factors Thatinfluence On Patients To Suffer From Chronic Diseases In The San Sebastian Clinical Laboratory

[1] Johanna Enith Aguilar, [2] Nancy Elizabeth Chariguaman Maurisaca, [3] Edwin Fernando Mejia Peñafiel, [4] Marlene Jacqueline Garcia Veloz

[1] Escuela Superior Politécnica de Chimborazo, Facultad de Ciencias, Estadística, Riobamba, Ecuador.
[2] Escuela Superior Politécnica de Chimborazo, Facultad de Ciencias, Estadística, Riobamba, Ecuador.
[3] Escuela Superior Politécnica de Chimborazo, Facultad de Ciencias, Estadística, Riobamba, Ecuador.
[4] Escuela Superior Politécnica de Chimborazo, Facultad de Ciencias, Estadística, Riobamba, Ecuador.
DOI: 10.47750/pnr.2023.14.S02.189

Abstract

The study aims to analyze the factors that influence to suffer chronic diseases in the patients of the clinical laboratory San Sebastian, in the period 2019; the information matrix consists of several 108 registered patients, with 11 statistical mud tables, each one with certain modalities that explain the characteristics of these patients, as well as the diseases they have and the effects that influenced to suffer these diseases. This information is developed through an exploratory data analysis and a multiple correspondence analysis, a multivariate statistical technique that allows representing in a reduced two-dimensional space the existing relationship between the categories of the variables under study. The results obtained from the registered patients lead to conclude that the majority of people suffering from chronic diseases are male 60.2% (65), the vast majority are married and have an independent job, with great frequency, these patients suffer from diseases such as gastritis, asthma, epilepsy and HIV AIDS, on the other hand, the female sex with 39.8% (43) of patients most of these people do not have a steady job and usually perform household chores, these patients suffer from hypertension, polycystic ovary and obesity. It should be emphasized that the male sex is the one that performs more physical activity and these diseases are developed frequently, concluding that physical activity does not influence to a great extent but the consumption of the bad habits detailed above. Therefore, it is recommended to inform health facilities to collect information on patients suffering from chronic diseases, considering a broader and more productive analysis, to inject this information to society to reduce the number of patients suffering from these diseases by using multivariate techniques provided by statistics.

Keywords: chronic diseases, multiple correspondence analysis, conceptual map, multivariate analysis, statistical muddling.

Resumen

El presente trabajo de investigación tiene como objetivo estudiar los factores que influyen a sufrir enfermedades crónicas en los pacientes del laboratorio clínico San Sebastian, en el periodo 2019, la matriz de información consta de una numerosidad de 108 pacientes registrados, con 11 mudables estadísticas cada una con ciertas modalidades que explican las características de estos pacientes, así como también de las enfermedades que poseen y los efectos que influyeron a padecer estas enfermedades. Esta información es desarrollada mediante un análisis exploratorio de datos y un análisis de correspondencias múltiples, siendo esta una técnica estadística multivariante que permite representar en un espacio bidimensional reducido, la

relación existente entre las categorías de las mudables en estudio. Los resultados obtenidos de los pacientes registrados, nos lleva a concluir que la mayoría de personas que padecen enfermedades crónicas son de sexo masculino con el 60.2% (65), la gran mayoría son casados y tienen un trabajo independiente, con gran frecuencia estos pacientes sufren de enfermedades como la gastritis, el asma, la epilepsia y el VIH SIDA, por otro lado el sexo femenino con un 39.8% (43) de pacientes la mayoría de estas personas no tienen un empleo fijo y suelen realizar quehaceres domésticos, estos pacientes sufren de hipertensión arterial, ovario poliquístico y de obesidad. Cabe recalcar que el sexo masculino es el que realiza mayor actividad física y estas enfermedades son desarrolladas con frecuencia, llegando a concluir que la actividad física no influye en gran medida sino el consumo de los malos hábitos detallados con anterioridad. Se recomienda informar a los establecimientos de salud que se recopile la información de los pacientes que sufren enfermedades crónicas, considerando un análisis más amplio y productivo, con la finalidad de inyectar esta información a la sociedad para reducir el número de pacientes a sufrir estas enfermedades haciendo uso de las técnicas multivariadas proporcionadas por la estadística.

Palabras clave: Enfermedades crónicas, análisis de correspondencia múltiple, mapa conceptual, análisis multivariante, mudable estadísticas.

1. INTRODUCTION

When the disease arrives, health is valued. The present research aims to analyze the characteristics that lead to suffering chronic diseases in patients of the San Sebastian clinical laboratory; chronic diseases can be chronic communicable diseases (CTCD) and chronic non-communicable diseases (NCD), each with specific characteristics and different symptoms, it is essential to know the factors that influence to suffer these diseases considering them as an aggressive problem in health, but this is not considered subjectively as a disease by most people, thus hindering the prevention of these diseases as the main cause is to cause death in people, these diseases often occurs when there is a sedentary lifestyle, lack of exercise, poor diet, overweight, obesity, alcohol consumption and smoking (Ruiz and Sáez [undated], p. 12).

Studies have shown that chronic diseases do not distinguish between age, sex or social class and frequently affect humanity. In 2005, 35 million people died from these diseases, most of them from infectious diseases such as HIV infection, AIDS, malaria and tuberculosis; chronic diseases have an impact on social and economic vulnerability and are considered to be the cause of the increasing mortality rate. NCDs are the most relevant problem for the countries; within this, it is shown that both nationally and regionally, the diseases that stand out to a large extent are cardiovascular diseases, diabetes and respiratory diseases.(Martinez and Diaz 2010, p. 8).

At present, the 2020 pandemic had marked a before and after, since before chronic diseases were taken lightly because certain patients with these diseases, their symptoms were very scarce and only when the disease reached its limit they sought the advice of a health professional, but after this pandemic patients who had chronic diseases complicated their clinical picture since these are one of the causes for the outcome to death.

The coronavirus (COVID-19) is the cause of many diseases that affect people; in this crucial time, most people have ingested vitamins so that our immune systems can resist this virus. However, those most affected were people with low immune systems and those suffering from chronic diseases because they could not resist the aggressiveness of this virus. Therefore, the state of emergency has become a double-edged sword since confinement has greatly increased stress and anxiety, and these diseases are more prevalent in people suffering from chronic diseases.

Chronic stress is one of the most influential problems that increase the level of intensity of chronic diseases of patients, considering it is a physical response that travels throughout the body when the body releases hormones when having some overwhelming situation, affecting the respiratory and cardiac system, so it is

important to treat this disease with the same intensity with which it affects, Knowing that it not only affects by itself, but it greatly affects any disease that is occurring in the body, if it acts to a large extent can affect the heart and thus suffer heart attacks or strokes, affects the immune system making it more susceptible to disease, can also cause overweight, brain pain, hair loss, acne, affects memory and concentration.

Anxiety is considered a chronic disorder more frequent in people, having as symptoms excessive fears and overwhelming worries that are present day after day; it is important to study it and try to prevent it because it affects 15% of the population, knowing it as a response of our body, which prevents a threat or a risk. When this is frequent, it is important to treat it because it affects insomnia, general discomfort, and eating disorders, regardless of age; for this you should seek help from a specialist because various techniques can treat it, it also greatly affects the chronic diseases exposed in the body such as obesity.

Nowadays, people live in a very hurried pace where time is our greatest enemy, they look for the easiest way to serve food, most of them processed and canned, without knowing the harmful effects on the organism, such as being overweight regardless of age or gender, being this a chronic disease difficult to carry, especially for the elderly, because they lack mobility compared to people with a minimum age.

Lifestyles make these diseases evolve to a great extent; in this way, they intend to inform each of these diseases, as well as the statistical techniques that will be used for the statistical management of the information provided, deepening statistical concepts, starting with an exploratory analysis of data and consequent to it a Multivariate Analysis (MA), specifically the Multiple Correspondence Analysis (MCA) which is responsible for the study of 7 statistical variables among them they have: Marital Status, Gender, Occupation, Final Diagnosis, Toxic Habits and Physical Activity each with different modalities that will provide results that will be taken to prevent these diseases.

This research work is considered qualitative since these are statistical variables that will be used for the process of multiple correspondence analysis; according to the objective of the study, it is applied since the research is focused on the solution of a health problem, according to the level of depth in the object of study it will be explanatory since it seeks to determine the factors involved in the development of chronic diseases, according to the manipulation of variables it is non-experimental, since the information matrix of patients suffering from chronic diseases comes from a secondary source, according to the type of inference it is inductive since it seeks to know the influential factors through concentrated information of the patients of the San Gabriel clinical laboratory who have chronic diseases, according to the time it is transversal since there has not been a follow-up for the collection of the information (Hernández Sampieri et al., 2014; Patten and Newhart 2018).

II. MATERIALS AND METHODS

METHODOLOGY

The research aims to announce the factors that influence suffering chronic diseases, as well as the statistical techniques that will be used for the statistical management of the information provided, deepening statistical concepts, starting with an exploratory analysis of data, independence analysis and consequently a Multivariate Analysis (MA), specifically the Multiple Correspondence Analysis (MCA) that was in charge of the study of 11 statistical variables among them are: Marital Status, Sex, Patient Occupation, Patient Diagnosis, Tobacco Consumption, Alcoholic Beverage Consumption, Processed Food Consumption, Drug Consumption, Junk Food Consumption, Hereditary Diseases and Physical Activity each with different categories that provided appropriate information for the study.

Type and Design of Research

According to the research method, it is considered qualitative since these are statistical variables that will be used for the process of multiple correspondence analysis, according to the objective of the study it is

applied since the research is focused on the solution of a health problem, according to the level of depth in the object of study it will be explanatory since it seeks to determine the factors that are involved in the development of chronic diseases, according to the manipulation of variables it is non-experimental, since the information matrix of patients suffering from chronic diseases comes from a secondary source, according to the type of inference it is inductive since it seeks to know the influential factors through concentrated information of the patients of the San Sebastian clinical laboratory who have chronic diseases, according to the time period it is transversal, since there has not been a follow-up for the collection of the information (Hernández Sampieri et al. 2014; Patten and Newhart 2018).

Study population

The study consisted of patients registered in the San Gabriel clinical laboratory in 2019 who suffer from chronic diseases.

Data collection technique

Through the history of registered patients that were provided by the San Gabriel clinical laboratory, who suffer from chronic diseases.

Statistical analysis

A multivariate descriptive analysis of each of the variables and a multiple correspondence analysis were applied to meet the research objective.

Operationalization of Variables

Table 1-2: Operationalization of Variables

Variable Name	Description	Type of Variable	Measuring scale	Category
CIVIL STATUS	Stores the legal status held by an individual.	Qualitative	Nominal	MARRIED DIVORCED SINGLE WIDOWED
SEX	Stores the biological characteristic that differentiate people from each other.	Qualitative dichotomous	Nominal - dichotomous	FEMALE MALE
PATIENT'S OCCUPATION	Stores work or labor performed by the patient	Statistical changeable	Nominal	UNEMPLOYED PUBLIC EMPLOYEE INDEPENDENT HOUSEHOLD CHORES
PATIENT DIAGNOSIS	Stores chronic illnesses detected in patients	Statistical changeable	Nominal	RHEUMATOID ARTHRITIS ASMA CANCER EPILEPSY

				GASTRITIS (HELICOBACTER PYLORI) ARTERIAL HYPERTENSION OBESITY CHRONIC RHINITIS POLYCYSTIC OVARY SYNDROME HIV AIDS
TOBACCO USE	Stores the frequency at which the patient uses tobacco.	Statistical changeable	Ordinal	NEVER ON OCCASION FREQUENTLY ALWAYS
CONSUMPTION OF ALCOHOLIC BEVERAGES	Stores the frequency at which the patient consumes alcoholic beverages	Statistical changeable	Ordinal	NEVER ON OCCASION FREQUENTLY ALWAYS
CONSUMPTION OF PROCESSED FOODS	Stores the frequency at which the patient consumes processed foods	Statistical changeable	Ordinal	NEVER ON OCCASION FREQUENTLY ALWAYS
DRUG USE	Stores the frequency in which the patient consumes drugs.	Statistical changeable	Ordinal	NEVER ON OCCASION FREQUENTLY ALWAYS
CONSUMPTION OF JUNK FOOD	Stores the frequency in which the patient consumes junk food.	Statistical changeable	Ordinal	NEVER ON OCCASION FREQUENTLY ALWAYS
INHERITED DISEASES	Stores whether diagnosed diseases have developed by inheritance	Statistical changeable	Nominal-dichotomous	NO YES
PHYSICAL ACTIVITY	Determines whether patients engage in any physical activity.	Statistical changeable	Nominal-dichotomous	NO YES

Source: San Sebastian" Clinical Laboratory

Performed by: Aguilar Johanna, Chariguaman Nancy, Mejia Fernando 202 2

III. RESULTS

The information provided by the Clinical Laboratory "San Sebastian" was considered, particularly of the patients who were diagnosed as suffering from chronic diseases; the data matrix has a number of the collective of 108 patients whose information was recorded in 11 statistical variables.

Exploratory Data Analysis

Mudable Statistics: Marital Status

Table 1-3: Statistical distribution of frequencies of the variable Marital Status

CIVIL STATUS	Frequency	Percentage
MARRIED	83	76,9
DIVORCED	9	8,3
SINGLE	10	9,3
WIDOWED	6	5,6
Total	**108**	**100,0**

Source: San Sebastian" Clinical Laboratory
Performed by: Aguilar, Johanna, Chariguaman, Nancy, Mejia, Fernando 2022

Most of the patients examined were married with 76.9% (83), 9.3% (10) were single, 8.3% (9) were divorced and 5.6% (6) were widowed.

Mudable Statistics: Gender

Table 2-3: Statistical distribution of frequencies of the variable sex

SEX	Frequency	Percentage
FEMALE	43	39,8
MALE	65	60,2
Total	**108**	**100,0**

Source: San Sebastian" Clinical Laboratory

Performed by: Aguilar, Johanna, Chariguaman, Nancy, Mejia, Fernando 2022

The most predominant sex in the patients examined was male with 60.2% (65) and female with 39.8% (43).

Mudable Statistics: Patient Occupancy

Table 1-3: Statistical distribution of frequencies of the variable Patient's Occupation

PATIENT'S OCCUPATION	Frequency	Percentage
UNEMPLOYED	15	13,9
PUBLIC EMPLOYEE	15	13,9
INDEPENDENT	63	58,3
HOUSEHOLD CHORES	15	13,9

Total	**108**	**100,0**

Source: San Sebastian" Clinical Laboratory
Performed by: Aguilar, Johanna, Chariguaman, Nancy, Mejia, Fernando 2022

58.3% (63) of the patients examined have an independent occupation, 13.9% (15) have a public job, the same number of patients are unemployed and perform household chores.

Mudable Statistics: Patient Diagnosis

Table 2-3: Statistical distribution of frequencies of the variable Patient's Diagnosis

PATIENT DIAGNOSIS	Frequency	Percentage
RHEUMATOID ARTHRITIS	3	2,8
ASMA	2	1,9
CANCER	7	6,5
EPILEPSY	2	1,9
GASTRITIS (HELICOBACTER PYLORI)	33	30,6
ARTERIAL HYPERTENSION	22	20,4
OBESITY	10	9,3
CHRONIC RHINITIS	10	9,3
POLYCYSTIC OVARY SYNDROME	17	15,7
HIV AIDS	2	1,9
Total	**108**	**100,0**

Source: San Sebastian" Clinical Laboratory
Performed by: Aguilar, Johanna, Chariguaman, Nancy, Mejia, Fernando 2022

The chronic diseases that occur with the greatest impact on the patients examined are Gastritis (Helicobacter pylori) with 30.6% (33), followed by arterial hypertension with 20.4% (22), polycystic ovary syndrome with 15.7% (17), 9.3% (10) suffer from obesity, 9.3% (10) from chronic rhinitis and the remaining 15% (16) are from patients suffering from rheumatoid arthritis, asthma, cancer, epilepsy and HIV AIDS.

Mudable Statistics: Tobacco Consumption

Table 3-3: Statistical distribution of frequencies of the variable Tobacco Use

TOBACCO USE	Frequency	Percentage
FREQUENTLY	33	30,6
ON OCCASION	13	12,0
NEVER	1	0,9
ALWAYS	61	56,5
Total	**108**	**100,0**

Source: San Sebastian" Clinical Laboratory

Performed by: Aguilar, Johanna, Chariguaman, Nancy, Mejia, Fernando 2022

Of the patients examined, 56.5% (61) always use tobacco, 30.6% (33) use it frequently, 12% (13) use it occasionally and only 0.9% (1) never use it.

Mudable Statistics: Consumption of Alcoholic Beverages

Table 4-3: Statistical frequency distribution of the variable Consumption of Alcoholic Beverages

CONSUMPTION OF ALCOHOLIC BEVERAGES	Frequency	Percentage
FREQUENTLY	29	26,9
ON OCCASION	33	30,6
NEVER	8	7,4
ALWAYS	38	35,2
Total	**108**	**100,0**

Source: San Sebastian" Clinical Laboratory
Performed by: Aguilar, Johanna, Chariguaman, Nancy, Mejia, Fernando 2022

There is a maximum percentage of 35.2% (38) of the patients examined who always consume alcoholic beverages, followed by 30.6% (33) who consume occasionally, 26.9% (29) consume frequently and 7.4% (8) never consume these beverages.

Mudable Statistics: Processed Food Consumption

Table 5-3: Statistical distribution of frequencies of the variable Consumption of Processed Foods

CONSUMPTION OF PROCESSED FOODS	Frequency	Percentage
FREQUENTLY	30	27,8
ON OCCASION	30	27,8
NEVER	2	1,9
ALWAYS	46	42,6
Total	**108**	**100,0**

Source: "San Sebastian" Clinical Laboratory
Performed by: Aguilar, Johanna, Chariguaman, Nancy, Mejia, Fernando 2022

Of the patients examined, 42.6% (46) always consumed processed foods, 27.8% (30) consumed frequently, the same amount consumed occasionally and only 1.9% (2) never consumed these foods.

Mudable Statistics: Drug Use

Table 6-3: Statistical distribution of frequency of the variable Drug Use

DRUG USE	Frequency	Percentage
FREQUENTLY	2	1,9
ON OCCASIONS	54	50,0
NEVER	16	14,8
ALWAYS	36	33,3

Total	**108**	**100,0**

Source: Clinical Laboratory "San Sebastian" **Performed by**: Aguilar, Johanna, Chariguaman, Nancy, Mejia, Fernando 2022

Half of the patients examined sometimes use drugs, 33.3% (36) always use drugs, 14.8% (16) do not use drugs and only 1.9% (2) use drugs frequently.

Mudable Statistics: Junk Food Consumption

Table 7-3: Statistical distribution of the variable Junk Food Consumption

CONSUMPTION OF JUNK FOOD	Frequency	Percentage
FREQUENTLY	17	15,7
ON OCCASION	37	34,3
NEVER	1	0,9
ALWAYS	53	49,1
Total	**108**	**100,0**

Source: "San Sebastian" Clinical Laboratory
Performed by: Aguilar, Johanna, Chariguaman, Nancy, Mejia, Fernando 2022

There are 49.1% (53) of patients examined who always consume junk food, 34.3% (37) consume sometimes, 15.7% frequently and 0.9% (1) never consume junk food.

Mudable Statistics: Inherited Diseases

Table 8-3: Statistical distribution of frequencies of the variable Inherited Diseases

INHERITED DISEASES	Frequency	Percentage
NO	46	42,6
YES	62	57,4
Total	**108**	**100,0**

Source: "San Sebastian" Clinical Laboratory
Performed by: Aguilar, Johanna, Chariguaman, Nancy, Mejia, Fernando 2022

57.4% (62) of the examined patients have chronic diseases due to inheritance from past generations, the remaining 42.6% (46) do not suffer from chronic diseases due to inheritance.

Mudable Statistics: Physical Activity

Table 9-3: Statistical distribution of frequencies of the variable Physical Activity

PHYSICAL ACTIVITY	Frequency	Percentage
NO	78	72,2
YES	30	27,8
Total	**108**	**100,0**

Source: "San Sebastian" Clinical Laboratory
Performed by: Aguilar, Johanna, Chariguaman, Nancy, Mejia, Fernando 2022

There are 72.2% (78) of patients who do not engage in physical activity and only 27.8% (30) do exercise their body.

Exploratory Conjoint Analysis of Toxic Habits

Table 10-3: Statistical distribution of joint frequencies

	TOBACCO CONSUMPTION	ALCOHOL CONSUMPTION	CONSUMPTION OF PROCESSED FOODS	DRUG CONSUMPTION	JUNK FOOD CONSUMPTION
FREQUENTLY	33	29	30	2	17
ON OCCASION	13	33	30	54	37
NEVER	1	8	2	16	1
ALWAYS	61	38	46	36	53

Source: San Sebastian" Clinical Laboratory
Performed by: Aguilar, Johanna, Chariguaman, Nancy, Mejia, Fernando 2022

There is a higher frequency of 61 patients who always use tobacco, 38 of them always use alcohol, 46 always use processed foods, 36 use drugs and 53 use junk food, with high frequencies concerning the others in the always mode; that is to say that most patients always use some toxic habit.

Statistical Analysis Of Habits As A Function Of Patient Diagnosis

MUTABLE: TOBACCO USE-ALWAYS AND PATIENT DIAGNOSIS

Table 11-3: Statistical distribution of frequencies of the variable Tobacco Consumption -Always

TOBACCO USE-ALWAYS		
PATIENT DIAGNOSIS	**Frequency**	**Percentage**
RHEUMATOID ARTHRITIS	0	0,0
ASMA	2	3,3
CANCER	6	9,8
EPILEPSY	1	1,6
GASTRITIS (HELICOBACTER PYLORI)	15	24,6
ARTERIAL HYPERTENSION	20	32,8
OBESITY	4	6,6
CHRONIC RHINITIS	4	6,6
POLYCYSTIC OVARY SYNDROME	9	14,8
HIV AIDS	0	0,0
Total	**61**	

Source: San Sebastian" Clinical Laboratory
Performed by: Aguilar, Johanna, Chariguaman, Nancy, Mejia, Fernando 2022

It was shown that the disease that predominates most when a patient always uses tobacco is arterial hypertension with 32.8% and gastritis with 24.6%, and the diseases that are not a consequence of this habit are HIV AIDS and rheumatoid arthritis.

CHANGEABLE: CONSUMPTION OF ALCOHOLIC BEVERAGES -ALWAYS AND PATIENT'S DIAGNOSIS

Table 12-3: Statistical distribution of frequencies of the variable Consumption of Alcoholic Beverages - Always

CONSUMPTION OF ALCOHOLIC BEVERAGES-ALWAYS		
PATIENT DIAGNOSIS	**Frequency**	**Percentage**
RHEUMATOID ARTHRITIS	1	2,6
ASMA	0	0,0
CANCER	1	2,6
EPILEPSY	0	0,0
GASTRITIS (HELICOBACTER PYLORI)	13	34,2
ARTERIAL HYPERTENSION	17	44,7
OBESITY	1	2,6
CHRONIC RHINITIS	1	2,6
POLYCYSTIC OVARY SYNDROME	4	10,5
HIV AIDS	0	0,0
Total	**38**	

Source: Clinical Laboratory "San Sebastian**" Performed by**: Aguilar, Johanna, Chariguaman, Nancy, Mejia, Fernando 2022

It was evidenced that the most frequent chronic disease due to active consumption of alcoholic beverages are: arterial hypertension affecting 44.7% of the patients and gastritis with 34.2%, the diseases that do not occur in patients who consume this habit are asthma, epilepsy and VH AIDS.

MUTABLE: CONSUMPTION OF PROCESSED FOODS -ALWAYS AND PATIENT DIAGNOSIS

Table 13-3: Statistical distribution of frequencies of the variable Processed Food Consumption -Always

CONSUMPTION OF PROCESSED FOODS-ALWAYS		
PATIENT DIAGNOSIS	**Frequency**	**Percentage**
RHEUMATOID ARTHRITIS	1	2,2

ASMA	1	2,2
CANCER	5	10,9
EPILEPSY	1	2,2
GASTRITIS (HELICOBACTER PYLORI)	18	39,1
ARTERIAL HYPERTENSION	6	13,0
OBESITY	6	13,0
CHRONIC RHINITIS	3	6,5
POLYCYSTIC OVARY SYNDROME	3	6,5
HIV AIDS	2	4,3
Total	**46**	

Source: Clinical Laboratory "San Sebastian**" Performed by**: Aguilar, Johanna, Chariguaman, Nancy, Mejia, Fernando 2022

It was found that the most frequent chronic disease in patients due to the active consumption of processed foods were: gastritis (39.1%), arterial hypertension (13%) and obesity (13%).

MUTABLE: DRUG USE -ALWAYS AND PATIENT'S DIAGNOSIS

Table 14-3: Statistical distribution of frequencies of the variable Drug Consumption -Always

DRUG USE-ALWAYS		
PATIENT DIAGNOSIS	**Frequency**	**Percentage**
RHEUMATOID ARTHRITIS	1	2,8
ASMA	2	5,6
CANCER	4	11,1
EPILEPSY	2	5,6
GASTRITIS (HELICOBACTER PYLORI)	13	36,1
ARTERIAL HYPERTENSION	8	22,2
OBESITY	1	2,8
CHRONIC RHINITIS	1	2,8
POLYCYSTIC OVARY SYNDROME	4	11,1
HIV AIDS	0	0,0
Total	**36**	

Source: Clinical Laboratory "San Sebastian**" Performed by**: Aguilar, Johanna, Chariguaman, Nancy, Mejia, Fernando 2022

It was found that the most frequent chronic disease that occurs most frequently in patients due to drug use are: gastritis (helicobacter pylori) with 36.1% and arterial hypertension with 22.2%, HIV AIDS is not a disease caused by drug use.

MUTABLE: CONSUMPTION OF JUNK FOOD -ALWAYS AND PATIENT'S DIAGNOSIS

Table 15-3: Statistical distribution of frequencies of the variable Junk Food Consumption -Always

JUNK FOOD CONSUMPTION-ALWAYS		
PATIENT DIAGNOSIS	**Frequency**	**Percentage**
RHEUMATOID ARTHRITIS	0	0,0
ASMA	0	0,0
CANCER	2	3,8
EPILEPSY	1	1,9
GASTRITIS (HELICOBACTER PYLORI)	16	30,2
ARTERIAL HYPERTENSION	14	26,4
OBESITY	9	17,0
CHRONIC RHINITIS	4	7,5
POLYCYSTIC OVARY SYNDROME	7	13,2
HIV AIDS	0	0,0
Total	**53**	

Source: Clinical Laboratory "San Sebastian**" Performed by**: Aguilar, Johanna, Chariguaman, Nancy, Mejia, Fernando 2022

It was evidenced that the chronic disease that occurs most frequently in patients due to the consumption of junk food are: gastritis with 30.2%, arterial hypertension with 26.4% and obesity with 17%, the diseases that have not developed due to the consumption of this habit in patients are: HIV AIDS, asthma and rheumatoid arthritis.

Multivariate Analysis

A previous independence analysis is applied to develop the multiple correspondence analysis in order to know if two variables are independent of each other. For this purpose, the chi-square hypothesis test detailed below is developed

Independence Test χ^2

1) **Hypothesis statement**
   H_0: Las mudables estadísticas A_i y A_j
   son independientes

H_1: Las mudables estadísticas A_i y A_j son independientes

2) **Significance level**

$\alpha = 0.05$

3) **Test statistic**

$$\chi^2 = n\sum_{k=1}^{k}\lambda_k^2$$

Donde:

$\lambda_k^2 =$ Valores singulares al cuadrado

Table 16-3: p-value for Chi-Square Test

	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11
A1		0,248	0,595	0,626	0,781	0,533	**0,042**	**0,002**	0,842	0,981	0,248
A2	0,248		**0**	**0**	0,448	0,571	0,466	0,502	0,106	0,143	**0**
	0,595	**0**		**0**	0,325	0,706	0,05	0,176	0,911	**0,014**	**0,019**
A4	0,626	**0**	**0**		0,186	**0,003**	0,526	**0,002**	0,334	**0**	**0,01**
A5	0,781	0,448	0,325	0,186		**0,003**	**0,03**	0,51	**0,035**	0,405	0,413
A6	0,533	0,571	0,706	**0,003**	**0,003**		**0,005**	**0,006**	**0,015**	**0,011**	0,95
A7	**0,042**	0,466	0,05	0,526	**0,03**	**0,005**		**0,026**	**0,002**	0,17	0,4
A8	**0,002**	0,502	0,176	**0,002**	0,51	**0,006**	**0,026**		**0,008**	0,343	0,82
A9	0,842	0,106	0,911	0,334	**0,035**	**0,015**	**0,002**	**0,008**		0,248	0,445
A10	0,981	0,143	**0,014**	**0**	0,405	**0,011**	0,17	0,343	0,248		0,101
A11	0,248	**0**	**0,019**	**0,01**	0,413	0,95	0,4	0,82	0,445	0,101	

Source: San Sebastian" Clinical Laboratory

Performed by: Aguilar, Johanna, Chariguaman, Nancy, Mejia, Fernando 2022

Table 17-3: Nomenclature of Statistical Removables

A1	**CIVIL STATUS**
A2	**SEX**
A3	**OCCUPATION**
A4	**FINAL DIAGNOSIS**
A5	**FUMA**
A6	**CONSUMPTION OF ALCOHOLIC BEVERAGES**
A7	**CONSUMPTION OF PROCESSED FOODS**
A8	**DRUG CONSUMPTION**
A9	**JUNK FOOD CONSUMPTION**
A10	**HEREDITARY**
A11	**PHYSICAL ACTIVITY**

Source: San Sebastian" Clinical Laboratory

Performed by: Aguilar, Johanna, Chariguaman, Nancy, Mejia, Fernando 2022

Multiple Correspondence Analysis

This analysis is intended to represent in a reduced two-dimensional space, the relationship between the categories of qualitative variables, thus highlighting the similarity that exists between the characteristics and habits that lead to chronic diseases.

Perceptual map

Chart 1-3: Perceptual map of the categories of the statistical variables

Performed by: Aguilar, Johanna, Chariguaman, Nancy, Mejia, Fernando 2022

The perceptual map shown represents the distances between the modalities of all the statistical variables, but it is impossible to give certain conclusions since the graph does not show concrete results, so the perceptual map was developed in the parts detailed below.

Perceptual map of the variables: Diagnosis - Marital Status-Sex-Occupation

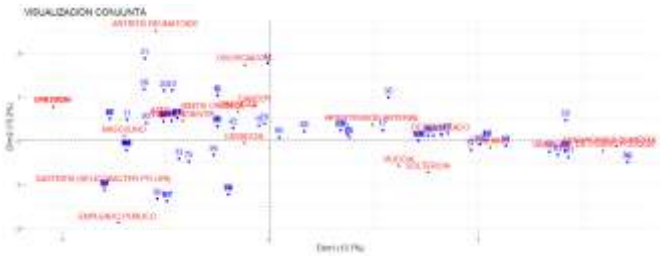

Chart 2-3: Perceptual map of the variables: Diagnosis - Marital Status-Sex-Occupation

Performed by: Aguilar, Johanna, Chariguaman, Nancy, Mejia, Fernando 2022

The perceptual map indicates that female patients examined are less likely to contract a chronic disease, male patients are usually married, have an independent job and suffer from chronic diseases usually gastritis (helicobacter pylori), asthma, epilepsy and HIV AIDS, married patients usually suffer from cancer, obesity and chronic rhinitis, female patients are usually unemployed and usually widowed or single, suffer from polycystic ovarian syndrome and hypertension and are engaged in housework.

Perceptual map of variables: Diagnosis - Smoking

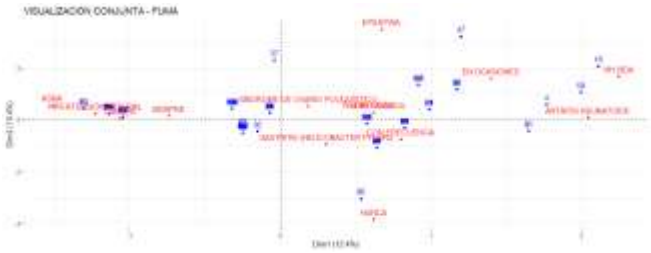

Chart 3-3: Perceptual map of the variables: Diagnosis - Smoking

Performed by: Aguilar, Johanna, Chariguaman, Nancy, Mejia, Fernando 2022
The perceptual map indicates that patients who frequently smoke always have diseases such as asthma, high blood pressure and cancer, those who smoke frequently suffer from gastritis (helicobacter pylori), chronic rhinitis, obesity and polycystic ovary syndrome, those who smoke are sometimes prone to suffer from epilepsy, HIV AIDS and rheumatoid arthritis.

Perceptual map of variables: Diagnosis - Alcoholic Beverage Consumption

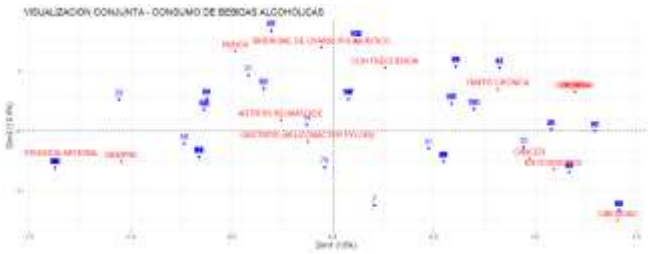

Chart 4-3: Perceptual map of the variables: Diagnosis - Alcoholic Beverage Consumption

Performed by: Aguilar, Johanna, Chariguaman, Nancy, Mejia, Fernando 2022
The perceptual map indicates that patients who always consume alcoholic beverages tend to suffer from arterial hypertension, patients who consume frequently and have not consumed tend to suffer from polycystic ovary syndrome, rheumatoid arthritis and gastritis (helicobacter pylori), those who consume occasionally suffer from cancer, obesity, chronic rhinitis, epilepsy, asthma and HIV AIDS.

Perceptual map of variables: Diagnosis - Processed Food Consumption

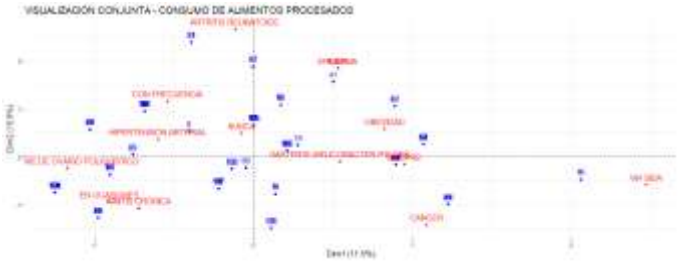

Chart 5-3: Perceptual map of the variables: Diagnosis- Consumption of Processed Foods

Performed by: Aguilar, Johanna, Chariguaman, Nancy, Mejia, Fernando 2022
The perceptual map shows that those patients who always consume processed foods tend to suffer from gastritis (helicobacter pylori), cancer and obesity, those who occasionally consume them suffer from chronic rhinitis and polycystic ovary syndrome, and those who frequently and never consume them suffer from arterial hypertension.

Perceptual map of the variables: Diagnosis - Drug Use

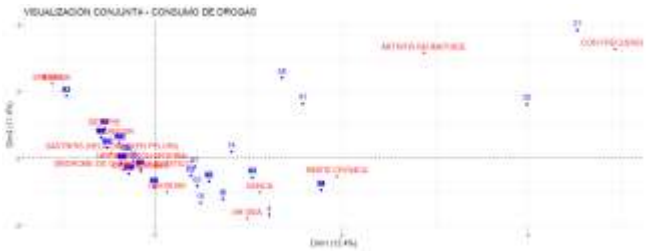

Chart 6-3: Perceptual map of the variables: Diagnosis - Drug Use

Performed by: Aguilar, Johanna, Chariguaman, Nancy, Mejia, Fernando 2022

The perceptual map indicates that those patients who always use drugs suffer from cancer, gastritis (helicobacter pylori) and arterial hypertension, those patients who use drugs occasionally suffer from polycystic ovary syndrome and obesity, those who do not use drugs suffer from chronic rhinitis and HIV AIDS, and those patients who use drugs frequently suffer from rheumatoid arthritis.

Chart 7-3: Perceptual map of the variables: Diagnosis - Junk Food Consumption

Performed by: Aguilar, Johanna, Chariguaman, Nancy, Mejia, Fernando 2022
The perceptual map shows that the examined patients who usually consume junk food always suffer from obesity, arterial hypertension and gastritis (helicobacter pylori), those patients who usually consume junk food frequently suffer from chronic rhinitis, those who consume junk food sometimes suffer from cancer and epilepsy.

Perceptual map of variables: Diagnosis-Hereditary-Physical Activity

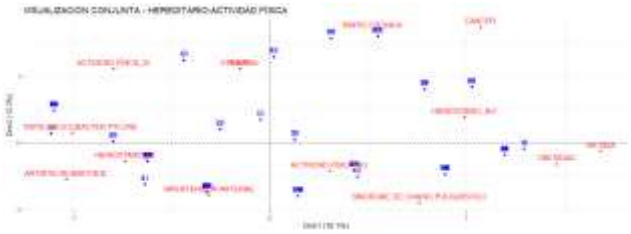

Chart 8-3: Perceptual map of the variables: Diagnosis-Hereditary-Physical Activity

Performed by: Aguilar, Johanna, Chariguaman, Nancy, Mejia, Fernando 2022
By means of the perceptual map of the 3 mutable statistics it is said that patients suffering from diseases such as gastritis (helicobacter pylori), rheumatoid arthritis and arterial hypertension are usually inherited by previous generations and are present even if the patient performs some physical activity, while patients who do not perform any physical activity suffer from diseases such as polycystic ovary syndrome, obesity, HIV-AIDS, chronic rhinitis and cancer, the same are considered as non-hereditary.

IV. Conclusions

The data matrix consists of 108 registered patients, with 11 statistical variables each with certain modalities that explain the characteristics of the patients registered in the San Sebastian Clinical Laboratory, through the exploratory analysis of data, it is highlighted that 60.2% (65) of male patients suffer from some chronic disease, 76.9% of patients are married, 63 have a self-employment, 56.5% have a job, and 56.5% have a job.
(61) always consume tobacco, 42.6% (46) always consume processed foods, 35.2% (38) always consume alcoholic beverages, 49.1% (53) patients always eat junk food, the diseases that occur most frequently in these patients are gastritis (helicobacter pylori) affecting 30.6% (33) and arterial hypertension with 20.4% (22), it is important to know that certain chronic diseases occur by inheritance obtaining 57.4% (62) of patients who inherit the disease and that 20.4% (22) of them have high blood pressure.6% (33) and arterial hypertension with 20.4% (22), it is important to know that certain chronic diseases are inherited, obtaining

57.4% (62) of patients who inherit the disease and that most patients do not do physical activity, occupying 72.2% (78) of the patients.

Applying the MCA technique, leads us to conclude that the majority of people suffering from chronic diseases are male with 60.2% (65), the vast majority are married and have an independent job, with great frequency these patients suffer from diseases such as gastritis (helicobacter pylori) caused by consuming processed foods, tobacco consumption, junk food and alcoholic beverages, being also considered a hereditary disease, asthma caused by frequent consumption of snuff, epilepsy and HIV AIDS, the female sex with a 39.8% (43) of patients, most of these people do not have a permanent job and usually perform household chores, these patients suffer largely from high blood pressure caused by alcohol, drugs and tobacco consumption, this disease is also usually inherited, they also suffer from polycystic ovary and obesity, the consumption of processed foods and junk food largely causes this disease.

V. REFERENCES

1. ALVAREZ-PITTI, J., MALLÉN, J.A.C., TRABAZO, R.L., LUCÍA, A., DE LARA, D.L., AZNAR, L.A.M. y MARTÍNEZ, G.R., 2020. Ejercicio físico como «medicina» en enfermedades crónicas durante la infancia y la adolescencia. Anales de Pediatría. S.l.: Elsevier, pp. 173–e1.

2. AVELLANEDA, A., IZQUIERDO, M., TORRENT-FARNELL, J. y RAMÓN, J.R., 2007. Enfermedades raras: enfermedades crónicas que requieren un nuevo enfoque sociosanitario. Anales del Sistema Sanitario de Navarra, vol. 30, no. 2, pp. 177-190. ISSN 1137-6627.

3. BARRANTES SOLÍS, T., 2009. Principales Causas de Cáncer Atendidas en un Centro Hospitalario: Costa Rica 2003-2007. Revista Costarricense de Salud Pública, vol. 18, no. 1, pp. 37-42. ISSN 1409-1429.

4. BETANCOURT, L. y ROBLES, J.N., 2001. Tabaquismo. Panorama general y perspectivas. Revista Mexicana de Cardiología, vol. 12, no. 2, pp. 85-93. ISSN 0188-2198.

5. BOLET ASTOVIZA, M., 2000. La prevención del alcoholismo en los adolescentes. Revista Cubana de Medicina General Integral, vol. 16, no. 4, pp. 406-409. ISSN 0864-2125.

6. CORTES, J.B., FERNÁNDEZ, C.S., DE OLIVEIRA, M.B., LAGOS, C.M., MARTÍNEZ, M.T.B., HERNÁNDEZ, C.L. y DEL CURA GONZÁLEZ, I., 2020. Enfermedades crónicas en población pediátrica: comorbilidades y uso de servicios en atención primaria. Anales de Pediatría. S.l.: Elsevier,

7. CRESPO VALDÉS, N., ROSALES GONZÁLEZ, E., GONZÁLEZ FERNÁNDEZ, R., CRESPO MOJENA, N. y DE DIOS HERNÁNDEZ BEGUIRISTAIN, J., 2003. Caracterización de la diabetes mellitus. Revista Cubana de Medicina General Integral, vol. 19, no. 4, pp. 0-0. ISSN 0864-2125.

8. CUADRAS, C.M., 2007. Nuevos métodos de análisis multivariante. S.l.: CMC editions Barcelona.

9. Diabetes. [en línea], [sin fecha]. [Consulta: 28 noviembre 2020]. Disponible en: https://www.who.int/es/news-room/fact-sheets/detail/diabetes.

10. DUEDEVOCACION, T.P.-, 2020. Retos de salud urgentes para la próxima década según la OMS. Teresa Pérez [en línea]. [Consulta: 13 noviembre 2020]. Disponible en: https://teresaperez.net/2020/01/21/retos-de-salud-urgentes-para-la-proxima-decada-segun-la-oms/.

11. ECNT_COVID19_3ago.pdf [en línea], [sin fecha]. S.l.: s.n. [Consulta: 13 noviembre 2020]. Disponible en: https://nutricionistaspanama.com/wp-content/uploads/2020/08/ECNT_COVID19_3ago.pdf.

12. JIMÉNEZ, M.G. y MARTÍNEZ, P., [sin fecha]. Bienestar psicológico y hábitos saludables: ¿están asociados a la práctica de ejercicio físico? , vol. 8, pp. 19.

13. LIDIA ESTHER, G.L. y MIDALYS, Q.N., 2020. Estado nutricional en adultos mayores y su relación con enfermedades crónicas no transmisibles. I Jornada Científica Virtual CaliMay 2020. S.l.: s.n.,

14. MANUEL MORENO, G., 2012. Definición y clasificación de la obesidad. Revista Médica Clínica Las Condes, vol. 23, no. 2, pp. 124-128. ISSN 0716-8640. DOI 10.1016/S0716-8640(12)70288-2.

15. MARTINEZ, R.R. y DÍAZ, F.A.E., 2010. Las enfermedades crónicas no transmisibles en Colombia. Boletín del observatorio en salud, vol. 3, no. 4.

16. MESSANA, L., MANRESA, N., CASTRO, M. y HERNÁNDEZ, Y., 2020. Tabaquismo como factor de riesgo de enfermedades crónicas. Revista Horizonte de Enfermería, vol. 21, no. 2, pp. 55–62.

17. ORLANDINI, A., 2012. El estrés: Qué es y cómo evitarlo. S.l.: Fondo de Cultura Economica. ISBN 978-607-16-1177-2.

18. OTZEN, T., FUENTES, N., WETZEL, G., HENRÍQUEZ, C., ANTÚNEZ, Z., MELNIK, T., OTZEN, T., FUENTES, N., WETZEL, G., HENRÍQUEZ, C., ANTÚNEZ, Z. y MELNIK, T., 2020. Suicidabilidad y apoyo social percibido en estudiantes universitarios con enfermedades crónicas no transmisibles. Terapia psicológica, vol. 38, no. 1, pp. 119-129. ISSN 0718-4808. DOI 10.4067/S0718-48082020000100119.

19. (PDF) Análisis de Datos Multivariantes. ResearchGate [en línea], [sin fecha]. [Consulta: 22 septiembre 2020]. Disponible en: https://www.researchgate.net/publication/40944325_Analisis_de_Datos_Multivariantes.

20. PEIRO, J., 2001. El estrés laboral: Una perspectiva individual y colectiva. Prevención, trabajo y salud: Revista del Instituto Nacional de Seguridad e Higiene en el Trabajo, ISSN 1575-1392, Nº 13, 2001, pags. 18-38, vol. 13.

21. PEÑA, D., 2013. Análisis de datos multivariantes. S.l.: McGraw-Hill España.

22. RAMÍREZ, B.S.B. y AGUILAR, S.A., 2009. Desgaste físico y emocional del cuidador primario en cáncer. México: Universidad Autónoma de Tamaulipas,

23. RUIZ, A.M., GÓMEZ, I.R., RUBIO, C., REVERT, C. y HARDISSON, A., 2004. Efectos tóxicos del tabaco. Revista de toxicología, vol. 21, no. 2-3, pp. 64–71.

24. RUIZ, Z.V. y SÁEZ, M.J.L., [sin fecha]. Programa de prevención de enfermedades crónicas y dieta mediterránea en la comarca de Pamplona. , pp. 83.

25. SILLERO, D.B., 2010. La actividad física relacionada con la salud. Efectos, beneficios de la misma y consecuencias de la inactividad física. Apunts Educación Física y Deportes, pp. 1–8.

26. SILVA, G.G., MOTELLÓN, M.C., GÓMEZ, C.A., SANTOS, L.S., DOVAL, F.M.G. y NÚÑEZ, A.R., 2020. Escolares con enfermedades crónicas,?` qué les preocupa a sus profesores? Anales de Pediatría. S.l.: Elsevier,

27. VALDÉS, M.Á.S., 2020. Las enfermedades crónicas no transmisibles y la pandemia por COVID-19. Revista Finlay, vol. 10, no. 2, pp. 78–88.