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RINOE Journal-Public Economy

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National budget, Deficit, and Debt: Budget, Budget systems, Deficit, Surplus, Debt, Debt management; State and local government; Intergovernmental relations: State and local taxation, Subsidies, and Revenue, State and Local budget and expenditures, Interjurisdictional Differentials and their effects, State and Local Borrowing, Intergovernmental relations, Federalism; Miscellaneous issues: Governmental loans and credits, Governmental property, International fiscal issues and other topics related to Social Sciences.

Presentation of the content

In the first article we present, *Public policies oriented to social development: budget analysis of the food assistance program in the State of Guanajuato, Mexico for the years 2018-2023*, by GALVÁN-ZAVALA, Karina & GARCÍA-GONZÁLEZ, José de Jesús, with adscription in the, Universidad de Guanajuato, in the next article we present, *Microdata management of ENSU in the study of urban public safety perceptions*, by MERY-RUIZ, Miriam Elizabeth, with adscription in the Universidad Autónoma de Coahuila, in the next article we present, *Knowledge management in the public sector: a model with structural equations*, by HUERTA-CHÁVEZ, Irma Alicia & FIGUEROA-OCHOA, Edgar Benjamín, with adscription in the Universidad Autónoma de Guadalajara, Universidad de Guadalajara, in the last article we present, *Proposal for instructional design of associate and bachelor's degree academic programs at the Universidad Autónoma de Nayarit*, by ZEA-VERDÍN, Aldo Asunción, GUZMÁN-ÁLVAREZ, Alejandra, CASTELLÓN-LEPE, Alma Jazmín and GALVÁN-MEZA, Norma Liliana, with adscription in the Universidad Autónoma de Nayarit.

Content

Article **Journal-Public Economy**
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Public policies oriented to social development: budget analysis of the food assistance program in the State of Guanajuato, Mexico for the years 2018-2023

Políticas públicas orientadas al desarrollo social: Análisis presupuestario del programa de asistencia alimentaria en el Estado de Guanajuato, México para los años 2018-2023

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Abstract

The global economic shows a significant increase in the number of people living in poverty, with the regions of Africa, Latin America, the Caribbean and some countries in Asia being mainly affected. For Mexico, 2018 marks a juncture in the country's governance that is guided by the increase in public spending allocated to programs in response to the global economic slowdown and the crisis caused by the COVID-19 pandemic, which resulted in a significant increase in indicators of poverty, inequality and marginalization. This research is qualitative, exploratory, documentary and aims to review the indicators of poverty and inequality in the state of Guanajuato for the periods 2018-2023, as well as the volume of public spending allocated to the food assistance and guidance program, concentrating in identifying the convergence of spending and reduction of inequality in the state. The methodology used to determine the evolution of public spending of the social assistance program is based on the analysis of the accounting, programmatic, budgetary and results information presented in the public account with emphasis on the functional classification of spending, the representativeness of spending and information on result indicators. Currently, the state of Guanajuato is positioned below the national average in poverty indicators; however, among the greatest challenges is ensuring that the use of public resources allocated to social assistance effectively reduces inequality and poverty gaps in the state of Guanajuato.

Public policies, Budgetary, Programatic

Resumen

La desaceleración económica a nivel mundial arroja un incremento significativo en el número de personas que viven en condiciones de pobreza, siendo mayormente afectadas las regiones de África, Latinoamérica, el Caribe y algunos países de Asia. Para México el 2018 marca una coyuntura en la gobernanza del país que se orienta en el incremento del gasto público destinado a programas asistencialistas como respuesta a la desaceleración económica mundial y la crisis provocada por la pandemia COVID-19, que derivo en un incremento significativo en indicadores de pobreza, desigualdad y marginación. Esta investigación es de tipo cualitativa, exploratoria, documental y tiene como finalidad revisar los indicadores de pobreza y desigualdad en el estado de Guanajuato para los periodos 2018-2023, así como el volumen de gasto público destinado al programa de asistencia y orientación alimentaria, concentrándose en identificar la convergencia del gasto y reducción de desigualdad en el estado, La metodología usada para determinar la evolución del gasto público del programa de asistencia social es a partir del análisis de la información contable, programática, presupuestal y de resultados que se presenta en la cuenta pública con énfasis en la clasificación funcional del gasto, la representatividad del gasto y la información de los indicadores de resultados. Actualmente el estado de Guanajuato se posiciona por debajo del promedio nacional en los indicadores de pobreza, sin embargo, entre los mayores retos se identifica el garantizar que el ejercicio de los recursos públicos destinados a la asistencia social reduzca eficazmente las brechas de desigualdad y pobreza en el estado de Guanajuato.

Políticas públicas, Seguridad alimentaria, Presupuesto

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Introduction

In 2015, the United Nations General Assembly established the Sustainable Development Goals (SDGs), which present the challenges of the 2030 Agenda for the countries of the region. These set out to eradicate hunger and malnutrition as a way to address food insecurity in the Latin American and Caribbean region through the development of sustainable agriculture and the adoption of healthy eating patterns. (López Salazar & Sandoval Godoy , 2018)

Figure 1 Sustainable Development Goals
Source: United Nations

As a way of integrating the Sustainable Development Goals, the Mexican state contemplates the alignment of the national development plan that integrates as a general axis the well-being of citizenship, which aims to ensure that the entire population has access to a dignified life, promoting the full exercise of their social rights. At the same time, it focuses on guaranteeing social protection for people living in vulnerable situations.

At the federal level, the National System for the Integral Development of the Family (SNDIF) is the body that operationally and programmatically coordinates the fund, according to the provisions established in the Social Assistance Law (LAS), which refer to the benefit of the population, in a context of national social development, through the implementation of public policies and the performance of activities related to social assistance; and specifically, to social food assistance (LAS, 2018). Within this framework, SNDIF, together with the State Systems for the Integral Development of the Family (SEDIF), operates the Integral Strategy for Social Food Assistance (EIASA), which is the instrument that allows coordinating the allocation, operation, exercise and evaluation of FAM-AS resources. (INSAD, 2018).

The State of Guanajuato has integrated the human and social dimension in its state development plan 2040, which integrates as social welfare objectives to abate poverty in all its aspects and from its causes.

Methodology

The present findings are derived from the research stay in the public sector, in the system of integral development for the family of the state of Guanajuato, the consultation of financial, budgetary and programmatic reports, the contrast between the planning and the results obtained for each of the years observed, the analysis and review of the public account.

Results

The latest State of Food Security and Nutrition in the World report reveals that there is a reversal in efforts to eliminate hunger and malnutrition. The number of hungry people in the world rose to 828 million people in 2021, an increase of 46 million since 2020 and 150 million since the outbreak of the coronavirus disease pandemic (COVID-19), according to a United Nations report that provides new evidence showing the world is moving away from its goal of ending hunger, food insecurity and malnutrition in all its forms by 2030. (UN, 2022)

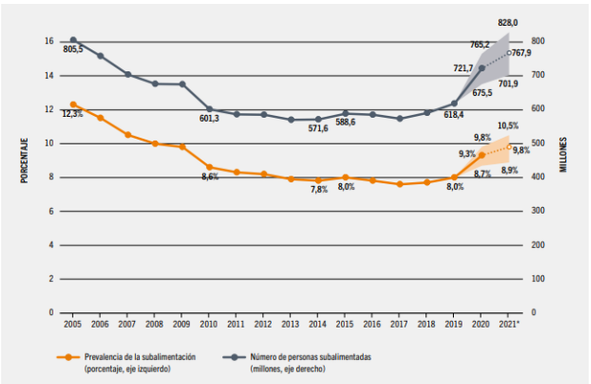

Figure 2 People facing hunger around the world in 2021
Source: United Nations

The figure above shows that between 702 and 828 million people faced hunger worldwide in 2021. Considering the midpoint of the estimated range (768 million), in 2021 hunger affected 46 million more people than in 2020 and a total of 150 million more people than in 2019, before the COVID-19 pandemic.

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In Mexico, the food security of its inhabitants is one of the most important challenges facing the State. However, hunger and poverty (the counterpart of food security) continue to represent one of the most acute problems faced by Mexicans, despite the implementation of multiple policies and plans to combat them over the last four decades (López Salazar & Sandoval Godoy, 2018). (López Salazar & Sandoval Godoy, 2018).

It follows that in order to guarantee food security it is necessary to improve the economic conditions of families. The measurement of poverty in the Mexican state reveals an increase in the number of people living in poverty according to the measurement of the national council for the evaluation of social development policy. Poverty measurement in its statistical annex 2018-2020.

Federal State	2018			2020		
	Total	Moderate poverty	Extreme poverty	Total	Moderate poverty	Extreme poverty
United Mexican States	51,890.9	43,194.5	8,696.4	55,654.2	44,861.2	10,793.0
Aguascalientes	360.8	347.3	13.6	396.5	361.8	34.7
Baja California	884.2	833.6	50.6	851.7	793.7	58.0
Baja California Sur	141.4	132.5	8.9	223.4	200.0	23.4
Campeche	430.9	347.5	83.4	472.4	359.9	112.6
Coahuila de Zaragoza	778.1	731.4	46.7	812.1	731.2	81.0
Colima	219.8	205.9	13.9	196.0	182.4	13.7
Chiapas	4,166.0	2,533.3	1,632.7	4,218.0	2,594.9	1,623.1
Chihuahua	980.9	887.6	93.3	952.5	842.0	110.5
Mexico City	2,755.9	2,603.8	152.1	3,009.4	2,609.0	400.4
Durango	694.5	656.0	38.5	715.5	635.9	79.6
Guanajuato	2,519.7	2,303.0	216.8	2,649.6	2,368.5	281.2
Guerrero	2,378.5	1,435.1	943.4	2,363.2	1,455.6	907.6
Hidalgo	1,517.2	1,303.4	213.9	1,570.6	1,318.6	252.0
Jalisco	2,285.8	2,096.7	189.1	2,633.4	2,381.6	251.8
Mexico	7,036.3	6,252.7	783.6	8,342.5	6,940.6	1,401.9
Michoacán de Ocampo	2,153.2	1,905.5	247.7	2,133.7	1,770.0	363.7
Morelos	952.9	831.8	121.1	1,006.7	839.9	166.8
Nayarit	436.5	368.4	68.1	376.6	329.6	47.0
Nuevo León	1,066.5	1,026.1	40.4	1,425.0	1,301.1	123.9
Oaxaca	2,575.3	1,707.1	868.3	2,569.8	1,709.4	860.5
Puebla	3,756.3	3,231.4	524.9	4,136.6	3,292.2	844.3
Querétaro	604.5	566.2	38.2	750.4	680.7	69.7
Quintana Roo	546.4	477.4	69.0	892.9	693.4	199.4
San Luis Potosi	1,179.5	990.9	188.6	1,214.0	963.4	250.6
Sinaloa	928.0	862.3	65.6	853.9	779.9	73.9
Sonora	774.2	709.5	64.7	885.0	780.1	104.9
Tabasco	1,333.2	1,047.7	285.5	1,316.1	985.3	330.8
Tamaulipas	1,205.4	1,101.0	104.4	1,233.9	1,098.4	135.5
Tlaxcala	664.8	622.2	42.7	800.4	667.5	132.9
Veracruz de Ignacio de la Llave	4,776.7	3,495.4	1,281.2	4,749.6	3,619.9	1,129.8
Yucatan	992.3	844.7	147.6	1,156.9	893.2	263.7
Zacatecas	795.3	737.3	58.1	745.7	681.7	64.0

Table 1 Population living in poverty by state by degree of poverty, 2018 and 2020 (thousands of people)
Source: Own elaboration based on data INEGI and CONEVAL

The table above shows the number of thousands of people who moved into poverty between 2018 and 2020, it is possible to observe that at the national level the increase is 7.25% while for the state of Guanajuato it is 5.16%.

In this case, the deterioration of food conditions is the result of the impacts of the economic crises that affected the purchasing power of Mexicans and was accompanied by the loss of food self-sufficiency and sovereignty, together with the dependence on food imports, mainly basic grains (Torres Torres & Rojas Martínez, 2022). (Torres & Rojas Martínez, 2022).

According to the operating rules of the food assistance programme and in view of the expected increase in the number of people living in poverty due to the effects of the pandemic, as well as the updated methodology for measuring multidimensional poverty, for the 2018-2020 measurement period the percentage of the population living in poverty in the state of Guanajuato increased from 41.5 per cent in 2018 to 42.7 per cent in 2020.

Therefore, the GTO Contigo Sí strategy was created to help the population of the state of Guanajuato to have access to a full life and opportunities for their social and human development, with the main purpose of expanding their capabilities in education, health and income, and to develop in an appropriate space for family coexistence in an environment of peace and values, through an innovative scheme of social participation, governance and community life.

According to López Salazar & Sandoval, the success of the programme will depend on its implementation and on mechanisms that allow for an effective link between assistance programmes and those programmes and policies focused on food distribution and access, in such a way that food security becomes a primary governmental objective and thus favours the reduction of poverty, hunger and malnutrition.

The System for the Integral Development of the Family of the State of Guanajuato is a decentralised public body, with its own legal personality and assets, in charge of the matters entrusted to it by the Law on the State Social Assistance System.

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Its purpose is to attend to the population that lives in a situation of vulnerability, for the period 2021-2024 it works in the following strategic axes.

I. Restitution of the right to live in a family for children and adolescents.

II. social support to families living in vulnerability.

III. Education and nutritious and quality food

IV. Care for the elderly with a human rights approach.

V. Strengthening community resources for families.

Aligned to the sustainable development objectives, national development plan, state development plan, and current government programme, its main purpose is to reduce poverty, hunger and inequality, for which it operates through cross-cutting axes.

Figure 3 Orientation towards the fulfilment of sustainable development goals
Source: Guanajuato Integral Family System Strategic Programme 2021-2024

Its expenditure is based on social development activities that are detailed through the following sub-functions of the functional classification of expenditure issued by the National Council for Accounting Harmonisation (CONAC)

1.3.4 Public function

2.2.2 Community development

2.5.6 Other educational and related services
2.6.1 Other educational and related services

2.6.2 Advanced age

2.6.3 Family and Children

2.6.5 Food and Nutrition

2.6.8 Other Vulnerable Groups

2.6.9 Other Social Security and Social

2.7.1 Other Social Issues

Article 42 of the internal regulations of the system for the integral development of the family of the state of Guanajuato establishes the powers of the directorate of community strengthening, among which the following are detailed:

I. Analyse problems faced by the communities and participate in their diagnosis.

II. Propose, implement, follow up and participate in the evaluation of public policies in the area of community strengthening, as well as in food assistance.

III. Propose, direct, supervise and participate in the evaluation of the system's programmes and actions which, from a human rights perspective, will

a. Strengthening community development;

b. The promotion of access to governmental procedures and services for persons and families in vulnerable situations;

c. The orientation and quality food assistance to people in vulnerable situations;

d. The promotion of the regulation, development and operation of civil society organisations whose purpose is to provide social assistance services to the persons referred to in article 4 of the Law, in terms of the applicable legal framework; and

e. The provision of child care, attention and development services in congruence with the policies issued by the System for the Protection of the Rights of Children and Adolescents of the State of Guanajuato;

IV. Verify social assistance organisations in terms of the Law of Social Assistance Organisations for the State of Guanajuato and its regulations;

V. Promote social and community organisation and participation for the implementation of social assistance programmes within the scope of its competence;

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VI. Coordinate, supervise and cooperate with the activities related to community strengthening and development and food assistance that are implemented in the municipalities of the state, providing the necessary training and technical assistance;

VII. propose, direct, execute, supervise and participate in the evaluations of support to communities affected by risk situations, emergencies or natural disasters in terms of Article 19 of the Law;

VIII. Follow up on the obligations of the System, established by the Law to regulate the Provision of Services for the Attention, Care and Integral Development of Children in the State of Guanajuato and propose actions for their fulfilment; and

IX. Establish and administer the State Register of Child Care, Care and Development Centres.

The budget programme S006 called "Food assistance and guidance" aims to contribute to the construction, with citizens, of a healthy, equitable and inclusive social fabric, especially in areas with high social backwardness by strengthening family functions that promote harmonious social coexistence and its purpose is that people with some condition of vulnerability living in localities with high and very high degree of marginalisation are served with the food programme, which contributes to their nutrition.

Guanajuato is one of the states adhered to the fiscal collaboration agreement. Chapter IV of the Fiscal Coordination Law establishes the mechanism for the operation of the contributions, Article 25 states that with respect to the participation of states and municipalities in federal revenue collection, federal contributions are established as resources that the federation transfers to the public treasuries of states and municipalities, conditioning their spending on the achievement and fulfilment of the objectives established by law for each type of contribution in the following funds.

1. Contribution fund for educational payroll and operating expenditure.

2. Contribution Fund for Health Services

3. Contribution fund for social infrastructure

4. Contribution fund for the strengthening of the municipalities and territorial divisions of the federal district.

5. Multiple Contribution Fund

6. Contribution fund for technological and adult education.

7. Contribution fund for public security in the states and the federal district.

8. Contribution fund for the strengthening of the federal entities.

One of the main funds operated by the system for the integral development of families in the State of Guanajuato is FAM.

Currently, RG33 is composed of eight funds, including the Fondo de Aportaciones Múltiples (FAM). This fund integrates two components: one for educational infrastructure (FAM-IE) and one for social assistance (FAM-AS). Based on evaluations carried out by the National Council for the Evaluation of Social Development Policy (CONEVAL), some questions have been identified about the way in which coordination is carried out for the use of the resources of these funds (INSAD, 2018).

Derived from the analysis of the state of Guanajuato's expenditure budget, an allocation for a total amount of $1,041,363,614.61 is identified for the operation of the System for the Integral Development of the Family for the fiscal year 2023, with the following distribution by programme:

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Budget Programme ID	Name of the programme	Approved budget	Percentage representation
P000	Planning, monitoring and evaluation of public policies	$89,186,443.11	8.56%
E008	Comprehensive care for children and adolescents	$16,247,935.51	1.56%
E010	Reconstruction of the social fabric	$48,501,976.72	4.66%
E009	Comprehensive care for the elderly	$111,010,902.31	10.66%
E061	Family values	$28,735,180.64	2.76%
S006	Food assistance and guidance	$679,850,647.17	65.28%
E054	Rehabilitation of children and adolescents in conflict	$8,300,000.00	0.80%
M000	Support for the budget process and for improving institutional efficiency	$6,818,305.37	0.65%
E015	Legal certainty for the people of Guanajuato	$835,758.93	0.08%
S003	Promotion of the fight against poverty through the improvement of the family situation.	$51,876,464.85	4.98%
		$1,041,363,614.61	**TOTAL**

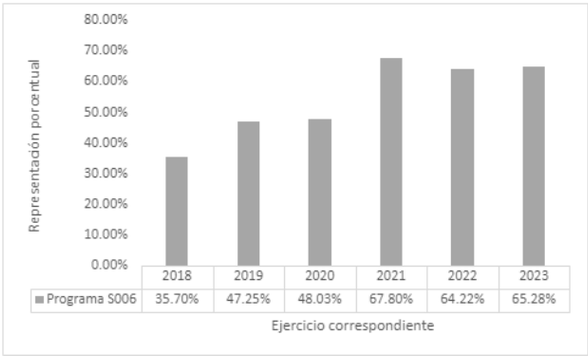
Table 2 Budget state resource 2023 by budget programme.
Source: SFIA/Presupuesto Abierto Guanajuato

In detail the information for 2023 reveals that the concentration of expenditure is oriented in the budget programme S006 Food assistance and guidance. The above table shows that in percentage terms, programme S006 accounts for more than 50% of the institution's income, making it the programme most susceptible to analysis.

Year	Amount	percentage of total annual budget
2018	$551,871,756.05	35.70%
2019	$613,860,656.96	47.25%
2020	$560,680,317.85	48.03%
2021	$505,494,393.94	67.80%
2022	$556,405,992.98	64.22%
2023	$679,850,647.17	65.28%

Table 3 Budget allocated by fiscal year 2018-2023 to the "food assistance and guidance" budget programme"
Source: Own elaboration based on SFIA/Presupuesto abierto Guanajuato

The table above shows the behaviour of the budget allocation for the programme, the evolution of the percentage of the budget in relation to the total expenditure has been increasing from levels of approximately 30% in 2018 to approximately 60% by 2023, however, in monetary terms the difference in amount is only +23.19%.



Graphic 1. Evolution of the budget allocated to the "Food Assistance and Guidance" programme"
Source: Own elaboration based on SFIA/Presupuesto abierto Guanajuato

The graph above compares the years before and after the pandemic, showing that the year with the highest allocation of resources is 2021 as an immediate response to the economic effects of the pandemic; for the years 2022 and 2023 the amounts are still higher than in 2019 but lower than in 2021.

The marked inequality in income distribution leads to an increase in the vulnerability of people in the lowest income deciles, so that much of the deterioration in living standards and the growth of food poverty is inextricably linked to low income. In this way, the income dimension plays a fundamental role in explaining the growth of food poverty in the country, since income has grown in a limited way and, above all, indexed to inflation as measured by the CPI, but food inflation (goods to which poor people spend a greater proportion of their income) has shown a much higher evolution than the general inflation index. The problem is exacerbated by the fact that wages in general are adjusted with average inflation, so whenever food price growth is higher than inflation, there is a significant loss of purchasing power of income with respect to the basic food basket. (López Salazar & Sandoval Godoy , 2018).

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The literature review shows that greater efforts are required to combat poverty, inequality, marginalisation and vulnerabilities, in addition to coherent public policies and evaluations of budgetary programmes, an economic environment conducive to development with low inflation rates, increased investment and sources of employment is necessary.

The Mexican state must transform economic policy by promoting self-sufficiency and sovereignty in strategic foodstuffs, diversifying exports to reduce dependence, especially with the United States, and strengthening domestic production of basic grains; it must also increase credit and improve prices for small producers, increase investment in agricultural infrastructure, and design an agro-food policy that assumes food security as a basic condition for national security. (Torres Torres & Rojas Martínez, 2022).

The dependence on food imports is a variable that affects poverty levels. Promoting economic activities oriented towards food production is one of the ways to reduce dependence on food imports; the margin of poverty will be gained as the productive vocations of the regions are oriented.

Furthermore, an urgent task is related to the design of mechanisms that allow for an effective linkage between programmes aimed at combating food poverty and those programmes and policies focused on food distribution and access, so that food security becomes a principle of social policy and a lever to reduce the problems of poverty, hunger and malnutrition in the country. However, this can only be possible if it is associated with a national food security model with an inter- and trans-disciplinary approach that makes it possible to influence the reduction of food risk problems with social policy intervention instruments on a regional and global scale. In fact, part of the government's institutional efforts could be aimed at strengthening international links with official bodies and non-governmental organisations concerned with local production traditions and global food, in an attempt to strengthen medium and long-term visions that are more effective than those that have so far been implemented at the local level. (López Salazar & Sandoval Godoy , 2018)

In Mexico, the inconsistencies and limitations of social assistance policies and programmes to achieve so-called food security have been associated with the failure of an economic development model that sees indirect subsidies and economic transfers to the most vulnerable groups as a threat to market equilibrium and competition (Meseguer, 1998).

Regarding the operation of the programme, it is valuable to constantly update the list of beneficiaries, so that an ex ante and ex post evaluation of the programme's operation on the beneficiaries' living conditions can be determined.

The legal and normative provisions that regulate the operation of the fund, by not explicitly describing its objectives, only establish guidelines for the distribution of resources in three elements: school breakfasts, food support and social assistance. This situation has resulted in the ESIASA guidelines becoming the main normative, coordination and programming reference for the operation of the fund. At the same time, there are no diagnoses that recognise the situation of the problem addressed by the fund; this generates problems in the targeting of the support delivered. (INSAD, 2018).

Conclusions

The literature review shows that greater efforts are required to combat poverty, inequality, marginalisation and vulnerabilities, in addition to coherent public policies and evaluations of budgetary programmes, an economic environment conducive to development with low inflation rates, increased investment and sources of employment is necessary.

Dependence on food imports is a variable that affects poverty levels. Promoting economic activities oriented towards food production is one of the ways to reduce dependence on food imports.

Regarding the operation of the programme, it is valuable to constantly update the list of beneficiaries, so that an ex-ante and ex-post assessment of the programme's operation can be made on the beneficiaries' living conditions.

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Currently, the state of Guanajuato is positioned below the national average in terms of poverty indicators; however, one of the greatest challenges is to ensure that the use of public resources allocated to social assistance effectively reduces inequality and poverty gaps.

In the period analysed, there is evidence that the amounts spent on social assistance have increased and that the number of people living in poverty or vulnerability has risen.

The results reveal that the use of public resources for social assistance does not have a significant impact on the reduction of poverty and inequality.

The challenges are to ensure that the use of public resources for social assistance effectively reduces inequality and poverty gaps in the state of Guanajuato.

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Microdata management of ENSU in the study of urban public safety perceptions

Manejo de microdatos de la ENSU en el estudio de percepciones de seguridad pública urbana

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Abstract

This paper presents a comprehensive approach to managing and analyzing microdata from the National Survey of Urban Public Safety (ENSU) by the National Institute of Statistics, Geography, and Informatics (INEGI). The core objective is to elucidate the intricacies of urban public safety perceptions through robust statistical tools and techniques, specifically utilizing Stata software. We focus on the gendered nuances of safety perception in public parks during daylight hours, a critical aspect often overlooked in public safety discourse. By merging various ENSU databases, we dissect the interplay between sociodemographic factors and safety perceptions, offering a granular view that challenges traditional narratives of urban security. The study's findings aim to bridge the gap between subjective perceptions of safety and objective data, providing actionable insights for policymakers and urban planners. Through methodological rigor and detailed data analysis, this research contributes to a deeper understanding of urban safety dynamics and fosters the development of gender-responsive strategies to enhance safety in urban public spaces.

Gender, Public space, Urban studies

Resumen

Este documento presenta un enfoque integral para el manejo y análisis de microdatos de la Encuesta Nacional de Seguridad Pública Urbana (ENSU) realizada por el Instituto Nacional de Estadística, Geografía e Informática (INEGI). El objetivo principal es dilucidar las complejidades de las percepciones de seguridad pública urbana a través de herramientas y técnicas estadísticas robustas, utilizando específicamente el software Stata. Nos centramos en las sutilezas de la percepción de seguridad basadas en género en parques públicos durante las horas diurnas, un aspecto crítico que a menudo se pasa por alto en el discurso de seguridad pública. Al fusionar varias bases de datos de la ENSU, diseccionamos la interacción entre los factores sociodemográficos y las percepciones de seguridad, ofreciendo una visión detallada que desafía las narrativas tradicionales de la seguridad urbana. Los hallazgos del estudio buscan cerrar la brecha entre las percepciones subjetivas de seguridad y los datos objetivos, proporcionando conocimientos prácticos para los responsables de la formulación de políticas y los urbanistas. A través de la rigurosidad metodológica y el análisis detallado de los datos, esta investigación contribuye a una comprensión más profunda de las dinámicas de seguridad urbana y fomenta el desarrollo de estrategias sensibles al género para mejorar la seguridad en los espacios públicos urbanos.

Espacio público, Estudios urbanos, Género

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Introduction

Urban public safety represents a critical challenge, encompassing not just the incidence of crime, but also the perceived security among residents in urban areas. The Encuesta Nacional de Seguridad Pública Urbana (ENSU) 2021, a significant statistical project by INEGI, is designed to provide a comprehensive snapshot of national concerns regarding public safety, including the prevalence of antisocial behavior and its impact on the population's daily routines and sense of security (INEGI, 2021). The survey's scope extends to capturing the impact of crime on the household, personal victimization, harassment, and sexual violence, providing a detailed picture of the security landscape across urban Mexico.

The perception of insecurity, however, extends beyond the fear of crime. It negatively affects trust in law enforcement and erodes the quality of life for city dwellers. This is particularly pronounced in marginalized urban areas, where concerns about street safety can lead to a societal retreat among middle-class populations and the fortification of security among the upper classes, thus exacerbating social segregation (INEGI, 2021). The ENSU identifies local "incivilities" - such as neighborhood disputes, public consumption of alcohol, and visible signs of disorder like trash and graffiti - as key factors that amplify feelings of insecurity. These elements, coupled with a lack of community cohesion and confidence in local police, can heighten the sense of vulnerability among residents (INEGI, 2021).

Demographic factors, including age and gender, also influence these perceptions. Although subjective, the quantification of insecurity is crucial as ignoring it may lead to increased distrust in authorities and reduce civic engagement in justice processes, thereby inflating the 'dark figure' of crime - crimes that go unreported and unrecorded in official statistics (INEGI, 2021). Such feelings of insecurity have tangible consequences, altering the daily habits of citizens and limiting their freedom, further diminishing their quality of life (INEGI, 2021).

To analyze the data harvested by surveys like the ENSU, it is essential to understand the data formats available for extraction and analysis. The microdata files provided by ENSU are rich with individualized, anonymized data points that need specialized software for proper analysis, as these files contain raw data without aggregation (INEGI, 2021).

The National Survey of Urban Public Safety (ENSU), conducted by the National Institute of Statistics, Geography, and Informatics (INEGI), is a critical initiative aimed at understanding the multifaceted nature of urban public safety in Mexico. The ENSU, as a part of the National Subsystem of Government Information, Public Safety, and Justice Administration, is designed to offer comprehensive information on public safety perceptions at both the national and city-specific levels (INEGI, 2021). It is an annual project that collects data to estimate the public's perception of safety in their city, focusing on a wide range of topics from witnessing criminal or antisocial behaviors to the impact of crime on personal experiences, including victimization and harassment.

The survey's methodology involves a detailed collection of data on the public's experience with and exposure to crime and delinquency. This includes documenting the changes in activities and routines prompted by fear of crime, incidents within the home, and personal experiences of victimization and harassment. The ENSU's comprehensive approach provides a nuanced picture of how public safety, or the lack thereof, shapes the lives of urban dwellers across Mexico (INEGI, 2021).

One of the ENSU's significant contributions is its investigation into the perception of insecurity. It is well acknowledged that these perceptions can have a profound negative impact on trust in institutions and affect the quality of life of the populace (INEGI, 2021) . By measuring incivilities and other local factors contributing to this sentiment, the ENSU offers invaluable insights into the variables that influence public feelings of safety or danger in their everyday environments (INEGI, 2021).

The ENSU data, rigorously anonymized to protect respondents' confidentiality, is made available in ASCII file formats that require specialized statistical software for analysis. These microdata files are essential for researchers and policymakers to understand and address the factors contributing to public safety perceptions (INEGI, 2021).

Microdata, which consist of individual records containing information on variables of interest, are pivotal in analyzing and interpreting the complex dynamics of public safety perceptions. The granularity of microdata allows researchers to dissect and understand the nuances of how individuals experience and perceive safety within their urban environments. The National Survey of Urban Public Safety (ENSU) by INEGI employs microdata to capture a wide array of variables that reflect the perceptions and experiences of the public regarding safety, incivilities, and crime in their cities (INEGI, 2021).

The detailed nature of microdata is particularly valuable when examining the influences on the public's sense of security. It enables the identification of patterns and correlations that might be obscured in more aggregated data. For instance, ENSU microdata can reveal how demographic variables like age and gender intersect with experiences of crime or observations of disorder, such as litter or vandalism, providing deeper insights into the societal and environmental factors that impact feelings of safety (INEGI, 2021).

Moreover, microdata are instrumental in understanding the behavior changes that individuals may adopt in response to their perceptions of insecurity. They offer a detailed view of the modifications in daily routines or the avoidance of certain areas due to fear of crime, which can significantly alter the social dynamics within urban spaces (INEGI, 2021).

The ENSU microdata files, made available in a structured ASCII format, contain individual responses that, while anonymized to maintain confidentiality, provide the raw, unaggregated data essential for robust statistical analysis. This level of detail is crucial for policymakers and practitioners who seek to design interventions and strategies that are responsive to the specific needs and conditions of different urban populations (INEGI, 2021)

The primary aim of this research is to harness the potential of microdata from the National Survey of Urban Public Safety (ENSU) to dissect and understand the subjective perceptions of safety among urban populations in Mexico. This study intends to leverage the detailed, individual-level data provided by ENSU to explore the factors that influence perceptions of safety and insecurity, and how these perceptions correlate with various demographic and socio-environmental factors. By doing so, this research endeavors to contribute to a more nuanced understanding of public safety and inform the development of targeted, evidence-based public policies and urban planning strategies.

This study seeks to navigate the depths of ENSU microdata to decipher the varied tapestry of public safety perceptions within urban locales, examining how these perceptions differ among diverse demographic groups. By dissecting the socio-environmental factors documented in the ENSU, the research aims to determine their relationship with the feelings of safety or insecurity experienced by urban residents. An exploration into how crime and antisocial behavior, as reported in the ENSU, shape both individual and communal perceptions of safety is central to this analysis. Moreover, the investigation will consider the extent to which fear-induced alterations in daily life activities mirror the wider social and economic currents in urban settings. A pivotal aspect of the study is to ascertain if a thorough analysis of the ENSU microdata can shed light on how gender dynamics influence the perception of safety within the public spaces of the city. These inquiries are integral to the study's broader objective: to intricately understand and address the complex web of factors that contribute to the mosaic of public safety perceptions in Mexico's urban centers, thereby informing more nuanced policy responses.

Studies on urban public safety perceptions

Understanding urban public safety perceptions has been a central theme in a broad array of academic inquiries, reflecting the complexity of how individuals perceive safety and security within their urban environments. Research in this area is diverse, employing a range of methodologies to capture the nuanced experiences and perceptions of urban residents.

Survey-based research, such as that conducted through the ENSU, provides a wealth of microdata for researchers to gauge public sentiments regarding safety. These surveys typically include questions about personal experiences with crime, observations of neighborhood conditions, and general feelings of safety or insecurity. The quantitative data derived from these surveys reflect the subjective feelings and objective realities of urban living, offering a broad overview of public safety perceptions across different demographics and locales.

Complementing these are in-depth qualitative studies that delve into the personal narratives and complex emotions surrounding public safety. Through interviews and focus groups, researchers uncover the psychological and emotional impacts of crime, and the perceived effectiveness of law enforcement and community safety measures. These studies provide depth and context to the statistical patterns observed in survey data, revealing the human stories behind the numbers.

Comparative analyses are also prevalent, with researchers conducting studies across different neighborhoods, cities, or countries to understand the diverse factors influencing public safety perceptions. These studies identify patterns and trends, highlighting how urban design, policing strategies, and social cohesion might impact feelings of safety in various contexts.

Longitudinal research tracks changes in public safety perceptions over time, helping to understand how events, policy changes, or shifts in social attitudes impact feelings of safety. This approach is particularly valuable in assessing the effectiveness of policy interventions and societal changes on public sentiment and behavior.

Lastly, the field of urban public safety perceptions benefits greatly from cross-disciplinary approaches. It's an area where criminology, sociology, urban planning, and psychology intersect, revealing how interconnected factors collectively influence perceptions of safety. From street lighting and urban design to social policies and community programs, a wide range of elements are considered in understanding and improving the public's sense of safety.

Previous use of ENSU data in research

The Encuesta Nacional de Seguridad Pública Urbana (ENSU) has been utilized in various statistical studies aimed at enriching national information related to government, public safety, and justice administration. The 2021 ENSU, in particular, has provided researchers with data to estimate public perceptions of urban safety and to measure the witnessing of criminal or antisocial behaviors that affect the population. This includes examining changes in activities and routines due to fear of crime, incidents of crime in the home, experiences of victimization, harassment, and sexual violence, all of which are essential aspects of understanding urban safety from a societal viewpoint.

Researchers have employed statistical software such as Stata to analyze ENSU data, which comes in various formats including CSV, DBF, DTA, Rdata, and SAV, to perform descriptive analysis by merging different databases provided by the ENSU microdata. These efforts have been instrumental in addressing key questions such as the influence of gender on the perception of safety or insecurity in parks, showcasing the ENSU's role in informing policy and urban planning by providing a data-driven foundation for understanding and addressing public safety concerns.

Methodology

The data management procedure was meticulous, involving the integration of three primary ENSU databases: the household information table, the sociodemographic table of household members, and the main questionnaire table. These databases were merged using Stata commands, ensuring that each table was properly aligned based on their relational keys. This merging was a critical step in creating a cohesive dataset that would allow for a comprehensive analysis of the variables of interest.

Following the integration, we performed a summary check to verify the contents of the new merged database. This step was the base to ensure that the data fusion had been successful and that the dataset was correctly structured for further analysis. To enhance the readability and interpretability of the data, a thorough labeling process was conducted.

This involved assigning descriptive labels to each variable and category based on the data structure documentation provided by INEGI. These labels were essential for making the data more accessible and for facilitating an accurate analysis of the responses.

The core of the analysis hinged on the use of contingency tables, which are instrumental in examining the relationships between two variables. In this case, the focus was set on exploring the influence of gender on the perception of safety or insecurity in urban parks. By cross-tabulating gender with the perceptions of safety, it is possible to scrutinize the association between these variables, thus addressing one of the primary research questions of our study.

The methodology adopted for this study reflected a rigorous approach to data management and analysis, with a focus on ensuring the integrity and clarity of the ENSU microdata. Through careful preparation and detailed examination of the dataset, the aim was to extract meaningful insights that would contribute to a deeper understanding of public safety perceptions within urban environments.

Results

ENSU Microdata with STATA

As a first step to obtain the data, the ENSU Microdata section was accessed at INEGI's website: https://www.inegi.org.mx/programas/ensu/#Microdatos.

The page shows the formats in which it is possible to download microdata, from the most recent database which is for the month of March 2022, and which are: CSV, DBF, DTA, Rdata and SAV, as shown in **Figure 1**.

In this case, the DTA format was downloaded for Stata.

Figure 1 Latest Microdatabases available for downloading
Source: INEGI, 2022

The file was then unzipped because it was downloaded as a .zip file, as shown in **Figure 2**.

Figure 2 ENSU microdata download file in .zip extension
Source: Self elaboration, 2022

Then a .pdf file was downloaded with the survey descriptors, as shown in **Figure 3**, unzipped as they were downloaded compressed in .zip as shown in **Figure 4**.

Figure 3 Survey descriptors download
Source: INEGI, 2022

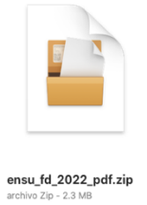

Figure 4 Descriptor file, download as .zip extension
Source: Self elaboration, 2022

The next step was to review the file with the descriptors, called "Database Structure" whose cover page is shown in **Figure 5.**

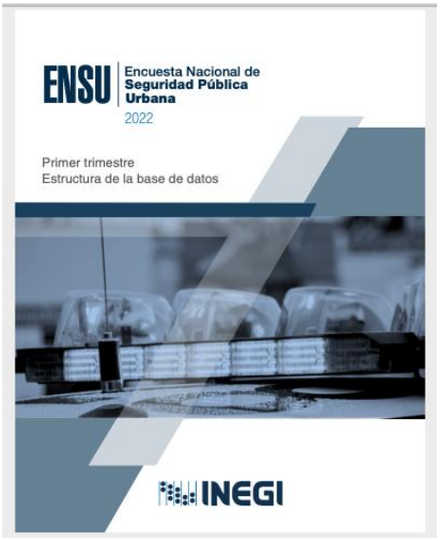

Figure 5 Cover page of the file "Database structure extension
Source: INEGI, 2022

The ENSU database, according to the INEGI document (2022), consists of 3 tables in which the information captured by the survey is distributed. The following is a list of the tables and the information contained in each one of them. The notation [mm][aa] in the name of the table indicates the two digits of the month and the last two digits of the corresponding year.

Table of housing information (ENSU_ VIV_[mm][yyy])

This table contains the general characteristics of the dwelling, as well as of the main household. In addition, it captures information on the data of the operating personnel and the final result of the interview.

Table of socio-demographic information of the members of the dwelling (ENSU_CS_ [mm][yyy])

This table contains information on the main sociodemographic characteristics of the resident population of the main household and identifies the population aged 18 and over, since the questions of the ENSU questionnaire are applied to the latter.

Main questionnaire table (ENSU_CB_ [mm]_[yyy])

This table contains information on the perception of the population 18 years of age and older about the public safety situation in the urban environment, conflicts or confrontations, government performance, as well as experiences of corruption in the performance of any payment, procedure and/or service. It should be noted that question 1.6 alternates: in the first and third quarters, the inquire is about the ways of finding out about public safety, while in the second and fourth quarters, about personal and household victimization. During the first quarter the frequency of mobility in the last three months is inquired.

Relationship between tables

The table ENSU_VIV_[mm][aa] is related to the table ENSU_CS_[mm][aa] through the primary key of ENSU_VIV_[mm][aa] formed by the fields: CVE_ENT + UPM + VIV_SEL

The description of such fields is as follows:
CVE_ENT = Federation Entity Key
PSU = Primary Sampling Unit
VIV_SEL = Selected dwelling

The table ENSU_CS_[mm][aa] is related to the table ENSU_CB_[mm][aa] through the primary key of ENSU_CB_[mm][aa] formed by the fields: CVE_ENT + UPM + VIV_SEL + R_SEL

The description of such fields is as follows:

CVE_ENT = Federation Entity Key

PSU = Primary Sampling Unit

VIV_SEL = Selected dwelling

R_SEL = Row of the selected person

Figure 6 below shows the relationship between the ENSU tables, using the entity-relationship model.

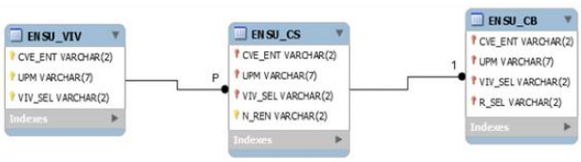

Figure 6 Entity-Relationship model
Source: INEGI, 2022

The entity number in the file, which corresponds to Saltillo, is 17. To continue, the Stata program was opened. In the File menu, the DTA file ENSU_CS was opened, as shown in **Figure 7**.

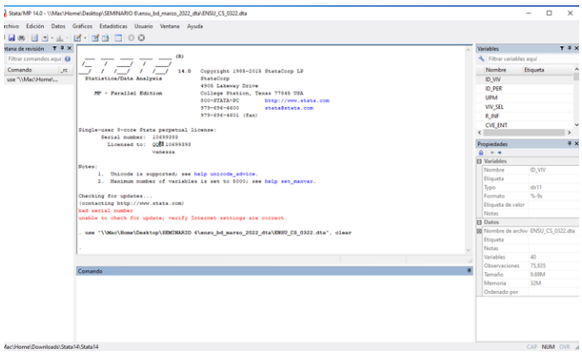

Figure 7 Stata interface to ENSU_CS database
Source: Self elaboration, 2022

Merging databases

As mentioned above, the ENSU has 3 databases: Table of housing information (ENSU_ VIV_[mm][yyy]) 2, table of socio-demographic information of household members (ENSU_CS_ [mm][yyy]), and table of the main questionnaire (ENSU_CB_ [mm]_[yyy]).

Based on the relationship between tables, the following tables were merged ENSU_VIV with ENSU_CS, ENSU_VIV being the key for the merging, and ENSU_CB with ENSU_CS, with ENSU_CB being the key for this merge.

The following commands were introduced in Stata, in order to open each of the 3 databases, save them with a different name to be able to identify them when merged with another database as shown in **Figure 8** and **Figure 9**, as well as in the syntax:

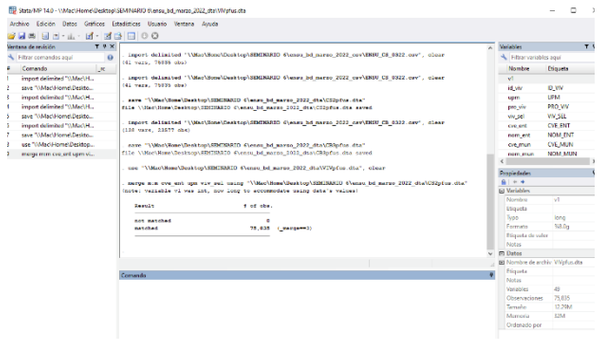

Figure 8 Stata procedure for merging databases
Source: Self elaboration, 2022

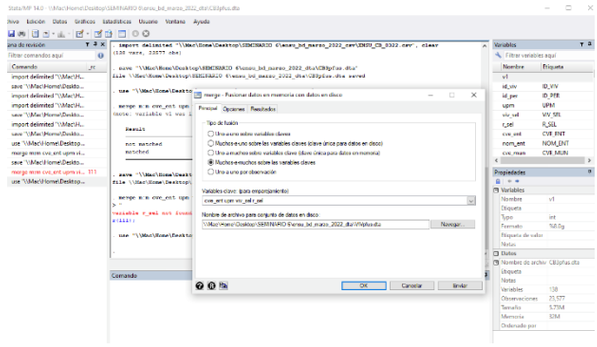

Figure 9 How to merge databases by means of a key with several variables
Source: Self elaboration, 2022

.import delimited "\\Mac\Home\Desktop\SEMINARIO 6\ensu_bd_marzo_2022_csv\ENSU_VIV_0322 .csv"
(29 vars, 23577 obs)

. save "\\Mac\Home\Desktop\SEMINARIO 6\ensu_bd_marzo_2022_dta\VIVpfus.dta"
file \\Mac\Home\Desktop\SEMINARIO 6\ensu_bd_marzo_2022_dta\VIVpfus.dta saved

. import delimited "\\Mac\Home\Desktop\SEMINARIO 6\ensu_bd_marzo_2022_csv\ENSU_CS_0322.c sv", clear
(41 vars, 75835 obs)

. import delimited "\\Mac\Home\Desktop\SEMINARIO 6\ensu_bd_marzo_2022_csv\ENSU_CS_0322.c sv", clear
(41 vars, 75835 obs)

. save "\\Mac\Home\Desktop\SEMINARIO 6\ensu_bd_marzo_2022_dta\CS2pfus.dta"
file \\Mac\Home\Desktop\SEMINARIO 6\ensu_bd_marzo_2022_dta\CS2pfus.dta saved

. import delimited "\\Mac\Home\Desktop\SEMINARIO 6\ensu_bd_marzo_2022_csv\ENSU_CB_0322.csv", clear
(138 vars, 23577 obs)

. save "\\Mac\Home\Desktop\SEMINARIO 6\ensu_bd_marzo_2022_dta\CB3pfus.dta"
file \\Mac\Home\Desktop\SEMINARIO 6\ensu_bd_marzo_2022_dta\CB3pfus.dta saved

. use "\\Mac\Home\Desktop\SEMINARIO 6\ensu_bd_marzo_2022_dta\VIVpfus.dta", clear

. merge m:m cve_ent upm viv_sel using "\\Mac\Home\Desktop\SEMINARIO 6\ensu_bd_marzo_2022_dta\CS2pfus.dta"
(note: variable v1 was int, now long to accommodate using data's values)

Result	# of obs.	
not matched	0	
matched	75,835	(_merge==3)

From the review in the data editor, it can be seen that the merging of the two databases has been satisfactory. See **Figure 10**.

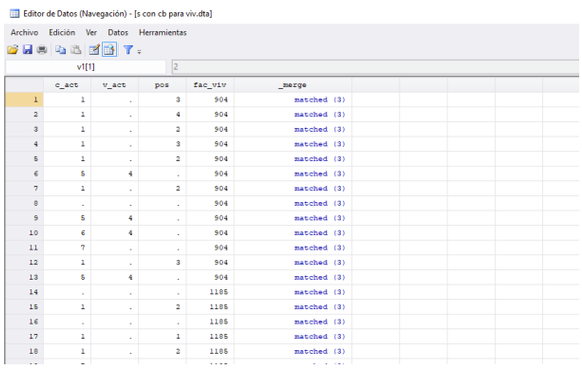

Figure 10 Variable generated by merging two tables
Source: Self elaboration, 2022

Once the databases have been merged, the file is saved as shown in **Figure 11** and in the syntax:
. save "\\Mac\Home\Desktop\SEMINARIO 6\ensu_bd_marzo_2022_dta\VIVpfus.dta", replace

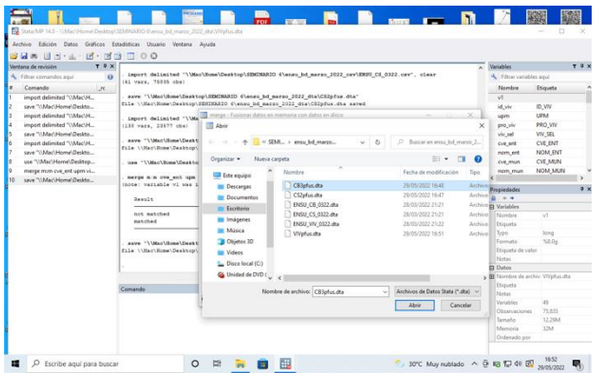

Figure 11 Variable generated by merging two table How to save a merged database in Stata
Source: Self elaboration, 2022

With the above, we have two merged databases, we proceed to merge the remaining database with the already merged file containing two previously merged databases, the following syntax was used:

file\\Mac\Home\Desktop\SEMINARIO 6\ensu_bd_marzo_2022_dta\VIVpfus.dta saved

. use "\\Mac\Home\Desktop\SEMINARIO 6\ensu_bd_marzo_2022_dta\CB3pfus.dta", clear

. merge m:m cve_ent upm viv_sel using "\\Mac\Home\Desktop\SEMINARIO 6\ensu_bd_marzo_2022_dta\CS2pfus.dta"
(note: variable v1 was int, now long to accommodate using data's values)

Result	# of obs.	
not matched	0	
matched	75,835	(_merge==3)

. save "\\Mac\Home\Desktop\SEMINARIO 6\ensu_bd_marzo_2022_dta\CS2pfus.dta", replace
file \\Mac\Home\Desktop\SEMINARIO 6\ensu_bd_marzo_2022_dta\CS2pfus.dta saved

. save "\\Mac\Home\Desktop\SEMINARIO 6\ensu_bd_marzo_2022_dta\s con cb para viv.dta"
file \\Mac\Home\Desktop\SEMINARIO 6\ensu_bd_marzo_2022_dta\s con cb para viv.dta saved

```
. use "\\Mac\Home\Desktop\SEMINARIO
6\ensu_bd_marzo_2022_dta\VIVpfus.dta",
clear
r(110);

. merge m:m cve_ent upm viv_sel using
"\\Mac\Home\Desktop\SEMINARIO
6\ensu_bd_marzo_2022_dta\CB3pfus.dta", gen
> erate(_merge2)

    Result                      # of obs.
    -----------------------------------------
    not matched                         0
    matched                        75,835
(_merge2==3)
    -----------------------------------------
```

With this the 3 databases were merged into one, the one that was used first, which is the key, as shown in Figure 12 and Figure 13.

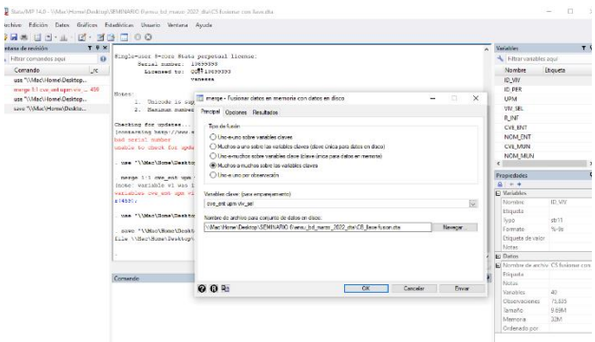

Figure 12 *Merging a previously merged database.* Source: Self elaboration, 2022.

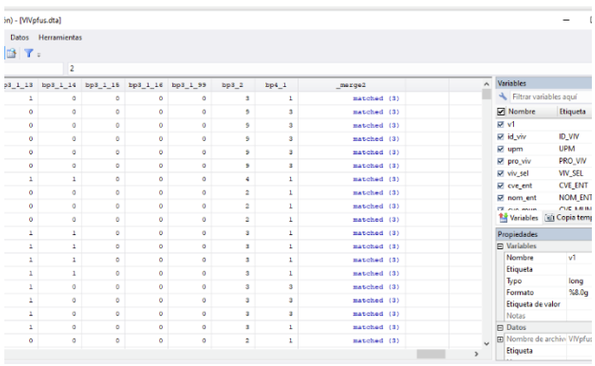

Figure 13 *Data editor with database merged with another database.* Source: Self elaboration, 2022.

Afterwards, a summary of the data was made to see the content of the new database generated and where the mergers of the two databases previously merged to form the new one can be observed, as shown in the syntax:

```
. sumarize
command sumarize is unrecognized
r(199);

. sum

Variable |       Obs        Mean    Std. Dev.
Min        Max
-------------+---------------------------------------
--------------
v1 |    75,835    11882.96    6787.768         1
23577
id_viv |    75,835     1532985    815754.5
100071    3201159
id_per |         0
upm |    75,835     1532985    815754.5
100071    3201159
viv_sel |    75,835    2.996281    1.419402
1         5
-------------+---------------------------------------
--------------
r_sel |    75,835    2.052759    1.344188         1
14
cve_ent |    75,835    15.27669    8.170077
1         32
nom_ent |         0
cve_mun |    75,835    35.67581    43.11864
1         553
nom_mun |         0
-------------+---------------------------------------
--------------
loc |    75,835    7.191838    45.90177         0
1599
cd |    75,835    50.08464    27.61377         1
96
nom_cd |         0
per |    75,835         122           0       122
122
r_def |    75,835           1           0         1         1
-------------+---------------------------------------
--------------
h_mud |    75,835    .0438979    .2275574
0         3
s_mud |    75,835    .6404958    .5864583
0         4
tipo_cuest |         0
n_ent |    75,835    2.990624    1.410293         1
5
sexo |    75,835    1.559043     .496505         1
2
-------------+---------------------------------------
--------------
edad |    75,835    42.99316    16.03544        18
98
bp1_1 |    75,835    1.653761    .5825324
1         9
bp1_2_01 |    75,835     1.20476    .4266562
1         9
bp1_2_02 |    75,835    1.795226    .8836877
1         9
```

bp1_2_03	75,835	1.590769	.5552989	1 9
bp1_2_04	75,835	2.923254	.7369165	1 9
bp1_2_05	75,835	1.68206	.7522692	1 9
bp1_2_06	75,835	1.458904	.6852451	1 9
bp1_2_07	75,835	1.800435	.7265039	1 9
bp1_2_08	75,835	1.94339	.6880422	1 9
bp1_2_09	75,835	2.003112	.794936	1 9
bp1_2_10	75,835	1.459234	.6781657	1 9
bp1_2_11	75,835	1.658983	.7242149	1 9
bp1_2_12	75,835	1.784097	.8562597	1 9
bp1_3	75,835	2.698569	1.335342	1 9
bp1_4_1	75,835	1.606013	.6108709	1 9
bp1_4_2	75,835	1.393881	.5830183	1 9
bp1_4_3	75,835	1.494758	.606736	1 9
bp1_4_4	75,835	1.765451	.6058924	1 9
bp1_4_5	75,835	1.704635	.9736833	1 9
bp1_4_6	75,835	1.644359	.6138847	1 9
bp1_4_7	75,835	2.057322	.8111155	1 9
bp1_4_8	75,835	1.960084	.8967166	1 9
bp1_5_1	75,835	1.518441	.5963485	1 9
bp1_5_2	75,835	1.571847	.5842218	1 9
bp1_5_3	75,835	1.70962	.5200383	1 9
bp1_5_4	75,835	1.86319	.7926795	1 9
bp1_5_5	75,835	2.30482	.8399946	1 9
bp1_6_01	75,835	.5482033	.4976743	0 1
bp1_6_02	75,835	.1731654	.3783927	0 1
bp1_6_03	75,835	.6064218	.4885464	0 1
bp1_6_04	75,835	.0498978	.2177352	0 1
bp1_6_05	75,835	.2002242	.4001707	0 1
bp1_6_06	75,835	.0208215	.1427874	0 1
bp1_6_07	75,835	.0866223	.2812826	0 1
bp1_6_08	75,835	.5995385	.4899952	0 1
bp1_6_09	75,835	.209758	.4071385	0 1
bp1_6_10	75,835	.097699	.2969091	0 1
bp1_6_11	75,835	.2154414	.4111309	0 1
bp1_6_12	75,835	.0068966	.0827592	0 1
bp1_6_13	75,835	.002334	.0482555	0 1
bp1_6_99	75,835	.0023472	.0483913	0 1
bp1_7_1	75,835	1.519773	.8094822	1 9
bp1_7_2	75,835	1.22727	.481397	1 9
bp1_7_3	75,835	1.150115	.4320403	1 9
bp1_7_4	75,835	1.088732	.3516962	1 9
bp1_7_5	75,835	1.201648	.4951487	1 9
bp1_8_1	50,014	2.722078	1.031708	1 9
bp1_8_2	59,132	2.643357	1.189377	1 9
bp1_8_3	65,011	2.20958	1.47597	1 9

bp1_8_4	69,512	1.888552	1.271841	1	9
bp1_8_5	61,341	1.874619	1.521194	1	9
bp1_9_1	50,014	2.707682	.9916403	1	9
bp1_9_2	59,132	2.638639	1.108576	1	9
bp1_9_3	65,011	2.142376	1.27722	1	9
bp1_9_4	69,512	1.870166	1.114454	1	9
bp1_9_5	61,341	1.852334	1.393827	1	9
bp2_1	75,835	1.625199	.5299536	1	9
bp2_2_01	28,864	.3378603	.4729889	0	1
bp2_2_02	28,864	.1293307	.3355714	0	1
bp2_2_03	28,864	.3047395	.460305	0	1
bp2_2_04	28,864	.0374861	.1899531	0	1
bp2_2_05	28,864	.2478866	.4317931	0	1
bp2_2_06	28,864	.1238567	.3294237	0	1
bp2_2_07	28,864	.0596244	.2367938	0	1
bp2_2_08	28,864	.1618972	.3683628	0	1
bp2_2_09	28,864	.200492	.4003754	0	1
bp2_2_10	28,864	.1388927	.3458406	0	1
bp2_2_11	28,864	.0920524	.2891049	0	1
bp2_2_12	28,864	.0255682	.1578459	0	1
bp2_2_13	28,864	.0470136	.2116716	0	1
bp2_2_14	28,864	.1065341	.3085253	0	1
bp2_2_15	28,864	.1250346	.3307639	0	1
bp2_2_16	28,864	.0665535	.2492514	0	1
bp2_2_17	28,864	.01074	.1030778	0	1
bp2_2_18	28,864	.1335227	.3401447	0	1
bp2_3_1	25,010	.1142343	.5554046	0	9
bp2_3_2	25,010	.7568972	.625537	0	9
bp2_3_3	25,010	.0552579	.5094035	0	9
bp2_3_4	25,010	.3160336	.6507307	0	9
bp2_3_5	25,010	.1823271	.5969717	0	9
bp2_3_6	25,010	.0641743	.517053	0	9
bp2_3_7	25,010	.0340664	.4900944	0	9
bp2_4_01	25,010	.2602559	.4387829	0	1
bp2_4_02	25,010	.2395442	.4268138	0	1
bp2_4_03	25,010	.0295882	.1694516	0	1
bp2_4_04	25,010	.0397041	.1952671	0	1
bp2_4_05	25,010	.0068373	.0824062	0	1
bp2_4_06	25,010	.0017193	.0414298	0	1
bp2_4_07	25,010	.0010796	.0328397	0	1
bp2_4_08	25,010	.0252299	.1568258	0	1
bp2_4_09	25,010	.4683727	.4990087	0	1
bp2_4_10	25,010	.1786086	.3830319	0	1
bp2_4_11	25,010	.0187125	.1355105	0	1
bp3_1_01	75,835	.5407002	.498344	0	1
bp3_1_02	75,835	.3169776	.4653017	0	1
bp3_1_03	75,835	.4060131	.4910903	0	1

```
bp3_1_04 |    75,835    .1865102    .3895204
0        1
bp3_1_05 |    75,835    .5876574    .4922595
0        1
bp3_1_06 |    75,835     .27275    .4453763
0        1
-------------+---------------------------------------
--------------
bp3_1_07 |    75,835    .1382343     .345148
0        1
bp3_1_08 |    75,835    .4207424    .4936815
0        1
bp3_1_09 |    75,835    .0572559    .2323324
0        1
bp3_1_10 |    75,835    .7613107    .4262852
0        1
bp3_1_11 |    75,835    .3645414    .4813045
0        1
-------------+---------------------------------------
--------------
bp3_1_12 |    75,835    .5345553    .4988078
0        1
bp3_1_13 |    75,835    .3528582    .4778622
0        1
bp3_1_14 |    75,835    .3633283    .4809614
0        1
bp3_1_15 |    75,835    .0102591    .1007671
0        1
bp3_1_16 |    75,835    .0157711    .1245896
0        1
-------------+---------------------------------------
--------------
bp3_1_99 |    75,835     .001345    .0366502
0        1
bp3_2 |    74,537     2.94977    .9175371        1
9
bp4_1 |    75,835    1.782752    1.126794
1        9
fac_sel |    75,835    2212.092    2111.538
38     41469
dominio |         0
-------------+---------------------------------------
--------------
est |    75,835    2.624672    .7591174        1
4
upm_dis |    75,835    27092.53    15535.73
10     54000
est_dis |    75,835    1375.959    803.9109
10      2740
r_inf |    75,835     2.00265    1.295575        1
14
n_ren |    75,835    2.735096    1.768148        1
19
-------------+---------------------------------------
--------------
nom |         0
c_res |    59,734    1.084675    .4027202        1
3
paren |    75,835    2.486082    1.325617        1
6
nac_d |    14,382    17.03776    14.06581
1        99
nac_m |    14,382    8.209846    12.79087
1        99
-------------+---------------------------------------
--------------
cod |    56,375    1.581783    .4932706        1
2
cod_sel |         0
i_niv |    73,297    4.489774    2.615157        0
9
i_anio |    70,186    3.429829    1.426816
1        6
a_esc |    73,297    1.732008    .4761679        1
9
-------------+---------------------------------------
--------------
c_act |    56,375    2.620754    2.260659        1
8
v_act |    19,825     3.73367     .79527        1
4
pos |    38,058    2.317568    .5983632        1
5
fac_viv |    75,835    774.0074    603.5436
29     13800
_merge |    75,835           3           0           3
3
```

The interest, for this exercise, is to know the perception of insecurity by gender, so it is necessary to use the ENSU_CB and ENSU_CS databases, which although they are already merged for practical purposes of this exercise, it is important to know in order to be able to consult the nomenclatures of the results.

ENSU_CS database

Gender data were obtained from the ENSU_CS database (Page 15). The tabular command sex was applied to know the number of people in the survey by gender, as shown below:

```
. tab sexo

      SEXO |      Freq.     Percent        Cum.
-----------+-----------------------------------
         1 |     36,585       48.24       48.24
         2 |     39,250       51.76      100.00
-----------+-----------------------------------
     Total |     75,835      100.00
```

A pie chart was generated for the sex variable:

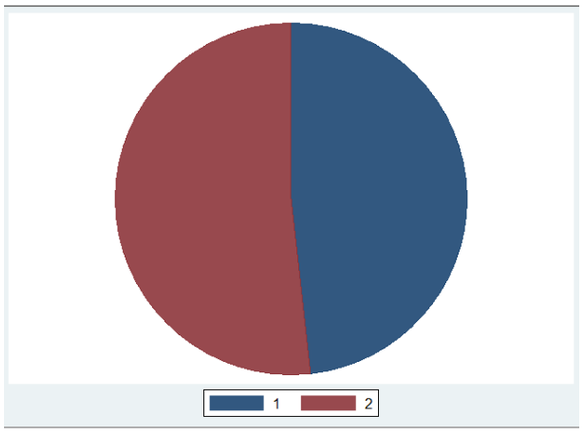

Figure 14 Pie chart for the variable "gender"
Source: Self elaboration, 2022

To read the graph, the database structure file was consulted and the required nomenclature was found. See **Figure 15.**

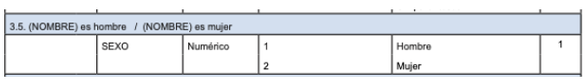

Figure 15 Data for categories
Source: Self elaboration, 2022

As a result of the tabulation and the graph, the data shows that 48.24% of the respondents were male and 51.76% female.

ENSU_C database

From the ENSU_C database (Page 19), question 1.2: In terms of crime, tell me if in (PLACE) you feel safe or unsafe. The options are shown in **Table 1**. with their keys or mnemonics were. Possible answers are shown in **Table 2**.

Question	Mnemonic
Your home	BP1_2_01
Your work	BP1_2_02
The streets you usually use	BP1_2_03
Your school	BP1_2_04
The market	BP1_2_05
The shopping mall	BP1_2_06
The bank	BP1_2_07
The ATM located on the public street	BP1_2_08
Public transportation	BP1_2_09
The automobile	BP1_2_10
The road	BP1_2_11
Recreational park or recreation center	BP1_2_12

Table 1 Response options for ENSU question 1.2
Source: Self elaboration, 2022

1	Secure
2	Insecure
3	Not applicable
9	Don't know/no answer

Table 2 Response options for ENSU question 1.2
Source: Self elaboration, 2022

All the variables in the previous question were tabulated in frequencies:

```
. tab bp1_2_01

BP1_2_01 |      Freq.     Percent        Cum.
------------+-----------------------------------
1 |     60,489       79.76       79.76
2 |     15,320       20.20       99.97
9 |         26        0.03      100.00
------------+-----------------------------------
Total |     75,835      100.00

. tab bp1_2_02

  BP1_2_02 |      Freq.     Percent        Cum.
------------+-----------------------------------
         1 |     37,725       49.75       49.75
         2 |     16,268       21.45       71.20
         3 |     21,783       28.72       99.92
         9 |         59        0.08      100.00
------------+-----------------------------------
     Total |     75,835      100.00

. tab bp1_2_03

  BP1_2_03 |      Freq.     Percent        Cum.
------------+-----------------------------------
         1 |     32,089       42.31       42.31
         2 |     43,111       56.85       99.16
         3 |        565        0.75       99.91
         9 |         70        0.09      100.00
------------+-----------------------------------
     Total |     75,835      100.00

. tab bp1_2_04

  BP1_2_04 |      Freq.     Percent        Cum.
------------+-----------------------------------
         1 |      4,359        5.75        5.75
         2 |        972        1.28        7.03
         3 |     69,859       92.12       99.15
         9 |        645        0.85      100.00
------------+-----------------------------------
     Total |     75,835      100.00

. tab bp1_2_05
```

```
  BP1_2_05 |      Freq.     Percent        Cum.
------------+-----------------------------------
         1 |     34,007       44.84       44.84
         2 |     32,886       43.37       88.21
         3 |      8,783       11.58       99.79
         9 |        159        0.21      100.00
------------+-----------------------------------
     Total |     75,835      100.00
```

```
. tab bp1_2_06
```

```
  BP1_2_06 |      Freq.     Percent        Cum.
------------+-----------------------------------
         1 |     46,504       61.32       61.32
         2 |     24,695       32.56       93.89
         3 |      4,497        5.93       99.82
         9 |        139        0.18      100.00
------------+-----------------------------------
     Total |     75,835      100.00
```

```
. tab bp1_2_07
```

```
  BP1_2_07 |      Freq.     Percent        Cum.
------------+-----------------------------------
         1 |     25,961       34.23       34.23
         2 |     39,941       52.67       86.90
         3 |      9,784       12.90       99.80
         9 |        149        0.20      100.00
------------+-----------------------------------
     Total |     75,835      100.00
```

```
. tab bp1_2_08
```

```
  BP1_2_08 |      Freq.     Percent        Cum.
------------+-----------------------------------
         1 |     16,606       21.90       21.90
         2 |     47,948       63.23       85.12
         3 |     11,109       14.65       99.77
         9 |        172        0.23      100.00
------------+-----------------------------------
     Total |     75,835      100.00
```

```
. tab bp1_2_09
```

```
  BP1_2_09 |      Freq.     Percent        Cum.
------------+-----------------------------------
         1 |     19,139       25.24       25.24
         2 |     38,665       50.99       76.22
         3 |     17,807       23.48       99.70
         9 |        224        0.30      100.00
------------+-----------------------------------
     Total |     75,835      100.00
```

```
. tab bp1_2_10
```

```
  BP1_2_10 |      Freq.     Percent        Cum.
------------+-----------------------------------
         1 |     46,868       61.80       61.80
         2 |     23,726       31.29       93.09
         3 |      5,138        6.78       99.86
         9 |        103        0.14      100.00
------------+-----------------------------------
     Total |     75,835      100.00
```

```
. tab bp1_2_11
```

```
  BP1_2_11 |      Freq.     Percent        Cum.
------------+-----------------------------------
         1 |     33,174       43.74       43.74
         2 |     36,506       48.14       91.88
         3 |      5,962        7.86       99.75
         9 |        193        0.25      100.00
------------+-----------------------------------
     Total |     75,835      100.00
```

```
. tab bp1_2_12
```

```
  BP1_2_12 |      Freq.     Percent        Cum.
------------+-----------------------------------
         1 |     32,063       42.28       42.28
         2 |     29,708       39.17       81.45
         3 |     13,793       18.19       99.64
         9 |        271        0.36      100.00
------------+-----------------------------------
     Total |     75,835      100.00
```

Labeling of variables

The above tables show that the data do not have labels to be able to read the data easily, so the document containing the INEGI data structure (2022) was consulted and the labels corresponding to the variables were placed.

```
. label variable bp1_2_01 "su casa"

. label variable bp1_2_02 "su trabajo"
```

A frequency table was then generated to test whether the command worked or not:

```
. tab bp1_2_01
```

```
   su casa |      Freq.     Percent        Cum.
------------+-----------------------------------
         1 |     60,489       79.76       79.76
         2 |     15,320       20.20       99.97
         9 |         26        0.03      100.00
------------+-----------------------------------
     Total |     75,835      100.00
```

The command was tested to see if it had worked and the labels continued to be applied to each variable of the chosen question. See **Figure 16** and syntax:

. label variable bp1_2_03 "las calles que habitualmente usa"

. label variable bp1_2_04 "la escuela"

. label variable bp1_2_05 "el mercado"

. label variable bp1_2_06 "el centro comercial"

. label variable bp1_2_07 "el banco"

. label variable bp1_2_08 "el cajero automático localizado en la vía"

. label variable bp1_2_08 "el cajero vía pública"

. label variable bp1_2_09 "transporte público"

. label variable bp1_2_10 "automóvil"

. label variable bp1_2_11 "la carretera"

. label variable bp1_2_09 "el transporte público"

. label variable bp1_2_10 "el automóvil"

. label variable bp1_2_12 "el parque recreativo o centro recreativo"

. label variable bp1_2_12 "el parque recreativo"

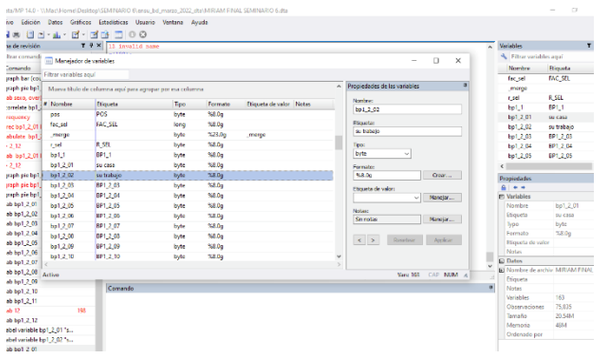

Figure 16 Variable handler for manual editing
Source: Self elaboration, 2022.

Based on the question to be solved, and knowing the names of the variables, it was decided to work only with the variable bp1_2_12, which is the one that corresponds to parks; the other variables of the question were discarded for this work.

Category labeling

The next step was to label the categories of the variables for the study in order to identify what each response refers to. In Stata, the commands label define and label values were used to obtain the corresponding labels, as shown in **Figure 17**, **Figure 18** and **Figure 19**.

. use "\\Mac\Home\Desktop\SEMINARIO 6\ensu_bd_marzo_2022_dta\MIRIAM FINAL SEMINARIO 6.dta", clear

. label define bp1_2_12 1"seguro o segura" 2"inseguro o insegura" 3"no aplica" 9"no sabe o no responde"

. label values bp1_2_12 bp1_2_12

. tab bp1_2_12

tab bp1_2_12

el parque recreativo	Freq.	Percent	Cum.
seguro o segura	32,063	42.28	42.28
inseguro o insegura	29,708	39.17	81.45
no aplica	13,793	18.19	99.64
9	271	0.36	100.00
Total	75,835	100.00	

Figure 17 Table of frequencies for question 2.1 of the ENSU
Source: Self elaboration, 2022

The table above shows that 42.28% of respondents feel safe in recreational parks, 39.17% feel unsafe.

. label define sexo 1"Hombre" 2"Mujer"

. label values sexo sexo

. tab sexo

SEXO	Freq.	Percent	Cum.
Hombre	36,585	48.24	48.24
Mujer	39,250	51.76	100.00
Total	75,835	100.00	

Figure 18 Frequency table for the ENSU variable "gender"
Source: Self elaboration, 2022.

Regarding the gender variable, 48.24% of the respondents were male and 51.76% female.

. tab sexo bp1_2_12

SEXO	el parque recreativo seguro o	inseguro	no aplica	9	Total
Hombre	15,965	13,922	6,567	131	36,585
Mujer	16,098	15,786	7,226	140	39,250
Total	32,063	29,708	13,793	271	75,835

Figure 19 Frequencies of perception of safety in parks by gender
Source: Self elaboration, 2022.

A frequency table was also generated with the two variables, resulting in 15,965 men feeling safe in parks and 13,922 feeling unsafe, while 16,098 women feel safe in these spaces and 15,786 feel unsafe.

The above information at a glance and without inferential analysis, that there is a tendency for women to feel safe, but also unsafe in recreational parks.

Contingency tables

Contingency tables are useful to see relationships between two variables, so that the question posed for the present study can be answered: Does gender have an influence on the perception of safety or insecurity in parks?

tab sexo bp1_2_12, row

Key
frequency *row percentage* *column percentage*

SEXO	el parque recreativo seguro o	inseguro	no aplica	no sabe o	Total
Hombre	15,965	13,922	6,567	131	36,585
	43.64	38.05	17.95	0.36	100.00
	49.79	46.86	47.61	48.34	48.24
Mujer	16,098	15,786	7,226	140	39,250
	41.01	40.22	18.41	0.36	100.00
	50.21	53.14	52.39	51.66	51.76
Total	32,063	29,708	13,793	271	75,835
	42.28	39.17	18.19	0.36	100.00
	100.00	100.00	100.00	100.00	100.00

Figure 20 Contingencies with frequencies in percentages for the variable perception of safety in parks and gender
Source: Self elaboration, 2022.

When reading **Figure 20**, it can be seen that if the data were arranged differently, a different reading would be obtained, so to answer the question of whether gender has an influence on the perception of security or insecurity in parks, it is necessary to invert the data in the columns and rows.

The contingency table presented in **Figure 21** was generated, showing frequencies and percentages that give another reading, since it indicates that gender influences the perception of security in parks.

. tab sexo bp1_2_12, col row

Key
frequency *row percentage* *column percentage*

el parque recreativo	SEXO Hombre	Mujer	Total
seguro o segura	15,965	16,098	32,063
	49.79	50.21	100.00
	43.64	41.01	42.28
inseguro o insegura	13,922	15,786	29,708
	46.86	53.14	100.00
	38.05	40.22	39.17
no aplica	6,567	7,226	13,793
	47.61	52.39	100.00
	17.95	18.41	18.19
no sabe o no responde	131	140	271
	48.34	51.66	100.00
	0.36	0.36	0.36
Total	36,585	39,250	75,835
	48.24	51.76	100.00
	100.00	100.00	100.00

Figure 21 *Contingencies with frequencies in percentages for gender variable with perception of safety in parks.*Source: Self elaboration, 2022.

Graphs

For this type of variables, the most convenient is to make a bar chart. A bar chart was generated by means of the syntax:

. graph bar (count), over(sexo) over(bp1_2_12)
. graph bar (count), over(sexo) over(bp1_2_12) ytitle(Frecuencias) title("Percepción de seguridad o inseguridad en parques por género")

In both cases the resulting graph is the same as shown in **Figure 22**.

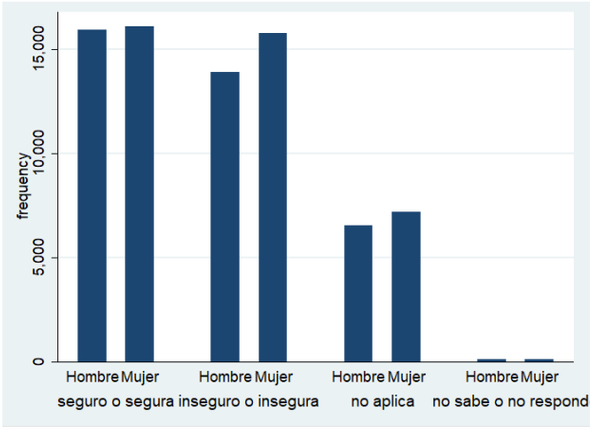

Figure 22 *Frequencies of gender and perception variables in parks*
Source: Self elaboration, 2022

Pearson's Chi-square test

This test evaluates, by means of a comparison of proportions, the association between two categorical or qualitative variables by means of observed versus expected frequencies.

In this case, two categorical variables were analyzed: sex and perception of safety in parks (bp_2_12).

The following path was followed in Stata. See **Figure 23** and **Figure 24**.

1. Statistics
2. Summaries, tables, and statistical tests
3. Frequency tables
4. Contingency tables with measures of association

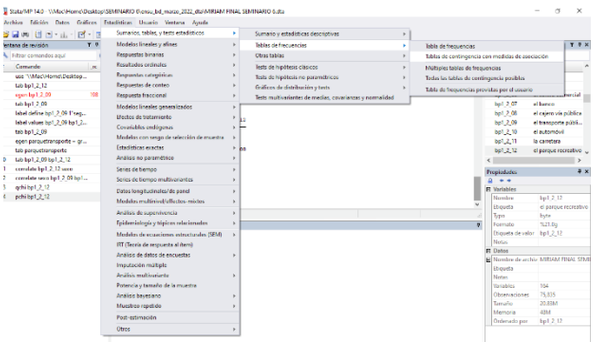

Figure 23 Path for making contingency tables with measures of association
Source: Self elaboration, 2022

The null hypothesis was stated that both variables are independent. Alternate hypothesis, the variables were associated by obtaining a P value lower than P= 0.05, the null hypothesis was rejected, leaving the alternate hypothesis, indicating that the variables are dependent on each other, or that they show an association, as shown in **Figure 24** and **Figure 25**.

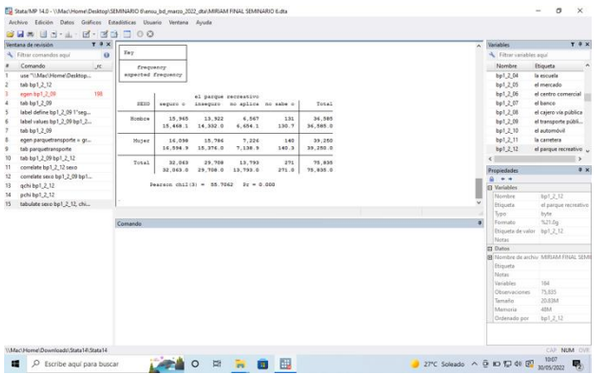

Figure 24 Pearson's Chi-square test for the variables "gender" and "perception of security or insecurity in parks"
Source: Self elaboration, 2022.

Key

frequency
expected frequency

SEXO	el parque recreativo: seguro o	inseguro	no aplica	no sabe o	Total
Hombre	15,965	13,922	6,567	131	36,585
	15,468.1	14,332.0	6,654.1	130.7	36,585.0
Mujer	16,098	15,786	7,226	140	39,250
	16,594.9	15,376.0	7,138.9	140.3	39,250.0
Total	32,063	29,708	13,793	271	75,835
	32,063.0	29,708.0	13,793.0	271.0	75,835.0

Pearson chi2(3) = 55.7062 Pr = 0.000

Figure 25 Pearson's Chi-square test
Source: Self elaboration, 2022

The differences between the proportions observed between the two variables are statistically significant, indicating that gender has an influence on whether a park is safe or unsafe for users.

Acknowledgements

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Your steadfast encouragement and guidance have been pivotal, and your dedication to academic excellence remains a driving force behind this scholarly work.

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Conclusions

The comprehensive analysis conducted utilizing Stata for data management proved to be highly beneficial and efficient. This advanced statistical software facilitated the merging of databases, and the creation of frequency and contingency tables, as well as the labeling of variables and categories. It also proved instrumental in generating relevant graphics and conducting statistical analyses tailored to the variable types. Through the detailed examination of three separate databases, this study focused on two specific variables from the ENSU: gender, as recorded in one database, and the availability of recreational parks, as recorded in another. The investigation sought to determine whether gender impacts individuals' perceptions of safety or insecurity in park areas.

The findings confirm that gender indeed plays a significant role in shaping perceptions of safety or insecurity in recreational parks. This outcome underscores the importance of considering gender perspectives in the development and management of urban recreational spaces to ensure they meet the safety expectations and needs of all users.

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Knowledge management in the public sector: a model with structural equations

Gestión del conocimiento en el sector público: un modelo con ecuaciones estructurales

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Abstract

This study aims to answer the research question: what is the relationship between Knowledge Management (KM), Organizational Learning (OL), and Intellectual Capital (IC) in the public sector? Its purpose is to propose a theoretically supported innovative model and to confirm its validity in the context studied through an empirical test with multivariate statistics. The research type is quantitative, non-experimental, descriptive, explanatory, correlational, and cross-sectional. The simple random sample consisted of 296 employees of the public social assistance sector in the state of Jalisco, Mexico. Through the use of Structural Equation Modeling (SEM), the model and the hypotheses were tested. The findings show a significant relationship between the model variables: OL and KM; CI and KM; CI and OL, too. This research built an innovative theoretical model for the sector studied, with standardized adjustment indexes within statistical parameters and valid and reliable indicators, highlighting the importance of knowledge as an added value in public institutions, and its play an important role in improving and innovating public sector performance to respond to the citizens' demands for their wellbeing.

Knowledge, Intellectual capital, Organizational learning

Resumen

Este estudio pretende responder a la pregunta de investigación: ¿cuál es la relación entre la Gestión del Conocimiento (GC), el Aprendizaje Organizativo (AA) y el Capital Intelectual (CI) en el sector público? Su propósito es proponer un modelo innovador sustentado teóricamente y confirmar su validez en el contexto estudiado mediante una prueba empírica con estadística multivariante. El tipo de investigación es cuantitativo, no experimental, descriptivo, explicativo, correlacional y transversal. La muestra aleatoria simple estuvo conformada por 296 empleados del sector público de asistencia social del estado de Jalisco, México. Mediante el uso del Modelo de Ecuaciones Estructurales (SEM), se probaron el modelo y las hipótesis. Los resultados muestran una relación significativa entre las variables del modelo: OL y KM; CI y KM; CI y OL, también. Esta investigación construyó un modelo teórico innovador para el sector estudiado, con índices de ajuste estandarizados dentro de parámetros estadísticos e indicadores válidos y confiables, resaltando la importancia del conocimiento como valor agregado en las instituciones públicas, y su importante papel en la mejora e innovación del desempeño del sector público para responder a las demandas de los ciudadanos para su bienestar.

Conocimiento, Capital intelectual, Aprendizaje organizacional

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Introduction

Since public institutions are places where a lot of knowledge is generated and consumed. Likewise exist its responsibility and commitment to respond to citizens' demands and the institutional objectives proposed since the creation of these instances. It implies identifying as raw material the intangible assets by public servants, such as knowledge, learning, and intellectual capital. This research explains through a multivariate analysis the existing relationships between Knowledge Management (KM), Organizational Learn-ing (OL), and Intellectual Capital (IC) in this sector.

Furthermore, the public sector faces challenges greats in the knowledge economy, stemming from the knowledge is a determining factor in its competitiveness. Moreover, this sector must be subject to the citizens´ new demands, which implies adequate management of intangible assets representing a competitive advantage. Added to this is the frequent retirement of employees and the abundant transfer of knowledge workers among the various government departments (Sánchez et al. 2010; Sarmiento and Roman 2011).

Also, this leads to the loss of the most valuable resource of institutions, such as knowledge, which impacts organizational learning and intellectual capital. Therefore, knowledge management implies articulated actions that consider the various stakeholders according to citizens´ requirements for the public institutions´ improvement with knowledge generation and retention (Huerta-Chávez 2021). In addition, there is a lack of teamwork to support knowledge exchange, inadequate documentation to preserve organizational memory, and little or no training for successful management implementation (Aladwan et al. 2022).

Now, after reviewing the state of the art, in addition to the problems described, regarding the responsibility and challenges faced by the sector. It is possible to state that the public sector lacks sufficient studies to explain the impact of knowledge management, organizational learning, and intellectual capital together.

Consequently, it generates knowledge gaps due to the prevalence of isolated studies which, in their methodologies, focus on management informants, necessitating the inclusion of middle and operational managers who have direct contact with citizens in the provision of public services.

Synthesizing, the new public management, the knowledge economy, and the public sector´s duty consist in providing its services and solving citizens´ demands. It implies worrying about how knowledge, organizational learning, and intellectual capital generating. Also, it involves identifying what happens within the organization to generate a theoretical, practical, and methodological contribution, whose applicability in the sector leads to findings to describe and explain the behavior and interactions of the constructs under study.

Based on the above, to contribute to knowledge and innovation theory, the problem is formulated from the following question:

> What is the relationship between Knowledge Management (KM), Organizational Learning (OL), and Intellectual Capital (IC) in Jalisco public sector?

For this, it is possible to establish the main aim: Evaluate the relationship between Knowledge Management (KM), Organizational Learning (OL), and Intellectual Capital (IC) in the public sector in Jalisco. In order to influence the problem, the central hypothesis is established as follows:

> H_0: There is no significant relationship between Knowledge Management (KM), Organizational Learning (OL), and Intellectual Capital (IC) in the public sector in Jalisco.
>
> H_a: There is a significant relationship between Knowledge Management (KM), Organizational Learning (OL), and Intellectual Capital (IC) in the public sector in Jalisco.

This article is composed of ten sections, which are described below, in order to clarify the content of each one of them. In the first section, there is an introduction to the research topic, the problem to be solved, the hypothesis, the added value of the technique used and the generalities of the research.

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In the second section, the literature review is presented, including an overview of the theory supporting the research and hypothesis. In this same sense, the third section details materials and methods, including study design, sample, research instrument and data analysis. The fourth section includes the results. In the fifth section includes the discussion, with SEM, as well as the discussion in the light of the supporting theory. The sixth section includes the annexes, where the instrument used is included.

The seventh section includes the acknowledgements to the participating. The eighth section shows the source of financing for the research work. The ninth section presents the conclusions and recommendations, where the main findings, contributions and future research directions are presented. Finally, the ten section lists the references of the authors who contribute directly to this study.

Theoretical framework and hypothesis

Organizational learning and knowledge management

Easterby-Smith and Lyles (2003), have theorized the relationship between OL and KM. In this regard, they considered that KM focuses on knowledge content, while OL em-phasizes the knowledge process that a company obtains, produces, manages, and finally uses. Meanwhile, Ho (2008) conducted an empirical study in Taiwan and collected survey data to test the relationships among the four dimensions expressed in the proposed structural equation model. The results showed that self-directed learning directly and sig-nificantly impacts OL and KM capability. Furthermore, self-directed learning influenced organizational performance indirectly through OL and KM capabilities.

In this regard Liao and Wu (2009) also conducted an empirical study based on a sample of knowledge-intensive Taiwanese firms using structural equations. They proved that OL is a coordination mechanism. Empirical evidence supports the perspective that KM affects organizational performance through OL. However, Chawla and Joshi (2011) used a convenience sample of 51 senior and mid-level executives from 16 public and private sector organizations in India.

They found that private sector organizations fared better in all dimensions of OL comparing public sector organizations. Although the scores were merely satisfactory and there was room for improvement.

On the other hand, Noruzy et al. (2013) used a sample of 280 senior managers, executives, administrative and more levels from companies in Iran and the structural equation modeling. They found that transformational leadership directly influenced OL and KM; OL directly influenced KM. Meanwhile, Castañeda (2015) points out a difference between KM and OL. He mentions that KM is managing the knowledge that already exists. However, OL focuses on the new knowledge creation for the institution, including individual, group, and organizational levels.

Now, Imran et al. (2017), on their part, in an empirical study involving 228 managerial level employees of public and private banks in Pakistan. Their results show a substantial positive influence of KM capabilities in improving organizational performance, and OL partially mediates the relationship between KM capabilities and organizational performance. Also, Abdi et al. (2018), with data collection through a survey of 279 compa-nies supplying auto parts to Iran Khodro Company, used PLS-SEM for data analysis. The researchers found that organizational culture and KM influenced organizational innovation. In addition, OL played a mediator in that relationship. Too there is a positive relationship between KM and OL.

In another sense, Castañeda et al. (2018) studied through a systematic literature review concerning the publications on KM and OL from the 1970s to 2016. The authors conclude that the core processes of OL, the creation, and acquisition of knowledge, have been conceptually absorbed by the literature on KM in recent years. Due to the above, the close relationship between these two variables, with tendencies to form part of each other. In this regard, Huerta-Chávez (2019), through a pilot test, validated a scale with the measurement of KM, OL, and IC variables, proposing a model in which there is theoretically a relationship between the variables studied. Subsequently, Huerta-Chávez et al. (2020) identified with Exploratory Factor Analysis nine factors for these variables.

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Due to what already has been described is concluded that the literature has recognized the importance of KM and OL, as well as the relationship between these two constructs, which allows the first hypothesis to arise:

H_1: Organizational Learning (OL) has a significant relationship with Knowledge Management (KM) in the public sector.

Intellectual capital and knowledge management

Another relationship theoretically demonstrated and tested with some empirical studies is between IC and KM. For their part, León et al. (2006) state that KM is related to IC as a tool to increase these intangible assets in the organization. On the other hand, Sánchez et al. (2010), through an empirical study in the public sector in Mexico with 180 public servants from government institutions, conclude that KM is related to IC and knowledge comes from the internal environment.

Also, Núñez (2014) points out the existence of studies that show the association of KM and IC, which he verified by finding values that ensure the correlation between these variables with the participation of 50 companies in the tequila industry in Jalisco, Mexico, with quantitative and correlational research of non-experimental design. Likewise, Archibold and Escobar (2015), in an empirical study in the public sector, concluded that the existence of strategic capabilities of KM as identifying, transmitting, and producing knowledge as an intangible asset that generates value and competitive advantages with human, structural and relational capital, so the relationship between the variables comes to light.

Similarly, Vizcaíno et al. (2018), with a descriptive, exploratory, cross-sectional, and correlational study through the hypothetic-deductive method, to a non-representative sample composed of 33 academics of the University of Guadalajara, through an applied survey comprised of 41 items, whose Cronbach's alpha was .881 and the data were worked with SPSS. The researchers concluded that competitiveness is considered comprehensively from KM and IC components. The results showed that KM and IC are related and determine competitiveness.

For their part, Huerta-Chávez and Castro-Valencia (2019) concluded that KM and IC are inseparable binomials of utmost importance for public sector improvement. Good management depends on the generation of IC with a beneficial impact on citizens, better practices for modernization, and organizational objectives fulfillment. Likewise, Huerta-Chávez (2019) proposes a theoretical model showing the relationship between KM and IC in addition to OL for the public sector.

In concomitance with the relationships of the variables, it is possible to refer to Mendoza-Orellana (2019), who evaluated IC as a critical success factor for the improvement of performance in KM processes in Public Universities in Zone 4 of Ecuador with 345 participants with a descriptive correlational non-experimental type of research. He concluded human resources represent the most important intangible asset for organizations to develop and grow. Therefore, it requires investment in IC through preparation and training to sustain its identity as an institution.

According to Huerta-Chávez et al. (2020), in an empirical study with the participation of 305 employees of the public social assistance sector, identified nine factors to explain the variables of KM, OL, and IC by using the EFA methodology. Also Ibarra-Cisneros et al. (2020) point out that KM theorists connect it with IC, allowing them to have empirical studies to demonstrate the correlation between the variables.

As a result of the theoretical review, it is possible to affirm the existence of an inseparable relationship between KM and IC because they are significant elements in the organization. They are very characteristic of organizations, so they are intangible resources that are complicated to manage. In addition, they create value based on the resources and capabilities theory and the knowledge-based theory. Due to the above, the second hypothesis formulated is:

H_2: Intellectual Capital (IC) shows a significant relationship with Knowledge Management (KM) in the public sector.

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Intellectual capital and organizational learning

Several researchers supported the relationship between IC and OL. In this regard, Bontis (1998) stated that IC and OL come together when IC is considered the unit of the inventory of organizational learning flows. However, IC may not necessarily obtain through education or training. In this same sense, Koenig (1998) affirmed that IC has grown within KM, and this has incorporated OL, so the relationship between the variables is present.

Conforming to Bueno (1999), he spoke not only of KM but also pointed out the scope of OL and IC. KM is dynamic since it manages the set of knowledge flows (external and internal, captured or created, explicit or tacit). While learning is a process that transforms and incorporates individual, group, and organizational knowledge such a whole. Finally, IC is the value created in the organization.

Now Lennon and Wollin (2001) stated that when organizations develop and disseminate their OL, they will create a form of IC that is difficult for other competitors to imitate, denoting their relationship. In the same vein, Chen et al. (2004) stated that OL is implicit in the three types of IC: human, structural, and customer or relational. Likewise, León et al. (2006) detected a relationship that implies adequate KM, which should be supported by OL, thus contributing to the improvement and development of IC in organizations.

In this same sense, in compliance with Caraballo et al. (2009), the management of IC and the OL acquisition as organizational processes, being interrelated, require KM so that learning to increase and improve continuously. In agreement with Archibold and Escobar (2015), through a quantitative study with public officials' participation of the territorial comptrollers of the Department of Atlántico. They evaluated KM with three dimensions, OL, technologies for KM, and IC. In this way, the relationship between the factors is predominant as part of the construct of KM.

Similarly, Chahal and Bakshi (2015) found in their research the impact of IC on competitive advantage as well as the role of innovation as a mediating variable and OL as a moderating variable in the relationship between IC and competitive advantage with the participation of 144 branches of 21 public and seven private banks operating in North India (Jammu), three executives (including one manager and the two-senior staff) from each branch. On the other hand, conforming to Angulo (2017), KM and OL undoubtedly promote IC at all levels of the organization with the management of both human, structural, and relational capital for the improvement of organizations as a strategic factor for the development of truly useful knowledge.

In the same vein, Abualoush et al. (2018), with their quantitative study in Jordan and using structural equation modeling, found that KM infrastructure has a positive effect on the process of KM. In addition, the KM process, IC, and organizational performance are related. As reported by Huerta-Chávez (2019) a study validated a scale with OL, and IC, proposing a model in which, there is theoretically a relationship between the related variables. Subsequently, Huerta-Chávez et al. (2020), in an empirical study managed to identify nine factors for the explanation of the variables.

In summary, according to the literature reviewed, both IC and OL are focused on knowledge, are intangible resources, and join when IC is the unit of the inventory of organizational learning flows. Therefore, it is possible to state that the hypothesis to test is:

H_3: Intellectual Capital (IC) has a significant relationship with Organizational Learning (OL) in the public sector.

Materials and methods

Study design, sample, research instrument and data analysis

The present research is non-experimental, descriptive, explanatory, and correlational, under a quantitative approach. The existing relationships between the KM, OL, and IC constructs were evaluated based on the measurements obtained from the perceptions of 296 employees of the public sector of Jalisco (see Table 1) through simple random sampling.

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The research subjects were operating personnel, middle and senior management working in the public sector in charge of social assistance at the state level in Jalisco, and the simple random sampling was used with a confidence level of 95% and with a margin of error of ±5% (Bernal, 2016; Hernández et al., 2014).

Categorical variables	Sample profile
Age	Average = 42 years
Gender	Male = 25%
	Female = 75%
Educational level	Basic education = 24%
	Bachelor's degree = 65%
	Postgraduate degree = 11%
Position	Operating personnel = 72%
	Middle and senior management = 28%

Table 1 Characteristics of the sample
Source: Own elaboration (2023) based on the results obtained in SPSS version 25.

The measuring instrument integrated three constructs with nine dimensions, adapted from Castañeda and Fernández (2007); Chahal and Bakshi (2015); Huerta-Chávez (2019); Huerta-Chávez et al. (2020); Rodríguez-Ponce (2007) after applying exploratory by Huerta-Chávez et al. (2020) and confirmatory factor analysis, the validated instrument was with 40 items using Structural Equation Modeling (SEM).

For hypothesis testing with estimates of causal relationships, we used SEM. It can incorporate measurement error in the estimation process and the simultaneous estimation, as well as several interrelated dependence relationships of latent and multidimensional variables (Hair et al., 1999). We also used the statistical software Statistical Package for the Social Sciences (SPSS) with Analysis of Moment Structures (AMOS) version 25.

Results

Confirmatory factor analysis (CFA)

The data for the factor analysis development at the confirmatory level was analyzed using SEM to understand the relationships between the dimensions. This multivariate analysis technique deals with multiple relationships simultaneously and evaluates the proposed relationships between the variables.

SEM allows the transition from an exploratory to a confirmatory factor analysis by estimating the parameters of these relationships and confirming them (Hair et al., 1999).

The analyses were with the maximum likelihood method that simultaneously and interactively estimates all the coefficients until the differences between the estimated and observed covariances are minimal in the AMOS statistical software version 25, with a sample of 296 questionnaires after applying exploratory factor analysis (Huerta-Chávez et al., 2020; Huerta-Chávez and Figueroa-Ochoa, 2023).

Path analysis

With the path analysis, was 16 items eliminated from the 56 originals for presenting R^2 lower than 0.60 and relationships lower than 0.70 concerning the information contribution to dimension explanation. With the 40 items that prevailed, the confirmatory factor analysis was for each construct, which ran adequately in the AMOS statistical software in version 25, for which the recommendations provided by AMOS for the model improvement considered, achieving acceptable values in the adjustment model in each of the three variables: KM, OL, and IC.

KM validated with the ten original items that presented factor loadings greater than .80 between each item and its dimension. In addition, the covariances between the dimensions were over than 0.90. Also, OL validated with nine from ten originals items whose factor loadings were over than 0.70 between each item and its dimensions, the covariances between the dimensions were over than 0.80. Finally, IC validated with 21 of 36 originals items, both the factor loadings of the items and the covariances in the dimensions presented values greater than 0.80.

The goodness-of-fit indices were within the established parameters (Hair et al., 1999). To KM, the values obtained were by absolute fit with RMSEA = 0.071, for incremental fit with TLI = 0.984, NFI = 0.986, and CFI = 0.991, to parsimony fit CMIN/DF = 2.475. While for LO, the goodness-of-fit indices were by absolute fit with RMSEA = 0.065, for incremental fit with TLI = 0.979, NFI = 0.981, and CFI = 0.989, to parsimony fit CMIN/DF = 2.238.

Finally, for IC, the goodness-of-fit indices were by absolute fit with RMSEA = 0.075, for incremental fit with TLI = 0.953, NFI = 0.948, and CFI = 0.967, to parsimony fit CMIN/DF = 2.672 (see Table 2).

Variables	Absolute adjustment	Incremental adjustment			Parsimony adjustment
	RMSEA < .08	TLI ≥ .90	NFI ≥ .90	CFI ≥ .90	CMIN/DF < 3
KM	0.071	0.984	0.986	0.991	2.475
LO	0.065	0.979	0.981	0.989	2.238
IC	0.075	0.953	0.948	0.967	2.672

Table 2 Goodness-of-fit indices for each variable
Source: Own elaboration (2023) based on the results obtained in SPSS AMOS version 25

Structural and measurement model

The validated instrument consisted of 40 items of the 56 initially proposed. This model adjusted in all its dimensions with positive factor loadings above 0.70 (see Figure 1), presenting standardized adjustment indexes CMIN/DF of 2.652, RMSEA of 0.075, TLI of 0.981, NFI of 0.982, and CFI of 0.989, as well as the estimated standardized data of the model (see Table 3).

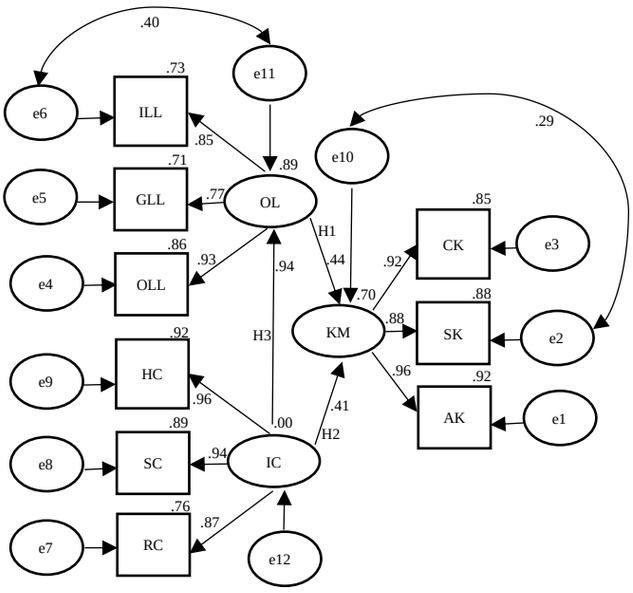

Figure 1 Structural and measurement model. This structural and measurement model shows the linked to organizational learning and intellectual capital with knowledge management
Source: Own elaboration (2023) based on the results obtained in SPSS AMOS version 25

Variables	Absolute adjustment	Incremental adjustment			Parsimony adjustment
	RMSEA < 0.08	TLI ≥ 0.90	NFI ≥ 0.90	CFI ≥ 0.90	CMIN/DF < 3
KM-OL-IC	0.075	0.981	0.982	0.989	2.652

Table 3 Goodness-of-fit indices of the structural equation model
Source: Own elaboration (2023) based on the results obtained in SPSS AMOS version 25

Reliability of the structural model: AVE and CR

Composite Reliability (CR) is a more robust measure than Cronbach's Alpha, whose value should be greater than 0.70. While Average Variance Extracted (AVE) explains the amount of variability that can be explained by the model, whose value should be greater than 0.50 (Hair et al., 1999). To determine convergent validity, the AVE and CR are calculated using the following formulas (see equations 1 and 2):

Equation 1 AVE calculation

$$(\Sigma\, \lambda\text{^}2)/n \qquad (1)$$

Equation 2 CR calculation

$$(\Sigma\, \lambda)^2/((\Sigma\, \lambda)^2 + (\Sigma\, \varepsilon)\,) \qquad (2)$$

The value of "λ" was obtained from the estimated values in the standardized regression weights calculated in the AMOS version 25 program; while the value of "n" is equal to the number of items contemplated in the measurement and structural models, and the value of "ε" was obtained from the difference of 1 minus λ^2, which in the end is added depending on the number of "n". The values obtained for each dimension of the three variables under study are shown below, where results were obtained that meet the criteria sought (see tables 4, 5, 6).

Dimension	AVE criterion > 0.50	CR criterion > 0.70
Create Knowledge (CK)	0.763	0.941
Share Knowledge (SK)	0.920	0.971
Apply Knowledge (AK)	0.864	0.927

Table 4 AVE and CR by dimension of the Knowledge Management (KM) variable
Source: Own elaboration (2023)
In this table, the dimensions of KM variable meet the criteria sought to determine the convergent validity of AVE and CR.

Dimension	AVE criterion > 0.50	CR criterion > 0.70
Individual Level Learning (ILL)	0.632	0.836
Group Level Learning (GLL)	0.763	0.906
Organizational Level Learning (OLL)	0.693	0.871

Table 5 AVE and CR by dimension of the Organizational Learning (OL) variable
Source: Own elaboration (2023)
In this table, the dimensions of OL variable meet the criteria sought to determine the convergent validity AVE and CR.

Dimension	AVE criterion > 0.50	CR criterion > 0.70
Human Capital (HC)	0.701	0.933
Structural Capital (SC)	0.765	0.970
Relational Capital (RC)	0.720	0.927

Table 6 AVE and CR by dimension of the Intellectual Capital (IC) variable
Source: Own elaboration (2023)
In this table, the dimensions of IC variable meet the criteria sought to determine the convergent validity AVE and CR.

Hypothesis testing

After the path analysis and confirmatory factor analysis in AMOS with acceptable standardized values is integrated the single measurement and structural model, including the hypotheses of cause and effect between each of the variables (see Figure 1), in addition to calculating the standardized values and compliance with criteria (see Table 7).

With a structural model, the R^2 values are higher than 0.60, which denotes that each dimension has adequate coverage. Likewise, the relationship of each dimension with its construct is correct higher than 0.70, presenting standardized adjustment indexes CMIN/DF of 2.652, RMSEA of 0.075, TLI of 0.981, NFI of 0.982, and CFI of 0.989 (see Table 3).

Now, the structural equation model with its hypotheses stated and the p-values generated by AMOS version 25 (all less than 0.05). It´s possible to conclude that all hypotheses are accepted. The KM, OL, and IC regression weights are below (see Table 7).

	Estimate	S.E.	C.R.	P
IC → OL	1.012	0.048	21.147	***
OL → KM	0.526	0.175	3.009	0.003
IC → KM	0.514	0.187	2.756	0.006

Table 7 Hypothesis tests and standardized estimated values for the structural equation model
Source: Own elaboration (2023) based on the results obtained in SPSS AMOS version 25. This table shows that there is a significant relationship between the variables studied, where the "p" value is less than 0.05.

The confirmatory factor analysis showed a good structural relationship between the variables and also made it possible to hypotheses proposed test. Relating to the hypothesis test and the standardized estimated values for the structural equation model of this research, it is possible to conclude that OL has a positive influence on KM with a standardized coefficient of 0.526 (OL→KM), thus proving the first hypothesis H_1: Organizational Learning (OL) has a significant relationship with Knowledge Management (KM) in the public sector.

In the same sense, with the structural model and the standardized values, it is possible to affirm that IC positively influences KM with a standardized coefficient of 0.514 (IC→KM), so the second hypothesis H_2: Intellectual Capital (IC) shows a significant relationship with Knowledge Management (KM) in the public sector is proven.

Finally, according to the hypothesis test and the standardized estimated values, this research demonstrated that IC positively influences OL with a standardized coefficient of 1.012 (IC→OL). Therefore, the third hypothesis H_3: Intellectual Capital (IC) has a significant relationship with Organizational Learning (OL) in the public sector was tested.

Discussion

The development of KM is a process within the organization that allows managing the most valuable resource, knowledge, through OL flows and IC. In addition, KM generates individual knowledge and for the institution. This knowledge comes from interactions between individuals and organizations and contemplates individuals' experiences. When the knowledge is transmitted, it is shared and the moment when tacit knowledge becomes explicit knowledge to be applied.

To KM variable and its CK, SK, and AK dimensions can be compared with results obtained by Araneda-Guirriman et al. (2017); Huerta-Chávez (2019); Huerta-Chávez and Castro-Valencia (2019); Huerta-Chávez et al. (2020); Pedraja-Rejas and Rodríguez-Ponce (2008); Pedraja-Rejas et al. (2009); Rodríguez-Ponce (2016); Rodríguez-Ponce et al. (2010); who demonstrated that the scale is indeed measuring KM with the three dimensions mentioned.

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They presented acceptable levels of reliability, with Cronbach's alpha values above 0.70 (Nunnally, 1978; Hair et al., 1999), as in this study. Likewise, the KMO index in both the Huerta-Chávez (2019) study and the present investigation was higher than 0.50 as an acceptable value (Hair et al., 1999) they were higher than 0.80.

The fundamental three-dimensional process measuring for managing knowledge in organizations made it possible to determine the relationship between OL and CI with KM. In this regard, KM has a principal role in organizations that consists of articulating and amplifying the new knowledge developed by individuals (Nonaka, 1994; Nonaka and Takeuchi, 1995). At the same time, it allows for generating, absorbing, transmitting, and using knowledge in a knowledge society, resulting in a technological information society only carrying what can be valuable for the organization (Zambrano-Vargas and Suárez-Pineda, 2017).

Consequently, the principal indicators contributing to KM explanation in the public social welfare sector focus on the existence of an information exploration system. Also, the processing and integration of the information obtained added to the need for the system information finding presence as part of the creation and interaction for the new knowledge generation in organizations. However, other indicators of great relevance for KM are found precisely in the exchange of knowledge among managers and the mutual sharing of this knowledge.

In the same vein, the application of knowledge by managers when contemplating it in decision-making is essential for KM to fulfill its fundamental role within organizations by creating, sharing, and applying knowledge for the generation of value for stakeholders (Araneda-Guirriman et al., 2017; Huerta-Chávez, 2019; Huerta-Chávez and Castro-Valencia, 2019; Huerta-Chávez et al., 2020; Pedraja-Rejas and Rodríguez-Ponce, 2008; Pedraja-Rejas et al., 2009; Rodríguez-Ponce, 2007; Rodríguez-Ponce, 2016; Rodríguez-Ponce et al., 2010).

Regarding the confirmatory factor analysis for this construct, goodness-of-fit indices were found within the parameters established in statistical theory (Hair et al., 1999), for absolute fit with RMSEA = 0.071, for incremental fit with TLI = 0.984, NFI = 0.986, and CFI = 0.991, and for parsimony fit CMIN/DF = 2.475 (see Table 2). These values confirmed the KM theory with CK, SK, and AK factors because its measure is correct to explain this variable in the study context.

For its part, the OL variable, understood as the process of individual and shared thinking and actions in an organizational context (Rashman et al., 2009), is provided at three levels: individual, group, and organizational, for which OL is an instrument to create competitive advantages that affect performance (Riquelme et al., 2008). OL measured with its ILL, GLL, and OLL dimensions, can be compared with results obtained by Castañeda (2015); Huerta-Chávez (2019); Huerta-Chávez et al. (2020); López et al. (2012); Quispe and Vigo (2017); and Suárez et al. (2019), in which acceptable levels of reliability were demonstrated, with Cronbach's alpha values above 0.70 (Nunnally, 1978; Hair et al., 1999), as in the present study.

However, of the six studies, only for the ILL dimension, in the Castañeda (2015) and Suárez et al. (2019) studies, values lower than those proposed by statistical theory were obtained. Regarding the KMO index for this variable, the values obtained in various studies by Castañeda (2015); Huerta-Chávez (2019); Huerta-Chávez et al. (2020); López et al. (2012); and Quispe and Vigo (2017); were higher than 0.50 which demonstrated an acceptable value according to Hair et al. (1999), in agreement with the values obtained in the present work.

In addition, it is relevant to emphasize the OL three dimensions allowed for determining the relationship between KM, IC, and itself. In this research, the principal indicators of the OL explanation corroborated are the form of individual learning by observation or instruction and the opportunity to develop skills as part of the learning.

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At the same time, the learning indicators at GLL imply learning with enthusiasm, the exchange of knowledge, and the achievement of collective learning in group work. Finally, learning at the OLL involves three principal indicators, the use of knowledge that occurs in organizations, adaptation to change, and the design of new products or services (Castañeda, 2015; Castañeda and Fernández, 2007; Huerta-Chávez, 2019; Huerta-Chávez et al., 2020; López et al., 2012; Quispe and Vigo, 2017; Suárez et al., 2019).

Likewise, in the confirmatory factor analysis for this construct, goodness-of-fit indices were found within the parameters established in statistical theory (Hair et al., 1999), for absolute fit with RMSEA = 0.065, for incremental fit with TLI = 0.979, NFI = 0.981, and CFI = 0.989, for parsimony fit CMIN/DF = 2.238 (see Table 2).

The IC variable is the accumulated intangible assets generated by the KM within the organization, although not counted in the organization´s accounting statements, create present or future value for the fulfillment of different social objectives in a strategic manner; it is also a form of knowledge, intellect and intellectual capacity activity is used to create value (Shin et al., 2010; Edvinsson and Sullivan, 1996).

Conceptualizing IC as part of the organization's intangible assets based on knowledge integrated of human capital, structural capital, and relational capital increases organizational performance and creates value. IC measured with HC, SC, and RC dimensions, can be compared with results obtained by Chahal and Bakshi (2016); Huerta-Chávez (2019); Huerta-Chávez and Castro-Valencia (2019); and Huerta-Chávez et al. (2020), who demonstrated that the scale is reliable, given that they presented Cronbach's alpha values above 0.70 (Nunnally, 1978; Hair et al., 1999) as in the present study. Similarly, the KMO index in the Huerta-Chávez (2019) study and in this research was higher than 0.50 as an acceptable value (Hair et al., 1999).

Principal indicators for the IC explanation in the public social assistance sector corroborated in the present research focus on employees' continuous training, education, and skills. Too, motivation to share new ideas without forgetting employee happiness and satisfaction. The formation of HC is imminent because the employee is contemplated as a fundamental factor for the organization by training, instructing, and motivating him.

Now, for the SC development, principal indicators to focus on are, in the first instance, the creation of a pleasant environment, communication among personnel, knowledge duly supported, the development of new products and services, as well as support for innovative ideas, improvement of service quality, structures, and systems, accessibility to information, processes and organizational culture. About RC, the indicators focus on updating customer data, knowledge, opinion, interaction, and shared customer feedback (Chahal and Bakshi, 2015; Chahal and Bakshi, 2016; Huerta-Chávez, 2019; Huerta-Chávez and Castro-Valencia, 2019; Huerta-Chávez et al., 2020).

With the confirmatory factor analysis for this construct, goodness-of-fit indices were found within the parameters established in statistical theory (Hair et al., 1999) and results similar to those obtained by Chahal and Bakshi (2015) and Chahal and Bakshi (2016). Specifically, in the present research, the results were: for absolute fit with RMSEA = .075, for incremental fit with TLI = 0.953, NFI = 0.948, and CFI = 0.967, for parsimony fit CMIN/DF = 2.672 (see Table 2).

Also, SEM was considered as a means to explain the relationship between KM, OL, and IC in the sector studied to test the hypotheses. The model starts with the first finding showing a positive relationship between OL and KM (cf. H_1 of structural and measurement model of knowledge management linked to organizational learning and intellectual capital, see Figure 1) as an explanation of the approach of Easterby-Smith and Lyles (2003) who theoretically point out, there is a relationship between OL and KM, considering that KM focuses on the content of knowledge. While the OL focuses on a vibrant knowledge-based process, which involves moving between the various levels of action, starting from the personal to the group level and then to the organizational level and back again.

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This relationship between the variables is also consistent with the findings of Abdi et al. (2018); Castañeda et al. (2018); Chawla and Joshi (2011); Ho (2008); Imran et al. (2017); Jain and Moreno (2015); Liao and Wu (2009); and Noruzy et al. (2013).

Likewise, Huerta-Chávez (2019) found in a theoretical way the relationship between the mentioned variables. In concomitance with the various authors and the results obtained in the structural and measurement model, it is possible to affirm the relationship between OL and KM (cf. H_1 of structural and measurement model of knowledge management linked to organizational learning and intellectual capital, see Figure 1).

The second finding in the model showed a positive relationship between IC and KM (cf. H_2 of structural and measurement model of knowledge management linked to organizational learning and intellectual capital, see Figure 1). To corroborate the theory is necessary to resort to researchers such as Bueno (1999), Koenig (1998), and Wiig (1997). This relationship was found by Caraballo et al. (2009), Hussi (2004), León et al. (2006), Ling (2013), Núñez (2014), and Sánchez et al. (2010), to mention a few.

Archibold and Escobar (2015) concluded that the existence of strategic KM capabilities, identifying, transmitting, and producing knowledge as an intangible asset, generates value and competitive advantages with human, structural, and relational capital, reiterating their relationship. In the same sense, Hussinki et al. (2017) state that there is a relationship between IC and KM practices with the company's performance. Therefore, the companies characterized by high levels of IC and the use of KM practices are likely to outperform those with low levels of these two variables. The discussion carried out so far has allowed us to understand the results obtained, supported by theory.

Also, Vizcaíno et al. (2018) found that KM and IC are related and determine competitiveness. These variables efficiently managed will greater the competitiveness of companies. Now in agreement with Huerta-Chávez and Castro-Valencia (2019), it is possible to conclude that IC and KM are inseparable binomials for organizational improvement. At the same time, Huerta-Chávez (2019) shows the relationship between IC and KM in her theoretical model.

In concomitance with this second finding, Mendoza-Orellana (2019) evaluated IC as a critical success factor for performance improvement in KM processes, concluding that it is required to invest in IC through preparation and training to support its identity as an institution. Likewise, Ibarra-Cisneros et al. (2020) point out that KM theorists manage to connect it with IC. Therefore, KM helps institutions to use their IC for performance improvement. Their study corroborated the positive relationship between IC and KM.

Finally, the third finding in the model showed a positive relationship between IC and OL (cf. H_3 of structural and measurement model of knowledge management linked to organizational learning and intellectual capital, see Figure 1), which coincides with Bontis (1998) who states that both variables are united when IC is the unit of the inventory of OL flows. In this sense, there is a relationship between both variables (Abualoush et al., 2018; Archibold and Escobar, 2015; Chahal and Bakshi, 2015; Bueno, 1999; Caraballo et al., 2009; Chen et al., 2004; Huerta-Chávez, 2019; Huerta-Chávez et al., 2020; Koenig, 1998; Lennon and Wollin, 2001; León et al., 2006). So, IC occurs at all levels of the organization, just like OL, to improve organizations with knowledge (Angulo, 2017). Both variables start with knowledge as an intangible and valuable resource for the organization.

The discussion carried out so far, it is possible to comment the theoretical model elaborated proved to have adequate structural and measurement relationships by obtaining indexes above what is established in the statistical theory, presenting acceptable standardized adjustment indexes within the parameters (Hair et al., 1999) with values: CMIN/DF of 2.652, RMSEA of 0.075, TLI of 0.981, NFI of 0.982, and CFI of 0.989 (see Table 3). Therefore, the variables studied allow a closer explanation of the phenomenon, demonstrating the relationship between KM, OL, and IC.

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Given that the model constructed proved to have a scale of valid and reliable indicators that allow measuring the individual variables or dimensions that make up the constructs or variables studied, starting from the review of various theoretical and empirical research, where studies show the influence between the constructs studied. However, few referred to the subject of study of this research, so the theoretical and empirical contribution is crucial.

Annexes

The items evaluated in the instrument are shown below (see Table 8).

Variable	Item
CK1	The institution has an efficient system for exploring internal and external information.
CK2	The information obtained from various sources is efficiently processed and integrated into the organization.
CK3	The institution has a system that allows it to identify important findings for its work from both internal and external sources.
CK4	Institution managers create new knowledge considering the system of exploration, detection of findings, and integration of information.
CK5	Institution managers interact with each other favoring the creation of knowledge.
SK1	Organization managers exchange knowledge with each other.
SK2	Organization managers transfer knowledge to each other.
SK3	Institution managers share knowledge with each other.
AK1	Institution managers apply the knowledge generated and shared.
AK2	Managers make decisions based on the application of previously generated knowledge.
ILL1	Institution managers learn by observing their co-workers.
ILL2	This institution offers staff opportunities to develop their skills to perform the job.
ILL3	In this institution, staff learns by following instructions, whether verbal or written.
GLL1	Institution staff learn enthusiastically when working in groups.
GLL2	Institution staff exchange knowledge freely when working in groups.
GLL3	When the institution works in a group, collective learning is achieved.
OLL1	Staff uses the knowledge that the institution has.
OLL2	The institution adapts in a timely manner to changes in the environment.
OLL3	The institution designs new products or services based on the knowledge of the personnel who work in it.
HC1	Staff training is ongoing.
HC2	Staff is highly educated.
HC3	Staff skills improve.
HC4	There is motivation to share new ideas.
HC5	Managers make staff happy.
HC6	The manager makes the staff satisfied.
SC1	The atmosphere in this institution is pleasant.
SC2	Managers and staff communicate well.
SC3	The increase in knowledge is well supported.
SC4	The institution develops new products and services.
SC5	There is great support for innovative ideas.
SC6	The institution improves the quality of service.
SC7	There is information on structures and systems.
SC8	There is easy access to information.
SC9	Processes develop unique capabilities.
SC10	The culture is supportive and comfortable.
RC1	User data is up to date.
RC2	Meetings with the user occur continuously.
RC3	The opinion of users is valued.
RC4	User feedback is shared across the institution.
RC5	Interactions improve competence.

Table 8 Items instrument
Source: Own elaboration (2023) based on Castañeda and Fernández (2007); Chahal and Bakshi (2015); Huerta-Chávez (2019); Huerta-Chávez et al. (2020); Rodríguez-Ponce (2007) instruments

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Conclusions and recommendations

Due to this, in the employees' public social assistance sector of Jalisco, KM is influenced by OL and IC. Likewise, there is a relationship between the latter since they presented significant factorial loads higher than .30 (Hair et al., 1999), corroborating the direct link between the variables studied. Added to this are the common elements between these variables, such as the human factor and the knowledge developed in people to generate value in the various organizations, making a distinction between one and the other.

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It concluded OL influences KM, as it is a process based on knowledge of the employees´ public sector participation. Which transforms and incorporates individual, group, and knowledge into organizational knowledge as a whole (Bueno, 1999) and implies moving between the different levels of action, starting from the personal to the group level and then to the organizational level and again. Also, for being a thought process and individual action are shared within an organizational context, while KM exists to focus on knowledge content (Easterby-Smith and Lyles, 2003; Rashman et al., 2009).

In this same sense, IC influences KM by concentrating on the renewal and maximization of the value of intellectual assets in organizations. That is, on the systematic and explicit detailed processes for value creation; while knowledge management focuses on the administration of knowledge flows (Wiig, 1997; Bueno, 1999).

Also, IC influences OL since it is considered the unit of the inventory of organizational learning flows. It starts from the existing IC and transforms into learning in organizations when shared from the individual to the group level and finally to the organizational level. Therefore, in public sector welfare organizations, bright people must also be supported and nurtured to share their human capital through OL (Bontis, 1998).

In conclusion, with the present investigation, it was possible to state that employees at all levels are a fundamental part of public sector social assistance institutions, where the constant search for innovative change from bureaucratic practices to a culture of collaboration is necessary for the generation and increase of OL and IC to have excellent KM and add value in the delivery of products and services for citizens. This innovative practice affects society's well-being and satisfaction, which every day is more informed and demands better products and public services.

At the same time, these innovative practices focused on the adequate KM, OL, and IC to retain knowledge, integrating it into the company as capital, contributing to knowledge leakage reduction, and coming with the knowledge workers transfer between various government agencies and even those employees who retire.

Therefore, it is possible to affirm that IC is the measure of added value, considered a background variable that helps explain the OL effectiveness and the KM efficiency (Bueno, 1999).

Now, the main conclusions reached from this study are: there is a significant relationship between the variables of the proposed theoretical model: OL and KM, IC and KM, as well as IC and OL. This was verified through multivariate analysis with structural equation modeling, where standardized adjustment indices were obtained within the statistical parameters and valid and reliable indicators, highlighting the importance of knowledge as added value in public institutions.

This research generates three main contributions: theoretical, practical and methodological. In the first instance, the theoretical contribution to the science of administration consisted in the generation of the analysis of the existing theory, as well as the comparison of results based on it, creating new knowledge, since from the theory a model with interrelation of the variables under study, which was verified empirically.

Immediately, the practical contribution consisted in the approach of new strategies for the public sector, based on the results obtained in the empirical study, setting the tone to promote strategic decision making and the establishment of improvement projects that strengthen good practices, organizational practices, on the part of the operational personnel, the middle managers and managers responsible for public institutions, so that the practices of knowledge management, organizational learning and intellectual capital promote the improvement of the actions of the employees of this sector, propitiating the change of bureaucratic practices to a culture of collaboration that affects the wellbeing of society, whose benefit will be mainly for the citizens who with their taxes pay in advance for public services.

Finally, the methodological contribution consisted in the integration of a valid and reliable instrument from the particular theoretical model, which was verified after the inclusion of new perspectives of informants, through an empirical test in the public sector of social assistance in Jalisco.

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At the same time that, through the multivariate analysis, the constructs under study were interrelated, allowing the generation of knowledge that explained the variables analyzed, with potential use in the substantive improvement of management processes and for the establishment of new strategies in other public institutions.

Future research directions are:

1) Expand the study universe to other public sectors because the present investigation contemplated only the social assistance public sector.

2) Carry out confirmatory studies where the influence of the variables studied on organizational performance, integrating the citizens' perception in the reception of products and services from the public sector of social assistance.

3) Apply the instrument in other institutions, both in the public and private sectors, which can predict the behavior of the variables studied.

4) Integrate qualitative tools into the variables studied since the study was merely with a quantitative approach.

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Proposal for instructional design of associate and bachelor's degree academic programs at the Universidad Autónoma de Nayarit

Los académicos de la universidad pública estatal: rasgos en cifras de la Universidad Autónoma de Nayarit

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Abstract

Higher Education Institutions respond to public policies and these in turn to an educational project that historically has been developed by academics, who are considered a pillar of the Higher Education System because they mainly perform teaching, research, and liaison functions, among others. This article presents a characterization of the teaching staff of the Universidad Autónoma de Nayarit, by analyzing figures on their professionalization, since it is organized by areas of knowledge and, therefore, by teachers and researchers who are experts in each discipline. In general terms, the data presented here, give a preamble to two of the recognitions or distinctions to which an academic can aspire: the SNI and the PRODEP; therefore, data will be shown to know the changes that have taken place and, above all, to conclude if academics have common traits or follow trends according to their discipline.

Higher Education, Academics and Professionalization

Resumen

Las Instituciones de Educación Superior responden a políticas públicas y estas a su vez a un proyecto educativo que históricamente ha sido desarrollado por los académicos; mismos que son considerados como un pilar del Sistema de Educación Superior porque realizan principalmente funciones de docencia, investigación, vinculación, entre otras. En este artículo se presenta una caracterización de la planta docente de la Universidad Autónoma de Nayarit, a partir de analizar cifras sobre su profesionalización, ya que está organizada por áreas de conocimiento y, por ende, por docentes e investigadores expertos en cada disciplina. En términos generales, los datos que aquí se presentan, dan un preámbulo a dos de los reconocimientos o distinciones a las que un académico puede aspirar: el SNI y el PRODEP; por ello se mostrarán datos para conocer los cambios que se han tenido y, sobre todo, concluir si los académicos tienen rasgos en común o siguen tendencias de acuerdo con su disciplina.

Educación superior, Docentes y Profesionalización

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Introduction

The Higher Education System (HES) is made up of various institutions and actors. Among the latter, academics are actors who play a key role in Higher Education Institutions (HEIs). Altbach (2000 and 2004) and Forest (2014) consider them to be an indispensable pillar for the subsistence of higher education by promoting the generation and transmission of knowledge.

In this sense, studying academics is of great interest because of the important role they play in higher education; because of their evolution from the traditional university to the present day; and because of the features that make them diverse, beyond the yoke of HEIs or SES.

Therefore, this paper identifies the traits of academics at the Autonomous University of Nayarit (UAN) from the elements that frame the academic profession: the establishment and the discipline (Clark, 1983 and Becher, 2001). That is to say, figures will be analysed considering the UAN as an establishment, and the areas of knowledge as disciplines.

More students, more professors

Since the expansion of higher education in the world in the 1950s, academics have been considered as a professional group, with functions, activities, sanctions and rewards (Clark, 1989).

In Mexico, between the 1960s and 1980s, the expansion of the Higher Education System required the expansion of coverage with new universities and with it, an increase in academic staff positions throughout the country (Gil, et. al. 1994). According to Grediaga (1998), those who practice the academic profession transcended as a result of the arrival of new segments of students coming from a society in economic growth, in the process of mobility and with expectations of improvement through university studies.

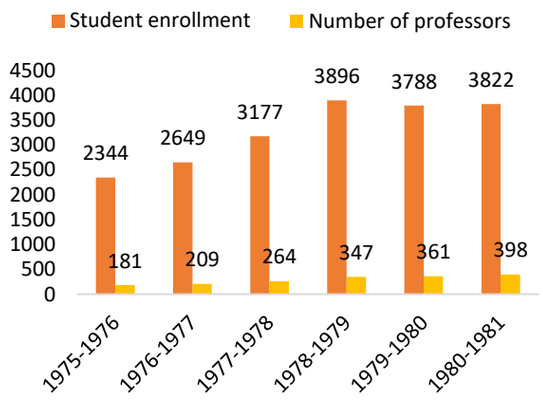
This expansion also reached Nayarit. In 1965, the University of Nayarit was founded and in 1975 its autonomy was decreed, becoming, as it is known today, the Autonomous University of Nayarit (UAN). Its creation allowed the young people of Nayarit to have access to higher education, thus initiating a clear social change that brought cultural and economic progress.

According to the historical data of the first 12 school years that the UAN worked, in the 1969-1970 school year there was an enrolment of 353 students and for the 1975-1976 school year, when university autonomy was decreed, the enrolment reached 2,344 students.

School year	Student enrolment
1969-1970	353
1970-1971	589
1971-1972	905
1972-1973	1547
1973-1974	1628
1974-1975	1984
1975-1976	2344
1976-1977	2649
1977-1978	3177
1978-1979	3896
1979-1980	3788
1980-1981	3822

Table 1 Enrolment for the first twelve school years worked at UAN
Source: UAN (n.d.). Manual of basic statistics 1969-1981

From Table 1 it can be said that in six years the enrolment multiplied almost seven times and for the school year 1980-1981, the student population reached 3822. These figures show the expansion of SES. With this phenomenon, inevitably the academic staff also grew, although at a different rate than that of enrolment. The data are shown below:



Graphic 1 Increase in student enrolment and number of teachers from 1975 to 1981
Source: UAN (n.d.). Manual of basic statistics 1969-1981

The growth of the academic staff must have taken place in a particular way in each area of knowledge and in each faculty -as the UAN was organised at that time-, probably due to the number of students, the nature of the disciplines, the characteristics of the curricula, among other aspects.

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The multifunctionality of professors

Beyond the increase in numbers, the new academic professionals multiplied their academic tasks, eventually ceased to be only professors and began to carry out activities that diversified their functions within the HEIs and for the SES.

Within HEIs, according to Boyer, E. (1997), academic activity is defined as the balanced combination of teaching and research, the latter being of great importance at the higher education level. Therefore, four types of academic work are carried out in the present time: discovery, integration, application and teaching. In this sense, academics carry out these four functions, through which they generate, develop, produce and share, directly impacting on their work as teachers.

In order to consolidate these functions, the SES responds through programmes that encourage academics to be more productive and to carry out research, such as the Programme for the Professional Development of Teaching Staff (PRODEP) and the National System of Researchers (SNI).

The SNI was created in 1984 to recognise the work of academics who are dedicated to producing scientific knowledge and technology. For this purpose, a peer review process is carried out and the appointment of national researcher and economic incentives are granted (CONACYT, n.d.). Being a SNI is synonymous with quality and prestige of scientific contributions, which benefits academics and HEIs, as it contributes to the training of researchers with high-level scientific and technological knowledge, fundamental for cultural development and social welfare.

PRODEP seeks to professionalise Full-Time Lecturers (FTE), so that they can achieve research, teaching, technological development and innovation capacities with social responsibility, so that they can articulate and consolidate academic bodies and thus generate a new academic community capable of transforming their environment (DGESUI, n.d.). PRODEP has antecedents in the Programa Nacional de Superación de Personal Académico (SUPERA) created in 1994 and the Programa para el Mejoramiento del Profesorado (PROMEP) created in 1996.

Both programmes have been of great help for universities to promote research work and teaching productivity among their academics. This is of interest for the present work, which aims to find the particularities of each area of knowledge, starting from the question: Does academic work occur in the same way in all disciplines?

Based on this question, we will seek to identify the particularities through the SNI and PRODEP indicators at the UAN, since teachers exercise an academic profession, which is framed, according to Clark (1983), in two elements: the establishment and the discipline. These elements are two forces that pull teachers in opposite directions, the first delimits and regulates the fulfilment of tasks and functions, determined according to the purposes of the establishment; and the second segments and multiplies them into groups where cultures with particular standards and ways of undertaking certain functions are developed Becher, 2001).

It is then argued that academics belong to the same establishment, such as the UAN, where those who are integrated there have a common purpose. But within this, academics are grouped into disciplines, which in the UAN are distinguished by areas of knowledge, where they are delimited and generate particular ways of exercising the academic profession. Academics generate habits, ways of living academic life and develop processes specific to their establishment, influenced by their discipline. They also exercise the academic profession, work with knowledge that is organised into disciplines, recognise each other and generate bonds of identity. Grediaga (2000) defines the academic profession as a legitimate grouping where its members have the main function of producing, transmitting and certifying knowledge.

Methodology

In order to identify some of the features of academics at the Autonomous University of Nayarit, from the establishment and from the discipline (Clark, 1983 and Becher, 2001), an analysis of figures is presented that allows us to find the particularities of each area of knowledge that are integrated in the UAN.

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Returning to the ideas raised above, the UAN is the establishment, is a State Public University (UPE) with 54 years of antiquity, where a total of 17,000 students and 105 educational programs of higher education (Format 911, Institutional), organized in six areas of knowledge are attended:

1. Arts
2. Basic Sciences and Engineering
3. Biological-Agricultural and Fishery Sciences
4. Health Sciences
5. Economic-Administrative Sciences
6. Social Sciences and Humanities

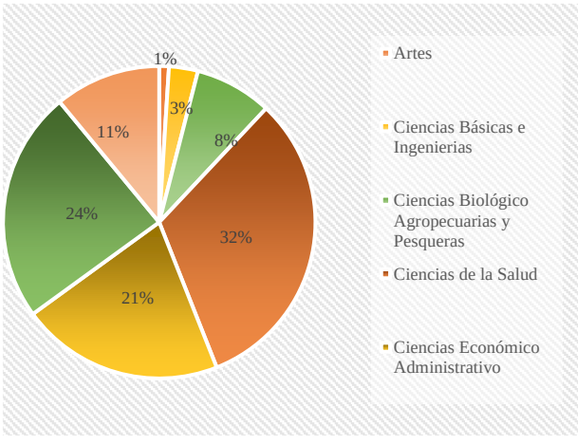
For this work, the areas of knowledge are identified as disciplines, so the analysis will give a first quantitative diagnosis, which will allow us to differentiate the particularities between them. Figures from 2014 to 2023 are taken as a reference.

The unit of analysis is the Full-Time Lecturers (PTC), since they are the academics with an appointment that accredits that their activities include teaching, student tutoring and knowledge generation and application (SEP, 2020), as well as those who have the possibility of participating in the calls for the PRODEP profile and the SNI, for the latter will be quantified those who have such a mention and meet the requirement of being full-time.

In this sense, the academics with PTC appointments in each of the six areas of knowledge will be analysed and the indicators derived are: number of academics by area of knowledge, number of academics who are Full Time Professors, number of PTC by academic degree, number of PTC with PRODEP profile and number of PTC members of the SNI (in this indicator, the total will be quantified and those who are not PTC will be distinguished).

The particularities of UAN academics through figures

By the year 2023, the UAN will have reached a student enrolment of 16,687 higher level students; however, the growth of enrolment is different in each area of knowledge, as it depends on the demand and the availability of spaces in each educational programme. The percentage distribution of enrolment is shown below.



Graphic 2 Percentage distribution of student enrolment by area of knowledge in 2023
Source: UAN (2023). Statistical Yearbook 2022-2023.

The three areas of knowledge with the highest number of students are Health Sciences, Social Sciences and Humanities, and Economic and Administrative Sciences. The three areas with the lowest demand are Biological, Agricultural and Fisheries Sciences, Basic Sciences and Engineering and Arts.

To serve the 16,687 students in the year 2023, the academic staff is made up of 1,341 academics, who work in the different areas of knowledge. Of these 878 are Full-Time Professors, as can be seen in the table below:

Area of knowledge	Year						
	2017	2018	2019	2020	2021	2022	2023
	12	14	28	24	26	21	29
Arts	77	80	92	81	81	78	77
Basic Sciences and Engineering	138	147	146	143	135	117	125
Biological, Agricultural and Fisheries Sciences	358	413	452	401	462	405	412
Health Sciences	269	291	305	276	277	228	267
Economic-Administrative Sciences	266	272	297	294	289	289	298
Social Sciences and Humanities	103	109	148	138	137	133	133
Total	1120	1217	1468	1357	1407	1271	1341

Table 2 Number of academics by area of knowledge
Source: UAN (2017) Statistical Yearbook 2016-2017, UAN (2018) Statistical Yearbook 2017-2018, UAN (2019) Statistical Yearbook 2018-2019, UAN (2020) Statistical Yearbook 2019-2020, UAN (2021) Statistical Yearbook 2020-2021, UAN (2022) Statistical Yearbook 2021-2022, UAN (2023) Statistical Yearbook 2022-2023

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In proportion to enrolment, the number of academics has increased and is dispersed in a particular way by each area of knowledge: Health Sciences, Social Sciences and Humanities and Economic and Administrative Sciences are those with the highest number of academics; and Biological and Agricultural Sciences and Fisheries, Basic Sciences and Engineering and Arts are those with the lowest number.

In seven years, Health Sciences has increased its academic staff from 358 to 412 from 2017 to 2023, i.e. an increase of 54 academics. The area of Social Sciences and Humanities in 2017 consisted of 266 academics and increased to 298 in 2023, i.e. 32 academics were integrated.

The areas that have had slower growth are: Arts, which from 2017 to 2023 has only increased by 17 academics in its staff; and Basic Sciences and Engineering, which in 2017 had 77 members and whose maximum reached 92 in 2019 and in 2023 dropped again to 77.

Likewise, there are also areas of knowledge that show a decrease in the number of academics. Biological, Agricultural and Fisheries Sciences had 138 academics in 2017 and 125 in 2023. Economic and Administrative Sciences is a similar case: in 2017 it had 269 academics, in 2019 it reached a maximum of 305 and in 2023 it dropped to 267.

These variations in the number of academics are probably due to the fact that there are different types of contracts or that there are changes of assignment between administrative areas and academic units, such as those who are Part-Time Lecturers (PTP) and those who are Full-Time Lecturers (PTC), hence the indicators of the PTC will be considered as a reference.

- Full-Time Lecturers (FTE) by area of knowledge

PTCs are engaged in teaching, tutoring and knowledge generation and application activities in the areas related to their academic training. By 2023, of the 1,208 academics assigned to the UAN, 72.7% are PTC.

Area of knowledge	2017		2023	
	n	%	n	%
Arts	0	0.0	5	0.6
Basic Sciences and Engineering	55	6.8	60	6.8
Biological, Agricultural and Fisheries Sciences	163	20.3	175	20.0
Health Sciences	171	21.3	182	20.7
Economic-Administrative Sciences	243	30.2	267	30.4
Social Sciences and Humanities	172	21.4	189	21.5
Total	804	100.0	878	100.0

Table 3 Percentage of PTC by area of knowledge
Source: UAN (2017) Statistical Yearbook 2016-2017, UAN (2023) Statistical Yearbook 2022-2023

From the data shown in the table, it is evident that in 2023, 30.4% of the PTC are assigned to the area of Economic-Administrative Sciences. In the areas of Biological-Agricultural and Fisheries Sciences, Health Sciences and Social Sciences and Humanities, the proportion is almost similar, around 21.0%. Basic and Engineering Sciences have only 6.8% and Arts 0.6.%.

Here it can be seen that the proportions behave differently by PTC than by the total number of academics. For example, the area of Biological and Agricultural Sciences and Fisheries, which is among the areas with the lowest number of academics, has a percentage of PTC that is almost equal to that of Health Sciences and Social Sciences and Humanities, which are areas of knowledge with the highest number of students and academics.

- The academic degree of the academic staff in each area of knowledge

The academic degree refers to the higher level degrees obtained by the PTC, in this sense, the number of professors with bachelor's, master's and doctorate degrees is analysed, as shown in the graph below:

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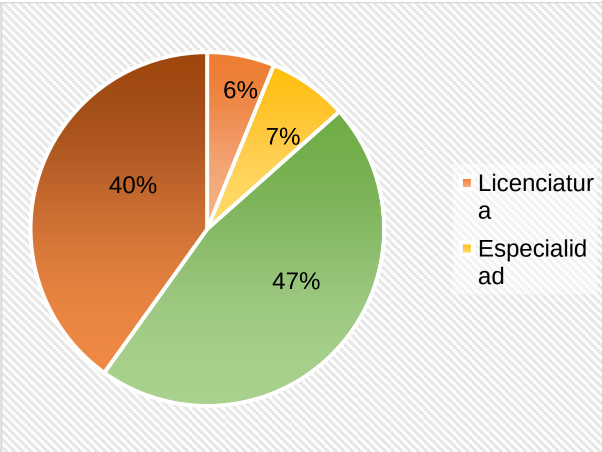

Graphic 3 Percentage distribution of PTC by academic degree in the year 2023
Source: UAN (2023). Statistical yearbook 2022-2023.

Of the 878 PTC, the academic degree with the greatest predominance is the master's degree with 47.0%, followed by the doctorate with 40.0%, then the speciality with 7.0% and finally the bachelor's degree with 6.0%.

Academic degree	Arts		Basic Sciences and Engineering		Biological, Agricultural and Fishery Sciences		Health Sciences		Economic-Administrative Sciences		Ciencias Biológicas, Agrícolas y Pesqueras	
	2017	*2023*	*2017*	*2023*	*2017*	*2023*	*2017*	*2023*	*2017*	*2023*	*2017*	*2023*
Bachelor's degree	0	3	12	9	15	4	15	0	44	28	22	10
Speciality	0	0	0	0	3	3	22	58	2	2	0	1
Master's degree	0	1	20	20	64	62	100	102	152	138	98	85
Doctorate	0	1	23	31	81	106	34	22	45	99	52	93
Total	0	5	55	60	163	175	171	182	243	267	172	189

Table 4 CTP by academic degree by area of knowledge, comparison 2017 and 2023
Source: UAN (2017) Statistical Yearbook 2016-2017, UAN (2023) Statistical Yearbook 2022-2023

In all areas of knowledge there are PTC with a bachelor's degree, however, the table shows how the number has decreased in seven years. The specialisation degree is more recurrent in Health Sciences. With regard to master's and doctoral degrees, the areas that stand out are Biological, Agricultural and Fisheries Sciences, Economic and Administrative Sciences, and Social Sciences and Humanities.

Participation of academics in PRODEP and SNI

The PRODEP is a federal programme that encourages professors to articulate research and teaching activities, technology development and innovation, and collegiate work through academic bodies, being responsible for the social environment (SEP, 2020). Table 5 shows these indicators:

Area of knowledge	**Year**	
	2017	**2023**
Arts	0	0
Basic Sciences and Engineering	26	26
Biological, Agricultural and Fisheries Sciences	102	98
Health Sciences	80	68
Economic-Administrative Sciences	130	126
Social Sciences and Humanities	103	95
Total	441	413

Table 5 Number of PTC with PRODEP profile, by area of knowledge, comparison year 2017 and year 2023
Source: UAN (2017) Statistical yearbook 2016-2017, UAN (2023) Statistical yearbook 2022-2023

In 2023, 47.0% of the total of 878 PTC are PRODEP profile. The Economic-Administrative Sciences area is the one with the highest number of academics with this profile, followed by Biological-Agricultural and Fisheries Sciences, and Social Sciences and Humanities. Finally, the areas with the fewest academics with a PRODEP profile are: Health Sciences and Basic Sciences and Engineering. Arts do not have any professors benefiting from the programme.

Regarding the SNI, it is a programme that was created for academic researchers, it remunerates scientific work and recognises the importance of research. The rules established by the system go beyond the institution. See the following table:

Area of knowledge	Year	
	2017	2023
Arts	0	0
Basic Sciences and Engineering	7	8
Biological, Agricultural and Fisheries Sciences	51	73
Health Sciences	3	18
Economic-Administrative Sciences	11	15
Social Sciences and Humanities	28	38
Total	100	152

Table 6 Number of PTC registered in the SNI, by area of knowledge, comparison between 2017 and 2023
Source: UAN (2017) Statistical yearbook 2016-2017, UAN (2023) Statistical yearbook 2022-2023

Compared to PRODEP, the proportion of PTCs registered in the SNI changes by area of knowledge. Biological, Agricultural and Fisheries Sciences leads the indicator, followed by Social Sciences and Humanities. These two areas are followed by Health Sciences, Economic-Administrative Sciences and Basic and Engineering Sciences.

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Economic and Administrative Sciences went from leading the PRODEP indicator to being the area with the second lowest number of PTC academics in the SNI.

Conclusions

The academic profession has distinguished itself by being made up of groups of professionals in different disciplines, i.e. engineers, doctors, lawyers, pedagogues, biologists, chemists, among many others, who converge in the same higher education institution; where, in addition to sharing a mission, a vision and objectives, they also generate their own ways of proceeding. In the case of the UAN, the figures were analysed by area of knowledge and for the present conclusion the most recent year, 2023, is considered.

Arts is the area of knowledge with the smallest number of students, with 1% of the enrolment. The academics who attend them have a maximum degree and there are none who participate in the PRODEP or SNI profile.

Enrolment in the area of Basic Sciences and Engineering represents 3% of the total enrolment in higher education. Of the 77 academics working in this area, 60 are PTC, of which 15.0% have a bachelor's degree, 33.3% have a master's degree and 51.6% have a doctorate. Of the 60 PTC 26 are PRODEP profile and 8 are SNI.

Biological, Agricultural and Fisheries Sciences has 8% of the student enrolment. Of the total number of academics, 175 are PTC, of which by academic degree 2.3% have a bachelor's degree, 1.7% have a speciality, 35.4% have a master's degree and 60.6% have a doctorate.

Health Sciences is the area of knowledge with the highest demand and student enrolment, representing 32% of the total. As of 2023, 412 professors have joined the academic staff, of which 182 are PTC. The academic degree of these PTC is distributed as follows: 31.9% have a speciality, 56.0% have a master's degree and 12.1% studied a doctorate. In this area, 68 of the total number of PTC have a PRODEP profile and 18 are SNI.

In Economic-Administrative Sciences, 21% of the University's higher education enrolment is catered for. There are 267 academics participating, of which 100% are PTC. By academic degree, more than half of the PTC have a master's degree (51.7%), 37.1% have a doctorate, 10.5% have a bachelor's degree and 0.8% have a speciality. Regarding participation in PRODEP, in 2023 there were 126 with this profile and 15 academics with the SNI distinction.

As for Social Sciences and Humanities, 24% of the enrolment is formed in this Academic Unit and it has a staff of 298 academics. Of the total number of academics in this area, 189 are PTC, i.e. 63.4%. By academic degree, these PTC have a doctorate (49.2%), followed by a master's degree (45.0%), a bachelor's degree (5.3%), and finally a speciality (0.5%). In this area there are 95 academics with PRODEP profile and 38 are recognised by the SNI.

Presenting the numbers of academics allows us to see from the surface the particularities of each area of knowledge and whether academics have traits in common or follow trends according to their discipline, as Becher (2001) mentions, they develop cultures. The results are a milestone that leads to deeper analysis in various dimensions: in the sense of educational and institutional policies, on the diversity of academic roles, the characteristics of choices for teacher education and qualification, gender differences, among others.

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Clearly focus each of its features

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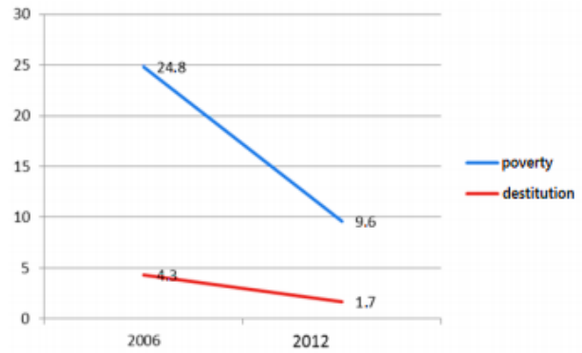

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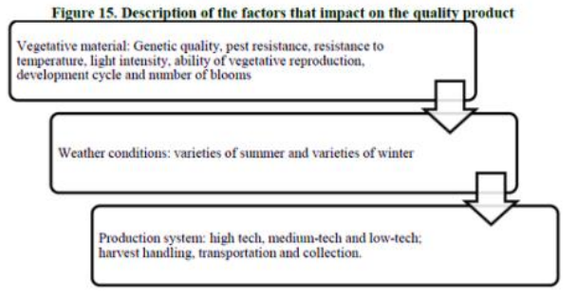

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LIQUIDITY	77.182	4	.427	532	180.669	.000
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