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Personal Determinants and Work Environments Associated with the Development of Osteoarthritis

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Abstract

Osteoarthritis is the most prevalent rheumatic disease, affecting 47% of the population. It is a condition with a worldwide distribution, and its prevalence increases with age. This research constitutes an analytical epidemiological case-control study aimed at analyzing the personal and work-related determinants of osteoarthritis. A survey, using dichotomous questions and a Likert scale, was administered to elderly patients attending a health center in western Spain. The study included 210 participants in a 1:2 ratio (70 cases and 140 controls). Of the 210 participants, 55% are male with an average age of 49, 41.2% are housewives, 28% are laborers, 37% have secondary education, 50% are from urban areas, and 51% are in stable unions.

Regarding disc alterations (vertebral column), it was shown that the probability of developing osteoarthritis was 2.2 times higher (p=0.04). People with arthritis of the hands were associated with a 2.7 times greater risk of developing osteoarthritis of the upper phalangeal extremities (p=0.002). Cruciate ligament injury from different causes was shown to be a risk factor, increasing the probability of developing osteoarthritis by 7.03 times (p=0.001).

Regarding the work environment, jobs involving plumbing (masonry) are associated with a 1.5-fold increased risk of developing osteoarthritis (p=0.04). Therefore, promoting self-care and avoiding trauma are important for preventing and treating joint diseases that can lead to osteoarthritis.

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Introduction

Osteoarthritis is the most prevalent rheumatic disease in developed countries. It is a condition with a worldwide distribution, and its prevalence increases with age [1]. The global prevalence of osteoarthritis is 47%, with women being the most affected. The most commonly affected joints are the spine, knees, hands, and hips, affecting more than 70% of those over 50 years of age.

Osteoarthritis is the most common musculoskeletal pathology in Western populations and is the most common cause of disability in elderly people. It is the rheumatic disease that has caused the greatest number of work absences and the most frequent cause of permanent disability. The social and economic impact of work disability due to osteoarthritis is also high, representing, according to some studies, 52.8% of total expenditure on subsidies [2,3].

In Latin America, the prevalence of symptomatic knee osteoarthritis diagnosed in adults ranges from 1.55% in Peru to 7.4% in Ecuador. The overall prevalence of radiographic knee osteoarthritis of grade ≥ 2 was less than half for those ≥ 39 years of age, given that the figures are similar in other countries, as well as in Brazil and Mexico. The prevalence of symptomatic-radiographic knee osteoarthritis is significant for those over 18 years of age, as this pathology affects them [4].

In Guatemala, regarding the incidence of the disease, there are more than 3,000 consultations per year, around 12 new cases per month with patients over 50 years old, and it is evident that the disease causes significant disability in the Guatemalan population.

Given that the PAHO in Guatemala has seen an increase in obesity, there are more significant health problems. There is little physical mobility, since in urban areas women have a prevalence of insufficient physical activity; the prevalence is less than half of the population, while in men it is greater than half of the population, emphasizing the development of osteoarthritis [5].

In Nicaragua, deaths caused by osteoarthritis have reached 10 (0.03% of all deaths). The age-standardized mortality rate is 0.20 per 100,000 population. In Nicaragua, as elsewhere, measures are being implemented to improve the diagnosis and treatment of this disease [6].

This research will contribute to research line No. 6 Trauma, disorders, musculoskeletal and degenerative since it determines the evaluation and monitoring of personal determinants and the work environment to the chronic health program.

Objectives

General Objective:

- Analyze the personal determinants and work environments associated with the development of osteoarthritis.

Specific Objectives:

- To demographically characterize the study population associated with the development of osteoarthritis.
- Identify the personal determinants associated with the development of osteoarthritis.
- Describe the work environments associated with the development of osteoarthritis.

Methodological Design

Type of Study: Study Type: Analytical epidemiological case-control study.

Analytical Study: I analyze the relationship between the variables and the health status of the individual since it goes beyond the description of the disease in a population, thus establishing the association of Osteoarthritis with personal determinants and the work environment.

Case-Control Studies: This allowed for measuring causality in a short time within a defined population. Populations of patients with arthritis who have developed

osteoarthritis (cases) will be compared with a group of patients who have not developed the disease being studied (controls).

Study Area: It was carried out in a primary care center in western Nicaragua

Unit of Analysis: Men and women with arthritis who attend a health unit in western Nicaragua.

Study Population: It consisted of 210 patients with arthritis, of whom 70 developed osteoarthritis (Cases) and 140 did not develop arthritis (controls) from the patients who attend a health unit in western Nicaragua, with a proportionality of 1 case: 2 controls.

Source of Information:

Primary: It will be obtained directly from the participants who participated in the study through the survey given to patients with the characteristics under study.

Definition of Controls:

- Patients with arthritis who have not been diagnosed with osteoarthritis with an evolutionary note in clinical records endorsed by a physician in the health area.
- Patients of both sexes, female and male, participated equally in the study
- That they are not diagnosed with osteoarthritis, which is the characteristic under study.
- Those who wish to participate in the study of their own free will with prior informed consent.
- All types of arthritis were taken as a reference according to the affected joint (Anatomical portion according to topographic plane)

Case Definition:

- Patients diagnosed with the characteristics under study (Cases).
- That prior to the diagnosis of Osteoarthritis they had gone through the stage of arthritis as an initial diagnosis.
- The active patients were selected for the unit.
- People over 45 years of age were taken as a reference due to the incidence in the population group.
- That they did not have another musculoskeletal pathology that causes a confounding factor of the characteristic under study.

Study Variables

Dependent:

- Osteoarthritis.

Independent:

- Personal determinants.
- Work environment.

Method of Data Collection

The survey method was used to obtain results on the problem under study. Contact was established with the authorities of the unit where the study was conducted to obtain the necessary permissions to administer the instrument.

The survey was distributed to the patients and completed by them. The researcher immediately received the survey and checked that it was filled out correctly. If a patient was unable to read or write, they were asked for the required information. Depending on their ability to read or write, the question was explained until a response was obtained or the survey was completed correctly. In all cases, the researchers completed the form in front of the patient participating in the study.

Data Collection Techniques and Instruments

The information was collected through a questionnaire with pre-prepared questions with dichotomous answers, Likert scale, multiple choice, where the information provided by the patients was reflected regarding sociodemographic data, personal determinants and work environment associated with the development of osteoarthritis in patients with arthritis.

The questionnaire consisted of three sections: the first, sociodemographic data, required 10 basic and easy-to-answer questions for the patient; the second, personal determinants, had 5 questions; and the last, the work environment, also had 5 questions. All questions used dichotomous responses for ease of understanding and patient participation. The questionnaire comprised a total of 20 questions, some of which were verified in the patient's medical record. The questionnaire was designed by the authors of this study to reflect the characteristics they wished to investigate.

Field Testing of the Instruments

A pilot test was conducted on 7 patients (case) and 14 patients (control) with arthritis from a health unit, independent of the study population to avoid information and measurement bias, who do not belong to the study, nor to the time period in which it will be carried out taking into account 10% of the study population, allowing the collection of valid and reliable information to improve the inconsistency of the questions as long as they meet the characteristics of the population to be investigated to obtain authenticity and accuracy.

Information processing and Analysis

The data will be processed using SPSS version 21 statistical software. Data analysis will be conducted using analytical statistics and 2x2 contingency tables to demonstrate the association between variables. The Chi-square (X^2) test will be used; a X^2 value less than 0.05 indicates an association between variables, while a X^2 value greater than 0.05 indicates that the variables are independent. The odds ratio (OR) will be used to calculate the risk associated with a variable; an OR less than 1 indicates a protective factor, while an OR greater than 1 indicates a risk factor. An OR equal to 1 indicates no association.

The analysis will be performed with a 95% confidence interval, therefore the lower and upper limits will be used to check the statistical significance of the variables.

Natural limits (Ln) containing the unit (1) are not statistically significant, while a result of natural limits (Ln) not containing the unit (1) is statistically significant. The information will be presented through tables and graphs.

Ethical Aspects

Informed Consent:

- Consent will be requested from the management of the health center by means of a letter indicating the objectives of the research.
- Respect will be maintained for the different participants included in the research, avoiding the issuance of judgments or criticisms by the researcher.
- The voluntary participation of the people in the study will be requested, explaining to them the objectives of the research and its usefulness, the patient will sign the informed consent document if he is willing to participate in the study.

Autonomy:

- The women who will be surveyed will be informed that their participation will be voluntary and that they can choose not to participate in the study.

Anonymous:

- Each woman in the study will be informed that the information provided is purely confidential and anonymous, and will only be used for research purposes.
- The confidentiality of the information will be respected and maintained.
- The patient will be informed that no data will be collected that could jeopardize the identity and integrity of the people participating in the research.

Confidentiality: The information obtained will be handled solely by the research team and will be used only for study purposes.

Results

Table 1: Sociodemographic Data Associated with the Development of Osteoarthritis

Most patients are 44 years old, the majority are female (55.0%), 41.2% are housewives, 37.0% have a secondary education, 50.7% live in urban areas, and 51.7% are in a stable common-law union.

Measures of central tendency	Age		
Average	49.27		
Fashion	44 years old		
Sociodemographic data		N	%
Sex	Male	94	44.5
	Female	116	55.5
Occupation	Housewife	87	41.2
	Workers	61	28.9
	Professional	34	16.1
	Farmer	28	13.3
Schooling	Primary	56	26.5
	Secondary	78	37.0
	Higher Technician	24	11.4
	University	52	24.6
Origin	Urban	107	50.7
	Rural	103	48.8
Marital status	Single	23	10.9
	Married	65	30.8
	Divorced	13	6.2
	Stable echo union	109	51.7
Total		210	100

Source: Questionnaire

Table 2: Personal Determinants in Osteoarthritis.

Regarding the types of hip arthritis, it was found that 19 of them developed hip arthritis. Of these, 10 were exposed to hip osteoarthritis and 9 were exposed but did not develop osteoarthritis. 60 of them were not exposed but developed osteoarthritis and 131 were not exposed and did not develop osteoarthritis, for a total of 191.

Of those with spinal arthritis, the following was found: 41 developed spinal arthritis; of these, 20 were exposed to spinal osteoarthritis, and 21 were exposed but did not develop osteoarthritis. 50 were not exposed but developed osteoarthritis, and 119 were not exposed and did not develop osteoarthritis, for a total of 169.

Of those with cervical arthritis, 7 developed it. Of these, 5 were exposed to cervical osteoarthritis, and 2 were exposed but did not develop osteoarthritis. 65 were exposed but developed osteoarthritis, and 138 were not exposed and did not develop osteoarthritis, for a total of 191.

Regarding hand arthritis, it was found that 78 of them developed hand arthritis. Of these, 37 were exposed

to hand osteoarthritis, and 41 were exposed but did not develop osteoarthritis. 33 were not exposed but developed osteoarthritis, and 99 were not exposed and did not develop osteoarthritis, for a total of 132. Regarding knee arthritis, it was found that 100% of the population reported not having knee arthritis.

Type of arthritis	Osteoarthritis	Arthritis	TOTAL	X^2	OR	CI: 95%
Hip						
Yeah	9	10	19	0.15	1.9	(0.75 - 5)
NO	60	131	191			
Column						
Disc Disruption	20	21	41	0.04	2.2	(1.02 - 4.1)
Without Alteration	50	119	169			
Cervical						
Disc Disruption	5	2	7	0.16	5.3	(0.61 -13)
Without Alteration	65	138	203			
Hand						
Yeah	37	41	78	0.002	2.7	(1.41 – 4.6)
No	33	99	132			

Source: Questionnaire

Table 3: Overload Activities Associated with the Development of Osteoarthritis

Regarding overload activities, it was found that: 123 of them perform overload activities, of these 45 were exposed to developing osteoarthritis, 78 of these were exposed but did not develop osteoarthritis, 25 of these were not exposed but developed osteoarthritis, and 62 of these were not exposed and did not develop osteoarthritis with an 87.

Overload activities	cases	controls	Total	X^2	OR	95% CI	
	Osteoarthritis	Arthritis				LI	Ls
Yeah	45	78	123	0.2	1.3	0.76	2.4
No	25	62	87				
Total	70	140	210				

Source: Questionnaire

Table 4: Paternal Relatives who have Presented with Osteoarthritis.

Regarding paternal relatives who have presented osteoarthritis, it was found that: 90 of them have a paternal relative who presents arthritis, of these 26 were exposed to developing osteoarthritis, 64 of these were exposed, but did not develop osteoarthritis, 43 of these were not exposed, but developed osteoarthritis, 77 of these were not exposed and did not develop osteoarthritis with a 120.

paternal relative	Case-Control		Total	X^2	OR	95% CI	
	Osteoarthritis	Arthritis				LI	Ls
Yeah	26	64	90	0.3	0.7	0.4	1.33
No	43	77	120				
Total	70	140	210				

Source: Questionnaire

Table 5: Maternal Relatives who have Presented with Osteoarthritis.

Regarding maternal relatives who have presented osteoarthritis, it was found that: 116 of them have a maternal relative who has presented arthritis, of these 44 were exposed to developing osteoarthritis, 72 of these were exposed, but did not develop osteoarthritis, 26 of these were not exposed, but developed osteoarthritis, 68 of these were not exposed and did not develop osteoarthritis with a 94.

Maternal relative	cases	controls	Total	X^2	OR	95% CI	
	Osteoarthritis	Arthritis				LI	Ls
Yeah	44	72	116	0.14	1.5	0.85	2.7
No	26	68	94				
Total	70	140	210				

Source: Questionnaire

Table 6: Causal Factors of Injury that Caused Osteoarthritis.

Regarding causal factors of meniscal rupture injury, it was found that: 29 of these developed some type of injury that caused osteoarthritis, of these 14 were exposed to developing osteoarthritis, 15 of these were exposed, but did not develop osteoarthritis, 56 of these were not exposed, but did develop osteoarthritis, 125 of these were not exposed and did not develop osteoarthritis with a 151.

Regarding cruciate ligament injuries, it was found that: 16 of these developed some type of injury that caused osteoarthritis; of these, 12 were exposed to developing osteoarthritis; 4 of these were exposed and did not develop osteoarthritis; 58 of these were not exposed but did develop osteoarthritis; and 136 of these were not exposed and did not develop osteoarthritis, with a 194.

Of the surgical procedures it was found: 39 of these developed some type of injury that caused osteoarthritis, of these 15 were exposed to developing osteoarthritis, 24 of these were exposed, but did not develop osteoarthritis, 55 of these were not exposed, but developed osteoarthritis, 116 of these were not exposed, and did not develop osteoarthritis with a 171.

Regarding joint deformity, it was found that: 24 of these developed some type of injury that caused osteoarthritis; of these, 10 were exposed to developing osteoarthritis; 14 of these were exposed but did not develop osteoarthritis; 60 of these were not exposed but did develop osteoarthritis; and 126 of these were not exposed

and did not develop osteoarthritis, with a 186.

Regarding joint alignment, it was found that: 8 of these developed some type of injury that caused osteoarthritis; of these, 5 were exposed to developing osteoarthritis; 3 of these were exposed and did not develop osteoarthritis; 65 of these were not exposed but did develop osteoarthritis; and 137 of these were not exposed and did not develop osteoarthritis, with a 202.
Of the fractures, it was found that: 93 of these developed some type of injury that caused osteoarthritis, of these 19 were exposed to developing osteoarthritis, 74 of these were exposed but did not develop osteoarthritis, 51 of these were not exposed but did develop osteoarthritis, and 66 of these were not exposed and did not develop osteoarthritis with a 117.

Causal factors of the injury that caused osteoarthritis	Osteoarthritis	Arthritis	TOTAL	X^2	OR	CI: 95%
Meniscal Rupture						
Yeah	14	15	29	0.13	2.03	(0.8 – 4)
No	56	125	181			
Cruciate ligaments						
Yeah						
No	12	4	16	0.001	7.03	(1.7 – 19.4)
	58	136	194			
Surgical Procedures						
Yeah						
No	15	24	39	0.65	1.3	(0.57 – 2.4)
	55	116	171			
Joint deformity						
Yeah	10	14	24	0.4	1.5	(0.6 – 3.3)
No	60	126	186			
Joint alignment						
Yeah	5	3	8	0.2	3.5	(0.5 – 8.6)
No	65	137	202			
Previous Fracture						
Yeah	19	74	93	0.78	0.3	(0.16 – 0.58)
No	51	66	117			

Source: Questionnaire

Work Environment Associated with the Development of Osteoarthritis.

Table 7: Work Developed with the Upper Limbs.

Regarding the work carried out with the upper limbs of mechanics, it was found: 17 of them perform some type of manual work that causes them osteoarthritis, of these 5 were exposed to developing osteoarthritis, 12 of these were exposed and did not develop osteoarthritis, 65 of these were not exposed, but did develop osteoarthritis, 128 of these were not exposed and did not develop osteoarthritis with a 193.

Of the painters it was found: 14 of them perform some type of manual work that causes them osteoarthritis, of these 8 were exposed to developing osteoarthritis, 6 of these were exposed and did not develop osteoarthritis, 62 of these were not exposed, but did develop osteoarthritis, 134 were not exposed and did not develop osteoarthritis with a 196.

From plumbing it was found: 9 of these perform some type of manual work that causes them osteoarthritis, of these 1 were exposed to developing osteoarthritis, 8 of these were exposed, but did not develop osteoarthritis, 69 of these were not exposed, but did develop osteoarthritis, 132 of these were not exposed, but did not develop osteoarthritis with a of 201.

In construction, it was found that: 39 of these perform some type of manual work that causes them osteoarthritis; of these, 16 were exposed to developing osteoarthritis, 23 of these were exposed but did not develop osteoarthritis, 54 of these were not exposed but did develop osteoarthritis, and 117 of these were not exposed and did not develop osteoarthritis with a 171.
Of the vehicle driver it was found: 29 of these perform some type of manual work that causes them osteoarthritis, of these 12 were exposed to developing osteoarthritis, 17 of these were exposed, but did not develop osteoarthritis, 58 of these were not exposed, but did develop osteoarthritis, 123 of these were not exposed and did not develop osteoarthritis with a 181.

Causal factors of the injury that caused osteoarthritis	Osteoarthritis	Arthritis	TOTAL	X^2	OR	CI: 95%
Meniscal Rupture						
Yeah	14	15	29	0.13	2.03	(0.8 – 4)
No	56	125	181			
Cruciate ligaments						
Yeah						
No	12	4	16	0.001	7.03	(1.7 –
	58	136	194			19.4)
Surgical Procedures						
Yeah						
No	15	24	39	0.65	1.3	(0.57 –
	55	116	171			2.4)
Joint deformity						
Yeah	10	14	24	0.4	1.5	(0.6 – 3.3)
No	60	126	186			
Joint alignment						
Yeah	5	3	8	0.2	3.5	(0.5 – 8.6)
No	65	137	202			
Previous Fracture						
Yeah	19	74	93	0.78	0.3	(0.16 –
No	51	66	117			0.58)

Of the painters it was found: 14 of them perform some type of manual work that causes them osteoarthritis, of these 8 were exposed to developing osteoarthritis, 6 of these were exposed and did not develop osteoarthritis, 62 of these were not exposed, but did develop osteoarthritis, 134 were not exposed and did not develop osteoarthritis with a 196.

From plumbing it was found: 9 of these perform some type of manual work that causes them osteoarthritis, of these 1 were exposed to developing osteoarthritis, 8 of these were exposed, but did not develop osteoarthritis, 69 of these were not exposed, but did develop osteoarthritis, 132 of these were not exposed, but did not develop osteoarthritis with a of 201.

In construction, it was found that: 39 of these perform some type of manual work that causes them osteoarthritis; of these, 16 were exposed to developing osteoarthritis, 23 of these were exposed but did not develop osteoarthritis, 54 of these were not exposed but did develop osteoarthritis, and 117 of these were not exposed and did not develop osteoarthritis with a 171.
Of the vehicle driver it was found: 29 of these perform some type of manual work that causes them osteoarthritis, of these 12 were exposed to developing osteoarthritis, 17 of these were exposed, but did not develop osteoarthritis, 58 of these were not exposed, but did develop osteoarthritis, 123 of these were not exposed and did not develop osteoarthritis with a 181.

Causal factors of the injury that caused osteoarthritis	Osteoarthritis	Arthritis	TOTAL	X^2	OR	CI: 95%
Meniscal Rupture						
Yeah	14	15	29	0.13	2.03	(0.8 – 4)
No	56	125	181			
Cruciate ligaments						
Yeah						
No	12	4	16	0.001	7.03	(1.7 – 19.4)
	58	136	194			
Surgical Procedures						
Yeah						
No	15	24	39	0.65	1.3	(0.57 – 2.4)
	55	116	171			
Joint deformity						
Yeah	10	14	24	0.4	1.5	(0.6 – 3.3)
No	60	126	186			
Joint alignment						
Yeah	5	3	8	0.2	3.5	(0.5 – 8.6)
No	65	137	202			
Previous Fracture						
Yeah	19	74	93	0.78	0.3	(0.16 – 0.58)
No	51	66	117			

Source: Questionnaire

Work Environment Associated with the Development of Osteoarthritis.

Table 7: Work Developed with the Upper Limbs.

Regarding the work carried out with the upper limbs of mechanics, it was found: 17 of them perform some type of manual work that causes them osteoarthritis, of these 5 were exposed to developing osteoarthritis, 12 of these were exposed and did not develop osteoarthritis, 65 of these were not exposed, but did develop osteoarthritis, 128 of these were not exposed and did not develop osteoarthritis with a 193.

Of the painters it was found: 14 of them perform some type of manual work that causes them osteoarthritis, of these 8 were exposed to developing osteoarthritis, 6 of these were exposed and did not develop osteoarthritis, 62 of these were not exposed, but did develop osteoarthritis, 134 were not exposed and did not develop osteoarthritis with a 196.

From plumbing it was found: 9 of these perform some type of manual work that causes them osteoarthritis, of these 1 were exposed to developing osteoarthritis, 8 of these were exposed, but did not develop osteoarthritis, 69 of these were not exposed, but did develop osteoarthritis, 132 of these were not exposed, but did not develop osteoarthritis with a of 201.

In construction, it was found that: 39 of these perform some type of manual work that causes them osteoarthritis; of these, 16 were exposed to developing osteoarthritis, 23 of these were exposed but did not develop osteoarthritis, 54 of these were not exposed but did develop osteoarthritis, and 117 of these were not exposed and did not develop osteoarthritis with a 171. Of the vehicle driver it was found: 29 of these perform some type of manual work that causes them osteoarthritis, of these 12 were exposed to developing osteoarthritis, 17 of these were exposed, but did not develop osteoarthritis, 58 of these were not exposed, but did develop osteoarthritis, 123 of these were not exposed and did not develop osteoarthritis with a 181.

Work developed with the upper limbs	Cases Osteoarthritis	Controls Arthritis	TOTAL	X^2	OR	CI: 95%
Mechanics						
Yeah	5	12	17	0.4	0.6	(0.2 – 2.1)
No	65	128	193			
Painter						
Yeah	8	6	14	0.1	2.1	(0.7 – 6.4)
No	62	134	196			
Plumbing						
Yeah	1	8	9	0.04	1.5	(1.3 – 1.6)
No	69	132	201			
Construction						
Yeah	16	23	39	0.4	1.3	(0.6 – 2.7)
No	54	117	171			
Vehicle driver						
Yeah				0.5	1.2	(0.5 – 2.9
No	12 58	17 123	29 181			
Kitchen						
Yeah	33	70	103	0.5	0.8	(0.4 – 1.5)
No	37	70	107			

Source: Questionnaire

Table 8: Work Developed with the Lower Limbs.

Regarding the work carried out with the lower limbs, it was found that: 189 of these perform foot work, of these 59 were exposed to developing osteoarthritis, 130 of these were exposed, but did not develop osteoarthritis, 11 of these were not exposed, and developed osteoarthritis, 10 of these were not exposed and did not develop osteoarthritis with a 21.

Work activity that requires the use of lower limbs	cases Osteoarthritis	controls Arthritis	Total	X^2	OR	95% CI LI	 Ls
Yeah	59	130	189	0.045	0.4	0.1	1
No	11	10	21				
Total	70	140	210				

Source: Questionnaire

Table 9: Time Spent Standing During your Workday.

Regarding the amount of time spent standing during their workday, it was found that: 149 of these spend more than 5 hours standing, of these 50 were exposed to developing osteoarthritis, 99 of these were exposed but did not develop osteoarthritis, 20 of these were not exposed and developed osteoarthritis, and 41 of these were not exposed and did not develop osteoarthritis, with a 61% risk.

Time spent standing at your workplace	cases	controls	Total	X^2	OR	95% CI	
	Osteoarthritis	Arthritis				LI	Ls
More than 5 hours	50	99	149	0.9	1	0.5	1.8
Less than 5 hours	20	41	61				
Total	70	140	210				

Source: Questionnaire

Table 10: Activities that Require Knee Bending.

Regarding knee activities, it was found that: 55 of these always perform knee activities, of these 20 were exposed to developing osteoarthritis, 35 of these were exposed but did not develop osteoarthritis, 155 of these occasionally perform knee activities, of these 50 were exposed to developing osteoarthritis, 105 were exposed but did not develop osteoarthritis.

Work activities that require bending the knees	cases	controls	Total	X^2	OR	95% CI	
	Osteoarthritis	Arthritis				LI	Ls
Always	20	35	55	0.7	1.1	0.5	2.1
Occasionally	50	105	155				
Total	70	140	210				

Source: Questionnaire

Table 11: Time in a Resting State.

Regarding the time spent in the resting stage, it was found: 61 of these spent in a resting state, of these 21 of these were exposed to developing osteoarthritis, 40 of these were exposed, but did not develop osteoarthritis, 149 of these did not spend in a resting state, of these 49 were not exposed, but did develop osteoarthritis, 100 of these were not exposed and did not develop osteoarthritis.

Time in resting state	cases	controls	Total	X^2	OR	95% CI	
	Osteoarthritis	Arthritis				LI	Ls
Yeah	21	40	61	0.9	0.9	0.5	1.8
No	49	100	149				
Total	70	140	210				

Source: Questionnaire

Table 12: Traumas that have Caused Osteoarthritis.

Regarding traumas that have caused osteoarthritis, it was found: 38 of these had car accidents, of these 16 were exposed to developing osteoarthritis, 22 of these were exposed and did not develop osteoarthritis, 54 of these were not exposed and did develop osteoarthritis, 118 of these were not exposed and did not develop osteoarthritis with a 172.

Regarding falls, it was found that: 50 of these suffered some type of fall, of these 20 were exposed to developing osteoarthritis, 30 of these were exposed and did not develop osteoarthritis, 50 of these were not exposed and did develop osteoarthritis, 110 of these were not exposed and did not develop osteoarthritis with a 160.

Of the blows it was found: 37 of these had suffered some type of blow, of these 17 were exposed to developing osteoarthritis, 20 of these were exposed and did not develop osteoarthritis, 53 of these were not exposed, but did develop osteoarthritis, 120 of these were not exposed and did not develop osteoarthritis with a of 174.

Of those with knife wounds, it was found that: 12 of these suffered knife wounds, 5 of these were exposed to developing osteoarthritis, 7 of these were exposed and did not develop osteoarthritis, 65 of these were not exposed and did develop osteoarthritis, 133 of these were not exposed and did not develop osteoarthritis with a 198.

Of gunshot wounds it was found: 10 of these had gunshot wounds, of these 5 were exposed to developing osteoarthritis, 5 of these were exposed and did not develop osteoarthritis, 65 of these were not exposed and did develop osteoarthritis, 135 of these were not exposed and did not develop osteoarthritis with a 200.

Traumas	Cases Osteoarthritis	Controls Arthritis	Total	X^2	OR	CI: 95%
Car accidents						
Yeah						
No	16 54	22 118	38 172	0.3	1.5	(0.6 – 2.9)
Falls						
Yeah	20	30	50	0.3	1.4	(0.6 – 2.6)
No	50	110	160			
Blows						
Yeah	17	20	37	0.1	1.9	(0.8 – 3.5)
No	53	120	173			
Bladed weapons						
Yeah	5	7	17	0.9	1.4	(0.2 – 3.5)
No	65	133	198			
Firearms						
Yeah	5	5	10	0.6	2.07	(0.3 – 5)
No	65	135	200			

Source: Questionnaire

Discussion

Sociodemographic Data

Analyzing the sociodemographic data, we find that the mean age is 49.27, indicating that these are elderly patients. Regarding sex, the majority are female (55.5%), which is higher than the number of males, thus demonstrating an interrelationship since the majority of those affected are female. In terms of occupation, housewives are the most active, as they are regularly the most affected, representing the majority of our population (87, or 41.2%). Secondary education is the most prevalent level of education, which coincides with and shows an interrelationship with the other data. The majority of those from urban areas (107) and those in stable unions (109) are in stable unions. Table 1.

Generalities.

Regarding hip arthritis associated with the development of osteoarthritis, a risk factor of 1.9 times the likelihood of developing osteoarthritis was observed. No association was found between the variables, and the data were not statistically significant. This contradicts the findings of Parker, M. J. The article states that while arthritis and osteoarthritis are diseases that affect the joints, they differ in their origin and treatments, although some symptoms, such as pain, stiffness, and swelling, are shared. People diagnosed with hip arthritis are highly likely to develop osteoarthritis over time.

Regarding spinal arthritis associated with the development of osteoarthritis, a 2.2-fold increased risk of developing osteoarthritis was observed, indicating a statistically significant association between the variables. This finding aligns with the findings of Parker, M.J., who states that while arthritis and osteoarthritis affect the joints, they differ in their origin and treatments. Some symptoms, such as pain, stiffness, and swelling, are shared by both. Individuals diagnosed with spinal arthritis have a high likelihood of developing osteoarthritis over time.

Regarding cervical arthritis associated with the development of osteoarthritis, a risk factor of 5.3 times the likelihood of developing osteoarthritis was observed. No association was found between the variables, and the statistical data were not significant. This contradicts Parker M.J.'s assertion that while arthritis and osteoarthritis are diseases that affect the joints, they differ in their origin and treatments. She notes that some symptoms, such as pain, stiffness, and swelling, are related to both conditions. She states that individuals diagnosed with cervical arthritis have a high probability of developing osteoarthritis over time.

Regarding hand arthritis associated with the development of osteoarthritis, a risk factor of 2.7 times the chances of developing osteoarthritis was evident. It was observed that there is an association between the variables and statistical significance was found, which is consistent with what Parker, M. J, states. Arthritis and osteoarthritis are diseases that affect the joints, but they differ in their origin and treatments. Some symptoms, such as pain, stiffness, and swelling, are related to both conditions, indicating that people diagnosed with arthritis of the hand have a high probability of developing arthritis. Table 2

Personal Determinants Associated with the Development of Osteoarthritis.

Regarding overload activities, it was found to be a risk factor with a 1.3 times greater likelihood of developing osteoarthritis. No association was observed between the variables, and no statistical significance was found, as this does not coincide with the findings of Eduardo Wainstein G., who states that increased stress on the joints leads to the chain of events described, and that excessive load has consequences that lead to osteoarthritis. Therefore, people who perform overload activities are more likely to develop osteoarthritis over time. Table 3.

Regarding paternal relatives with osteoarthritis, it was found to be a protective factor, with a 0.7 times greater probability of developing osteoarthritis. No association was observed between the variable and the findings, and no statistical significance was found. This aligns with the findings of JR Prieto Montaña, who states that individuals with a paternal relative who has osteoarthritis are less likely to develop osteoarthritis over time. Table 4.

Regarding maternal relatives with osteoarthritis, although it acted as a risk factor with a 1.5 times greater likelihood of developing osteoarthritis, no association was observed between the variables, and no statistical significance was found. This contradicts the findings of JR Prieto Montaña, who states that there is a greater

likelihood of developing osteoarthritis from the maternal side of the family, and that individuals with a maternal relative who has had osteoarthritis are more likely to develop osteoarthritis over time. Table 5.

Regarding the causal factors of injury, meniscal rupture was shown to be a risk factor with a twofold increased likelihood of developing osteoarthritis. No association was observed between variables, and no statistical significance was found, which contradicts Gregorio Marañón 's assertion that joint trauma increases the chances of developing osteoarthritis fourfold. It is interesting to note the controversial relationship between osteoarthritis and fractures; individuals who have suffered a meniscal rupture are more likely to develop osteoarthritis over time.

Regarding cruciate ligament injuries, it was found to be a risk factor with a 7.03 times greater chance of developing osteoarthritis. An association between variables was observed, and statistical significance was found, which coincides with what Gregorio Marañón states, in which he suggests that joint trauma increases the chances of developing osteoarthritis by 4 times. It is interesting to highlight the controversial relationship between osteoarthritis and fractures; people who have had cruciate ligament injuries have a greater chance of developing osteoarthritis over time.

Regarding surgical procedures, it was found to be a risk factor with a 1.3 times greater chance of developing osteoarthritis. It was observed that there is no association between variables and no statistical significance was found, which contradicts what Gregorio Marañón states, in which he says that surgical interventions do not reduce the risk of developing osteoarthritis; people who have undergone surgical repairs have a greater chance of developing osteoarthritis over time.

Regarding joint deformity, it was shown to be a risk factor with a 1.5 times greater chance of developing osteoarthritis. It was observed that there is no association between variables and no statistical significance was found, which contradicts what Gregorio Marañón states, in which he says that it alters the distribution of the load on different joint tissues and is associated with the development of osteoarthritis; people who have had joint deformity have a greater chance of developing osteoarthritis over time.

Regarding joint alignment, it was found to be a risk factor with a 3.5 times greater chance of developing osteoarthritis. No association was observed between variables, and no statistical significance was found. This contradicts the statement made by the Gregorio Marañón University General Hospital, which indicates that joint alignment is related to the lack of physical mobility and poor joint alignment. People who have had joint alignment issues are more likely to develop osteoarthritis over time.

Regarding previous fractures, it was found to be a protective factor, with a 0.3 times greater probability of developing osteoarthritis. An association was observed between the variables, finding statistical significance. This contradicts Gregorio Marañón's assertion that intra-articular fractures, in particular, predispose to osteoarthritis, as occurs with tibial plateau fractures, which are associated with pain, limited joint mobility, and angular deformity. This suggests that fractures contribute to the deterioration that leads to the development of osteoarthritis, meaning that people who have suffered fractures are more likely to develop osteoarthritis over time. Table 6

Work Environment Associated with the Development of Osteoarthritis.

Regarding work done with the upper limbs in mechanics, it was found to be a protective factor with a 0.6 times lower risk of developing osteoarthritis. It was observed that there is no association between variables, and no statistical significance was found, which contradicts what Khan, Ali states, in which he says that it is common for people who have performed repetitive manual work to present osteoarthritis of the joints. People who perform mechanical work have a greater chance of developing osteoarthritis over time.

Regarding painters, a risk factor was found with a 2.1 times greater probability of developing osteoarthritis. It was observed that there is no association of variables and the data are not statistically significant, which contradicts what Khan, Ali expresses, in which he states that it is common for people who have performed manual work to present osteoarthritis in the joints of the upper limbs due to performing repetitive work.

In relation to plumbing, a risk factor was identified with a 1.5 times greater probability of developing osteoarthritis. An association between variables was observed, finding statistical significance, which coincides with what Khan and Ali express, stating that the risk of developing it is due to people who must repeatedly bend or twist their wrists at work; this risk is 43 percent higher. People who perform plumbing work have a greater chance of developing osteoarthritis over time.

Regarding construction work, it was found to be a risk factor with a 1.3 times greater chance of developing osteoarthritis. It was observed that there is no association between variables, finding no statistical significance. This contradicts what Khan, Ali states, who indicates that it is common for people who have performed repetitive manual labor to develop osteoarthritis of the joints. People who work in construction have a greater chance of developing osteoarthritis over time.

Regarding car drivers, a risk factor was identified with a 1.2 times greater likelihood of developing osteoarthritis. However, no association was found between variables, and no statistical significance was found. This contradicts the findings of Khan and Ali, who state that the risk of developing osteoarthritis is 43 percent higher for people who repeatedly bend or twist their wrists at work. Specifically, they are more likely to develop osteoarthritis over time.

Regarding cooking, it was found to be a protective factor, with a 0.8 times greater likelihood of developing osteoarthritis. This association between variables was not statistically significant, which contradicts the findings of Khan and Ali, who state that the risk of developing osteoarthritis is 43 percent higher for people who work in kitchens, who must repeatedly bend or twist their wrists at work. Table 7.

Regarding work involving the lower limbs, it was found to be a protective factor with a 0.4 times greater likelihood of developing osteoarthritis. An association was observed between variables, but no statistical significance was found. This contradicts the statement by Eduardo Wainstein, who asserts that if an employee works standing up, both in movement and in a static position, the body's condition is diminished, increasing the risk of developing osteoarthritis. People who perform work standing up are more likely to develop osteoarthritis over time. Table 8.

Regarding the amount of time spent standing during the workday, it was found that there was no association with the likelihood of developing osteoarthritis. It was observed that there was no association between variables, with no statistical significance found, which contradicts the previous findings. According to Eduardo Wainstein, people who spend a lot of time on their feet during the workday are advised not to remain in the same position for more than 60 minutes over a 4-hour period, as this is a trigger for developing osteoarthritis. People who spend a lot of time standing are more likely to develop osteoarthritis over time. Table 9

Regarding work activities requiring knee flexion, a risk factor was identified with a 1.1 times greater likelihood of developing osteoarthritis. No association was observed between variables, with no statistical significance found, which contradicts Lohmander's findings. LS states that if the posture is highly repetitive, wear and tear of the skin structure can occur, eventually forming a fluid-filled sac, producing the aforementioned hygroma and increasing the likelihood of developing osteoarthritis. Therefore, people who perform knee-related activities are more likely to develop osteoarthritis over time. Table 10

Regarding time spent at rest, a protective factor was observed with a 0.9 times greater likelihood of developing osteoarthritis. No association was found between variables, and no statistical significance was found, which contradicts Lohmander's findings. He states that prolonged periods of rest can cause pain and swelling, and that joint pain after sitting or lying down for extended periods is a symptom of cartilage wear, which can lead to osteoarthritis. He further suggests that people who spend time at rest are more likely to develop osteoarthritis over time. (Table 11)

Regarding traumas that have caused osteoarthritis, specifically car accidents, a 1.5 times greater risk factor for developing osteoarthritis was observed. However, no association between variables was found, with no statistical significance. This contradicts the findings of Lohmander, LS, who states that traumas, such as those occurring while playing sports or in an accident, can increase the risk of osteoarthritis. Even injuries that occurred many years ago and appear to

have healed can increase the risk of osteoarthritis. From car accidents to falls, blows, or stab or gunshot wounds, individuals who have experienced trauma from car accidents are more likely to develop osteoarthritis over time.

Regarding falls, it was found to be a risk factor with a 1.4 times greater likelihood of developing osteoarthritis. However, no association was observed between the variables, with no statistical significance found, which contradicts Lohmander's statement that traumas, such as those occurring while playing sports or due to an accident, can increase the risk of osteoarthritis. Even injuries that occurred many years ago and that appear to have healed can increase the risk of osteoarthritis. From car accidents to falls, blows, or stab or gunshot wounds, people who have experienced falls are more likely to develop osteoarthritis over time.

Regarding blows, a risk factor was identified with a 1.9 times greater likelihood of developing osteoarthritis. However, no association was found between variables, and no statistical significance was found. This contradicts the statement by Lohmander, LS, who asserts that traumas, such as those occurring while playing sports or due to an accident, can increase the risk of osteoarthritis. Even injuries that occurred many years ago and appear to have healed can increase the risk of osteoarthritis. From car accidents to falls, blows, or stab or gunshot wounds, individuals who have experienced trauma from blows are more likely to develop osteoarthritis over time.

Regarding stab wounds, no association was found. Although there was a 1.4 times greater likelihood of developing osteoarthritis, no association was observed between the variables, with no statistical significance found. This contradicts Lohmander's statement that traumas, such as those occurring while playing sports or due to an accident, can increase the risk of osteoarthritis. Even injuries that occurred many years ago and appear to have healed can increase the risk of osteoarthritis. From car accidents to falls, blows, or stab or gunshot wounds, people who have experienced trauma from stab wounds are more likely to develop osteoarthritis over time.

Regarding gunshot wounds, a risk factor was identified with a 2.07 times greater likelihood of deveoping osteoarthritis. No association was observed between the variables, with no statistical significance found, which contradicts Lohmander's statement that traumas, such as those occurring while playing sports or due to an accident, can increase the risk of osteoarthritis. Even injuries that occurred many years ago and that appear to have healed can increase the risk of osteoarthritis, from car accidents to falls, blows, or stab or gunshot wounds. People who have experienced trauma from gunshot wounds are more likely to develop osteoarthritis over time [7-33]. Table 12.

Conclusion

Data Sociodemographic

The study was conducted with a sample of 210 participants, 70 cases and 140 controls, the majority of participants being female at 55%, with a predominance of the urban area, of the total participants 109 are in a stable de facto relationship.

Personal Determinants Associated with the Development of Osteoarthritis

Regarding spinal alterations (vertebral column) as an exponential risk factor in this study, it was shown that it increased the probability of developing osteoarthritis by 2.2 times, determining the statistically significant data.

Regarding people who have arthritis of the hands as an exponential factor, this is associated with a 2.7 times greater probability of developing osteoarthritis of the upper phalangeal extremities, with the data being statistically significant.

Cruciate ligament injuries from various causes were found to be a risk factor 7.03 times higher for the development of knee osteoarthritis. This is because an unstable knee can suffer other injuries that promote osteoarthritis, such as osteochondral fractures.

Work Environment Associated with the Development of Osteoarthritis.

All jobs involving plumbing are associated with the development of osteoarthritis 1.5 times more often than those who do not perform this same work activity.

Recommendations

General Directorate of the Health Center

1. Promote education in chronic disease programs to increase the knowledge of healthcare personnel about the disease in order to provide timely diagnosis to patients.
2. Promote educational workshops on osteoarthritis for proper management of the disease given its significant incidence in the study population.

Healthcare Personnel

1. Guide the patient to modify and adapt their activities and exercises according to their physical capacity to avoid overloading the joints.
2. Promoting self-care in health and physical activity to prevent and treat chronic diseases in patients with osteoarthritis; pain management, fatigue, and physical activity.

To Future Researchers

1. Increase the study population to verify the statistical significance of the indicators that have been tested, as well as the integration of other possible causal variables of risk to the development of osteoarthritis.
2. Continue conducting research, studying in depth the quality of life of these patients, emphasizing musculoskeletal disorders.

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