

Systematic Approach to Low Back Pain in Adults as a Public Health Problem-María Auxiliadora General Hospital, Lima, Perú

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Abstract: *This study aimed to investigate the systematic approach to low back pain as a public health issue in the outpatient setting. A longitudinal descriptive study was conducted with 112 patients, applying systematic diagnosis criteria for low back pain. Findings indicate a significant correlation between severe functional limitation and mental health disorders such as anxiety and depression $p < 0.05$. Obesity was also prevalent among patients with limited physical activity, with comorbidities such as hyperlipidemia and fibromyalgia frequently observed. The research highlights the need for a holistic diagnostic approach to low back pain, considering both physical and psychological factors.*

Keywords: low back pain, functional limitation, obesity, anxiety, comorbidity

1. Introduction

According to the WHO ⁽¹⁾, low back pain is considered a public health problem worldwide, because it compromises people's quality of life, daily activities and, in addition, it means economic losses and is one of the main causes of disabilities, absences from work; and disability - adjusted life years, which is the unit of the burden of a disease. meaning the years of life that were lost, due to injury, disability, or premature death. Macedo and Battié ⁽²⁾ argue that, despite the absence of a discernible disease or pathology, in most people with low back pain, for a long time, an injury model has been used to explain this type of pain, especially when it occurs in the workplace. For years, low back pain was considered a consequence of overexertion or trauma, from physically demanding activities, such as handling heavy materials, that cause damage or degeneration of the vertebrae, intervertebral discs, or muscles of the spine.

Roma - Chahud ⁽³⁾ reports that people with demanding jobs, physical and/or mental comorbidities have a significantly higher risk of developing low back pain. Hartvigsen et al. ⁽⁴⁾ express that this description corresponds to the Systematic Approach to Low Back Pain in Adults, which states that the person with low back pain not only requires evaluation by the doctor, with the respective request for x - rays of the lumbosacral spine, which leads to a clinical diagnosis for treatment purposes, but also that it is essential to consider the risk factors for musculoskeletal disorders, work or study, the presence of comorbidities, mental health status, level of education, lifestyle, etc. That is, a comprehensive

management of low back pain and what is associated with the clinical picture, which could interfere with the person's daily activities or cause disability. This study is significant as it emphasizes the importance of a comprehensive diagnostic approach for low back pain, which not only considers the physical causes but also incorporates mental health factors, contributing to more effective public health interventions. The objective of the research was to determine the relationship of the systematic approach to low back pain in adults, as a public health problem, in the hospital outpatient clinic.

2. Material and Methods

Design

Descriptive, prospective, longitudinal research. It was carried out at the María Auxiliadora General Hospital, in the Internal Medicine Outpatient Clinic.

Sample

The non - probabilistic sample consisted of 112 patients, aged between 20 and 60 years, with a diagnosis of low back pain, who were treated in two Internal Medicine Outpatient Clinics, of the María Auxiliadora General Hospital, in the southern cone of Lima, during the period of June - September 2023, who met the selection criteria of the protocol designed for the research. With a confidence level of 95% and an error of 5%.

Variables

Independent: Risk factors for the systematic approach to low back pain: Occupation (housewife, workers who were using

force in construction, bricklayers, cabinetmakers, etc. And the Independents, such as accountants, school teachers, merchants, etc.). Habits (alcohol and tobacco use). Physical activity or sedentary lifestyles. And the levels of Obesity, with the Body Mass Index (BMI).

- Low back pain: Index of functional alteration: mild, moderate, intense, severe, maximum.

Dependents:

- Public Health: Perception of Public Health in the outpatient clinic; Mental Health: Anxiety, Depression, Anxiety - Depression.

Procedure

The research instrument was the Protocol with the exclusion and inclusion criteria, which allowed the sample to be selected, applying the Oswestry Disability Index Test (IDO) (5), which is a self-administered questionnaire, specific for low back pain., which consists of 10 questions with 5 response probabilities each, which refers to the intensity of low back pain and activities that could be affected by the pain, such as personal care, lifting weights, walking, sitting, standing, sleeping, sexual activity, social life and travel. The Score made it possible to evaluate the intensity of pain and classify groups with functional disability: minimum, moderate, intense or severe. For the intensity of the perceived low back pain, the Likert Scale was used and it was classified as: mild, moderate, strong, very strong, unbearable.

To evaluate Mental Health, the GAD - 7 (6). Generalized Anxiety Disorder Scale, was applied, which includes 7 items of symptoms related to Anxiety, perceived during the last 2 weeks, based on the DSM - IV (Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition) and that were answered with options: "some days", "several days", "a week", "almost every day", with scores of 0, 1, 2 and 3, respectively. Likewise, the PHQ - 9 Depression Scale (7). Patient Health Questionnaire, was used, which consists of 9 items that evaluate the presence of depressive symptoms (corresponding to the DSM - IV criteria) present in the last 2 weeks. Each item has a severity index corresponding to: 0 = "never", 1 = "some days", 2 = "more than half of the days" and 3 = "almost every day". With the information obtained, the patients were referred for consultation with Psychiatry. To evaluate the perception of care in the hospital outpatient clinic, the Servqual Questionnaire (8) was applied. contained in the Technical Guide for the Evaluation of External User Satisfaction in Health Establishments. And to determine physical activity, we use the WHO Global Physical Activity Questionnaire (9).

Data analysis

The information obtained with the research instrument allowed the creation of a database, which was processed with

the SPSS v.25 statistical program and obtaining the chi square and the preparation of the respective tables, with the advice of a Statistics Professional.

Ethical aspects

The research was approved by the ethics committees of the María Auxiliadora General Hospital and the Postgraduate School of the Federico Villarreal National University, and the corresponding informed consent was also obtained from the patients, for due confidentiality of the data.

The authors did not have any type of financial or institutional conflict of interest, because the Research was self-financed.

3. Results

Gender and age

120 patients participated, who exceeded the non-inclusion criteria and the research instrument was applied, leaving 08, making the final sample of 112 patients, 47 women (42%) and 65 men (58%).

In relation to age, the age group of 41 to 50 years was prevalent, 24% men and 13% women, respectively. Table 1.

Table 1: Gender and age of adults in the hospital outpatient clinic

Age Group	Sex				Total	
	Female		Male			
	N	%	N	%	N	%
0 - 20	4	4%	0	0%	4	4%
21 - 30	9	8%	12	11%	21	19%
31 - 40	12	11%	16	14%	28	25%
41 - 50	15	13%	27	24%	42	38%
51 - 60	7	6%	10	9%	17	15%
Total	47	42%	65	58%	112	100%

Source: Survey applied to adult patients in outpatient clinics. There was a predominance of males (58%), and the age group with the highest number of patients was 41 - 50 years (38%).

Risk factors for the systematic approach to low back pain in adults in relation to the perception of Public Health in the hospital outpatient clinic.

The majority of adults (46%), who suffered low back pain with severe Functional Limitation, perceived public health as good in the hospital outpatient consultation; A statistically significant association was evidenced, p - value 0.036 less than 5%. Table 2.

Table 2: Systematic approach to low back pain in adults and public health perception

Functional Limitation	Public Health				Total		Chi square		
	Regular		Good				Value	df	p - value
	N	%	N	%	N	%			
Mínimum	0	0%	1	1%	1	1%	10,309	4	0.036
Moderate	1	1%	8	7%	9	8%			
Intense	9	8%	41	37%	50	45%			
Severe	0	0%	51	46%	51	46%			
Máximum	0	0%	1	1%	1	1%			
Total	10	9%	102	91%	112	100%			

Note: Survey applied to adult patients in outpatient clinic. The majority of adults (46%), who had severe Functional Limitation, perceived public health as good in the hospital outpatient consultation; A statistically significant association was evidenced, p - value 0.036 less than 5%.

Risk factors for the systematic approach to low back pain in adults and physical activity in the hospital outpatient clinic.

The majority (43%) of patients who performed independent work had a good perception of public health; and, also, the perception of public health and occupation were related, but

not significant, p - value 0.132 higher than 0.05. Likewise, patients with good habits and those without them (46% in both cases) perceived public health as good; there was no significant association between habits and public health perception, p - value 0.07 higher than 0.05. The majority of adults (51%) who did not engage in physical activity perceived public health as good; No significant association was observed, p - value 0.140, greater than 0.05. Finally, of adults who did not perform physical activity, 33% exhibited an intense functional limitation, p=0.021, less than 5%, showing a statistically significant relationship. Table 3.

Table 3: Risk factors for the systematic approach to low back pain and public health perception

Occupation	Health Public				Total		Chi square		
	Regular		Good		N	%	Value	df	p - value
	N	%	N	%					
Housewife	2	2%	5	4%	7	6%	7, 082	4	0.132
Employee	3	3%	13	12%	16	14%			
Student	1	1%	7	6%	8	7%			
Independent	3	3%	48	43%	51	46%			
Worker	1	1%	29	26%	30	27%			
Habits	N	%	N	%	N	%	Value	df	p - value
Yes	2	2%	51	46%	53	47%	3, 288	1	0.07
No	8	7%	51	46%	59	53%			
Physical activity	N	%	N	%	N	%	Value	df	p - value
Yes	2	2%	45	40%	47	42%	2, 175	1	0.14
No	8	7%	57	51%	65	58%			
BMI	N	%	N	%	N	%	Value	df	p - value
Obesity 1	2	2%	5	4%	7	6%	3, 563	2	0.168
Obesity 2	6	5%	75	67%	81	72%			
Obesity 3	2	2%	22	20%	24	21%			
Total	10	9%	102	91%	112	100%			

Note: Survey applied to adult patients in outpatient clinic. Most adults (67%) with type 2 obesity rated public health as good; no significant association was identified, p - value 0.168 greater than 0.05.

Association between low back pain in adults and Mental Health status - Anxiety and Depression

Anxiety

The majority of adults with severe functional limitation (46%) experienced severe anxiety, with a statistically significant association, p - value 0.000, below 5%. Table 4.

Table 4: Low back pain in adults and mental health status – Anxiety

Functional Limitation	Anxiety				Total		Chi square		
	Moderate		Serious		N	%	Value	df	p - value
	N	%	N	%					
Mínimum	1	1%	0	0%	1	1%	41, 306	4	0
Moderate	4	4%	5	4%	9	8%			
Intense	2	2%	48	43%	50	45%			
Severe	0	0%	51	46%	51	46%			
Maximum	0	0%	1	1%	1	1%			
Total	7	6%	105	94%	112	100%			

Note: Survey applied to adult patients in outpatient consultation.

Depression

The majority of adults with severe functional limitation (39%) suffered from severe depression, with a statistically

significant association, p- value 0.000, below the 5% threshold. Table 5.

Table 5: Low back pain in adults and mental health status – Depression

Functional Limitation	Depression								Total		Chi square		
	Mild		Moderate		Moderate to serious		Serious						
	N	%	N	%	N	%	N	%	N	%	Value	df	p - value
Mínimum	1	1%	0	0%	0	0%	0	0%	1	1%	113, 760	12	0
Moderate	2	2%	7	6%	0	0%	0	0%	9	8%			
Intense	2	2%	37	33%	8	7%	3	3%	50	45%			
Severe	0	0%	0	0%	7	6%	44	39%	51	46%			
Maximum	0	0%	0	0%	0	0%	1	1%	1	1%			
Total	5	4%	44	39%	15	13%	48	43%	112	100%			

Note: Survey applied to adult patients in outpatient consultation.

Anxiety - Depression

The majority of adults with intense and severe functional limitations (38% respectively) experienced anxiety and

depression, without a significant association, p - value 0.169, greater than 5%. Table 6.

Table 6: Low back pain in adults and mental health status

Functional Limitation	Mental Health						Total		Chi square		
	Anxiety		Anxiety/Depression		Depression						
	N	%	N	%	N	%	N	%	Value	df	p - value
Mínimum	0	0%	1	1%	0	0%	1	1%	11, 620	8	0.169
Moderate	3	3%	4	4%	2	2%	9	8%			
Intense	6	5%	43	38%	1	1%	50	45%			
Severe	4	4%	42	38%	5	4%	51	46%			
Maximum	0	0%	1	1%	0	0%	1	1%			
Total	13	12%	91	81%	8	7%	112	100%			

Note: Survey applied to adult patients in outpatient consultation.

Association between low back pain in adults and comorbidity

The majority of adults, who had severe functional limitation (38%), had some comorbidity. There was no evidence of a significant statistical association, p= 0.07, greater than 5%. In relation to comorbidities, hyperlipidemia (12%) occurred in patients with low back pain and a degree of moderate

functional limitation; and fibromyalgia (12%), in those who suffered from low back pain with severe functional limitation, as the most frequent simultaneous comorbidities. It was observed that there was no statistically significant association between comorbidity and final assessment of the degree of functional limitation of low back pain in adults, p= 0.304, greater than 5%. Table No.7.

Table 7: Association of low back pain in adults and comorbidity

Comorbidity	Final assessment of the functional limitation								Total		Chi square Value	df	p - value
	Mild		Moderate		Intense		Severe						
	N	%	N	%	N	%	N	%	N	%			
Type 2 Diabetes	0	0%	1	1%	6	5%	0	0%	7	6%	0.518	18	0.304
Fibromyalgia	0	0%	4	4%	13	12%	0	0%	17	15%			
Hyperlipidemia	5	4%	13	12%	12	11%	0	0%	30	27%			
Hypothyroidism	0	0%	3	3%	8	7%	0	0%	11	10%			
HBP*	1	1%	5	4%	8	7%	1	1%	15	13%			
Prediabetes	0	0%	2	2%	5	4%	0	0%	7	6%			
Ninguna	3	3%	10	9%	12	11%	0	0%	25	22%			
Total	9	8%	38	34%	64	57%	1	1%	112	100%			

Note: Survey applied to adult patients in outpatient consultation. *HBP: Hypertension Blood Pressure.

4. Discussion

The World Health Organization (WHO) ⁽¹⁾ states that low back pain is the main cause of disability globally, at any stage of life, affecting almost everyone at least once. Its prevalence increases with the age of the patient, which is around 80 years of age, and the non - specific form of low back pain is the most common type, accounting for approximately 90% of cases. The WHO also reported that low back pain affected 619 million individuals worldwide, with a tendency to increase to 843 million by 2050, carries significant costs both in social and health terms as well as personal for those who experience it. One of the main areas of concern is the impact on the

physical and psychological functionality, the quality of life of those affected. In addition, it is a leading cause of disability worldwide, which represents a condition that rehabilitation can offer significant benefits for a large number of people.

In various studies, factors such as sex and age are often linked to the samples investigated. For example, Cancho and López ⁽⁹⁾ found in their research carried out with the staff of the pediatric service of a hospital, that 52.5% were women and 47.5% men. In contrast, Torpoco ⁽¹⁰⁾ who studied merchants in the Lima Wholesale Market, where he reported 76.5% of men and 23.5% of women. In our study, we found that 58% of patients with low back pain were men and 42% were women; and 48% of patients was under 40 years of age.

According to the Global Burden of Disease Study ⁽¹¹⁾, low back pain and years lived with disability are decreasing in the population. During the period studied from 1990 to 2020 in 204 countries and territories, it is observed that this pain is decreasing among older adults and increasing in adults under 70 years of age, especially those who perform jobs that require physical strength, sit for prolonged periods and have a high body mass index (BMI), affecting their activity and work productivity. Zúñiga and Fuentes ⁽¹²⁾, found that 44% of people with low back pain were on average 40 to 50 years old. In our study, we observed that those in the 41 to 50 age group predominated according to the sample studied, representing 38%. This finding is consistent with that described by the Global Burden of Disease Study (GBD), supporting the observed trend of low back pain in middle - aged adults.

According to the WHO ⁽¹³⁾, in the Manual of the International Classification of Functioning, Disability and Health (ICF), disability is defined as limitations and restrictions for activity and participation. This reflects as unfavorable some aspects of interaction between people (health condition) and contextual factors of that individual (environmental and personal). Vargas ⁽¹⁴⁾, in his study on disability in the face of low back pain, at merchants in a market in Lima, reported that 79.5% of the sample experienced moderate disability and 2.3% severe disability. On the other hand, Tolentino ⁽¹⁵⁾, in his research with health workers, found that 61.3% had a moderate disability. In our research, we observed that 46% of adults suffered from a disability classified as severe, while 36% experienced intense disability.

The GBD ⁽¹¹⁾ indicates that risk factors for low back pain include obesity, occupational ergonomic factors, posture adopted, repetitive and rapid movements, handling heavy loads in the work environment, which would be responsible for 40% of low back pain cases.

Thus, various studies, Del Águila Silva ⁽¹⁶⁾ and Jara and Villacorta ⁽¹⁷⁾ have considered the type of work, obesity, as incidences, relegating physical activity to the background. However, from a comprehensive perspective of the patient who seeks care for their health, with low back pain as the main symptom, we propose that it is important to consider harmful habits, such as smoking and alcohol consumption, as risks; as well as the alteration of the state of mental health, expressed in the form of anxiety, depression and mixed anxiety - depression disorder (MADD). In addition, the concomitant presence of comorbidities should be taken into account as a crucial aspect in the systematic approach to low back pain.

For example, in a study conducted by Medina and Oseguera ⁽¹⁸⁾ on risk factors for low back pain in nursing staff, in relation to the ergonomic factors associated with lifting loads, 68% performed lifting movements and 50% incline movements routinely. In our research, 46% of patients who were engaged in independent occupations, such as merchants, teachers, accountants, computer technicians and cabinetmakers, had low back pain, followed by laborers with 27%.

In contemporary studies of low back pain, patient obesity highlights another significant risk factor. Sánchez ⁽¹⁹⁾ found in his research on prolonged postures and low back pain in motorcycle taxi drivers, that 14.9% of patients had obesity, with a type I BMI. Delgado - Montañó et al ⁽²⁰⁾, in their study

with hospital health care workers, reported that 13.9% of patients with low back pain had obesity, with a type I BMI and 11.1% had a type 2 BMI. In our research, we not only linked the presentation of low back pain with obesity, but also explored its actions with the physical activity performed by patients, which has not been considered in other studies. We observed that obesity with a type 2 BMI was the most frequent in 72% of patients, of whom 41% did not practice physical activity. Although the p - value turned out to be 0.125, which is greater than 0.05, this finding indicates the importance of emphasizing physical activity in patients with low back pain and obesity. In our study, we also analysed the degree of disability and physical activity, observing that 33% of patients with severe functional limitation did not engage in physical activity. In addition, we found a statistically significant association between both variables with a p - value of 0.021, which is below the threshold of 5%.

Recently, the importance of mental state in the field of Public Health has been recognized. Petrucci et al. ⁽²¹⁾ argue that psychological factors in individuals affected by low back pain are linked to an increased risk of disability. For example, the presence of depressive symptoms and the tendency to catastrophize pain predict adverse outcomes in relation to low back pain. Catastrophizing refers to a cognitive distortion that leads people to anticipate the worst possible outcome, even without sufficient information or an objective reason to do so. Therefore, cognitive and emotional aspects exert a significant impact on the perception of pain.

Coincident with the existing literature, it is essential to identify and adequately address psychological factors through a multidisciplinary approach in patients suffering from chronic low back pain. Depression has been widely studied as a mental health disorder associated with low back pain. For example, both Amiri, Behnezhad, and Azad ⁽²²⁾ and Park et al. ⁽²³⁾ point out that low back pain is significantly associated with depression, p value < 0.001, relating the risk of low back pain to depression, also with a p value < 0.001. On the other hand, Donatti and colleagues ⁽²⁴⁾ point out that there is a significant and directly proportional relationship with the number of disabilities or limitations caused by low back pain and the number of moderate depressive symptoms. In our research, we observed that 29% of patients had moderate depression, especially in the group that did not engage in physical activity. We agree with Donatti regarding the relationship between functional limitation and depression, since 46% of those with limitations, especially of the intense type, experienced depression, with a value of p = 0.000.

Anxiety, although less studied than depression in relation to low back pain, has also been identified as a major mental health disorder with significant repercussions on patients. Wang, Fu, Tsia, & Hung ⁽²⁵⁾ showed that anxiety at baseline was associated with negative long - term outcomes in patients with chronic low back pain; and that greater severity of anxiety at baseline was associated with higher intensity of low back pain.

Cancho ⁽²⁶⁾, in his research on musculoskeletal disorders and emotional disorders, in medical students at a private university, found that 70.7% of the participants had both low back pain and anxiety. In our study, we observed that,

according to occupation, 45% of those who carried out work activities classified as independent, such as teachers, accountants, small family entrepreneurs and cabinetmakers, experienced severe anxiety, with a value of $p < 0.003$. As for habits, 47% of those who consumed both alcohol and cigarettes had severe anxiety, with a value of $p < 0.010$. Likewise, 54% of the participants who did not practice physical activity showed severe anxiety, with a p value < 0.002 . Those with type 2 obesity, 68% showed severe anxiety, with a p - value < 0.023 . In relation to functional limitation, 46% of participants with severe limitation had severe anxiety.

Regarding Mixed Anxiety - Depression Disorder (MADD), there are studies that have addressed this condition. For example, Carbajal and Sabaduche⁽²⁷⁾ found in their research with university students, that those with a mild level of anxiety were 3.24 times more likely to suffer from depression, compared to those without anxiety symptoms. However, they found no association with depression and chronic low back pain in these college students. On the other hand, Wang, Fu, Tsia, and Hung⁽²⁸⁾ noted that the greater severities that occur with Depression and Anxiety were significantly related to a higher rate, a higher number of months of disability at the five - year follow - up, respectively. This suggests that Depression and Anxiety severities at baseline had greater power to predict disability compared to insomnia at baseline. In our study, in agreement with Wang, Fu, Tsia and Hung, we observed that 38% of patients with low back pain and intense and severe functional limitations, respectively, also had MADD. However, the p - value was 0.169, which exceeds the 5% threshold, indicating that the association did not reach statistical significance. We affirm that, although the association is not statistically significant, it confirms the relationship between low back pain and MADD, especially due to the association of its comorbidity with intense and severe degrees of functional limitations. In addition, it is important to note that MADD occurred in 58% of patients with type 2 obesity, with a p value of 0.022, which is statistically significant and is below 5%.

Finally, the relationship between low back pain and comorbidities deserves greater attention and study, since it occurs at any stage of life. However, according to Fu, Chiarotto, Enthoven, Thorgaard, and Koes⁽²⁹⁾, as the population ages, it is more likely to develop multiple and severe comorbidities, highlighting the importance of investigating the concomitance between comorbidities in adults with low back pain. These authors report that the most common and prevalent comorbidities in association with low back pain are musculoskeletal, accounting for 53%, such as shoulder pain, osteoarthritis of the hip or knees, and foot pain. Then, high blood pressure, with 38%, probably due to the fact that its study population was 55 years or older, and type 2 diabetes mellitus, at 12%. The aforementioned authors suggest that future studies should investigate the underlying mechanisms of these associations and identify prognostic factors for outcomes in people with low back pain and comorbidities, especially in musculoskeletal comorbidities, as outcomes worsen with an increasing number of comorbidities. In our research, we found that hyperlipidemia, at 27%, fibromyalgia, at 15%, and high blood pressure, at 13%, were the most prevalent comorbidities, particularly among those experiencing moderate to severe functional

limitation. Moreover, we observed that 78% of patients with low back pain had at least one comorbidity, especially those with intense functional limitation, 38%, and severe functional limitation, 34%, respectively, with a p value of 0.07 above the threshold of 0.05.

This study underscores the necessity of a holistic approach to diagnosing low back pain, one that considers both physical and psychological aspects. By focusing on functional limitations, mental health conditions, and comorbidities such as obesity and fibromyalgia; healthcare providers can implement more effective treatments. Future research should further explore the link between comorbid conditions and low back pain to improve patient outcomes.

References

- [1] World Health Organization (WHO). Low back pain. 19 June 2023. Obtenido de <https://www.who.int/es/news-room/fact-sheets/detail/low-back-pain>
- [2] Macedo, L., Battié, M. The association between occupational loading and spine degeneration on imaging – a systematic review and meta - analysis. *BMC Musculoskeletal Disord* **20**, 489 (2019). Obtenido de <https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/s12891-019-2835-2>
- [3] Roma Chahud G. Lumbago una mirada ergonómica. *Ergonomía, Investigación y Desarrollo*.2021.3 (3), 153 - 172. DOI. Obtenido de <https://doi.org/10.29393/EID332LMGR10032>
- [4] Hartvigsen J, Hancock MJ, Kongsted A, Louw Q, Ferreira ML, Genevay S, Hoy D, Karppinen J, Pransky G, Sieper J, Smeets RJ, Underwood M; Lancet Low Back Pain Series Working Group. What low back pain is and why we need to pay attention. *Lancet*.2018 Jun 9; 391 (10137): 2356 - 2367. Obtenido de DOI: 10.1016/S0140 - 6736 (18) 30480 - X
- [5] Mehra A, Baker D, Disney S, Pynsent PB. Oswestry Disability Index scoring made easy. *Ann R Coll Surg Engl*.2008 Sep; 90 (6): 497 - 9. doi: 10.1308/003588408X300984 Obtenido de <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2647244/>
- [6] Spitzer, R., Kroenke, K., Williams, J., Löwe, B. A Brief Measure for Assessing Generalized Anxiety Disorder: The GAD - 7. *Arch Intern Med*.2006; 1092 - 1097. Obtenido de <https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/410326>
- [7] Baader, T., Molina, J., Venezian, S., Rojas, C., Farías, R., Fierro - Freixeneta, C., Backenstrass, M., Mundt, C. Validación y utilidad de la encuesta PHQ - 9 en el diagnóstico de depresión. *Rev Chil Neuro - Psiquiat*.2012; 10 - 22. Obtenido de <https://scielo.conicyt.cl/pdf/rchnp/v50n1/art02.pdf>
- [8] Multiple - Item Scale for Measuring Consumer Perceptions of Service Quality (SERVQUAL) - Aplicación de encuesta para evaluar la satisfacción del usuario interno con metodología modificado en los servicios de consulta externa, hospitalización y emergencia del Hospital María Auxiliadora.2022. Obtenido de https://cdn.www.gob.pe/uploads/document/file/3477182/20220802142737_merged.pdf?v=1659968414

- [9] Cancho G. López A. Factores de riesgo de la lumbalgia ocupacional en el personal del servicio de pediatría del Hospital Sergio E. Bernales en Lima, Tesis. Universidad Continental, 2022. Obtenido de https://repositorio.continental.edu.pe/bitstream/20.500.12394/12850/3/IV_FCS_502_TE_Cancho_Lopez_2023.pdf
- [10] Torpoco T. Factores de riesgo asociados al dolor lumbar en comerciantes del Gran Mercado Mayorista de Lima - Santa Anita, 2022. Obtenido de <https://hdl.handle.net/20.500.12394/12734>
- [11] GBD 2021 Low Back Pain Collaborators. Global, regional, and national burden of low back pain, 1990 - 2020, its attributable risk factors, and projections to 2050: a systematic analysis of the Global Burden of Disease Study 2021. *Lancet Rheumatol.* 2023 May 22; 5 (6): e316 - e329. Obtenido de <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10234592/>
- [12] Zúñiga E., Fuentes E. Factores de riesgo y su incidencia en la lumbalgia en pacientes mayores de 40 años que acuden a rehabilitación al Hospital Nicolás Cotto Infante, Vinces - Los Ríos. Ecuador, junio - octubre, 2023. Obtenido de http://dspace.utb.edu.ec/handle/49000/15/browse?rpp=20&offset=324&etal=1&sort_by=1&type=title&starts_with=I&order=ASC
- [13] World Health Organization. How to use the ICF: A practical manual for using the International Classification of Functioning, Disability and Health (ICF). Exposure draft for comment. October 2013. Geneva: WHO. Obtenido de https://cdn.who.int/media/docs/default-source/classification/icf/drafticfpracticalmanual2.pdf?sfvrsn=8a214b01_4&download=true
- [14] Vargas D. Grado de dolor lumbar y nivel de discapacidad en comerciantes del mercado Modelo los Portales de Chillón. UNMSM.2021 Obtenido de <https://cybertesis.unmsm.edu.pe/handle/20.500.12672/17552>
- [15] Tolentino M. Discapacidad por dolor lumbar y estados emocionales en el personal de salud de la empresa Packaging Products del Perú S. A. Universidad Norbert Wiener.2022. Obtenido de <https://repositorio.uwiener.edu.pe/handle/20.500.13053/9546>
- [16] Del Águila Silva, E. *Factores clínicos y lumbalgia en el Hospital Nacional Daniel Alcides Carrión - Tesis (2020)*. chrome - extension: https://efaidnbmnnnibpcajpcglefindmkaj/https://cybertesis.unmsm.edu.pe/bitstream/handle/20.500.12672/11714/DelAguila_se.pdf?sequence=1&isAllowed=y
- [17] Jara J., Villacorta V. factores asociados del dolor lumbar en los internos de terapia física y rehabilitación del Hospital de Rehabilitación del Callao. Tesis. UNMSM.2017. Obtenido de https://repositorio.uccs.edu.pe/bitstream/handle/20.500.14095/435/Jara_Villacorta_a_tesis_bachiller_2017.pdf?sequence=1&isAllowed=y
- [18] Medina S., Osegura E. Factores de riesgo de lumbalgia en personal de enfermería, Hospital Militar Central, Honduras. *Rev. Fac. Cienc. Méd.* Enero - junio.2020. Obtenido de http://www.bvs.hn/RFCM/pdf/2020/pdf/RFCMVol17_1_2020_3.pdf
- [19] Sánchez R. Relación entre las posturas prolongadas y la lumbalgia en conductores de mototaxi de una empresa limeña. Posgrado UNMSM.2023. Obtenido de https://cybertesis.unmsm.edu.pe/bitstream/handle/20.500.12672/19791/Sanchez_pr.pdf?sequence=1&isAllowed=y
- [20] Delgado - Montaña G., Virú H., Alburquerque - Melgarejo J et al. Factores asociados a dolor lumbar en trabajadores sanitarios de un hospital de referencia del Perú. *Medicina Clínica y Social.* Paraguay. Vol.7 Núm.2: mayo - agosto, 2023. Obtenido de <https://www.medicinaclicaysocial.org/index.php/MCS/article/view/279>
- [21] Petrucci G, Papalia G, Russo F. et. al. Psychological Approaches for the Integrative Care of Chronic Low Back Pain: A Systematic Review and Metanalysis. *Int J Environ Res Public Health* 2022 Jan; 19 (1): 60. Obtenido de <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8751135/>
- [22] Amiri, S., Behnezhad, S., & Azad, E.). Back pain and depressive symptoms: A systematic review and meta-analysis. *The International Journal of Psychiatry in Medicine*, 2020; 0 (0). Obtenido de <https://doi.org/10.1177/0091217420913001>
- [23] Park SM, Kim HJ, Jang S, Kim H, Chang BS, Lee CK, Yeom JS. Depression is Closely Associated With Chronic Low Back Pain in Patients Over 50 Years of Age: A Cross-sectional Study Using the Sixth Korea National Health and Nutrition Examination Survey (KNHANES VI - 2). *Spine.* 2018 Sep 15; 43 (18): 1281 - 1288. doi: 10.1097/BRS.0000000000002595. PMID: 29462063. Obtenido de <https://pubmed.ncbi.nlm.nih.gov/29462063/>
- [24] Donatti A, Santos E, Terassi M, Moretti B, Iost S, Inouye K. Relationship between the intensity of chronic low back pain and the generated limitations with depressive symptoms. *BrJP* 2 (3) • Jul - Sep.2019. Obtenido de <https://www.scielo.br/j/brjp/a/vCNR45YC9qHR3cGYZ79Gx7k/?lang=en>
- [25] Wang L, Fu T, Tsia M, Hung C. The associations of depression, anxiety, and insomnia at baseline with disability at a five-year follow-up point among outpatients with chronic low back pain: a prospective cohort study. *BMC Musculoskeletal Disorders* (2023) 24: 565. Obtenido de <https://bmcmusculoskeletaldisord.biomedcentral.com/articles/10.1186/s12891-023-06682-6>
- [26] Cancho J. asociación de trastornos musculoesqueléticos y presencia de trastornos emocionales en estudiantes de medicina del ciclo XI - XII de la Universidad Privada San Juan Bautista, Tesis.2023. Obtenido de <https://repositorio.upsjb.edu.pe/handle/20.500.14308/4725>
- [27] Carbajal A & Sabaduche P. Asociación entre la depresión y el dolor lumbar crónico en los estudiantes de la Facultad de Ciencias Sociales de una Universidad de Lima. Universidad Peruana de Ciencias Aplicadas. Tesis (2022). Obtenido de <https://repositorioacademico.upc.edu.pe/handle/10757/660414>

- [28] Wang L, Fu T, Tsia M, Hung C. The associations of depression, anxiety, and insomnia at baseline with disability at a five - year follow - up point among outpatients with chronic low back pain: a prospective cohort study. *BMC Musculoskeletal Disorders* (2023) 24: 565. Obtenido de <https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/s12891-023-06682-6>
- [29] Fu Y, Chiarotto A, Enthoven W, Skou ST, Koes B. The influence of comorbidities on outcomes for older people with back pain: BACE - D cohort study. *Ann Phys Rehabil Med.*2023 Oct; 66 (7): 101754. doi: 10.1016/j.rehab.2023.101754. Epub 2023 Jun 4. PMID: 37276834. Obtenido de <https://www.sciencedirect.com/science/article/pii/S1877065723000258?via%3Dihub>