



LOW BACK PAIN ASSOCIATED WITH BMI ALTERATION AND SEDENTARY LIFESTYLE IN MEDICAL STUDENTS AT UNAERP

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ABSTRACT

Low back pain is a manifestation of pain, muscle spasm or stiffness located below the costal margin and above the lower gluteal fold, associated or not with radiating pain in the lower limb and glutes. After arterial hypertension, painful spinal disorders are the second most prevalent chronic disease in the Brazilian population. Psychological factors, occupational factors, overweight and physical inactivity may be related to a higher frequency of low back pain episodes, therefore, it is assumed that fifth-year medical students have a higher prevalence of low back pain compared to fourth-year students, due to supposedly more intense workloads that reduce their time to exercise and the stresses they are subjected to during internship, that can interfere with your psychological health.

Keywords: Low back pain, BMI, Sedentary behavior, College student.

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OBJECTIVE

The objective of this study was to compare the frequency of low back pain complaints associated with BMI alterations and sedentary lifestyle among fourth- and fifth-year medical students at the University of Ribeirão Preto (UNAERP), Ribeirão Preto Campus. Considering that fourth-year students are in the pathological cycle of the course, while fifth-year students are already in boarding school.

METHODOLOGY

To collect the necessary information, a digital questionnaire was used via Google Forms, in which 62 responses were obtained, after that, non-parametric and percentage tests were used to analyze these data. In addition, a bibliographic review of the subject was prepared based on the theoretical framework cataloged on the Scielo and Pubmed platforms, as well as books on orthopedics and traumatology.

DEVELOPMENT

Low back pain is a manifestation of pain, spasm or stiffness located between the costal margin and the lower gluteal fold associated or not with irradiation to the lower limbs. This is a symptom that can be associated with different diseases.

This symptom is one of the most prevalent among the Brazilian population. It is estimated that 18.5% of the Brazilian population over 18 years of age has some diagnosis of pathology related to the spine, the number is close to 27 million people. This scenario is reproduced all over the world, with low back pain being the leading cause of absenteeism at work worldwide.

BMI, on the other hand, stands for body mass index and is a good way to estimate body adiposity. The calculation is made by dividing the weight in kilograms by the height squared in meters. According to the World Health Organization (WHO) and the Ministry of Health, if the amount acquired is less than 18.5, the person is underweight, if it is between 18.5 and 24.9, the person is normal or eutrophic weight, if it is between 25 and 29.9, overweight, between 30 and 34.9 there is class I obesity, between 35 and 39.9, class II obesity and over 40 is severe obesity.

The WHO sets daily and weekly physical activity goals according to age group and people who do not reach these goals are considered sedentary. These physical activities consist of any movement performed by skeletal muscle that leads to energy expenditure, it can be through domestic activities, work, leisure or even physical exercises themselves. For children between 7 and 17 years old, the goal is 60 minutes of moderate to vigorous



intensity activity 3 times a week, most of which is aerobic. Adults between 18 and 64 years old, on the other hand, should practice 150 to 300 minutes a week of some moderate-intensity aerobic activity or 75 to 150 minutes of vigorous intensity, linked to 2 days of moderate-intensity muscle strengthening.

In general, what should be avoided at any age is sedentary behavior, which consists of being awake, but in a sitting or lying position, without performing any activity. A major factor that favors this attitude today is the use of cell phones or other electronic devices.

The etiology of low back pain is very diverse and can be classified into two major groups: those of mechanical origin, which include trauma, fracture, muscle strain, disc protrusion or herniation, and other mechanical causes; and those of inflammatory origin, which contain neoplasia, infection, ankylosing spondylitis and various inflammatory causes. However, 85% of cases are known as idiopathic or non-specific low back pain, in these situations the patient does not have any comorbidities such as those mentioned above, but they do have pain in the lower back. Many factors are related to the genesis of this symptom, they are: age, sex, income, level of education, behaviors (such as smoking, alcoholism, poor diet, sedentary lifestyle, among others), obesity and psychological morbidities.

A sedentary lifestyle and a BMI greater than 30kg/m² are very important conditions for the genesis of low back pain and in addition to being important for the onset of pain, they also make the treatment less efficient and longer, due to the anatomical changes caused.

In order to understand these anatomical alterations, the anatomy of the spine will be briefly covered. This is made up of elastic vertebrae and intervertebral discs. In general, vertebrae are made up of: vertebral body (more robust anterior region, which is the main support of body weight), vertebral arch (formed by the right and left pedicles, which surround the vertebral foramen, where the spinal cord passes) and the seven processes (responsible for intervertebral articulation and muscle fixation). The dorsal muscles can be divided into proper (or intrinsic) and extrinsic muscles, the former are responsible for maintaining posture and controlling the movements of the spine and their main representatives are the erector spinae or long muscles.

Between the vertebrae there is the intervertebral disc, it is formed by an external fibrous ring made up of fibrocartilage and an internal gelatinous material called nucleus pulposus, which gives the disc an elastic characteristic, due to the large percentage of water it contains. This feature allows movement between adjacent vertebrae and shock absorption.



Low back pain caused by a sedentary lifestyle can be explained based on the dorsal muscles themselves. Just like any other muscle in the human body, in the absence of stimuli, they become more flabby over time. On the other hand, in order for the person to remain in a sitting position, some of these muscles must remain contracted, so individuals who spend long periods in this position tend to cause continuous contraction and consequently, muscle fatigue. Both leading to muscle dysfunctionality, destabilization and misalignment of the spine and, therefore, low back pain.

High body weight, on the other hand, causes a mechanical overload on the spine, leading to an increase in intradiscal pressure and alteration of this disc, that is, dehydration and loss of proteoglycans of the nucleus pulposus and degeneration of the outer fibrous ring. These changes facilitate the occurrence of bulges and disc fissures, in addition to bringing adjacent vertebrae closer together and losing part of the mechanical support, which can culminate in a disc collapse. All of this causes more vertebral instability and inflammation in this region and are reasons for the occurrence of low back pain in people with a BMI above normal. The main point of the spine affected is the lumbar region, as it is there that most of the deposited weight is concentrated.

A study carried out by the Department of Orthopedic Surgery at the University of Washington evaluated several forms already used in the treatment of low back pain and the result achieved was that physical exercise is the best option for treating this symptom.

According to research carried out by the Brazilian Society of Exercise and Sports Medicine, it compared exercises performed with the help of weights, such as dumbbells and weight machines, and functional exercises, that is, using only the weight of the body itself or elastic bands. The benefits of these practices were compared for 8 weeks and the conclusion that was reached was that there is not a big difference in relation to the gains compared to the two modalities, both culminate in decreased pain, improved function, abdominal strength and flexibility. In this study, the use of analgesics without the practice of physical activity accompanied by clinical guidance on what should be avoided so as not to occur pain crises, the result in the short time (8 weeks) was also positive, but in the long term, this is not the best way to treat low back pain.

Regarding medications, in addition to analgesics, we have anti-inflammatories and weak opioids, such as tramadol, which can be used. Some studies also suggest the association of anticonvulsants, such as gabapentin, with an opioid, and the mechanism of action of the anticonvulsant is to reduce the neurotransmission of pain sensation in the afferent nervous system. In certain situations, the use of muscle relaxants and antidepressants can also be beneficial. However, it is important to highlight that the use of



drugs does not have positive effects on flexibility, muscle strength, quality of life or cardiovascular endurance, so it should be avoided, always giving preference to physical activity.

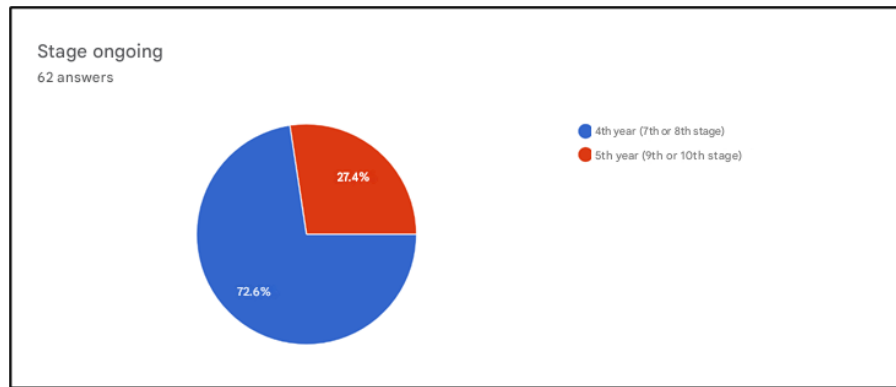
Stretching is an interesting practice for those who have low back pain, it is capable of generating biomechanical and sensory changes in the spine. Biomechanical changes consist of making muscle fibers and the tissues that surround them more elastic, aiming to reduce passive rigidity and prevent the collagen fibers present in these places from also stiffening, while sensory changes consist of increasing the threshold for pain through a mechanism called gate theory, where painful stimuli reach the spinal cord in smaller quantities (an effect similar to that of the anticonvulsant).

A very useful modality in this sense is pilates, for its practice it uses, in general, only body weight and elastic bands and in addition to stretching, it also stimulates the strengthening of the dorsal muscles, improving the alignment of the spine and posture of practitioners. The muscle class of the spine extensors (includes the erector spinae and gluteal muscles) are very worked, as well as the abdominal muscles, which are also very important for stabilizing the vertebrae.

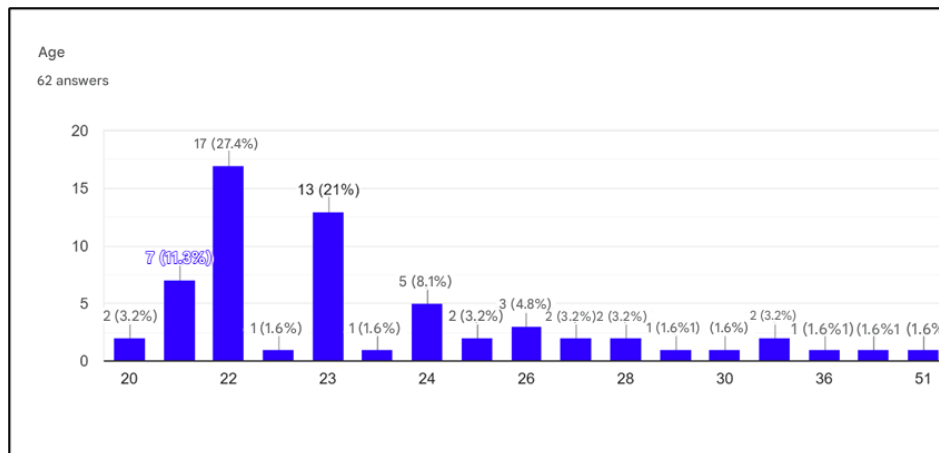
There are also therapies that are more invasive and can be applied in cases of specific low back pain, that is, when its cause is known. We have the infiltration of trigger points, when the pain is of muscular origin; there is nerve root infiltration, in cases where the pain is neuropathic root; facet block, when pain occurs due to inflammation of the facet joints; risotomy or radiofrequency neurolysis in cases where facet block relieved pain by 50 to 80%, and could eliminate all pain after the second intervention; And finally, there are some disc procedures that are much discussed, the most recently discovered is the injection of stem cells into the degenerated disc aiming at its regeneration.

Regarding the collection of empirical data, 62 responses were obtained from volunteer students who agreed to participate in the research in the questionnaire made available via Google Forms.

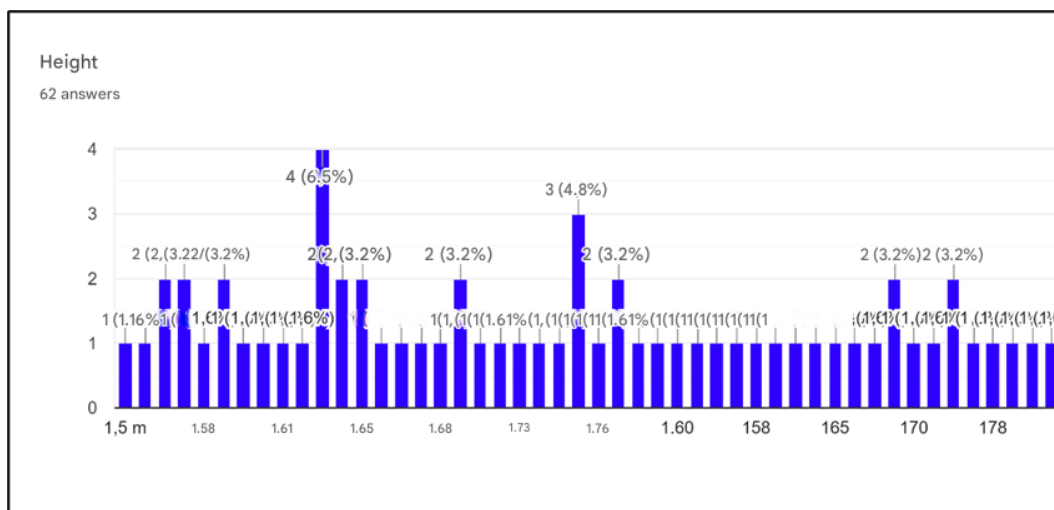
The research had 45 students who are in the 4th year and 17 who are in the 5th year of medicine at UNAERP.

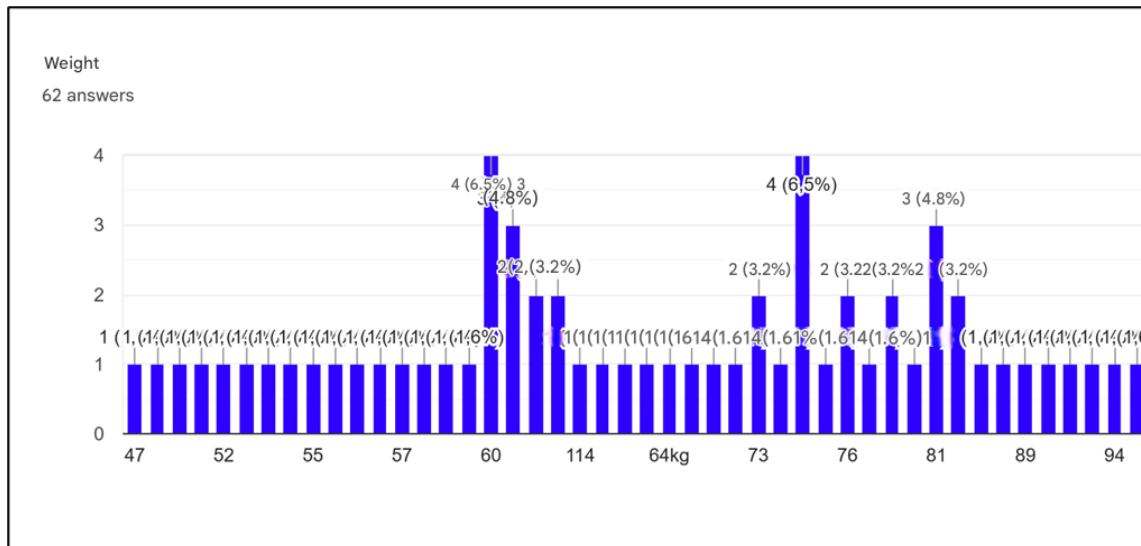


The mean age of the research participants was 24 years and 4 months.

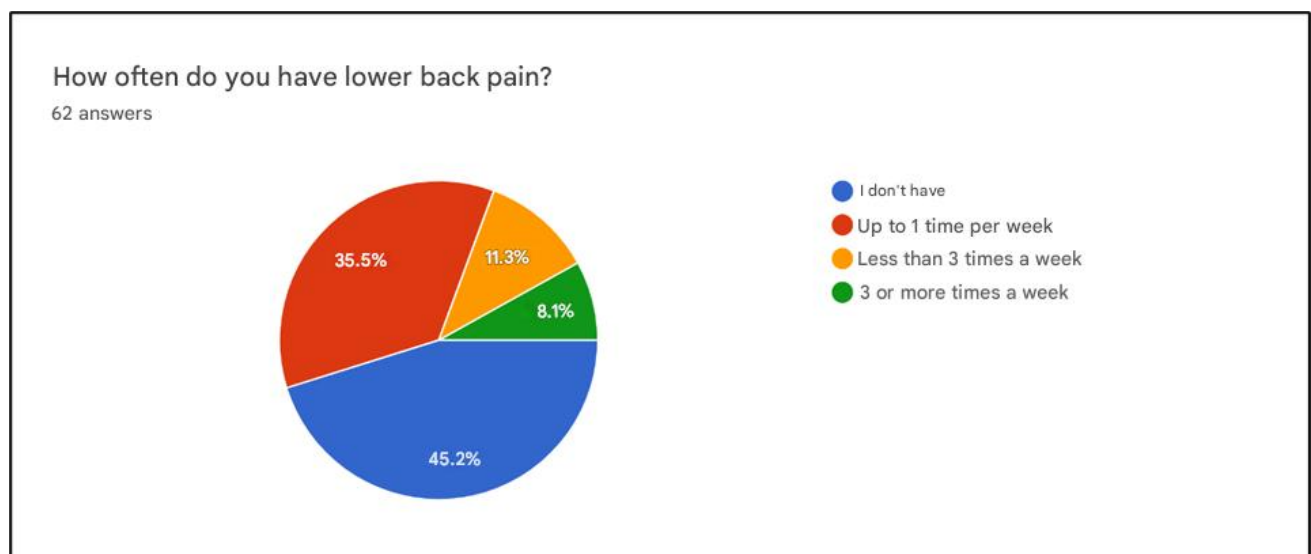


The mean BMI in 5th grade students was 24.3 kg/m² and in 4th grade students it was 24.67 kg/m².

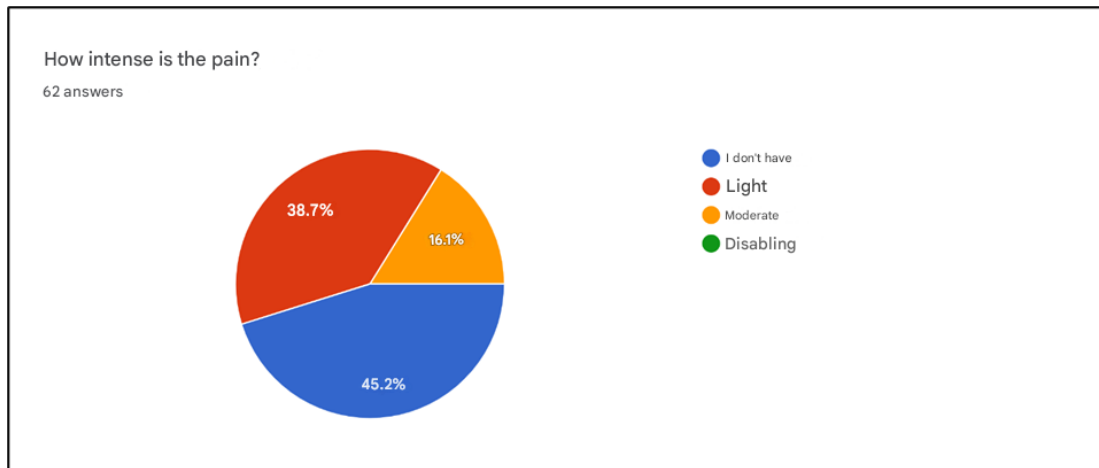




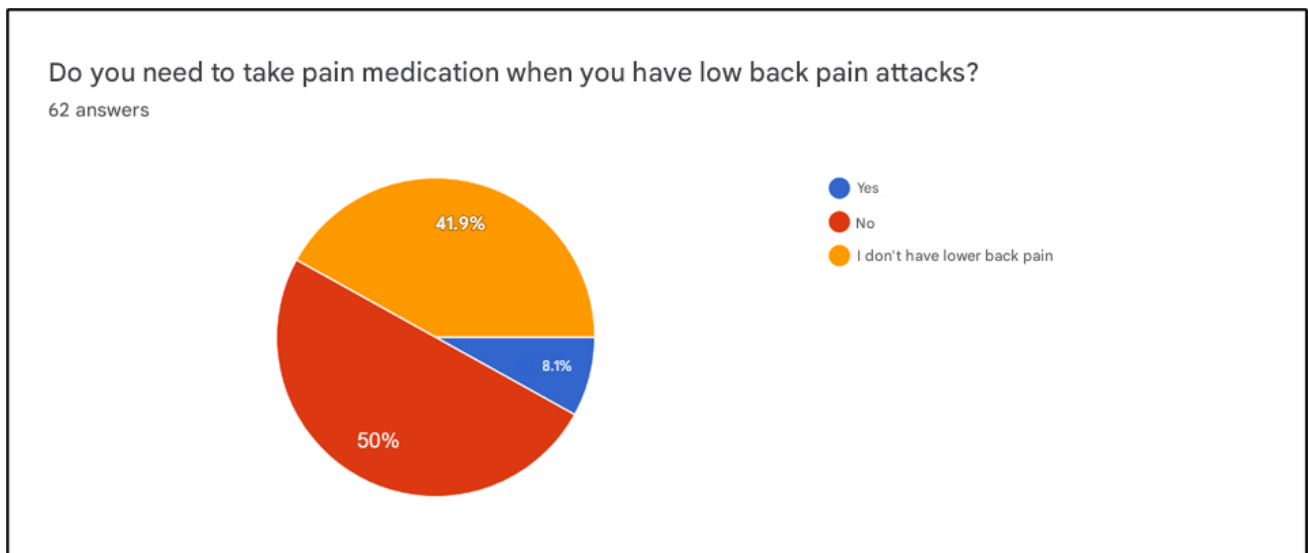
In all, 34 people answered that they have low back pain, of these, 22 answered that they have low back pain up to once a week, 7 answered that they have low back pain less than 3 times a week, 5 have it 3 or more times a week and 22 do not have this complaint.



Of the 34 people who have low back pain, 24 of them are of mild intensity and 10 of moderate intensity.



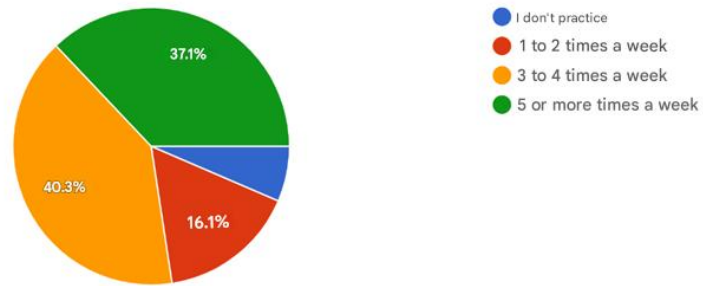
Only 5 students need to use medication in order to improve low back pain.



23 students answered that they practice physical activity 5 or more times a week, 25 practice 3 or 4 times a week, 10 practice 1 to 2 times a week and only 4 do not practice any type of physical exercise regularly.

How often do you exercise?

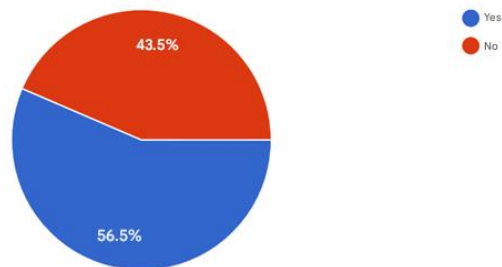
62 answers



35 students perform lower back stretching, while 22 do not.

Do you stretch your lower back?

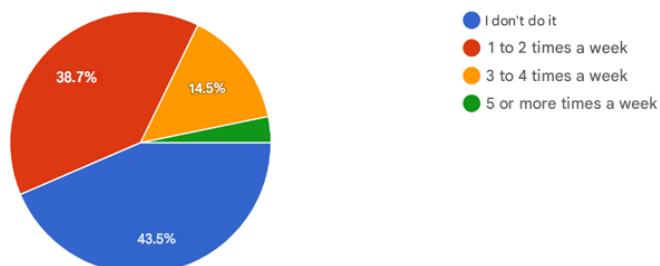
62 answers



Of the 29 students who perform lumbar stretching, 24 do it 1 to 2 times a week, 9 do it 3 to 4 times a week and 2 do it 5 or more times a week.

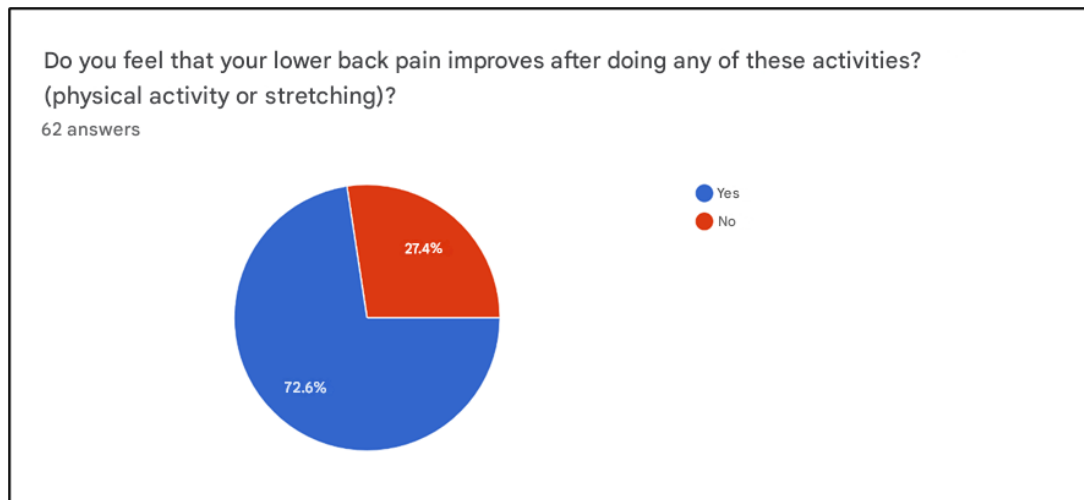
How often do you perform lower back stretches?

62 answers





The vast majority, 45 of the 62 students who participated in the research so far, perceive improvement in low back pain when performing physical exercise or stretching the lower back.



FINAL CONSIDERATIONS

From the study of the answers provided, it was noticed that despite the internship, contrary to what was expected, 5th grade students are able to maintain a more active physical activity routine than 4th grade students, a lower mean BMI and, consequently, have a lower prevalence of low back pain. Therefore, these facts corroborate the great importance of maintaining an adequate body weight and the practice of regular physical exercise, because even being exposed to a more exhausting and stressful school routine, more advanced students in the course have less low back pain.

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