



LITHUANIAN UNIVERSITY OF HEALTH SCIENCES  
MEDICINE FACULTY  
DEPARTMENT OF RHEUMATOLOGY  
SHOULDER PAIN IN YOUNG ADULTS

AUTOR: FRANCISCO FERNANDEZ PADILLA

SUPERVISOR: MARGARYTA PILECKYTE, associated professor, M.D., Ph.D.

Kaunas, Lithuania 2017

# TABLE OF CONTENTS

SUMMARY .....	3
CONFLICTS OF INTEREST .....	4
ABBREVIATION LIST .....	4
TERMS.....	4
INTRODUCTION.....	5
LITERATURE REVIEW.....	6
Common causes of shoulder pain .....	7
Assesment and diagnosis of shoulder pain .....	7
1) Rotator cuff disorders .....	8
2) Glenohumeral disorders .....	10
3) Acromioclavicular disease .....	12
4) Referred mechanical neck pain.....	13
RESEARCH METHODOLOGY AND METHODS .....	14
RESULTS.....	15
DISCUSSION OF THE RESULTS .....	21
CONCLUSIONS .....	25
REFERENCES.....	26

# SUMMARY

Francisco Fernandez Padilla. Shoulder pain in young adults

**Abstract:** We conduct an study by performing a questionnaire about shoulder pain to young adults to asses its stadistics and results.

**Aim:** To evaluate shoulder pain prevalence and characteristics among young adults

**Objectives:** The objectives of the study were as following: To evaluate the extent of disabilities caused by shoulder pain and its impact.To evaluate the different characteristics of shoulder pain in young adult population. To provide insight into the prevalence of shoulder pain among a population of university atmosphere and young workers

**Methods and study participants:** Young adult population were chosen for carrying the survey.There were 94 people (age range from 21 – 50, with a median age of 25 years old) involved in our study. A questionnaire based on different shoulder complaints and characteristics was send through internet, social media and email to the addressees along the study.The data was processed using SPSS 19.0 version stadistical data analysis package

**Results:** 90.5% of the contestants affirm that they had any kind of shoulder pain in their lifetime, and 19% are currently suffering from it. The duration, in the majority of the cases, 85.2%, was acute (less than 6 months) with a higher prevalence in intensity, involving values among 3 to 7 out of 10. Then, 84.1% had an unilateral kind of pain and 54.7% took any kind of medication, either prescribed by the doctor or not. The level of incapability among young adults due to this pain is up to 47%. Even though this results, just a 27.3% visited the doctor

**Conclusions** The aging process contribute to the raise shoulder muskuloskeletal problems, although we found high prevalence of this problems in every group age. This pain is related to huge levels of incapacabilities for daily life and working activities. Shoulder pain is subjective and the complaints vary depending on the person and results it may have in their normal day-life. There were changes in the parameters among sex, with modest increase in female gender. Finally, young adult population tend to self-medicate and seek for medical advice.

## CONFLICTS OF INTEREST

The autor reports no conflict of interest

## ABBREVIATION LIST

SPSS    Statistical Package for the Social Sciences

SPADI   Shoulder Pain and Disability Index

GP       General Practitioner

UK       United Kingdom

CBC     Complete Blood Count

LSMU   Lietuvos sveikatos mokslų universitetas

## TERMS

*Acromion*: the outward end of the spine of the scapula or shoulder blade.

*Biomechanics*: the study of the action of external and internal forces on the living body, especially on the skeletal system

*Dupuytren's contracture*: a condition that causes one or more fingers to bend into the palm of your hand

# INTRODUCTION

Shoulder complaints are really common nowadays in our society, but only a small percentage seek for expert advice 53.4%[1]. This complaints represents the third most common among the musculoskeletal [2]. Approximately 1% of all adults consult a GP(General Practitioner) with a new shoulder pain episode annually[14]. This disorders should also be considered from a social point of view, and not only from the illness itself, causing high costs to the public health by being up to the 30% of all the causes for absence and sick-leave days [3]

Compromised shoulder movement due to pain, stiffness, or weakness can cause substantial disability and affect a person's ability to carry out daily activities (eating, dressing, personal hygiene) and work(2)

Scientific and epidemiologic literature about shoulder pain is limited, and most of them are restrained to specific social communities, ages or precise work-related groups [5,6,7]. Some data from specific groups was found among lithuanian population [4,12,13]. Most of the studies are not up-to-date, and are still working based on the data of Nordic countries[9], Netherlands[10] and UK(United Kingdom)[8-11].

A population that receives relatively little attention regarding shoulder pain are university students and young workers. Although there are only few studies that estimated the prevalence of upper extremity complaints among young population[15,16], research data shows that frequent episodes of upper extremity symptoms are also prevalent and an important concern among young population

The first aim of our study is to evaluate the shoulder pain prevalence and characteristics in young adults by formulating a questionnaire and assess its results to get statistical conclusions. Our second aim is to compare our data with the literature seen so far in terms like social groups, age, sex, characteristics of the pain, disability degree or rate of consultation to the GP.

## AIM

The **aim** of the study was: To evaluate shoulder pain prevalence and characteristics among young adults

## OBJECTIVES

The **objectives** of the study:

- To evaluate the extent of disabilities caused by shoulder pain and its impact.
- To evaluate the different characteristics of shoulder pain in young adult population
- To provide insight into the prevalence of shoulder pain among a population of university atmosphere and young workers

## LITERATURE REVIEW

Limited movements, stiffness or weakness due to shoulder pain can cause significant disability and handicap people on its daily activities (dressing, personal hygiene, leisure activities) and work.

As we saw before, shoulder complaints are the third most common cause among the musculoskeletal visitation to the primary care. Different occupations, as heavy workers that requires high physical demand, or those in which shoulder undergo repetitive movements, vibrations or lifting heavy weights, are clear influences for shoulder pain disability, worsening and provoking the chronicity of symptoms.

The anatomy of the shoulder joint as well as its biomechanics is very complicated and is not similar to any other joint. The range of motion in this joint is also specific, being very wide in all axes and planes.

This motion is achieved by means of three true joints and two junctions. In the function of the shoulder joint 26 muscles and their parts take part, but most important about the biomechanics are the smallest rotation muscles and the deltoid muscle. If any of this muscles with their ligaments, tendons, bones or cartilage, the patient will feel pain, weakness and disability. [17]

Disorders are classified by pathological process (tendonitis, tendinosis and rupture), by anatomical localization (rotator cuff disease, subacromial pain syndrome), by mechanism (impingement syndrome), and by aetiology (work-related shoulder pain, repetitive strain syndrome). The terminology used reflects the medical speciality consulted: industrial medicine (work-related pain), orthopaedic surgery (impingement syndrome) and radiology (peritendinitis calcarea, acromion

morphology). The various strategies for classification have certain advantages and disadvantages, but the use of different terms to describe the same condition may be confusing for someone not particularly informed in this field [39]

The lack of consistent terminology may also reflect the uncertain relationship between shoulder pain, radiological and histopathological findings. The clinician should consider this knowledge when examining the patient because pain may not arise from the structure that is shown as abnormal on imaging [38]. A comprehensive algorithm to serve as a guide for diagnostic evaluation and management of shoulder pain caused by soft-tissue disorders (Annex No 3)

Coming up next, the main causes of shoulder pain degeneration will be evaluated

## **Common causes of shoulder pain**

The four most common presentation of shoulder pain and disability in primary care are rotator cuff disorders, glenohumeral disorders, acromioclavicular joint disease and referred back pain.

One primary care study that used standardised clinical test for shoulder disorders found rotator cuff tendinopathy in 85% of the patients, but in 77% of patients a clinical diagnosis of more than one shoulder problem was made. For example, tendinosis and impingement(57%); tendinosis, impingement, acromioclavicular disease, and adhesive capsulitis (6%)[18]

## **Assesment and diagnosis of shoulder pain**

(Annex No 3) [28]

CBC(Complete blood count) and radiography are indicated only if there are “red flag”[31] indicators such as symptoms and signs of systemic disease like:

- History of cancer; symptoms and signs of cancer; unexplained deformity, mass, or swelling:tumour
- Red skin, fever, systemically unwell: infection
- Trauma, epileptic fit, electric shock; loss of rotation and normal shape: unreduced dislocation
- Trauma, acute disabling pain and significant weakness, positive drop arm test: acute rotator cuff tear
- Unexplained significant sensory or motor deficit: neurological lesion

## 1) Rotator cuff disorders (Age 35-75)

Rotator cuff tendinopathy is the most common cause of shoulder pain. An occupational history may reveal heavy lifting or repetitive movements, especially above shoulder level. Although related to activity, it often occurs in the non-dominant arm and in non-manual workers. Evidence suggests genetic susceptibility in some families.

### Classification

The different types of rotator cuff disorders and their slightly different causes are explained below:

**A rotator cuff tear** is usually strongly indicated by the history: traumatic in young people and atraumatic in elderly people (related to attrition from bony spurs on the undersurface of the acromion or intrinsic degeneration of the cuff). Tendon tears are most common in people aged over 40. Tears that affect younger people are usually caused by an accident. In older people, tears are often caused by impingement syndrome. It is estimated around half of people over the age of 60 may have partial or complete rotator cuff tears. This is because your tendons become weaker as you get older.

Partial tears may be difficult to differentiate from rotator cuff tendinopathy on examination; weakness in resisted movement may occur in either condition.

Several studies have suggested that no correlation exists between symptoms and loss of function in the presence of full thickness supraspinatus tears that tears of the lower rotator cuff may lead to inability to rotate beyond 20° and that partial and full thickness tears are commonly found during imaging of asymptomatic people. The “drop arm test” may be used to detect a large or complete tear (a high specificity and low sensitivity for this test was reported in a secondary care population)[33]

**Tendonitis** is inflammation (swelling) of a tendon. **Bursitis** is inflammation of a bursa. A bursa is a small fluid-filled sac usually found over the joints and between tendons and bones.

Rotator cuff tendonitis and bursitis are usually the result of irritation and inflammation caused by a shoulder injury or overuse of the shoulder. For example, these conditions may affect someone whose job involves a lot of overhead lifting, or an athlete who competes in throwing sports, such as the javelin or discus.

If there is any kind of injury to the shoulder joint, the tendons or bursa may become inflamed. This means there is less space within the joint for the tendons and muscles to move. If the tendons,

muscles or surrounding tissue become trapped between the bones in the shoulder, any repeated movement will irritate them.

Tendonitis and bursitis often occur together. When the tendons or bursa are trapped between the bones it is often known as **"impingement syndrome"**.

If the tendon is repeatedly scraped against the shoulder bones, it can gradually weaken and will sometimes tear. We should also include the term **"rotator cuff syndrome"** is used to describe any type of damage to tendons in the rotator cuff, including complete tears. [34]

## **Symptoms**

Wasting may be present on examination; active and resisted movements are painful and may be partially restricted, whereas passive movements are full, but painful. Although a painful arc is neither specific nor sensitive as a clinical sign, its presence reinforces the diagnosis of a rotator cuff disorder.[32]

## **Treatment**

Rotator cuff disorders should be treated initially with relative rest of the shoulder. The patient should return to normal activity or temporarily modified work as soon as possible, within the limits of the disability and pain. Overall, systematic reviews and more recent studies suggest equivalent short term benefit for physiotherapy (incorporating supervised exercise) and steroid injections in the management of shoulder disorders [21]. In a primary care population with undifferentiated shoulder disorders, participants allocated to a physiotherapy treatment group were less likely to re-consult with a general practitioner than were those receiving steroid injections alone.

A single recent study reported that a subacromial injection of xylocaine was as effective as steroid plus xylocaine in all disease specific outcome measures at two weeks, with follow-up of participants at six, 12, and 24 weeks. Some practitioners recommend larger volumes of injection of up to 10 ml, as a theoretical benefit of hydrodilatation of the subacromial bursa exists. However, inadequate evidence is available on evaluating outcomes with variation in volume injected.[23] Therefore, subacromial corticosteroid injections, up to 10 ml in volume, should be considered for short term pain relief and to facilitate rehabilitation. If the initial response is good, the injections should be repeated up to three times, at six weekly intervals. No evidence exists to show that steroid injections are either harmful or beneficial in the presence of a rotator cuff tear, so they should be avoided if the drop arm test is positive.

## 2) Glenohumeral disorders (adhesive capsulitis: age 40-65, median 50-55; osteoarthritis: $\geq 60$ )

### Classification

**Adhesive capsulitis** (“frozen shoulder”) and true glenohumeral arthritis are often preceded by a history of non-adhesive capsulitis symptoms, are characterized by deep joint pain, and restrict activities such as putting on a jacket (impaired external rotation). Adhesive capsulitis is more common in people with diabetes and may also occur after prolonged immobilization. On examination global pain is present, along with restriction of all movements, both active and passive.

**Frozen shoulder** occurs when the sleeve that surrounds the shoulder joint, known as the capsule, becomes swollen and thickened. It's unclear why this happens. (Annex No 4)

The shoulder is a ball and socket joint. The end of your upper arm bone (humerus) sits in contact with the socket of your shoulder blade (scapula). The shoulder capsule is fully stretched when you raise your arm above your head, and hangs down as a small pouch when your arm is lowered.

In frozen shoulder, bands of scar tissue form inside the shoulder capsule, causing it to thicken, swell and tighten. This means there's less space for your upper arm bone in the joint, which limits movements [36]

### Symptoms & stages

The symptoms of a frozen shoulder usually get worse gradually, over a number of months or years.

There are three separate stages to the condition (see below), but sometimes these stages may be difficult to distinguish. The symptoms may also vary greatly from person to person.

- Stage one:

During stage one, often referred to as the "freezing" phase, your shoulder starts to ache and become very painful when reaching out for things.

The pain is often worse at night and when you lie on the affected side. This stage can last anywhere from two to nine months.

- Stage two:

Stage two is often known as the "frozen" phase. Your shoulder may become increasingly stiff, but the pain doesn't usually get worse and may even decrease.

Your shoulder muscles may start to waste away slightly because they're not being used. This stage usually lasts 4-12 months.

- Stage three:

Stage three is the "thawing" phase. During this period, you will gradually regain some movement in your shoulder. The pain begins to fade, although it may come back occasionally as the stiffness eases. You may not regain full movement of your shoulder, but you'll be able to carry out many more tasks. Stage three can last from six months to many years.

## **Risk factors**

Most cases of frozen shoulder occur in people over the age of 40. And is more common in women than men. The exact cause of frozen shoulder is not fully understood. However, there are several risk factors that make developing frozen shoulder more likely. These include:

**-Shoulder injury or surgery** – keeping your arm and shoulder still for long periods of time; for example, while you recover from an arm injury or arm surgery

**-Diabetes** – you are more likely to develop frozen shoulder if you have diabetes, but the exact reason for this is unknown

**-Other health conditions** – these include heart or lung disease, an overactive thyroid (hyperthyroidism) and Dupuytren's contracture[ 35]

## **Treatment**

Traditional teaching is that the natural history of a frozen shoulder is recovery by two years; however, symptoms may persist for three years or more in some cases, particularly in patients with diabetes mellitus. Corticosteroid injections (intra-articular, anterior approach) may be of benefit in reducing pain in the early phase. No evidence exists to show that physiotherapy alone is of benefit for adhesive capsulitis; when the joint is very painful; movement is distressing and may well be counterproductive.<sup>7</sup> Intra-articular corticosteroid injections and physiotherapy, starting one week after the injection, may be of short term benefit. However, in this study, intra-articular injection was done as a guided technique using fluoroscopy, limiting the generalizability of these findings to primary care.

### 3) Acromioclavicular disease (teenage to 50)

#### Classification

Acromioclavicular disease is usually secondary to trauma or osteoarthritis; dramatic joint dislocation can occur after injury (teenage to 30 years). Pain, tenderness, and occasionally swelling are localised to this joint, and there is restriction of passive, horizontal adduction (flexion) of the shoulder, with the elbow extended, across the body. Acromioclavicular osteoarthritis may also cause subacromial impingement.

The acromioclavicular joint is the joint at the top of your shoulder (not the ball and socket joint).

Possible acromioclavicular joint disorders include:

- **Osteoarthritis**, that causes the joints to become painful and stiff, and is the most common cause of acromioclavicular joint disorders
- **Tearing or stretching the ligaments** in the acromioclavicular joint: ligaments are the tough bands of connective tissue that link two bones together at a joint
- **Partially or completely dislocating** your acromioclavicular joint

#### Symptoms

Pain in the joint, limited movement of the joint ,pain on the top of the shoulder. If the acromioclavicular joint is dislocated, it may also look visibly out of position.

#### Risk factors

Acromioclavicular joint disorders are more common in men and those between the ages of 20 and 50.

People who play contact sports such as rugby have an increased risk of developing acromioclavicular joint disorders.They are also more likely to occur in people who have fallen on their shoulder, for example, during a skiing accident [37]

#### Treatment

Acromioclavicular disorders usually resolve with rest and simple analgesia, unless significant traumatic dislocation is present. If symptoms persist, a local steroid injection may help. [26]

#### **4) Referred mechanical neck pain (common)**

Typically there is pain and tenderness of the lower neck and suprascapular area, referred to the shoulder and upper limb area; shoulder movement may be restricted. Movement of the cervical spine and shoulder may reproduce more generalized upper back, neck, and shoulder pain. Upper limb paresthesia may occur. Treatment is with relative rest and analgesia, and return to normal activities should be encouraged. Physiotherapy may be helpful. [27]

## **RESEARCH METHODOLOGY AND METHODS**

The research was carried in the Lithuanian University of Health Sciences(LSMU) during the X and XI semesters of medicine studies. We used a online questionnaire, performed to population aged among 18 and 50 year old, either if they sufer from shoulder pain or not.

Excluding criteria are teenagers and old adults out of age range. The representative study sample comprised 94 people young adults. The following determinants will be investigated: work-related factors, complaint characteristics, physical activity, age and sex factors.

People who agreed to complete the questionnaire were included in the study.

### **Questionnaire**

In this study the following variables were used for each individual: Current shoulder pain, if they ever felt it, age, sex, relation to one or both shoulders, duration, intensity, doctor consultation, medication taken, kind of work, sport activities and level of disability. (Annex No 5)

They were given clear written and illustrated instructions about how to complete the questionnaire, as well as the goals, confidentiality and anonymity to the respondents. Questions were based on the Oxford Shoulder Score, SPADI(Shoulder Pain and Disability Index) and Nordic Musculoskeletal Questionnaire.

Also SPSS (Statistical Package for the Social Sciences) stadistic analyser was used to interpret our results.

## RESULTS

Our survey throws significant data about the shoulder pain, specific in young adults, that we are going to analyze hereunder. We will begin with the specific characteristics of the contestants. Through the survey, we got the following data:

**Age :** Mean value of the contestants was 26.5 years old, widening from a range from 18 to 50 years old.

**Sex:** Female represented the 42.5% of the answers, with 40 people. On the other side male were up to 57.4% with 54 people.

**Work:** Almost the half of the respondents, 52.2%, were unemployed or studying. The other 47.8% are currently working.

Among the workers, 27.2% are involved in office work with computer handling as administratives, secretary, assistant or account manager. On the other side, the 31.8% are working on heavy load or physical works as builders, farmers, waiter/waitress, receptionist or professional sportman. Finally, the 31% left, have active works but not physically demanding, like doctors, nurses, lawyers, engineers or teachers.

**Sport/leisure activities:** The vast majority of the interviewed, make any kind of sports or hobbies with some range of physical activity, 82.8%. Meanwhile, the other 17.2% describe themselves as sedentary or inactive people, due to basically lack of time. Among the most practise sports stand up those like football, gym, basketball, volleyball or swimming.

On the other hand, in our survey we also analysed deeply the characteristics and peculiarities of shoulder pain, and most remarkable information is presented as:

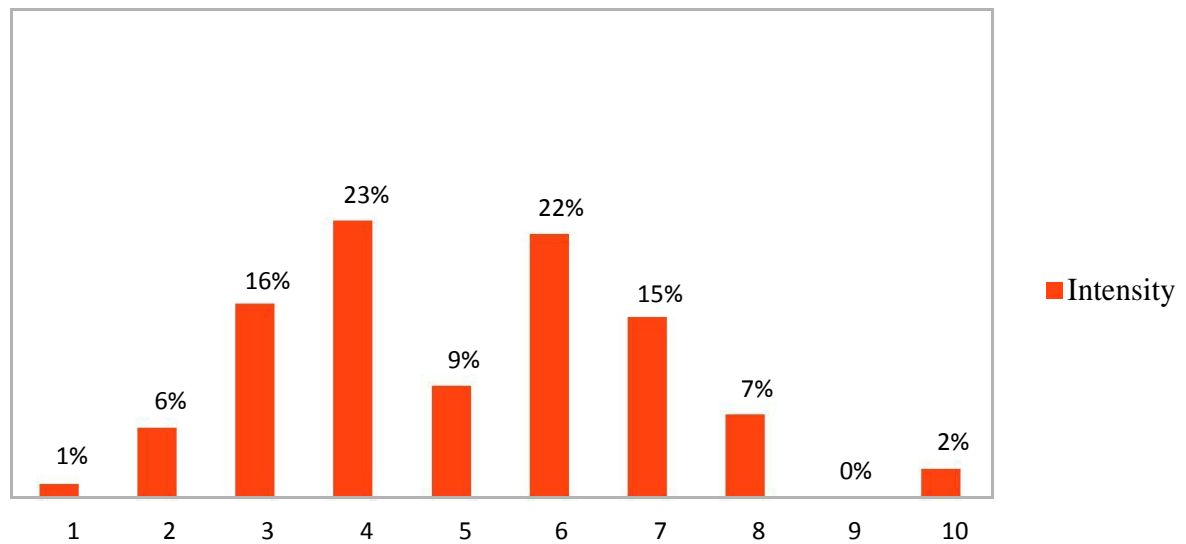
People that affirm **to experience any kind of shoulder pain** in their lifetime was up to 90.5%, and only 9.5% said that have never been involved in any shoulder condition.

Nonetheless, 80% declared that they did not have **shoulder pain at the moment** of performing the questionnaire, while the 19% said they had shoulder complaints by the time of the interview.

Furthermore, focusing on the **localization**, 84.1% said that was a unilateral pain and 15.9% said it answer that was billateral

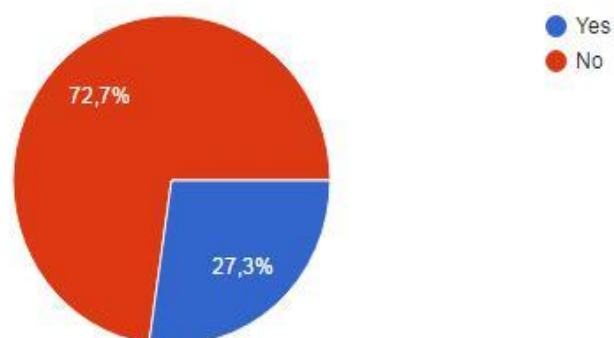
In relation to its **duration**, 85.2% claim that the complaints were acute, with a duration of less than 6 months and diminishing intensity. On the other side 14.8% said that they suffer from the shoulder condition for more than 6 months, with a constant intensity of the pain during this period.

Regarding the **intensity**(Fig.1), different values were found. This parameter is not really subjective but give us an orientation about the main pain levels the contestants were bearing. The questionnaire was made based on a 1-10 scale, showing the following parameters:



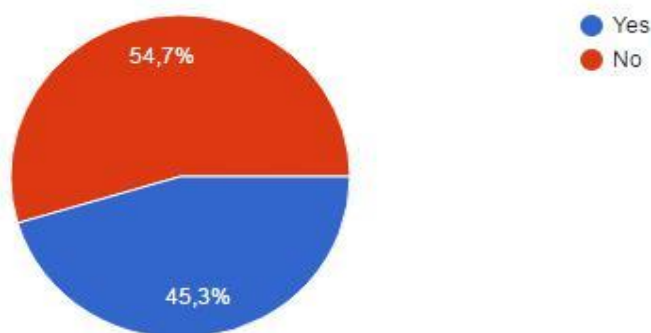
**Fig.1.**Intensity of pain

Moreover, the majority of the contestants said they have never **visited the doctor** due to shoulder complains ,72.7% and only a 27.3% seeked for expertise opinion.



**Fig.2.** Doctor consultation

Another important parameter that was analysed was if people either **take any medication** in this cases or not. In this case results were the following.

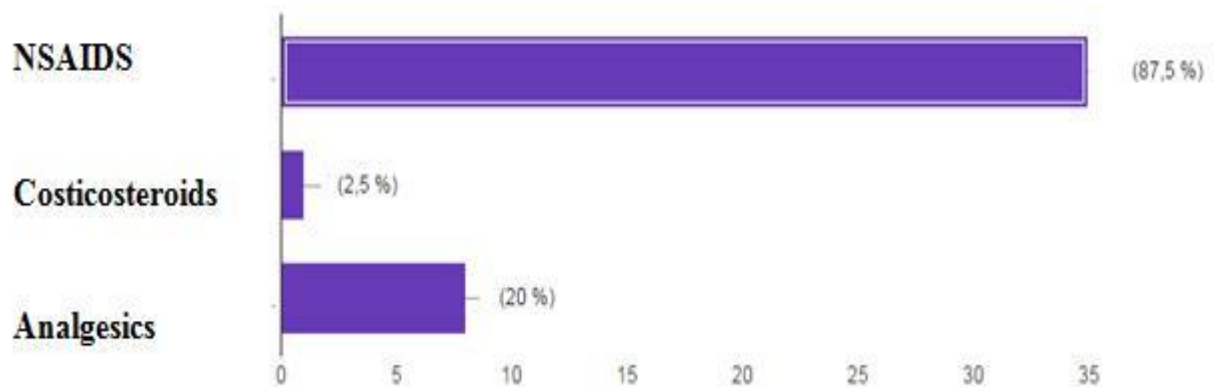


**Fig.3.** Medication use

Going further in this question, for the contestants that answered that they took any medication, we specifically asked **which kind of drugs** they employed.

There were 3 major groups; NSAIDS (Ibuprofen, Diclofenac, Asprin...), Corticosteroids or Analgesics (Tramadol, Oxycodone, Acetaminophen...)

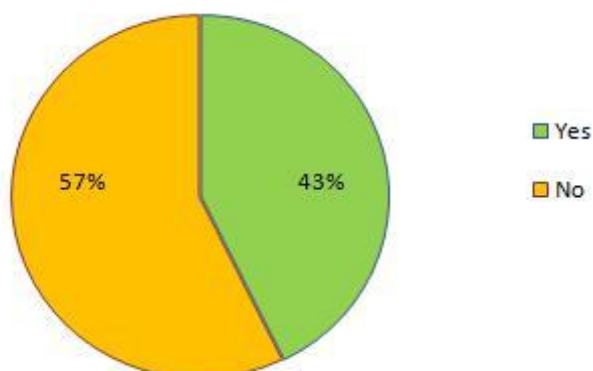
The data we obtained



**Fig.4.** Different kind of drugs taken

Finally, we assessed the **level of incapability** that the different shoulder complaints(stiffness, pain, weakness) could cause to the daily life and normal routine.

### Incapability of daily life

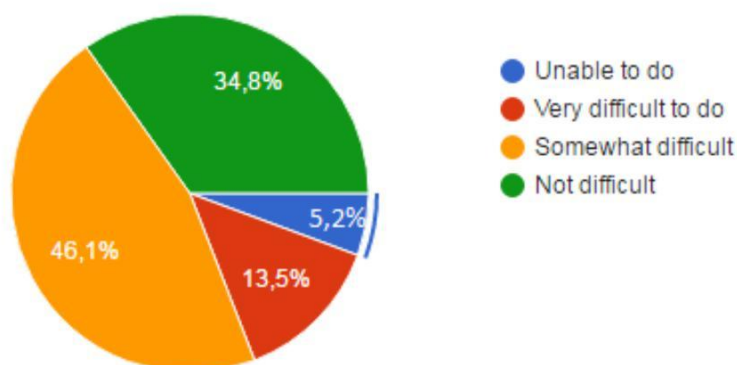


**Fig.5.** Incapability in daily life

Following the topic of daily incapacities, we analyze different parameters that shoulder complaints could cause. For that work, we perform different questions related to the possible difficulties they could find in their daily-life activities.

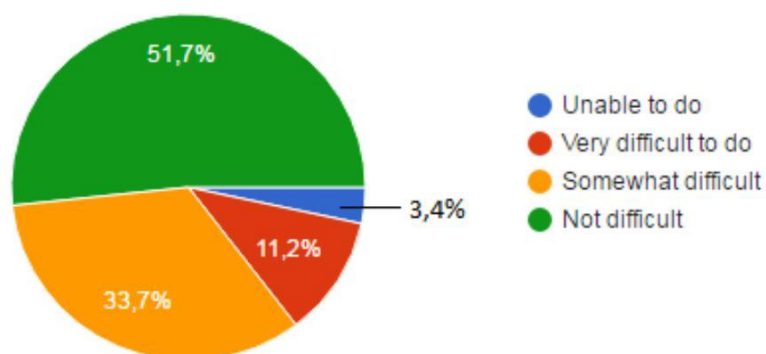
According to the results, we obtained the following data:

Was it difficult to sleep on the affected side?



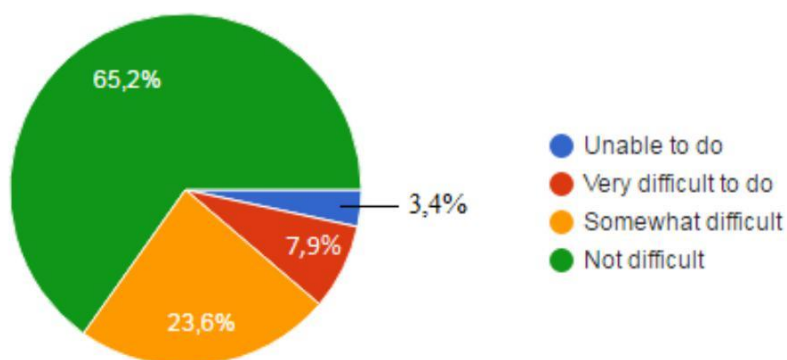
**Fig.6.** Sleep difficulties

Was it difficult to wash your back or toileting?



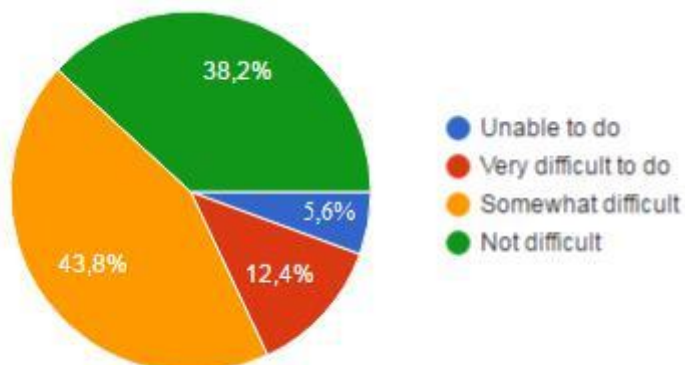
**Fig.7.** Toileting difficulties

Was it difficult to comb your hair?



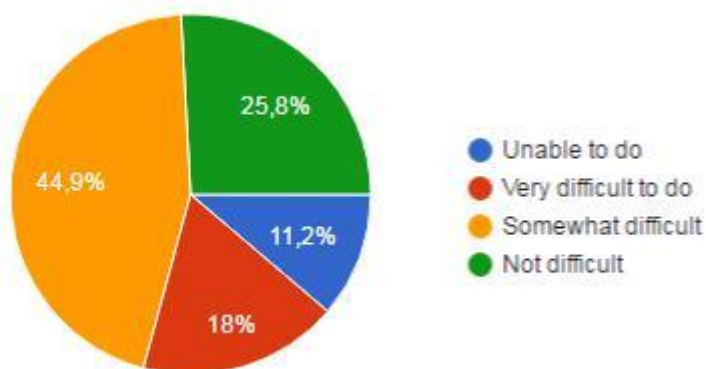
**Fig.8.** Hair dressing difficulties

Was it difficult to reach a high shelf?



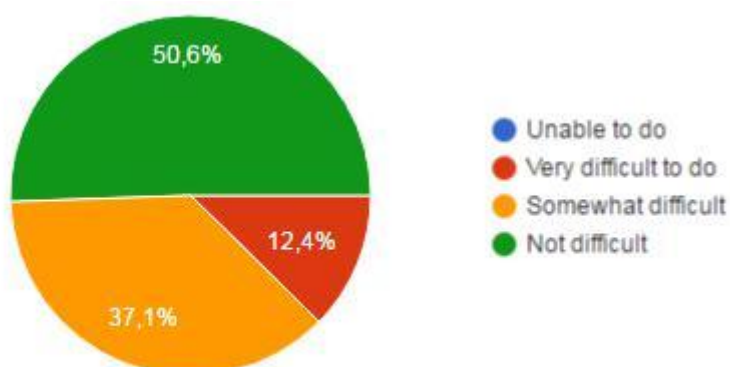
**Fig.9.** Difficulties on reaching a shelf

Was it difficult to lift more than 4.5kg over your shoulder?



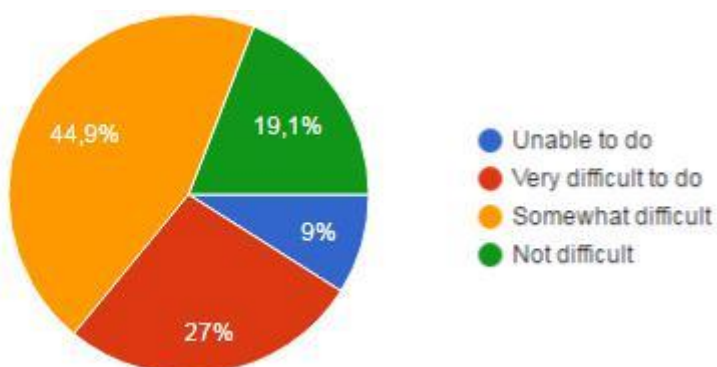
**Fig.10.** Lifting problems

Was it difficult for you to do your usual work?



**Fig.11.** Difficulties to work

Was it difficult for you to do your usual sport/leisure activity?



**Fig.12.** Difficulties with sport and spare time

## DISCUSSION OF THE RESULTS

Shoulder pain among young adults should be considered from different points of views according to the data we collected.

First of all, we should take in count that pain symptoms are related to with the kind of work, gender and age [2,11,40,41,42,44]

To begin with, the **age** is a very significant matter. Musculoskeletal pain is not necessarily a problem of the older age groups. In contrast to many health problems, musculoskeletal pain is also very prevalent among the younger age groups. Our study, focused on young adults, showed that 90.5% of the contestants have had any episode of shoulder pain in their lifetime, while the 19% had current pain at the time of the survey, which, in comparison with other diseases, it has a very high prevalence. Actually, there is some study [1] where the prevalence of shoulder pain for population of +65 where lower than those younger, but in general, this prevalence is increasing with age.[10-11-48]

How can the age effect be explained? Firstly, biological changes related to the aging process, for example, degenerative changes of muscles, tendons, ligaments, and joints, are suggested to contribute to the pathogenesis of musculoskeletal disorders. Secondly, the increasing number of years in service during which aging workers are exposed to harmful work demands may be associated with an increased risk of disorders. The disorders found in this study may have arisen as a consequence of many years of accumulated workload. Thirdly, a chronic overload for the elderly worker caused by a disruption of the balance between physical workload and physical work capacity with advancing age has also been suggested as a potential cause for the development of musculoskeletal disorders[50]

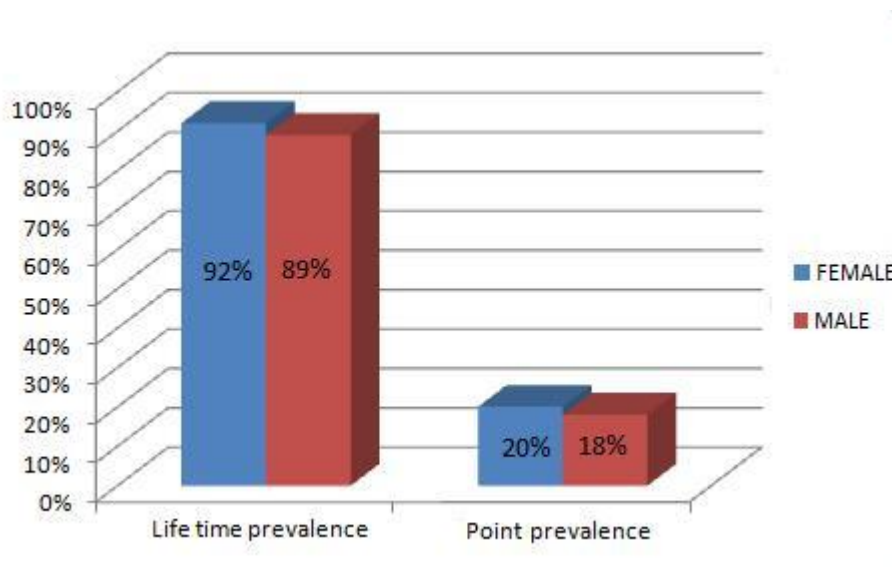
We should also remark that our scores for **lifetime prevalence** were higher than in many other studies(30.7% to 66.7%) [1,42, 47]. The reason could be due to the sample size, and the characteristics of the contestants, where up to 60% are working with high physical loads or handling computer during long periods. Also we should comment that 82.8% of contestants take part in physical activity involving repetitive movements or awkward postures that could lead to any period of shoulder pain.

For the **current pain**, 19% answered positively to this question, showing us an high point prevalence too. In other studies with the same age range, we saw values that went from 4,1% [41] to 20%[49]. Its important to remark that also in different studies we saw that this point prevalence was higher on older adults that on young ones[9,41]

According to the **sex**, there is some significant data that we should discuss. In consonance with our survey results, we could observe that there are differences among male and female sex.

Regarding the prevalence, we ask about lifetime prevalence and point prevalence (at the moment of the questionnaire) of shoulder pain.

For female gender we obtained a 92% that ever had any kind of shoulder pain, and a 20% of current pain. On the other side, for male gender we obtained a 89% for life prevalence, and 18% for current pain.



**Fig.13.** Life time and point prevalence differences among men and women

In general population we already saw that the prevalence of musculoskeletal shoulder complaints, is usually slightly higher among women than men, as described in different studies [1,45,46].

This differences could be caused by many reasons, as the unequal exposure to physical workloads (women in general carry more repetitive daily activities, static postures as in household tasks). Other reasons could be the different pain sensitivity as well as biological, social and psychological factors. This differences, in turn, could be progressively diminishing in developed countries, as most of this studies are not recent, and there is a closure of the sex-gap in many jobs.

Another important parameter that we assessed was the **duration**, where up to 85.2% affirmed that they had acute pain, with decreasing intensity. This have a clear interpretation related to the etiology that we could check in our literature review. The vast majority of young-related diseases are traumatic or inflammatory processes caused by physical overload and sport and leisure activities, which recovery is usually conservative and a matter of several days or weeks, that usually does not lead us to chronicity but to a relatively short term recovery. On the other side, only the 14,8% said that this pain was prolonged for more than 6 months. This could also be explained because other diseases like

rotator cuff disorders, glenohumeral disorders, acromioclavicular disease or referred pain start their incidence within our sample's age (18-50 years old)

Similar case we can see related with the **unilateral or bilateral** involvement.

Again, 84.1% said that this pain was unilateral, usually related to a physical condition triggered in work or sport atmosphere. Individuals are more likely to use their dominant arm for most mechanical activities requiring strength or precision of movement, and the excess of symptoms on the dominant side could reflect tissue damage from physical stresses.

On the other side we could see that 15.9% had this pain bilaterally. This pain is usual in patients with osteoarthritis, rheumatoid arthritis, gout or pseudogout among others, conditions that are usually unusual among young adults.[51]

Regarding to the **intensity**, the vast majority of the contestants move from 3 to 7 range out of 10. This shows that weak or mild pain is not usually referred, and strong and excruciating pain, that usually comes from fractures and heavy trauma, does not happen regularly.

Several factors are correlated with the intensity, including the **drug usage** and **doctor consultation**.

Respecting the **doctor consultation**, up to 27,3% sought for expertise advice (doctors, nurses, physiotherapist). In other studies[41] was shown that 52.1% of the patients visited the GP for their shoulder complaint, or 53.4% as in the DMC3-study [1] which is higher than in our study. This can be explained due to the age range we are working with. Degenerative changes in rotator cuff are more prevalent in persons older than 65, because of their age.

Furthermore, our survey display that 45.3% took any kind of **medication**, which in most of the cases was NSAIDS (87.5%) , just a 2.5% took corticosteroids and 20% any kind of analgesics in addition to it. This data is really similar to other studies [45] that also ranges in young adult population (19-39), that showed that 31,5% people that was treated initially took NSAIDS, while 11% were given injections or other forms of corticosteroids. They found that 50% of the initial treatments at first consultation involved an oral non-steroidal anti-inflammatory drug (NSAID) prescription, 32% a wait-and-see policy, 15% a referral for physiotherapy, and 3% a corticosteroid injection.

This percentages are explained by the accessibility and affordability of the NSAIDS. Besides, the usage of the corticosteroids or analgesics are kept for severe cases of pain or incapability, that as we saw before, are not the most common.

Finally, we should comment about the different levels of incapability that this shoulder complaints caused in the daily life of the interviewed, where 43% answered that they suffered any kind of incapability for performing routinary activities of their daily living, and 57% answered negatively.

In this area is worth to comment that the more difficult thing to do for our interviewed was to raise heavy weights above the shoulder, in which 29.2% said that it was really difficult or unable to do it.

Also to practise their usual sport or leisure activities, we found a 36% that affirm that was very difficult or unable to do it. This last data, that we could consider as hobbies, caused much higher rates of incapability in comparison for other section as for that representing the difficulties for performing their usual work. Here only 12.4% said it was difficult for them, but a 0% answer that were unable to do it.

Here, we may understand it as a subjective phenomena, where the same complaints that led people to quit practising their hobbies in their free time, were not enough to stop attending to their daily work.

## CONCLUSIONS

1. This pain results in a huge rates of incapacibilities for performing daily life activities. Incapabilities for daily life were subjective to the social or economic impact and repercussion that these incapacibilities could cause. Same kind of pain were not enough to sick-absence at work, but sufficient to stop practising activities in their free time.
2. Muskuloskeletal pain is not necessarily a problem of the older age groups but old adults are more vulnerable to shoulder complaints due to normal daily activities that involve the shoulder and that are progressively worsening with age. Drug usage and professional advice were less noted in young adult population
3. The prevalence on shoulder complaints changes among genders but doesnt change with increasing the age of our subgroups. In contrast to many health problems, muskuloskeletal pain is also very prevalent among the younger age groups.

## REFERENCES

1. Picavet HS, Schouten JS. Musculoskeletal pain in the Netherlands: prevalences, consequences and risk groups, the DMC(3)-study. *Pain* 2003;102:173–78.
2. Urwin M, Symmons D, Allison T, Brammah T, Busby H, Roxby M, et al: Estimating the burden of musculoskeletal disorders in the community: the comparative prevalence of symptoms at different anatomical sites, and the relation to social deprivation. *Ann Rheum Dis* 1998;57:649–55.
3. Leijon M, Hensing G, Alexanderson K.: Gender trends in sick-listing with musculoskeletal symptoms in a Swedish county during a rapid increase in sickness absence. *Scand J Soc Med* 1998;26:204–213.
4. Lina Skemiene, Ruta Ustinaviciene, Dalia Luksiene, Ricardas Radisauskas, Gintare Kaliniene: Computer use and musculoskeletal complaints in the Lithuanian adolescent population *Cent Eu Med*, 2012 (203-208)
5. Alipour A1, Ghaffari M, Shariati B, Jensen I, Vingard E. **Occupational** neck and shoulder pain among automobile manufacturing workers in Iran. *Am J Ind Med*, 2008 May;51(5):372-9
6. Pengying Yue, Fengying Liu and Liping Li: Neck/shoulder pain and low back pain among school teachers in China, prevalence and risk factors *BMC Public Health* 2012 12:789
7. Sunisa Chaiklienga, Maytinee Krusun: **Health** Risk Assessment and Incidence of Shoulder Pain Among Office Workers. *AHFE* 2015, Pages 4941–494
8. Pope DP, Croft PR, Pritchard CM, Silman AJ: Prevalence of shoulder pain in the community: the influence of case definition. *Ann Rheum Dis* 1997 ;56:308 – 12.
9. Allander E: Prevalence, incidence, and remission rates of some common rheumatic diseases or syndromes. *Scand J Rheumatol* 1974;3:145 – 53

- 10.** K Greving, O Dorrestijn, JC Winters, F Groenhof, K van der Meer, M Stevens, et al: Incidence, prevalence, and consultation rates of shoulder complaints in general practice. *Scand J Rheumatol* 2012; 41:150–155
- 11.** Urwin M, Symmons D, Allison T, Brammah T, Busby H, Roxby M, et al: Estimating the burden of musculoskeletal disorders in the community: the comparative prevalence of symptoms at different anatomical sites, and the relation. *Annals Rheu Dis.* December 1998 :649-55
- 12.** Gintare Kaliniene, Ruta Ustinaviciene, Lina Skemiene, Vidmantas Vaiciulis , Paulius Vasilavicius. Associations between musculoskeletal pain and work-related factors among public service sector computer workers in Kaunas County, Lithuania. *BMC Musc Dis.* 2016 Oct 7;17(1):420.
- 13.** Malinauskiene, V. Jonutyte, I.. Workplace bullying, post-traumatic stress disorder and neck/shoulder and arm pain among seafarers. *Int J Occup Med Environ Health* 2014 Dec;27(6):919-32
- 14.** Mitchell C, Adebajo A, Hay E, Carr A. Shoulder pain: diagnosis and management in primary care. *BMJ.* 2005;331(7525):1124-1128.
- 15.** Schlossberg EB: Upper extremity pain and computer use among engineering graduate students. *Am J Ind Med.* 2004, 46 (3): 297-303
- 16.** Katz JN: Assessment of upper extremity role functioning in students. *Am J Ind Med.* 2002, 41 (1): 19-26.
- 17.** Rimvalda Broga. Skausmas peties sąnario srityje: prieštastys, klinikiniai simptomai, diagnostika ir gydymas. 2003, 1 tomas, 2 numeris; p. 192–204
- 18.** Ostor AJ, Richards CA, Prevost AT, Speed CA, Hazleman BL. Diagnosis and relation to general health of shoulder disorders presenting to primary care. *Rheu Oxf* 2005;44: 800-5.
- 19.** Winters JC, Sobel JS, Groenier KH, Arendzen JH, Meyboom-de Jong B. The long-term course of shoulder complaints: a prospective study in general practice. *Rheu Oxf* 1999;38: 160-3.

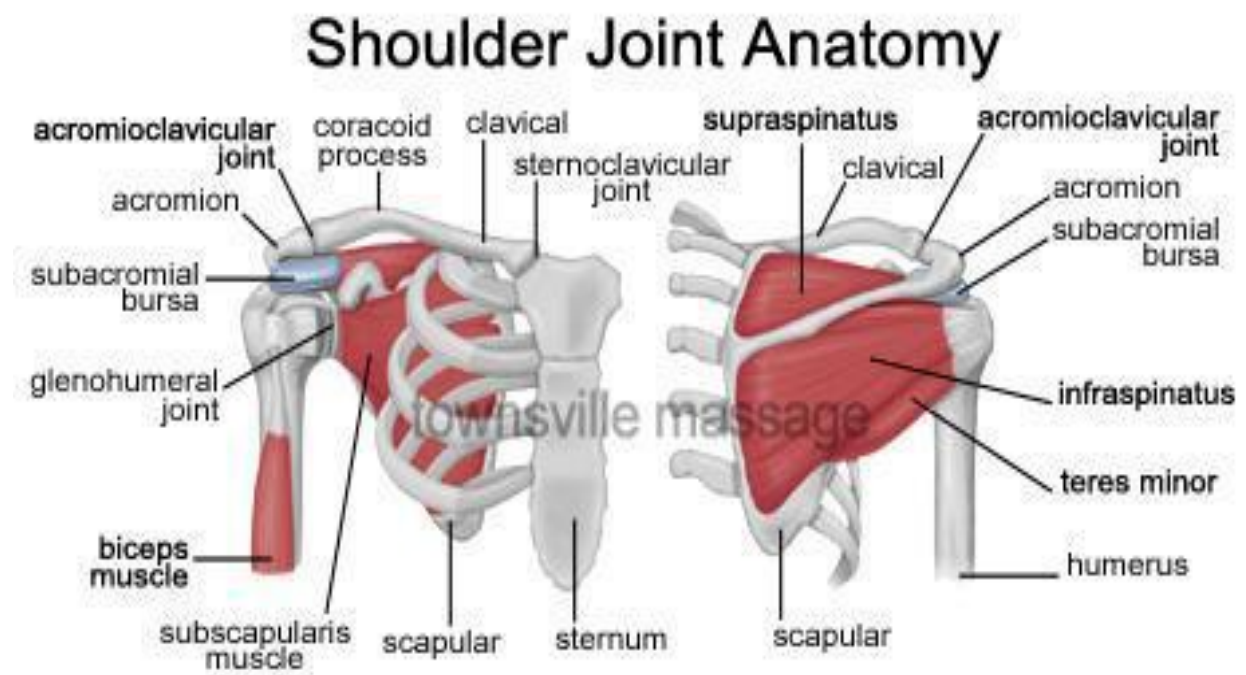
20. Van der Windt DA, Koes BW, Boeke AJ, Deville W, De Jong BA, Bouter LM. Shoulder disorders in general practice: prognostic indicators of outcome. *Br J Gen Pract* 1996;46: 519-23.
21. Green S, Buchbinder R, Glazier R, Forbes A. Interventions for shoulder pain. *Cochrane Database Syst Rev* 1999;(2)
22. Speed C, Hazleman B. Shoulder pain. *Clin Evid* 2004;(12): 1735-54.
23. . Green S, Buchbinder R, Glazier R, Forbes A. Systematic review of randomised controlled trials of interventions for painful shoulder: selection criteria, outcome assessment, and efficacy. *BMJ* 1998;316: 354-60
24. Urwin M, Symmons D, Allison T, Brammah T, Busby H, Roxby M, et al. Estimating the burden of musculoskeletal disorders in the community: the comparative prevalence of symptoms at different anatomical sites, and the relation to social deprivation. *Ann Rheum Dis* 1998;57: 649-55
25. B. Reeves. The Natural History of the Frozen Shoulder Syndrome. *Scand J Rheum*: 1975;4(4):193-6. Pages 193-196
26. James K. ; Harold K. : Treatment of Acromioclavicular Injuries, Especially Complete Acromioclavicular Separation . *J Bone Joint Surg Am*, 1972 Sep; 54 (6): 1187 -1194 .
27. Caroline M; Ade A; Elaine H: Shoulder pain: diagnosis and management in primary care. *BMJ : British Medical Journal*; London ,Nov 10, 2005: 1124.
28. Caroline Mitchell: Diagnosis of Shoulder problems in Primary Care: Guidelines on treatment and referral. *BMJ*. 2005 Nov 12;1124–1128.
29. Robert Lugo, Peter Kung, C. Benjamin . Shoulder biomechanics *Eu J Rad*, October 2008, Pages 16-24
30. Derek R. Armfield, Robert L. Stickle, Douglas D. Robertson, Jeffrey D. Towers, and Richard E. Debski. Biomechanical basis of common shoulder Problems. *Seminars in musculoskeletal radiology* April 2003 7(1):5-18 .

- 31.** Andrew Carr, Jonathan Rees, Chris Little, Stephen Gwilym, Jane Moser. Oxford shoulder and elbow clinics. Oxf Uni Hosp.
- 32.** Calış M, Akgün K, Birtane M, Karacan I, Calış H, Tüzün F .Ann. Diagnostic values of clinical diagnostic tests in subacromial impingement syndrome. Rheum Dis. 2000 Jan; 59(1):44-7.
- 33.** Milgrom C, Schaffler M, Gilbert S, van Holsbeeck M: Rotator-cuff changes in asymptomatic adults. The effect of age, hand dominance and gender. J Bone Joint Surg Br. 1995 Mar; 77(2):296-8.
- 34.** National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS) National Institute of Health. NIAMS update April 20, 2017
- 35.** Richard Dias, Steven Cutts, Samir Massoud. Frozen shoulder : Brit Med J; London (Dec 15, 2005): 1453.
- 36.** G. C. R. Hand, N. A. Athanasou, T. Matthews, A. J. Carr. The pathology of frozen shoulder. The bone and Joint Journal. 2 August 2007
- 37.** Beim GM. Acromioclavicular joint injuries. Journal of Athletic Training 2000; 35(3): 261-267.
- 38.** Shoulder pain. Jens Ivar Brox. National Hospital, Oslo N-0027, Norway. February 2003. Volume 17, pages 33-56
- 39.** Olsson O. Degenerative changes of the shoulder joint and their connection with shoulder pain. University of Gothenborg; 1953
- 40.** Van der Heijden GJ, Leffers P, Bouter LM. Shoulder disability questionnaire design and responsiveness of a functional status measure. J Clin Epidemiol 2000;53:29 – 38.
- 41.** Badley EM, Tennant A. Changing profile of joint disorders with age: findings from a postal survey of the population of Calderdale, West Yorkshire, UK. Ann Rheum Dis 1992;51:366 – 71.
- 42.** Brattberg G, Thorslund M, Wikman A. The prevalence of pain in a general population. The results of a postal survey in a county of Sweden. Pain 1989;37:215 – 22.

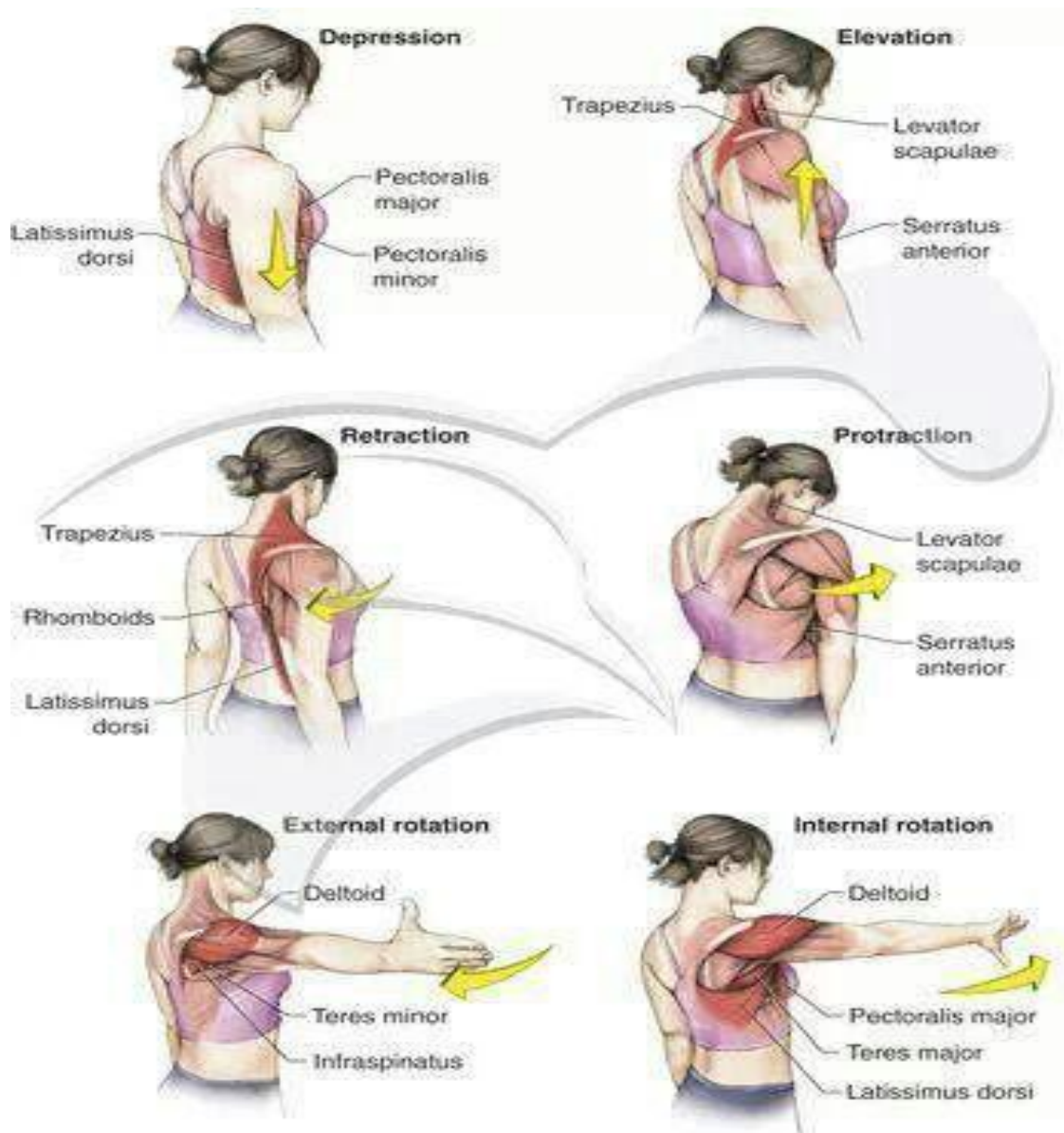
- 43.** Brattberg G, Parker MG, Thorslund M. The prevalence of pain among the oldest old in Sweden. *Pain* 1996;67:29 – 34.
- 44.** Gomez MR, Diz PG, Barros GL, Gomez CS, Lozano Eire,MJ, Robisco LP, et al. Estudio epidemiologico de la patologia dolorosa del hombro en nuestro medio. *Rev Esp Reumatol* 1997;24:247 – 50.
- 45.** Linsell L, Dawson J, Zondervan K, Rose P, Randall T, Fitzpatrick R, et al. Prevalence and incidence of adults consulting for shoulder conditions in UK primary care; patterns of diagnosis and referral. *Rheu Oxf* 2006;45:215–21.
- 46.** Luime JJ, Koes BW, Hendriksen IJ, Burdorf A, Verhagen AP, Miedema HS, et al. Prevalence and incidence of shoulder pain in the general population; a systematic review. *Scand J Rheumatol* 2004;33:73–81.
- 47.** Meyers OL, Jessop S, Klemp P. The epidemiology of rheumatic disease in a rural and an urban population over the age of 65 years. *S Afr Med J* 1982;62:403 – 5.
- 48.** Karen WB, Isabel R, David C, Cyrus C, Keith T. P. The anatomical pattern and determinants of pain in the neck and upper limbs: an epidemiologic study. *Pain* 109 (2004) 45–51
- 49.** Andersson HI, Ejlertsson G, Leden I, Rosenberg C. Chronic pain in a geographically defined general population: studies of differences in age, gender, social class, and pain localization. *Clin J Pain* 1993;9:174 – 82
- 50.** De Zwart BCH, Frings-Dresen MHW, Van Dijk FJH. Physical workload and the ageing worker: a review of the literature. *Int Arch Occup Environ Health* 1995;68:1–12.
- 51.** Benensn, Efim. *Rheumatology: symptoms and syndromes*. London: Springer 2011. xxi, 221 p
- 52.** *Harrison's rheumatology* / editor, Anthony S. Fauci ; associate editor, Carol A. Langford. 2010 New York McGraw-Hill Medical , 350 p.

## ANNEXES

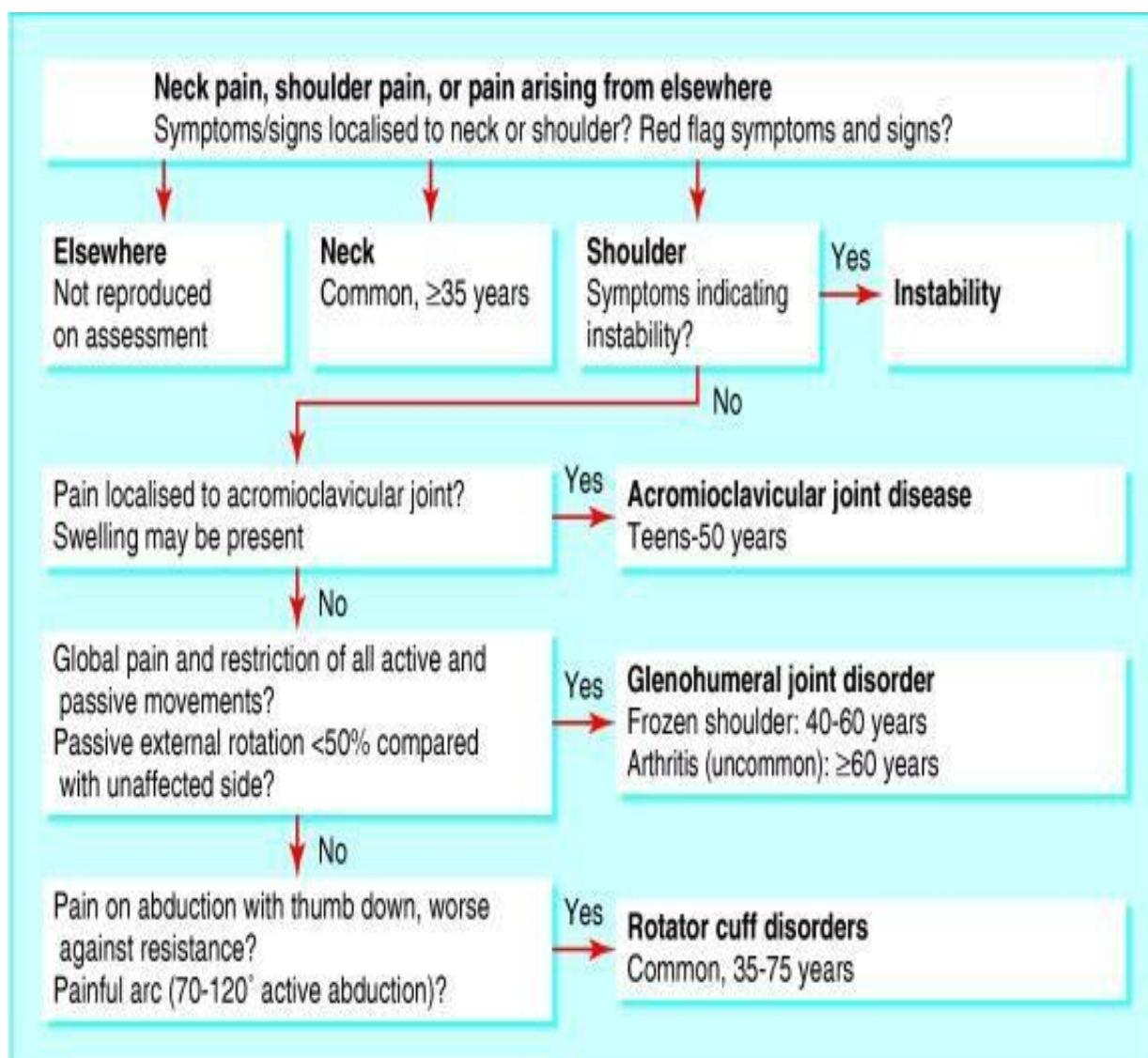
### Annex No 1. Shoulder joint anatomy



## Annex No 2. Shoulder movements



### Annex No 3. Shoulder complaint diagnosis



Annex No 4. **Frozen shoulder**



## Shoulder pain

Shoulder pain in young adults

**\*Mandatory**

1. Email address \*

2. How old are you?

3. Gender

☐ Male

☐ Female

4. Do you have shoulder pain at the moment? \*

☐ Yes

☐ No

5. Have you ever experienced shoulder pain? \*

☐ Yes

☐ No

6. This pain, was in one shoulder or both?

☐ One shoulder

☐ Both

7. For how long did you suffer this pain?

☐ Less than 6 months, intensity diminishes

☐ More than 6 months, intensity is constant

8. How would you assess the intensity of this pain?

1      2      3      4      5      6      7      8      9      10

Not pain at all Worst pain imaginable

9. Did you visit your doctor due to this pain?

☐ Yes

☐ No

10. Did you take any medication to treat this pain?

☐ Yes

☐ No

11. If yes, which medications did you take?.

☐ NSAIDS (Ibuprofen, Diclofenac, Aspirin...)

☐ Corticosteroids

☐ Analgesics (Tramadol, oxycodone, Acetaminophen...)

12. Do you work?

☐ Yes

☐ No

13. If yes, which kind of work? \_\_\_\_\_

14. Do you practise any kind of sport/leisure activities?

☐ Yes

☐ No

15. If yes, which kind of sport/leisure activities do you practise?  
\_\_\_\_\_

16. Did this pain cause any kind of incapability on your daily life?

☐ Yes

☐ No

17. Was it difficult to sleep on the affected side?

☐ Unable to do

☐ Very difficult to do

☐ Somewhat difficult

☐ Not difficult

18. Was it difficult to wash your back or toileting?

- ☐ Unable to do
- ☐ Very difficult to do
- ☐ Somewhat difficult
- ☐ Not difficult

19. Was it difficult to comb your hair?

- ☐ Unable to do
- ☐ Very difficult to do
- ☐ Somewhat difficult
- ☐ Not difficult

20. Was it difficult to reach a high shelf?

- ☐ Unable to do
- ☐ Very difficult to do
- ☐ Somewhat difficult
- ☐ Not difficult

21. Was it difficult to lift more than 4.5kg over your shoulder?

- ☐ Unable to do
- ☐ Very difficult to do
- ☐ Somewhat difficult
- ☐ Not difficult

22. Was it difficult for you to do your usual work?

- ☐ Unable to do
- ☐ Very difficult to do
- ☐ Somewhat difficult
- ☐ Not difficult

23. Was it difficult for you to do your usual sport/leisure activity?

- ☐ Unable to do
- ☐ Very difficult to do
- ☐ Somewhat difficult
- ☐ Not difficult