

# Sleep Quality and Nocturnal Pain in Patients of Rotator Cuff Syndrome

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## ABSTRACT

**Background:** Shoulder pain during sleep leads to poor quality sleep. It is a common problem in patients with Rotator cuff syndrome. Rotator cuff syndrome is a condition where your rotator cuff tendons are intermittently trapped and pinched during shoulder movements

**Objective:** To evaluate the relationship between sleep quality and nocturnal pain in patients of rotator cuff syndrome.

**Methods:** Current study was conducted in orthopedic and physiotherapy department of Jinnah Hospital Lahore. Cross-sectional survey was used in this study. Subjects with age group 18-75 years, both genders, diagnosed with rotator cuff syndrome with positive shoulder impingement test and empty can test were included. Patients were requested to fill the comprehensive questionnaire about current medical history, shoulder pain, impact on daily life activities and quality of sleep. Patients with coexisting neck pain and radiculopathies (spleen, kidney, gallbladder) and also with other disabilities e.g., osteoarthritis, rheumatoid arthritis, back pain were excluded from current study. Thirty-six patients were enrolled and examined by using Pittsburgh Sleep Quality Index (PSQI). Data was analyzed using SPSS 20.0.

**Results:** The results showed that sleep quality was disturbed in patients of rotator cuff syndrome with a mean Pittsburgh Sleep Quality Index score of 11.3333. The results showed that among 36 patients, 18 (50%) had moderate disturbance of sleep as calculated by PSQI scale and 11 (30.6%) had severe disturbance of sleep while 7 (19.4%) had mild disturbance of sleep due to rotator cuff syndrome.

**Conclusion:** The current study concluded that subjective sleep disturbance connected to shoulder pain was obvious in patients with rotator cuff syndrome. Patients experienced low quality of sleep associated with rotator cuff syndrome and affected their activities of daily living causing severe pain and physical disability.

**Keywords:** Shoulder pain, rotator cuff syndrome, Sleep quality.

## INTRODUCTION

Rotator cuff syndrome is the complication of shoulder joint in which rotator cuff tendons are irregularly stuck and strained during the joint's movement. This led to the injury of tendons and bursa at shoulder joint causing severe pain on movement. The rotator cuff plays an important role in stability and movement of glenohumeral joint, making it more susceptible to the injury.(1)

The prevalence of rotator cuff tears ranged 40-57%, however it is problematic to determine the exact prevalence, as the rotator cuff tears are mostly asymptomatic. About 1/3<sup>rd</sup> asymptomatic injuries may appear or become symptomatic after several years.(2) The prevalence of complete tears raised significantly after the age of 50 years.(3)

Risk factors for rotator cuff syndrome are: Age, History of shoulder trauma, Diabetes, Thyroid disorder, Post-operative immobilization, Elderly males, Positive impingement sign, Prolonged heavy labor, lesser active forward elevation and weaker muscle strength in abduction and external rotation.(4)

Pain and sleep disturbance because of chronic rotator cuff syndrome are very common complaints in routine clinics. In fact, this pain leads to problems when undergoing and maintaining the sleep.(5) The prevalence of rotator cuff syndrome is associated with disability in general population is around 20%. Chronic shoulder pain is associated with multiplicity of degenerative and traumatic injuries like tendonitis, bursitis, tear, impingement syndrome, adhesive capsulitis, gleno-humeral osteoarthritis, avascular necrosis.(6)

Rotator cuff syndrome develops because of mechanical disorder and impingement of rotator cuff tendons, particular supraspinatus muscle's tendon within sub-acromial space. It is described with pain and functional disabilities typically more at night or when overhead activities are done.(7) Pain and sleep disturbances are the two very important difficulties interrelating in complex behaviors that eventually lead to disturbed biological and behavioral health of patients. Pain generally disturb the night sleep and has a negative impact on the routine activities during day time. (8)

Pain related to rotator cuff syndrome is associated with poor night sleep, late onset of sleep, more awakenings and less sleeping hours because of pain during night.(9) (10) The shoulder pain during night time, leading to sleep disturbances is a very common problem in patients with shoulder joint injuries.(11) Several studies have proved that the pain, insomnia and inability to sleep at night on the side having syndrome are classically related to the pathological processes of shoulder joint.(12, 13) Information in literature is scarce regarding this relationship, it is still unclear that sleep disturbances are secondary to shoulder pain and shows negative effect on quality of life and may raise the depression and anxiety in patient. (11, 14) Rationale of the current study was to poor assess the quality of sleep-in patients with rotator cuff syndrome. More precisely, the aim was to describe the self-reported level of pain, functionality, and quality of sleep-in individuals diagnosed with rotator cuff disorders.

## MATERIAL AND METHODS

This descriptive cross-sectional study was conducted in orthopedic and physiotherapy department Jinnah Hospital Lahore. Study was completed over a time period of 5 months after approval of synopsis from August 2017 to January 2018. The total sample size for this research project was 36 cases with Confidence level = 95%, Acceptable error = 0.30 units, assumed standard deviation = 0.88 (assumed sleep quality index score in patient with rotator cuff tear from study of Mulligan et al). Sampling technique was Simple random sampling. Subjects with age group 18-75 years, both genders, diagnosed with rotator cuff syndrome with positive shoulder impingement test and empty can test were included. While patients with contraindications for physical therapy (infections or malignancies in the shoulder region, severe hypertension, severe cardiac failure, uncontrolled diabetes mellitus, neurological deficits, skin lesions involving the shoulder region, post-traumatic cases, coexisting neck pain and radiculopathies, osteoarthritis, rheumatoid arthritis, back pain, were excluded. Patients with coexisting neck pain and radiculopathies (spleen, kidney, gallbladder) and also with other disabilities e.g.,

osteoarthritis, rheumatoid arthritis, back pain were excluded from current study. Informed consents were signed by the patient before inclusion in this study. Pittsburg sleep quality and index scale (PSQI) Questionnaire was used to collect the data from the participants pre and post treatment. Data was analyzed using SPSS 20.0.

## RESULTS

Table 1: Participant's Age

Age	Frequency	Percent
< 25 years	4	11.1
26 - 50 years	25	69.4
51 - 75 years	7	19.4
Total	36	100.0

According to Table 1, that among 36 patients, 25 (69.4%) patients were between 26-50 years, 4 (11.1%) were < 25 years and 7 (19.4%) were between 51-75 years. So, it depicts that most of the patients were between 25-50 years.

Table 2: Character Of Pain

Character of Pain	Frequency	Percent
Aching	18	50.0
Stabbing	1	2.8
Sharp	6	16.7
Dull	11	30.6
Total	36	100.0

Table 2 showed that among 36 patients, half of the patients 18 (50%) had aching pain and 11 (30.6%) had dull pain. While others had sharp or stabbing pain.

Table 3: Affect Of Pain On Activities Of Daily Living

Affect of Pain	Frequency	Percent
Occasionally	5	13.9
Most of the times	27	75.0
Always	4	11.1
Total	36	100.0

Table 3 showed that among 36 patients, 27 (75%) were affected by nocturnal pain most of the times. 4 (11.1%) had always affected their activities of daily living due to pain and 5 (13.9%) had been affected occasionally. It showed that most of the patients had their activities of daily living affected by nocturnal pain in shoulder.

Table 4: Psychological assessment of pain and sleep pattern

GLOBAL PSQI	11.33 ±4.32
Mild disturbance (Score < 7)	7 (19.4%)
Moderate disturbance (Score 8 - 14)	18 (50%)
Severe disturbance (Score 15 - 21)	11 (30.6%)

According to Table 4, among 36 of patients, 7 (19.6%) had mild disturbance in sleep. 18 (50%) patients had moderate disturbance of sleep, and 11(30.6%) had severe disturbance of sleep according to global PSQI.

## DISCUSSION

In 2019, a systematic review was conducted by Umile Giuseppe Longo et al. on sleep disturbance and rotator cuff tears. They found that the majority of patients with RC tears had a sleep disturbance, especially before surgery with a general improvement in sleep quality post-operatively. Moreover, sleep quality was correlated with pain and it also seems that factors as comorbidities, obligatory position during night time, preoperative and prolonged postoperative use of narcotics and psychiatric issues may play an important role in sleep quality.(15) Current study also found that patient of rotator cuff syndrome had marked sleep disturbance.

Chase B. Ansok conducted an Objective assessment of sleep quality in patients with rotator cuff tears in 2020. The results of their study demonstrated poor sleep quality in patients with

rotator cuff tears with shorter sleep duration, frequent awakenings, and decreased efficiency.(16) In current study it was evaluated that among 36 patients, between age ranging from 18-75 years almost half of the patients including both male and females had moderate disturbance of pain according to global PSQI. Current study showed that among 36 participants, 35(97.22%) had the effect of rotator cuff syndrome shoulder pain on their sleep. The results showed that among 36 patients, 18 (50%) of patients had moderate disturbance of sleep, 11(30.6%) had severe disturbance score and 7(19.4%) had moderate disturbance score according to global PSQI due to rotator cuff syndrome.

A study conducted about sleep quality in rotator cuff syndrome and associated shoulder impingement studied 30 consecutive patients concluded that patients with rotator cuff syndrome experienced low level of sleep quality along with severe pain and physical disability.(17) While current study revealed that all rotator cuff syndrome patients had low sleep quality but almost half had moderate and others had severe pain. Only few patients had mild disturbance of sleep.

Some other researchers evaluated 343 patients with rotator cuff syndrome, rotator cuff tears, gleno-humeral osteoarthritis, and adhesive capsulitis shoulder lesions suffer from poor sleep quality as showed by elevated sleep quality index scores.(18) While current study was concerned only on sleep disturbance in rotator cuff syndrome. Another study evaluated 56 individuals underwent arthroscopic rotator cuff repair for full-thickness tears, showed the presence of sleep disturbances in 89% of the patients.(19) The results of current study revealed that all patients had scored well above the global sum of 5 on PSQI, which is suggested as an indicator of poor sleeper.

Ha et al., suggested that the sleep disturbances related to rotator cuff syndrome, have raised concentration of cytokines which are related to pain and inflammation. Melatonin concentrations, which are at highest peak at night and at early morning, may trigger this inflammatory response and can also act as the mediator.(20) While almost 11 patients had severe disturbance of sleep due to rotator cuff syndrome. Current study findings showed a strong relation between poor sleep quality and associated pain and almost all patients had their sleep disturbed due to nocturnal pain.

Tekeoglu et al., examined 43 patients for subjective sleep disturbances related to the shoulder joint pain. Patients with rotator cuff syndrome showed response with pain killers and improvement in cognitive behavior which particularly related to the sleep disturbances.(13) Largacha and colleagues during a ten-year period on 2674 patients, showed that 81% of patients with deficits in rotator cuff function were unable to sleep on the affected side, and 71% were unable to wash the back of their opposite shoulder. Therefore, pain and deterioration of function can affect different components of patient's quality of life including physical, mental, and general health.(21)

It has been found that there was significantly moderate positive correlation exists in severity of pain and sleep disturbance. Moreover, it is mysterious if any particular shoulder condition is more prone to the sleep disturbances and at which level this condition can interrupt the quality of the sleep. Because of the multifactorial etiology for rotator cuff syndrome and the lack of a definitive treatment for this pathology, pain and disability may remain for a long-time leading to worsening of the patient's function and impaired quality of life.(22) Because of prolongation and continuity of pain in rotator cuff syndrome, impaired sleep quality is a predictable consequence.(23) Another study of 287 individuals who had rotator cuff tear, 88.9% individuals had least one difficulty during sleep. It was observed that more pain and disability of the joint was associated with more sleep disturbances. Most common problem with sleep disturbance is rotator cuff syndrome.(24) Previous studies had evaluated sleep disturbance in all shoulder disabilities including all shoulder pathologies and rotator cuff tears while rationale of current study was to evaluate

sleep disturbance and associated pain only in rotator cuff syndrome

## CONCLUSION

According to the results of current study, rotator cuff syndrome had disrupted the sleep quality of the individuals taken in research. Detoriation of sleep was correlated with pain and almost all patients had their sleep affected due to nocturnal pain. Current study concluded that among 36 patients, all had low sleep quality with half of them had moderate disturbance of pain, almost 11 had severe disturbance of pain and others had mild disturbance of pain.

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