

Stress, Resilience, Sexual Functioning and Quality of Life in Patients Undergoing Arthroplasty and Arthroscopy

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Sheshagiri V¹, Ravitej Manjunath Thorlakki¹, Pradeep Kumar P C² 
and Shivananda Manohar J² 

Abstract

Background: In India, the incidence of orthopaedic conditions is significantly increasing, with 63 million people suffering from various orthopaedic issues, causing considerable distress to patients. This study aims to assess stress, resilience, sexual functioning, and quality of life in participants who underwent arthroplasty and arthroscopy surgery at baseline, one month, and three months.

Method: This comparative study utilised the Perceived Stress Scale (PSS), Connor-Davidson Resilience Scale, Sexual Function Scale, and the WHO Quality of Life Scale.

Results: The comparison between arthroscopy and arthroplasty reveals distinct patterns in stress, resilience, sexual functioning, and quality of life. For both procedures, stress levels were higher at baseline and one-month post-surgery but decreased by three months. Resilience scores improved consistently over time in both groups. However, sexual functioning and quality of life showed different trends: while sexual functioning initially decreased post-arthroscopy but improved by three months, arthroplasty participants generally experienced a more consistent improvement in both sexual functioning and quality of life from baseline through the follow-up periods.

Conclusion: The study showed that stress was significantly higher at baseline and one-month post-surgery. However, the trends in sexual functioning and quality of life differed between the two types of surgery. These findings highlight the need for tailored patient support and interventions based on the type of orthopaedic procedure performed.

Keywords

Arthroscopy, arthroplasty, stress, resilience, sexual functioning

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Introduction

Orthopaedics is an integral part of tertiary care general hospitals, catering to the needs of trauma patients with fractures, soft tissue injuries, deformities, congenital bone and joint problems, and other bone-related issues.¹ In India, the incidence of orthopaedic conditions is significantly increasing, with 63 million people suffering from some form of orthopaedic issue.² Fractures are the second leading cause of hospital admission in the country.² Trauma cases often require admission followed by surgical intervention, and orthopaedic conditions generally necessitate extended healing times before a patient can resume their normal duties. Post-surgical patients typically need several months of rest, during which they may

experience severe stress and develop common psychiatric issues. These issues can lead to difficulties in their occupation and daily life activities, further exacerbating the financial burden.

¹Department of Orthopaedics, JSS Medical College and Hospital, Mysuru, Karnataka, India

²Department of Psychiatry, JSS Medical College and Hospital, Mysuru, Karnataka, India

Corresponding author:

Shivananda Manohar J, Department of Psychiatry, JSS Medical College and Hospital, Mysore, Karnataka 570023, India.

E-mail: drshivan@gmail.com



For various reasons, the number of people undergoing arthroplasty and arthroscopy in India is increasing. In 2020, a total of 200,000 arthroplasty procedures were performed, and the volume is estimated to grow at the highest rate globally from 2020 to 2026.³ Additionally, market research on arthroscopy reported that 688,221 arthroscopy procedures were performed in 2022, with a massive increase projected by 2030.⁴

Arthroplasty is the surgical replacement of a joint with an artificial material that is fixated on the bone. Joint arthroplasties, particularly those involving the hip and knee, are among the most common elective orthopaedic procedures performed in India. This surgery is primarily conducted for severe osteoarthritis, although it is also performed for other conditions such as osteonecrosis of the femoral head, slipped capital femoral epiphysis, femoral neck and trochanteric fractures, and inflammatory arthritis. These procedures entail substantial economic costs and are projected to become increasingly frequent in the coming years.^{5,6}

Arthroscopy is a surgical procedure used by orthopaedic surgeons to visualise and treat problems within a joint. The most common arthroscopic surgeries are performed on the shoulder and knee. Arthroscopic procedures are preferred over open surgeries due to their reduced postoperative morbidity, smaller incisions, improved visualization, shorter hospital stays, lower complication rates, and enhanced follow-up evaluation.⁷

A narrative review on the impacts of anxiety and depression on outcomes in orthopaedic trauma surgery reported that up to 45% of orthopaedic trauma patients are affected by anxiety and depression. These mental health disorders increase the risk of morbidity and mortality, with depression and anxiety being the most common issues that worsen surgical outcomes.⁸ During the postoperative period following both arthroscopy and arthroplasty, patients may experience decreased interest in sex or encounter sexual problems, both physically and psychologically. However, due to the social stigma associated with these issues, patients rarely express their concerns. The resilience of the patient and the stress associated with recovery can impact surgical outcomes, subsequently affecting the quality of life. In India, very few studies were conducted on the mental health conditions of people who have undergone arthroscopy and arthroplasty. Therefore, this study aims to determine whether there is an association between psychological resilience, stress, sexual functioning, and quality of life in postoperative arthroscopy and arthroplasty patients.

Method

With the approval of the institute's ethics committee, this comparative study was conducted at a tertiary care general hospital in Mysore. The study assessed perceived stress, resilience, sexual functioning, and quality of life among the participants who underwent arthroscopy and arthroplasty procedures in the orthopaedic department of the hospital.

Sampling

The study used a purposive sampling technique to recruit patients between January 2022 and December 2023. A total of 26 participants underwent arthroscopy and 13 participants underwent arthroplasty procedures. The sample size was determined by the specific focus on these procedures and the feasibility of recruitment within the study period. Considering the nature of the research, this sample provides initial insights into the association between psychological resilience, stress, sexual functioning, and quality of life in this patient population. Additionally, ethical considerations were prioritised by including only those who provided written informed consent.

Data Collection Procedure

Patients admitted to the orthopaedic department for arthroscopy and arthroplasty treatment were invited to participate in the study. Before data collection, the researcher explained the study's objectives to the participants, highlighted the importance of their involvement, and addressed any questions or concerns they had. Subsequently, at a time convenient for each patient, the researcher conducted interviews in a separate conference room to collect baseline data. Each interview lasted approximately 45 minutes. Similarly, post-surgical intervention data were collected one month after arthroscopy and arthroplasty. For the three-month follow-up, the researcher contacted the patients by phone to gather their follow-up data and scheduled a follow-up interview accordingly to collect data. We have obtained the permission for tools used in this study.

Tools

Perceived Stress Scale

The Perceived Stress Scale (PSS-10) is used to measure stress after trauma and comprises 10 questions. The PSS-10 items measure the extent to which individuals perceive their lives as unstable, disorderly, and strained during the past month. The questions and available response options are easy to understand. The scale provides an idea of what the patient felt and thought in the last 30 days. The total score is calculated by reversing the responses (e.g., 0 = 4, 1 = 3, 2 = 2, 3 = 1, & 4 = 0) to the four positively stated items (items 4, 5, 7, & 8) and then adding them to the other items. Patients scoring 0–13 are considered to have low stress, 14–26 moderate stress, and 27–40 high stress.⁹

Resilience Scale

The Connor-Davidson Resilience Scale (CD-RISC-10) measures how well an individual can adapt to stressful events, disasters, and trauma. It is used to assess resilience and is a shortened version of the original 25-item scale, with redundant items removed from the primary questionnaire. The

scale asks individuals about their ability to deal with problems and challenges in the last 30 days. It consists of 10 components describing different aspects of resilience, including flexibility (items 1 and 5), sense of self-efficacy (items 2, 4, and 9), capacity to control emotions (item 10), optimism (items 3, 6, and 8), and cognitive focus/maintaining attention under stress (item 7). The statements are rated on a 5-point scale from 0 to 4, with 0 indicating 'not at all true' and 4 indicating 'true nearly all the time'. The final score is obtained by tallying the points for each statement, resulting in a total score ranging from 0 to 40. There are four quartiles: the lowest is 0–29, the second is 30–32, the third is 33–36, and the highest is 37–40. A higher score indicates that the individual has higher resilience to stressful events, while a lower score indicates lower resilience.¹⁰

Sexual Functioning

Sexual functioning in males and females will be evaluated using the Changes in Sexual Functioning Questionnaire (CSFQ), which consists of 14 questions and includes components such as pleasure, desire, frequency, arousal, and orgasm. The CSFQ (male and female versions) is designed to assess changes in sexual functioning. It considers five components: pleasure, desire/frequency, desire/interest, arousal/excitement, and orgasm/completion. The patient is given a 5-point Likert scale for each question to assess their sexual activity. To obtain the final score, responses for all 14 items are tallied. A total score of <47 for males and <41 for females indicates sexual dysfunction.¹¹

Quality of Life

Health-related quality of life will be assessed using the patient-rated WHOQOL-BREF scale. The WHOQOL-BREF

consists of 26 questions covering four core domains: Physical, Psychological, Social Relationships, and Environment. The questions are easy to understand and grasp.¹²

Statistical Analysis

For the analysis of the data, it was first entered into Microsoft Office Excel 365 and then transferred to SPSS software version 20 (IBM Corp., Armonk, N.Y., USA). Descriptive statistics, such as mean and standard deviation, were used to describe the data. The data was normally distributed according to the results of the Shapiro-Wilk and Kolmogorov normality distribution tests. Further, to find the differences in stress, resilience, sexual functioning, and quality of life of the participants at baseline, one month and three months, we used repeated measures analysis of variance. *F* and *P* values were obtained from Wilks' Lambda multivariate test. A *P* value of <.05 was considered significant.

The mean age of the participants who were admitted for arthroscopy and arthroplasty procedures was 35.88 years, and a majority of them were male (81.5%) (Table 1).

The multivariate analysis shows that participants who had an arthroscopy procedure experienced significantly higher stress at baseline and one-month post-procedure. In contrast, stress levels declined below baseline at three months. Resilience scores were almost similar at baseline and three months, with a slight decline at the one-month timeline.

Table 1. Age and Gender of the Participants.

Variable		Mean & SD & %
Age		35.88 (12.07)
Gender	Male	53 (81.5)
	Female	12 (18.5)

Note: SD, Standard deviation.

Table 2. Outcome of Multivariate Analysis (Arthroscopy) Regarding Perceived Stress, Resilience, Sexual Functioning and Quality of Life of Participants at Baseline, One Month and Three Months.

Arthroscopy (n = 26)	Timeline	Mean	Std. Deviation	f Value	P Value
Perceived stress scale	Baseline	24.12	2.085	27.61	.001*
	One month	25.04	1.509		
	Three months	23.00	1.200		
Resilience	Baseline	30.92	4.078	14.58	.001*
	One month	29.77	3.216		
	Three months	30.92	2.855		
Sexual functioning	Baseline	55.54	2.731	41.93	.001*
	One month	53.19	2.857		
	Three months	55.15	2.541		
Quality of life	Baseline	71.27	5.611	76.09	.001*
	One month	67.62	5.456		
	Three months	70.00	5.692		

Note: *f* and *P* values mentioned in the table obtained from Wilks' Lambda multivariate test, * indicating *P* value <.05.

Table 3. Outcome of Multivariate Analysis (Arthroplasty) Regarding Perceived Stress, Resilience, Sexual Functioning and Quality of Life of Participants at Baseline, One Month and Three Months.

Arthroplasty (n = 13)	Timeline	Mean	Std. Deviation	f Value	P Value
Perceived stress scale	Baseline	24.00	1.915	14.79	.001*
	One month	23.62	1.758		
	Three months	22.54	1.506		
Resilience	Baseline	25.15	2.853	13.62	.001*
	One month	26.69	2.250		
	Three months	27.92	1.320		
Sexual functioning	Baseline	49.08	4.291	10.48	.003*
	One month	50.62	3.595		
	Three months	51.85	3.105		
Quality of life	Baseline	60.31	3.794	72.55	.001*
	One month	62.31	3.591		
	Three months	63.69	3.816		

Note: f and P values mentioned in the table obtained from Wilks' Lambda multivariate test, * indicating P value <.05.

Similarly, the sexual functioning of participants was higher at baseline but significantly decreased one month after the procedure. By three months, sexual functioning had significantly increased. Concerning the quality of life of participants, the analysis showed a gradual and consistent improvement. At baseline and three months, participants scored significantly higher compared to one month (Table 2).

The table above shows the differences in stress, resilience, sexual functioning, and quality of life of participants who have undergone an arthroplasty procedure at baseline, one month, and three months. It was observed that the mean stress score was higher at baseline and gradually decreased at one- and three months post-surgery. In line with this, the mean score of resilience consistently increased, indicating that resilience among the participants was improving post-procedure. Similarly, the mean scores for sexual functioning and quality of life significantly improved at the one- and three-month phases compared to baseline (Table 3).

Discussion

Patients undergoing arthroscopy, a major surgery, often experience significant stress and anxiety related to the procedure, potential outcomes, and possible complications. This anxiety can affect their sexual functioning and quality of life, which in turn may influence the surgical results.

At baseline, patients exhibited higher stress levels due to the impending surgery, the injury itself, and the fear of the unknown. One month post-surgery, stress levels were found to have significantly increased, likely due to the extra care required to monitor the operated joint and the general restriction of activities until complete healing occurs. By the third month, stress levels had decreased ($p < .05$) as patients

entered the strengthening phase and most of the immediate postoperative restrictions were lifted. Patricia H. Rosenberger et al. demonstrated that optimism and perceived stress are critical psychological predictors of patient-rated pain severity, which can, in turn, affect quality of life and sexual functioning.¹³

Participants who had arthroscopy showed slightly higher mean resilience scores compared to post-surgery. However, by the third month, resilience levels returned to baseline as patients regained confidence and strength. Understanding a patient's resilience can provide valuable insights into their mental health and help surgeons make more informed decisions regarding the best treatment options and rehabilitation plans for each individual. Mazzocca et al., in their study, further revealed a correlation between resilience and mental health, showing that patients with robust mental health had high resilience scores, particularly among those undergoing arthroscopy.¹⁴

The sexual functioning scores showed a decreasing trend from baseline, which then improved by the third month and was statistically significant. Ibrahim Amr et al. demonstrated in their study that arthroscopic rotator cuff repair improved shoulder function, pain levels, sexual function, satisfaction, and mobility during sexual activity.¹⁵ Quality of life decreased in the first month post-surgery, as significant care is required during this period to prevent complications, and restrictions on daily activities are imposed.

Tim Saier et al. found that after an arthroscopic procedure, quality of life decreased in the early postoperative period but later increased above the measured preoperative levels within an average of 6–12 months.¹⁶ Seok Won Chung et al., also showed that arthroscopic rotator cuff repair significantly improved patients' HRQOL (Health-Related Quality of Life) both physically and mentally, with factors such as older age,

female sex, diabetes, and low levels of sports activity being associated with lower postoperative physical HRQOL, while female sex was also linked to lower postoperative mental HRQOL.¹⁷

In contrast, patients undergoing arthroplasty showed a decreasing trend in perceived stress, with a further decrease by the third month. Resilience also showed a significant increasing trend from baseline, and sexual functioning scores improved from baseline. By the third month, patients reported an improved quality of life compared to baseline. J. C. Sorel et al. showed that preoperative pain catastrophising, mental distress, symptoms of anxiety and/or depression, and somatoform disorders negatively affect pain and function after TKA (Total Knee Arthroplasty).¹⁸ Some patients undergoing TKA may therefore require psychological support to improve outcomes and quality of life. Robert J. Magaldi et al. found that preoperative resilience is a significant predictor of overall physical and mental health outcomes at both 3 and 12 months, with greater resilience predicting better outcomes across all measures. These findings suggest that major surgery, like other traumatic events, can alter resilience, and those with greater resilience at baseline are more likely to report an improved quality of life.¹⁹

In a narrative review, Rotem Meiri et al. highlight that sexual activity is a significant indicator of quality of life both before and after hip replacement surgery. As much of the pain is reduced, arthroplasty can improve sexual gratification and performance. Practitioners should be encouraged to inquire about sexual concerns with their total hip replacement (THR) patients and provide counselling on the physical and functional aspects of sexual activity. During the rehabilitation phase, patients should receive guidance on activities of daily living as well as advice on sexual positions. This support helps boost their confidence and body image, contributing to a more active sex life.²⁰

In a systematic and qualitative review study by Ethgen et al.,²¹ total hip and total knee arthroplasties were found to be quite effective in improving health-related quality-of-life dimensions, with occasional exceptions in the social dimension. It was observed that patients undergoing hip replacements reported better outcomes and a quicker return to daily activities compared to those undergoing knee replacements. Patients with poor preoperative quality-of-life scores reported satisfaction and improvement in pain following the surgery. Data on quality of life are invaluable as they assist health professionals in determining appropriate care for each individual.

Implications

The study findings suggest that comprehensive support is needed for patients undergoing arthroscopy and arthroplasty procedures, addressing both physical and psychological aspects. Comprehensive care includes stress reduction techniques, resilience-building programs post-surgery and during

follow-up, sexual health counselling to address specific sexual issues faced by patients, personalised care plans for holistic recovery, educational support for patients and their families to make them aware of the expected physical and psychological changes during recovery, and support groups where patients can share experiences and coping strategies, fostering a sense of community and support for optimising recovery and improving both mental and physical health.

Strength and Limitations

The strengths of this study include its rarity in the Indian context and its exploration of stress, resilience, sexual function, and quality of life in patients who have undergone arthroscopy and arthroplasty procedures. The findings of this study contribute to enhancing treatment care, particularly from a psychological well-being perspective. However, the study has limitations, including a small sample size, which may limit the generalizability of the results. This study suggests that future research could focus on examining the efficacy of psychosocial interventions before and after surgery, as well as, during follow-up, to address psychosocial issues more effectively.

Conclusion

Patients undergoing arthroscopy had significant stress, anxiety, and a decline in sexual functioning and quality of life, particularly in the early postoperative period. These factors can negatively impact the overall success of the surgery. However, stress levels tend to decrease, and resilience improves by the third month post-surgery as patients regain confidence and physical strength. The study highlights the importance of understanding patient resilience and its role in mental health, which can guide treatment and rehabilitation strategies. In contrast, patients undergoing arthroplasty show a more favourable trend, with reduced stress, increased resilience, and improved sexual functioning and quality of life over time. These findings suggest that psychological support and tailored rehabilitation could enhance recovery and outcomes in both arthroscopy and arthroplasty patients. The study underscores the need for future research on the efficacy of psychosocial interventions before and after surgery to address the psychosocial challenges these patients face.

Author's Contribution

SV designed the conceptual framework and supervised the study. RMT handled data collection and manuscript writing. PK conducted statistical analysis and assisted with manuscript writing. SM provided supervision and finalized the manuscript.

Declaration of Conflicting Interests

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Statement of Ethics

The study was approved by the institutional ethics committee with the reference number JSS/MC/PG/IEC-136/2022-23.

Data Availability Statement

The data is not available as it contains clinical information of patients.

ORCID iDs

Pradeep Kumar P C  <https://orcid.org/0000-0003-0881-2954>
Shivananda Manohar J  <https://orcid.org/0000-0002-2750-3711>

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