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Original Article

Frequency of Rotator Cuff Tendinopathy Among Gym Beginners

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ABSTRACT

Background: Rotator cuff–related shoulder symptoms are common in physically active populations, yet limited evidence exists regarding their frequency among gym beginners and their impact on quality of life. Objective: To determine the frequency of clinical findings suggestive of rotator cuff tendinopathy among gym beginners and to evaluate their association with shoulder-related quality of life. Methods: A cross-sectional observational study was conducted among 100 gym beginners aged 20–40 years in Bahawalpur. Participants were assessed using the Hawkins-Kennedy test to identify shoulder impingement–related symptoms and completed the Western Ontario Rotator Cuff Index questionnaire to evaluate quality of life. Descriptive statistics and chi-square tests were used for analysis. Results: A total of 56% of participants tested positive on the Hawkins-Kennedy test (95% CI: 46–66%). All participants with negative findings reported best quality of life, whereas 98.2% of positive cases had mildly affected quality of life and 1.8% had severe impairment ($p < 0.001$). Female participants showed a higher prevalence of positive findings compared to males (80% vs 40%; OR = 6.0, 95% CI: 2.5–14.4). Conclusion: A high proportion of gym beginners demonstrated clinical signs suggestive of rotator cuff–related shoulder involvement, which was strongly associated with reduced quality of life. These findings highlight the importance of early screening and preventive strategies in novice gym populations. Keywords: Rotator cuff, tendinopathy, gym beginners, shoulder pain, quality of life, Hawkins-Kennedy test.

INTRODUCTION

The shoulder is the most mobile joint in the human body, and this mobility depends heavily on the coordinated stabilizing function of the rotator cuff, which comprises the supraspinatus, infraspinatus, teres minor, and subscapularis muscles. These muscles dynamically center the humeral head within the glenoid and permit efficient force transmission during lifting, pushing, pulling, and overhead activity. Because gym-based exercise frequently involves repetitive upper-limb loading, especially during poorly controlled resistance training, the rotator cuff is exposed to considerable mechanical demand from the outset of participation in fitness programs. In novice exercisers, this demand may exceed tissue capacity when training loads are introduced rapidly, technique is suboptimal, supervision is inadequate, or recovery practices are insufficient, thereby increasing the likelihood of shoulder pain and tendon-related dysfunction (1,2).

Rotator cuff tendinopathy represents a common cause of shoulder pain and functional limitation and is generally understood as a spectrum of tendon-related pathology associated with pain, altered load tolerance, reduced function, and, in some cases, structural change. Contemporary literature suggests that its pathogenesis is multifactorial, involving intrinsic tendon degeneration, altered tendon biology, age-related changes, vascular compromise, and extrinsic mechanical compression or overload during movement. Rather than being explained by a single mechanism, rotator cuff-related symptoms appear to arise from the interaction of tissue loading, movement quality, muscular performance, and individual susceptibility factors. This complexity is particularly relevant in physically active populations in whom repetitive shoulder loading, progressive resistance exercise, and unaccustomed movement patterns may provoke symptoms early in training exposure (2-5).

From a PICO perspective, the population of interest comprises gym beginners, an understudied group despite their potentially heightened vulnerability to shoulder injury during the transition from sedentary or unstructured activity to regular resistance training. The exposure of interest is recent participation in gym-based exercise, particularly resistance and overhead activity performed during the early months of training. The comparison of interest lies between participants with and without positive clinical screening findings suggestive of rotator cuff-related shoulder pathology, as well as between male and female gym beginners. The outcomes of interest are the frequency of positive clinical findings and their association with shoulder-related quality of life and functional ability. This framing is clinically important because gym beginners often lack sufficient neuromuscular adaptation, movement competency, and load management skills, all of which are relevant determinants of tendon overload and symptom development (4-6).

The available literature consistently indicates that the shoulder is among the most frequently affected anatomical regions in exercise and resistance-training settings. In recreational gym populations, soft-tissue injuries predominate, and the shoulder is repeatedly identified as a common site of pain or dysfunction, particularly during free-weight and upper-body exercises that demand high levels of control and joint stability. Studies of resistance-training participants have shown that prolonged training duration, poor exercise technique, excessive loading, and inadequate supervision may increase the probability of shoulder complaints, while novice participants may be especially vulnerable because they have not yet developed appropriate movement strategies or tissue tolerance. Similarly, broader surveys of weightlifters and recreational athletes report high frequencies of shoulder pain, discomfort during or after exercise, and activity-related limitation, supporting the plausibility of a clinically meaningful burden in beginner gym users (6-10).

Beyond frequency alone, rotator cuff-related symptoms have important implications for function and quality of life. Previous research has shown that shoulder pain affects sleep, overhead reach, self-care, recreational participation, emotional well-being, and confidence in the injured limb. Exercise-based rehabilitation studies and qualitative investigations further suggest that shoulder symptoms can meaningfully disrupt daily activities even when pathology is not severe enough to warrant invasive treatment. This issue is particularly relevant in gym beginners, for whom early pain may discourage continued participation in exercise, impair adherence to healthy behaviors, and lead to avoidable progression of dysfunction if symptoms are not recognized and addressed promptly. Thus, evaluating not only symptom frequency but also the extent of associated quality-of-life compromise provides a more clinically interpretable picture of the burden of the condition in this population (11-14).

Despite the growing body of work on rotator cuff disorders, important gaps remain. Much of the existing evidence focuses on overhead athletes, elite sport populations, occupational groups, or general musculoskeletal samples rather than novice gym participants. Moreover, many studies emphasize treatment strategies, biomechanics, or awareness of shoulder injury without specifically quantifying the frequency of clinically suggestive rotator cuff involvement among beginners in community gym settings. Data from South Asian urban contexts, including Bahawalpur, are particularly limited, and evidence remains sparse regarding how early shoulder symptoms in gym beginners relate to shoulder-specific quality of life. This gap is important because preventive strategies, coaching practices, and rehabilitation planning are likely to differ between trained athletes and first-year gym participants, yet the latter group is often exposed to resistance training without adequate education on technique, progression, or symptom monitoring (6-10,12-14).

The present study was therefore designed to determine the frequency of clinical findings suggestive of rotator cuff tendinopathy among gym beginners in Bahawalpur and to examine the association of these findings with shoulder-related quality of life and functional status using the Western Ontario Rotator Cuff Index. It was hypothesized that a substantial proportion of gym beginners would demonstrate

positive clinical screening findings and that participants with positive findings would report poorer shoulder-related quality of life than those without such findings.

MATERIALS AND METHODS

This cross-sectional observational study was conducted in community gym settings located in Bahawalpur city over a three-month period following approval of the research synopsis. The design was selected because it allowed estimation of the frequency of clinical findings suggestive of rotator cuff tendinopathy in gym beginners at a defined point in time and enabled assessment of the relationship between screening status and shoulder-related quality of life within the same source population. The study targeted adults who had recently initiated regular gym participation and were engaged in routine exercise exposure likely to impose mechanical demand on the shoulder complex.

Participants were recruited from different gyms in Bahawalpur using a non-probability convenience sampling approach. Individuals were screened for eligibility at the point of contact before enrollment. Men and women aged 20 to 40 years were eligible if they had been attending a gym regularly for at least one month and for less than one year, thereby operationally defining the target group as gym beginners. Participants were excluded if they had undergone previous shoulder surgery, had any pre-existing shoulder-region injury, had cervical radiculopathy, or had clinically evident nerve impingement that could confound shoulder pain assessment and functional reporting.

These criteria were applied to reduce misclassification and to improve the likelihood that observed findings reflected exercise-related shoulder complaints in relatively novice gym users rather than chronic or alternative pathology.

Potential participants were approached in person at participating gym facilities and were provided with a brief explanation of the study purpose, procedures, voluntary nature of participation, and confidentiality safeguards. Written informed consent was obtained before data collection. To minimize participation bias, all eligible individuals encountered during the data collection visits were invited to participate irrespective of symptom status. Recruitment and assessment were performed using a standardized procedure so that eligibility screening, consent, clinical examination, and questionnaire administration occurred in the same sequence for all participants.

Data collection comprised demographic recording, clinical shoulder screening, and assessment of shoulder-related quality of life. Basic demographic information included age and sex. Each participant then underwent the Hawkins-Kennedy test, administered in a standardized manner to screen for shoulder pain provoked by subacromial impingement-related positioning. For the test, the participant was positioned either sitting or standing with the shoulder flexed to 90 degrees and the elbow flexed to 90 degrees.

The examiner stabilized the elbow and passively internally rotated the shoulder by moving the wrist downward. Reproduction of pain or marked discomfort during internal rotation was recorded as a positive test, whereas absence of pain or discomfort was recorded as a negative test. The test result was used as the primary clinical screening variable. To maintain consistency and reduce measurement variability, the same examination sequence and decision rule were used throughout the study.

Shoulder-related quality of life and functional status were assessed using the Western Ontario Rotator Cuff Index questionnaire. The instrument was administered to all enrolled participants after clinical screening, with items explained in a uniform manner to ensure comprehension and completeness of response. Participants provided responses based on their current shoulder-related symptoms and functional limitations.

For analysis, total questionnaire responses were summarized into predefined ordinal categories reflecting best quality of life, mildly affected quality of life, and severely affected quality of life. This

categorization allowed clinically interpretable comparison of shoulder-related quality of life across screening groups while preserving the study's descriptive focus.

The primary outcome was the frequency of positive Hawkins-Kennedy test findings among gym beginners. Secondary outcomes included the distribution of quality-of-life categories in the overall sample, the distribution of screening positivity by sex, the distribution of quality-of-life categories by sex, and the association between Hawkins-Kennedy test status and quality-of-life category. For analytic purposes, a positive.

Hawkins-Kennedy test was treated as a clinical finding suggestive of rotator cuff-related shoulder involvement rather than a stand-alone definitive diagnosis. This operational approach improved interpretive accuracy and aligned the study outcomes with the nature of the examination procedure used.

Several procedural steps were taken to limit bias and enhance internal consistency. Eligibility criteria excluded important alternative sources of shoulder-region pain, including prior shoulder surgery, established shoulder injury, cervical radiculopathy, and nerve impingement. All participants were drawn from the same target environment, assessed during the same study period, and examined using a uniform clinical procedure.

The use of a single data collection flow for all participants reduced differential measurement between symptomatic and asymptomatic individuals. Questionnaire administration was completed at the time of assessment, which minimized recall delay and reduced missing responses. Data were checked at the point of collection for completeness and consistency before final entry.

The sample size was set at 100 participants, with the target number determined using G*Power before data collection. This sample was considered adequate for estimation of the study frequency measures and for testing the association between categorical screening findings and categorized quality-of-life outcomes in the defined study population.

A complete-case analysis approach was used because all enrolled participants completed the study procedures and questionnaire administration, yielding a response rate of 100%.

All data were entered, cleaned, and analyzed using the Statistical Package for the Social Sciences (SPSS), version 25. Descriptive statistics were used to summarize the study sample and outcomes. Categorical variables were reported as frequencies and percentages. Cross-tabulations were constructed to examine the distribution of Hawkins-Kennedy test results by sex, quality-of-life categories by sex, and quality-of-life categories by Hawkins-Kennedy status.

The association between screening status and quality of life was evaluated using Pearson's chi-square test. A two-sided p-value of less than 0.05 was considered statistically significant. Because the study objective was primarily descriptive and exploratory, no multivariable adjustment model was specified. Data coding rules, category definitions, and analysis steps were applied uniformly to maintain reproducibility and analytic integrity.

Ethical principles for research involving human participants were observed throughout the study. Written informed consent was obtained from all participants before enrollment. Privacy was protected during assessment and data handling, and all information was kept confidential.

In accordance with local cultural considerations during data collection, male researchers collected data from male participants and female researchers collected data from female participants. All procedures were non-invasive, and participants retained the right to decline participation at any stage without consequence.

RESULTS

A total of 100 participants were included in the final analysis, yielding a response rate of 100%. Of these, 60 participants were male and 40 were female. The overall frequency of positive Hawkins-Kennedy test findings was 56%, while 44% tested negative. The estimated proportion of positive findings was 0.56 (95% CI: 0.46–0.66), indicating that more than half of the sampled gym beginners demonstrated clinical signs suggestive of rotator cuff–related shoulder involvement.

Table 1. Demographic characteristics and overall, Hawkins-Kennedy test frequency

Variable	Frequency (n)	Percentage (%)	95% CI (for proportion)
Gender			
Male	60	60.0	–
Female	40	40.0	–
Hawkins-Kennedy Test			
Positive	56	56.0	46.0 – 66.0
Negative	44	44.0	34.0 – 54.0

Quality of life (QOL) assessment using the Western Ontario Rotator Cuff Index demonstrated that 44% of participants had the best QOL, 55% had mildly affected QOL, and 1% had severely affected QOL. This distribution suggests that while a large proportion of participants reported some degree of impairment, severe functional limitation was uncommon in this population.

Table 2. Distribution of quality of life among participants

QOL Category	Frequency (n)	Percentage (%)
Best QOL	44	44.0
Mildly affected QOL	55	55.0
Severely affected QOL	1	1.0
Total	100	100

A gender-wise analysis of Hawkins-Kennedy test results revealed that 32 out of 40 females (80.0%) tested positive, compared to 24 out of 60 males (40.0%). This indicates a substantially higher proportion of positive findings among female participants. The association between gender and test positivity was statistically significant ($\chi^2 = 15.2$, $p < 0.001$). The odds of a positive test were six times higher in females compared to males (OR = 6.0; 95% CI: 2.5–14.4).

Table 3. Association between gender and Hawkins-Kennedy test results

Gender	Positive n (%)	Negative n (%)	Total (n)	Odds Ratio (95% CI)	p-value
Male	24 (40.0%)	36 (60.0%)	60	Reference	
Female	32 (80.0%)	8 (20.0%)	40	6.0 (2.5–14.4)	<0.001

Quality-of-life distribution across genders showed that 36 males (60.0%) reported the best QOL compared to only 8 females (20.0%). Conversely, mildly affected QOL was more common in females (77.5%) than in males (40.0%), and the only case of severely affected QOL was observed in a female participant. This distribution was statistically significant ($\chi^2 = 16.8$, $p < 0.001$), indicating a strong association between gender and QOL status.

Table 4. Association between gender and quality of life

QOL Category	Male n (%)	Female n (%)	Total (n)	p-value
Best QOL	36 (60.0%)	8 (20.0%)	44	
Mildly affected QOL	24 (40.0%)	31 (77.5%)	55	
Severely affected QOL	0 (0.0%)	1 (2.5%)	1	<0.001
Total	60	40	100	

A strong association was observed between Hawkins-Kennedy test results and quality of life. All participants who tested negative (100%) reported the best QOL, whereas among those who tested positive, 55 participants (98.2%) had mildly affected QOL and 1 participant (1.8%) had severely affected QOL. None of the participants with a positive test reported the best QOL. This association was statistically significant ($\chi^2 = 96.4$, $p < 0.001$), indicating a robust relationship between clinical shoulder findings and reduced quality of life.

Table 5. Association between Hawkins-Kennedy test results and quality of life

Hawkins-Kennedy Test	Best QOL n (%)	Mildly affected n (%)	Severely affected n (%)	Total (n)	p-value
Negative	44 (100.0%)	0 (0.0%)	0 (0.0%)	44	
Positive	0 (0.0%)	55 (98.2%)	1 (1.8%)	56	<0.001
Total	44	55	1	100	

Overall, these findings demonstrate a high frequency of positive clinical screening findings suggestive of rotator cuff–related shoulder involvement among gym beginners, with significantly higher prevalence in females. Furthermore, positive screening status was strongly associated with poorer shoulder-related quality of life, with nearly all affected individuals reporting some degree of functional limitation.

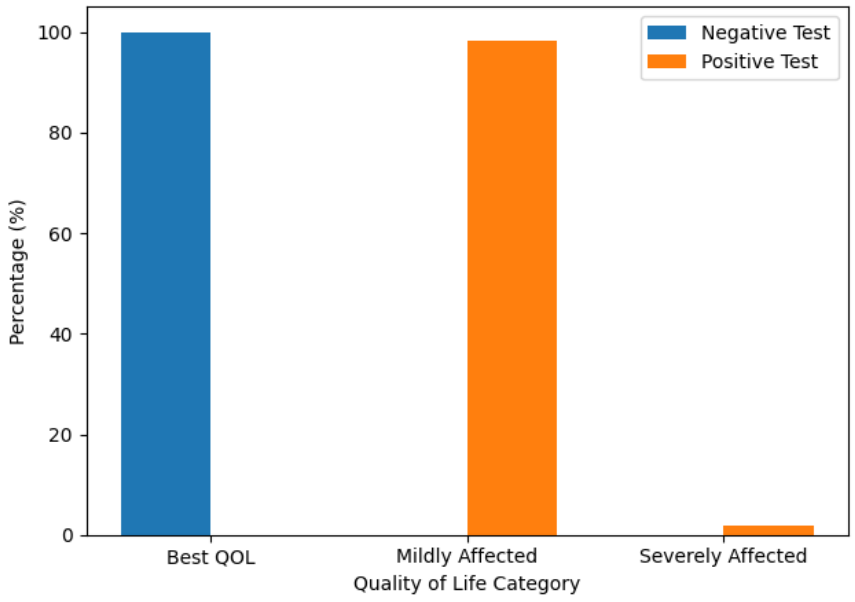

Figure 1 Quality of Life Distribution by Hawkins-Kennedy Test Status

The figure illustrates the distribution of quality of life (QOL) categories stratified by Hawkins-Kennedy test status, expressed as percentages. Among participants with a negative Hawkins-Kennedy test (n=44), 100% were classified in the "best QOL" category, with no individuals reporting mild or severe

impairment, indicating a complete absence of functional limitation in this group. In contrast, participants with a positive Hawkins-Kennedy test (n=56) demonstrated a markedly different distribution: 98.2% (n=55) fell into the "mildly affected" QOL category, while 1.8% (n=1) were classified as "severely affected," and none reported best QOL. This sharp divergence between groups highlights a strong association between positive clinical screening findings and reduced quality of life. The pattern suggests a near-complete shift from optimal to impaired functional status in the presence of positive shoulder impingement signs, reinforcing the clinical relevance of Hawkins-Kennedy test positivity as an indicator of functional compromise in gym beginners.

DISCUSSION

The present study demonstrated a high frequency of positive Hawkins-Kennedy test findings among gym beginners, with 56% of participants exhibiting clinical signs suggestive of rotator cuff–related shoulder involvement. This proportion is considerable when interpreted in the context of a relatively young and early-stage exercise population, suggesting that shoulder symptoms may develop rapidly following initiation of gym-based activities. These findings align with previous research indicating that shoulder pain and soft tissue injuries are highly prevalent in recreational gym settings, particularly among individuals exposed to unaccustomed loading and suboptimal exercise technique (6-8). The elevated frequency observed in this study may reflect the combined effects of early training errors, insufficient neuromuscular adaptation, and lack of structured supervision, all of which have been identified as modifiable contributors to shoulder pathology in novice exercisers (4,5,9,15).

A key finding of this study is the significant association between Hawkins-Kennedy test positivity and reduced quality of life. All participants with negative test results reported the best quality of life, whereas nearly all participants with positive findings experienced mild impairment, with a small proportion reporting severe limitation. This complete separation between groups indicates a strong relationship between clinical shoulder signs and functional status. Similar observations have been reported in studies examining rotator cuff–related shoulder pain, where even moderate symptom severity is associated with meaningful restrictions in daily activities, sleep, and physical performance (11,12). The findings suggest that clinical screening tools, although not diagnostic in isolation, may still provide valuable insight into the functional burden of shoulder symptoms in early-stage populations.

Gender differences observed in this study further highlight an important dimension of shoulder health in gym beginners. Female participants demonstrated a significantly higher frequency of positive Hawkins-Kennedy test findings (80% vs 40% in males) and a greater proportion of impaired quality of life. This pattern is consistent with previous literature indicating that females may be more susceptible to rotator cuff–related conditions due to factors such as lower muscle mass, hormonal influences, and differences in biomechanical loading patterns (5,13,16). Additionally, sociocultural and behavioral factors, including training practices and access to supervision, may contribute to delayed recognition and management of symptoms, thereby exacerbating functional limitations. The observed odds ratio further reinforces the magnitude of this disparity, suggesting a clinically meaningful sex-based difference in risk and outcome.

The interaction between screening status and quality of life observed in this study reveals a distinct nonlinear pattern, where the presence of positive clinical findings corresponds almost entirely with impaired functional states. This suggests that the transition from asymptomatic to symptomatic status in gym beginners may not be gradual but rather characterized by a threshold effect, beyond which functional limitations become apparent. Such a pattern has been described in tendon pathology models, where cumulative loading and inadequate recovery can lead to rapid onset of symptoms once tissue tolerance is exceeded (3,4). This has important implications for early detection and intervention, as timely identification of at-risk individuals may prevent progression to more severe dysfunction.

Despite these strengths, several limitations must be considered when interpreting the findings. The cross-sectional design precludes causal inference, and it cannot be determined whether gym participation directly led to the observed shoulder symptoms. The use of a single clinical test as a proxy for rotator cuff–related pathology may have resulted in misclassification, as Hawkins-Kennedy test positivity reflects impingement-related pain rather than confirmed tendinopathy. The use of convenience sampling limits generalizability, and the study population may not be representative of all gym beginners or other geographic regions. Furthermore, potential confounding variables such as training intensity, exercise type, coaching quality, prior minor symptoms, and anthropometric factors were not controlled, which may have influenced the observed associations.

From a clinical perspective, the findings underscore the importance of preventive strategies in gym settings, particularly for beginners. Structured training programs, proper technique instruction, gradual load progression, and early symptom monitoring may reduce the risk of shoulder-related dysfunction. Screening tools such as the Hawkins-Kennedy test, when used appropriately, may help identify individuals at risk and facilitate early intervention. Future research should focus on longitudinal designs to establish causal relationships, incorporate objective diagnostic measures, and explore biomechanical and ergonomic factors contributing to shoulder injury in this population. Additionally, targeted interventions addressing sex-specific risk factors may enhance prevention and rehabilitation outcomes.

CONCLUSION

This study found a high frequency of positive Hawkins-Kennedy test findings among gym beginners, with a significant association between positive clinical screening and reduced shoulder-related quality of life. Female participants demonstrated a higher likelihood of positive findings and greater functional impairment compared to males. These results highlight the substantial burden of shoulder symptoms in early-stage gym users and emphasize the need for improved preventive strategies, early screening, and structured training approaches to reduce the risk of rotator cuff–related dysfunction.

LIMITATIONS OF STUDY

This study's limitations include Unmeasured confounders, such as trainer expertise and nutritional status, may also influence RCT risk. Furthermore, cross-sectional data preclude causal inferences about the relationship between gym initiation and RCT. Additionally, factors such as strength deficiencies, improper exercise techniques, and restricted range of motion were not fully controlled, which may have affected the observed frequency of RCT among gym beginners.

FUTURE RECOMMENDATIONS

Future research should consider exploring the biomechanical factors and ergonomic factors contributing to rotator cuff tendinopathy among gym beginners. A more detailed analysis of movement patterns, posture during exercises, shoulder joint mechanism, and load distribution can provide a clear understanding of the underlying causes. Investigating how improper techniques, inadequate warm -ups or poor ergonomic setups influence tendon stress could help in designing preventive strategies. Therefore, conducting studies that assess these biomechanical aspects in relation to ergonomic factors would offer valuable insights and may lead to more effective prevention and rehabilitation programs for shoulder injuries in gym beginners.

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