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ORIGINAL RESEARCH

Personal and Psychological Perceptions of Return to Activities After Anterior Ligament Reconstruction Among Patients with an Anterior Cruciate Ligament Tear in Jazan Province

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Background: The knee joint is primarily stabilized by the Anterior Cruciate Ligament (ACL). ACL tear, a common injury resulting from sudden shock or intense forceful knee movement, is characterized by an ACL sprain or stretch. In Saudi Arabia, the incidence of ACL damage is estimated at 31.4%. Injuries can be contact-based (direct collision) or non-contact (imbalanced or flawed movement).

Methodology: This cross-sectional observational study was conducted in the Jazan region of Saudi Arabia between December 2022 and May 2023 to assess personal and psychological perceptions of returning to activities after ACL reconstruction. The study included 113 patients; data was collected via self-administered questionnaire, and data analysis was performed using SPSS 23rd version. This study provides valuable insights into the factors affecting the return to activities after ACL tears.

Results: The study found that most patients were male. Football is the most common physical activity associated with knee injury. Postoperative complication rates were low. Sex, site of injury, and reoperation were significantly associated with the perceived importance of the exercise score. Muscle strengthening postoperatively and age were significantly associated with knee injury and osteoarthritis outcome scores. Site of injury and ACL– quality of life score of "social and emotional" segment were significant factors associated with ACL – quality of life score of "entertaining and physical activity" segment. This study provides valuable insights into the factors affecting the return to ACL tear activity in the Jazan region.

Conclusion: This study highlights the importance of patient education and support for safe exercise and emotional well-being after ACL. We found correlations between injury location and exercise perception, thus emphasizing the need for a safe environment. Postoperative strengthening and age- and sex-specific strategies are also important, and emotional support is critical for rehabilitation success. Further research on patients' beliefs, motivations, and provider communication is needed.

Keywords: ACL, return to sport, patient-reported outcome, patient perspective, psychology, activity level

Introduction

The human knee joint has a complicated anatomy that is designed to act as a pivot point for movement and body weight support, resulting in frequent injuries. The knee has four ligaments: medial collateral ligament, lateral collateral ligament, posterior cruciate ligament, and anterior cruciate ligament (ACL). The ACL, which binds the tibia to the femur and prevents the internal rotation and translation of the tibia, is primarily responsible for knee joint stability.[1,2] (ACL) tears are frequent medical ailments characterized by stretching or spraining of the ACL within the knee joint.[1,2] According to a study conducted in Riyadh, the incidence of ACL damage in Saudi Arabia was estimated to be 31.4%.[3] ACL tears can be caused by two types of injuries: contact injuries involving a direct collision of the knee with a solid object and non-contact injuries

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involving intense forceful exertion of the knee owing to an imbalanced movement or a flaw in a technical movement.[4,5] A torn ACL is most commonly caused by acute non-contact deceleration injury, forceful hyperextension, or severe rotating stress around the knee.[6,7] The origin or insertion of the ligament may be fully ripe, partly torn, or avulsed. The ACL is a major restriction against excessive anterior translation and rotation of the tibia in the femur.[8] A person with a torn ACL will not be permitted to participate in sports until he has undergone surgery and comprehensive rehabilitation, which will take approximately six months.[9] Patellar tendon, hamstrings, and allografts are the most commonly used reconstruction procedures.[10] The adoption of a strong graft and adequate fixation, in conjunction with a suitable rehabilitation program, should restore knee function and allow a normal return to sports. However, some patients are unable to return to their pre-injury activities, even after ACL restoration and completion of specified rehabilitation. This issue is most obvious among athletes with high expectations and demands.[11,12] Therefore, the present study aimed to assess personal and psychological perceptions of return to activities after reconstruction in patients with ACL tears.

Materials and Methods

Study Design and Setting

This cross-sectional observational study was conducted in the Jazan Region of Saudi Arabia. The required sample size included patients with ACl tears who had undergone surgery and met the inclusion criteria. Data were collected using a self-administered questionnaire from patients who visited clinics between December 2022 and May 2023. Before the study began, informed consent was obtained from all study participants. This study was conducted in accordance with the principles of the Declaration of Helsinki study. Voluntary and anonymous participation was declared. Ethical approval for the study was obtained from the Jazan Health Ethics Committee of the Ministry of Health (No. 22125, dated November 20, 2022).

The questionnaire assessed personal and psychological perceptions of return to activities among patients with ACL tears after reconstruction,[13] which involved items measuring the socio-demographics of participants, risk of physical activities for knee injury, and questions regarding operation. We then assessed the perceived personal importance of exercise using the validated 9-item Exercise Identity Scale[14] on a five-point Likert scale. The higher the rating, the greater is the exercise value. The frequency and degree of the pain were assessed using nine items from the pain subscale of the Knee Injury and Osteoarthritis Outcome Score (KOOS).[15,16] Quality-of-life outcomes were assessed using the ACL Quality of Life (ACL-QOL) questionnaire.[17] In addition, a sample consisting of ten participants who were not part of the study was surveyed to conduct a pilot test of the questionnaire to evaluate its face validity, clarity of the items, and time required to complete it.

Sample Size and Technique

The Raosoft sample size calculator was used to determine the sample size for this study. This study used a convenient, nonrandom sampling method to obtain the required sample size. The Data were collected by health professionals via a self-administered questionnaire administered to patients visiting the clinics. Individuals who were not from Jazan were excluded from this study.

Statistical Analysis

Data analysis was performed using Statistical Package for the Social Sciences, SPSS 23rd version. Categorical variables are displayed as frequencies and percentages. Means and standard deviations were used to display the numerical variables. Independent *t*-tests and ANOVA variance were used to test for associations between the numerical and categorical variables. ANOVA was followed by Tukey's post hoc test to determine the exact difference between the groups. Pearson's correlation coefficient was used to test the correlation between the numerical variables. The level of significance was set at $p < 0.05$.

Results

A total of 113 participants were included in this study. Table 1 shows the sociodemographic profiles of the patients. The mean age of the patients was 31.18 ± 9.22. Regarding sex, 100 (88.5%) patients were male and 13 (11.5%) were female.

Table 1 Socio-Demographic Profile of The Patients (n = 113)

Demographical Characteristics	n	%
Age		
Mean	31.18	
Standard deviation	9.22	
Gender		
Male	100	88.50
Female	13	11.50
Educational levels		
High school	31	27.40
Bachelor's	72	63.70
Postgraduate	10	8.80
Marital Status		
Single	50	44.20
Married	55	48.70
Divorced	2	1.80
Widowed	6	5.30
Monthly Income		
Less than 5000 SR	19	16.80
Between 5000 and 10000 SR	39	34.50
More than 10000 and less than 15000 SR	35	31.00
15000 SR and more	20	17.70
BMI		
Underweight	4	3.50
Normal weight	51	45.10
Overweight	45	39.80
Obese	13	11.50
BMI		
Mean	25.27	
Standard deviation	3.77	

Regarding education level, 31 (27.4%) had a high school education, 72 (63.7%) had a bachelor's degree, and 10 (8.8%) had a postgraduate degree. Approximately 50 (44.2%) patients were single, 55 (48.7%) were married, two (1.8%) were divorced, and six (5.3%) were widowed. As for the monthly income, around 19 (16.8%) patients had less than 5000 SR, 39 (34.5%) had 5000–10000 Sr, 35 (31%) between 10000–15000 Sr and 20 (17.7%) had > 15000 SR. The mean BMI was 25.27 ± 3.77, around 4 (3.5%) were underweight, 51 (45.1%) had normal weight, 45 (39.8%) were overweight, and 13 (11.5%) were obese.

Figure 1 shows the site of injury. Sixty (53.1%) patients sustained the injury in a synthetic playground, 35 (31%) in a dirt court, 11 (9.7%) while practicing other activities, 5 (4.4%) in a naturally planted playground, and 2 (1.8%) in a bumpy place.

Only 22 (19.5%) patients experienced postoperative complications (Table 2). Regarding the complications experienced, 14 (63.6%) had inflammation, 3 (13.6%) had pain in the knee joint, 2 (9.1%) had bleeding, 2 (9.1%) had errors in the process nail, and 1 (4.5%) had tissue fibrosis. 106 (93.8%) patients strengthened their muscles postoperatively, while 7 (6.2%) did not. The reoperation rate was (16.8%) done for 19 patients, while that in the remaining 94 patients (83.2%) were not reoperated. Of the 19 patients who underwent reoperation, 14 (73.7%) underwent reapportion once and 5

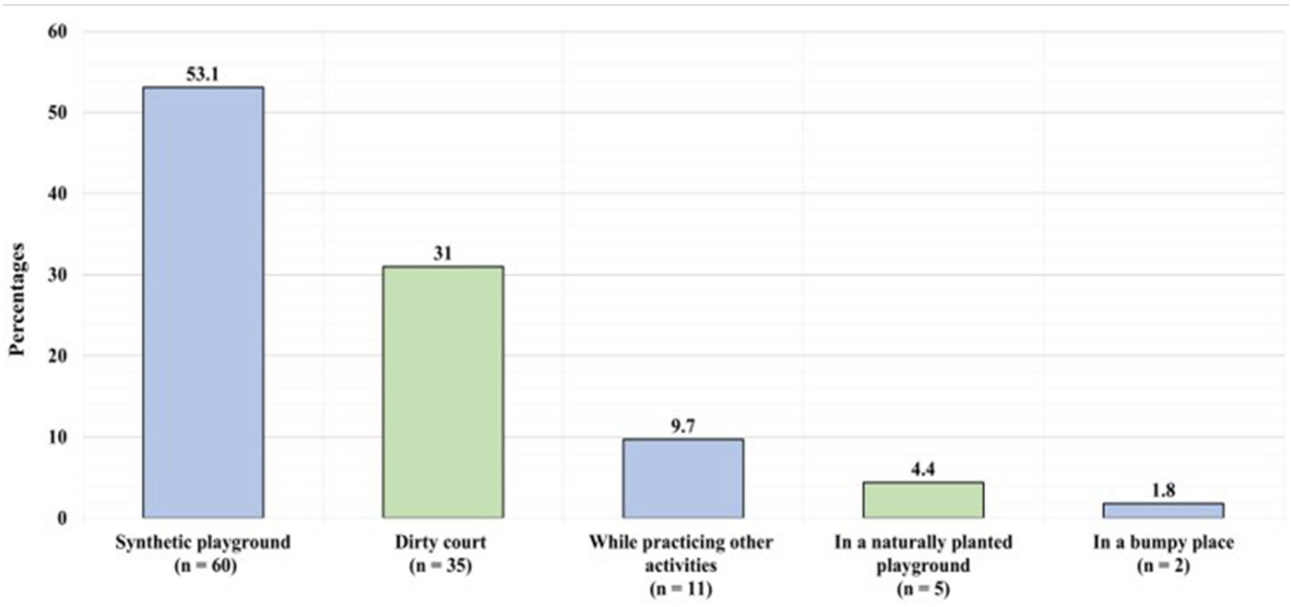

Figure 1 Site in which the injury occurred.

(26.3%) underwent reapportion twice. Regarding the reapportion reason, five (26.3%) due to inflammation, 10 (52.6%) due to another injury, and four (21.1%) were reported due to surgical errors.

Figure 2 demonstrates the higher risk of knee injury from physical activities practiced by the patients. 98 (86.7%) patients played football, 9 (8%) practiced mountaineering, 2 (1.8%) played volleyball, 2 (1.8%) played tennis, and 2 (1.8%) played hockey.

Figure 3 illustrates the lower risk of knee injury from physical activities practiced by the patients. Of these patients, 53 (46.9%) were swimming regularly, 36 (31.9%) were undergoing regular physiotherapy, 12 (10.6%) were running regularly, and 12 (10.6%) were cycling regularly.

Table 2 Anterior Cruciate Ligament Repair Operation Profile (n = 113)

Question	n	%
Q1/ Did you have complications after the operation?		
No	91	80.5
Yes	22	19.5
Q2/ Complications experienced after surgery (n = 22)		
Inflammation	14	63.6
Pain in the knee joint	3	13.6
Bleeding	2	9.1
Error in the process nail	2	9.1
Tissue fibrosis	1	4.5
Q3/ Did you strengthen the muscles after the operation?		
No	7	6.2
Yes	106	93.8
Q4/ Was the operation repeated?		
No	94	83.20
Yes	19	16.80

(*Continued*)

Table 2 (Continued).

Question	n	%
Q5/ How many times was the operation repeated? (n = 19)		
One times	14	73.7
Two times	5	26.3
Q6/ The reason for reoperation		
Inflammation	5	26.3
Another injury	10	52.6
A mistake from the doctor who performed the previous operation	4	21.1

Table 3 shows the assessment of patients using the perceived personal importance of exercise, KOOS, and ACL-QOL questionnaires. The mean perceived importance of exercise score was 34.3 ± 8. The mean knee injury and osteoarthritis outcome score was 64.1 ± 17. The mean score of ACL-QOL "entertaining and physical activity" segment was 44.4 ± 21, social and emotional" segment was 42.5 ± 26.7.

Table 4 shows the factors associated with the perceived importance of the exercise score. Gender was significantly associated with the perceived importance of exercise score ($p < 0.001$), and males had a significantly higher score than females (35.63 ± 6.21 vs 23.85 ± 12.01). The site of injury was also significantly associated with the perceived importance of the exercise score ($p = 0.035$). Tukey's post hoc test revealed that those who were injured in a dirty court had a significantly higher score than those who were injured in other activities ($p < 0.05$). Those who had repeated operations had a significantly lower perceived importance of exercise score than those who did not ($p < 0.001$) (28.47 ± 11.96 vs 35.45 ± 6.39). Age also had a significantly weak negative correlation with perceived importance of the exercise score ($p < 0.001$, correlation coefficient = −0.348). Education level, marital status, income, post-op complication, strengthening muscle post-op, type of practice lower risk of knee injury activity, BMI, KOOs, and score of ACL–QOL "entertaining and physical activity" segment and "social and emotional" segment were all not significantly associated with the perceived importance of exercise score.

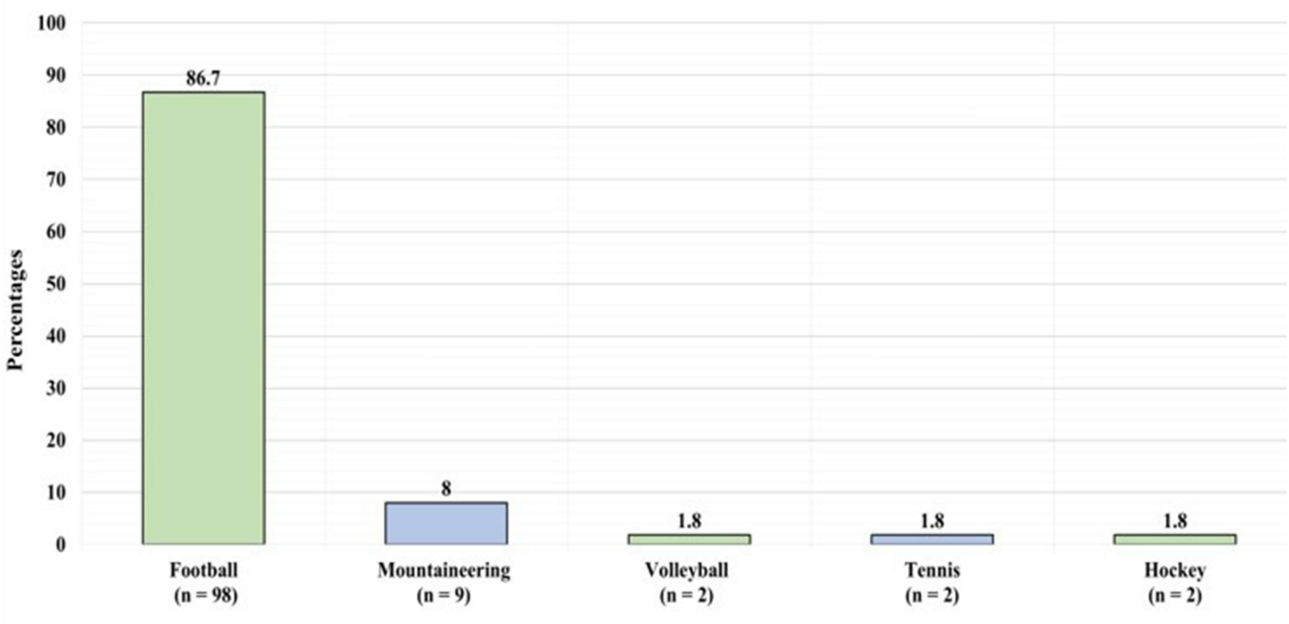

Figure 2 Higher risk of knee injury physical activities practiced by the patients.

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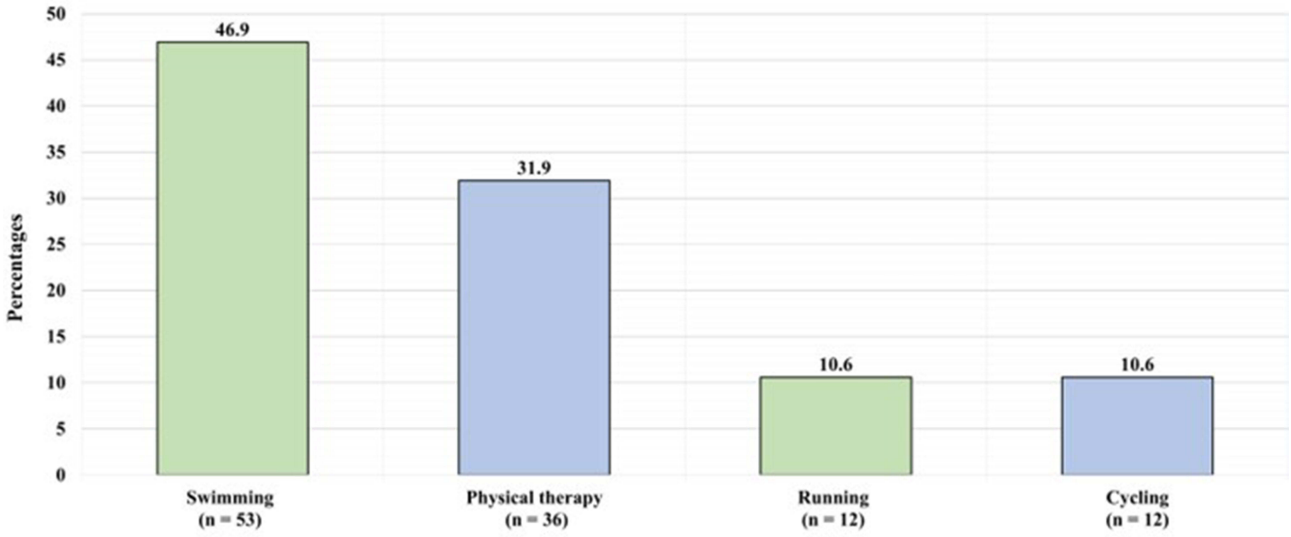

Figure 3 Lower risk of knee injury physical activities practiced by the patients.

Table 5 shows the factors associated with KOOS. Strengthening muscle postoperatively was significantly associated with KOOS ($p = 0.006$), where it was observed that those who strengthened their muscle had a significantly higher score compared to those who did not (64.25 ± 16.84 vs 47.22 ± 6.8). Age also showed a significantly weak negative correlation with KOOS ($p = 0.011$, correlation coefficient = −0.162). KOOS also had a significant weak positive correlation with score of ACL-QOL "social and emotional" Segment ($p < 0.001$, correlation coefficient = 0.324). Gender, education level, marital status, income, site in which the injury occurred, postoperative complications, operation repetition, type of practice lower risk of knee injury activity, BMI, and score of ACL-QOL "entertaining and physical activity" segments were not significantly associated with KOOS.

Table 6 shows the factors associated with ACL-QOL scores of.

Table 3 Assessment of Patients Using the Perceived Personal Importance of Exercise Questionnaire, KOOS, and ACL-QOL Questionnaire (n = 113)

Perceived Importance of Exercise Score	
Mean Standard deviation	34.3 8.0
KOOS Score	
Mean Standard deviation	64.1 17.0
ACL-QOL "Entertaining and Physical Activity" Segment	
Mean Standard deviation	44.4 21.0
ACL-QOL "Social and Emotional" Segment	
Mean Standard deviation	42.5 26.7

Table 4 Factors Associated With Perceived Importance of Exercise Score

Factor	Perceived Importance of Exercise Score		P-value
	Mean	Standard Deviation	
Gender			< 0.001*
Male	35.63	6.21	
Female	23.85	12.01	
Educational levels			0.121
High school	32.29	9.46	
Bachelor's	34.61	7.58	
Postgraduate	38.00	3.56	
Marital Status			0.498
Single	35.22	6.37	
Married	34.25	7.99	
Monthly Income			0.219
< 5000 SR	37.68	4.08	
5000 −10000 SR	33.26	8.61	
> 10,000 - < 15000 SR	33.49	9.09	
>15000 SR	34.40	7.01	
Site in which the injury occurred			0.035*
Synthetic playground	34.57	6.63	
Dirty court	35.80	9.62	
While practicing other activities	28.64	8.59	
Did you have complications after the operation?			0.515
No	34.52	7.29	
Yes	33.27	10.56	
Did you strengthen the muscles after the operation?			0.225
No	30.71	8.86	
Yes	34.51	7.92	
Was the operation repeated?			< 0.001*
No	35.45	6.39	
Yes	28.47	11.96	
Lower risk of knee injury physical activities			0.341
Physical therapy	33.64	9.22	
Running	36.92	4.74	
Swimming	34.77	7.23	
Cyclic	31.3333	9.50	
Correlation between perceived importance of exercise score and age			
p-value	< 0.001*		
Correlation coefficient	−0.348		
Correlation between perceived importance of exercise score and BMI			
p-value	0.835		
Correlation coefficient	0.200		
Correlation between perceived importance of exercise score and KOOS			
p-value	0.358		
Correlation coefficient	0.087		

(*Continued*)

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Table 4 (Continued).

Factor	Perceived Importance of Exercise Score		P-value
	Mean	Standard Deviation	
Correlation between perceived importance of exercise score andScore of ACL – QO L "Entertaining and Physical Activity" Segment			
p-value	0.606		
Correlation coefficient	0.049		
Correlation between perceived importance of exercise score andScore of ACL – QOL "Social and Emotional" Segment			
p-value	0.353		
Correlation coefficient	0.088		

Note: *Significant at level 0.05.

Table 5 Factors Associated With Knee Injury and Osteoarthritis Outcome Score (KOOS)

Factor	Knee Injury and Osteoarthritis Outcome Score		P-value
	Mean	Standard Deviation	
Gender			0.073
Male	65.1667	16.51	
Female	56.20	18.91	
Educational levels			0.855
High school	65.59	16.63	
Bachelor's	63.62	17.45	
Postgraduate	63.33	15.59	
Marital Status			0.334
Single	66.33	15.78	
Married	63.03	18.76	
Monthly Income			0.579
Less than 5000 SR	68.71	11.78	
Between 5000 and 10000 SR	64.32	18.56	
More than 10000 and less than 15000 SR	62.06	15.90	
15000 SR and more	63.06	19.79	
Site in which the injury occurred			0.993
Synthetic playground	64.49	18.09	
Dirty court	64.68	14.41	
While practicing other activities	65.15	17.18	
Did you have complications after the operation?			0.560
No	63.68	17.43	
Yes	66.04	15.07	
Did you strengthen the muscles after the operation?			0.006*
No	47.22	6.80	
Yes	65.25	16.84	

(*Continued*)

Table 5 (Continued).

Factor	Knee Injury and Osteoarthritis Outcome Score		P-value
	Mean	Standard Deviation	
Was the operation repeated?			0.784
No	64.33	17.31	
Yes	63.16	15.46	
Lower risk of knee injury physical activities			0.090
Physical therapy	58.33	14.92	
Running	67.36	12.71	
Swimming	67.24	17.98	
Cyclic	64.5833	18.99	
Correlation between KOOS and age			
p-value	0.011*		
Correlation coefficient	−0.162		
Correlation between KOOS and BMI			
p-value	0.245		
Correlation coefficient	−0.110		
Correlation between KOOS and Score of ACL –QOL "Entertaining and Physical Activity" Segment			
p-value	0.016		
Correlation coefficient	0.227		
Correlation between knee injury and osteoarthritis outcome score and Score of ACL – QOL "Social and Emotional" Segment			
p-value	< 0.001*		
Correlation coefficient	0.324		

Note: *Significant at level 0.05.

Table 6 Factors Associated With ACL-QOL Score of "Entertaining and Physical Activity" Segment

Factor	ACL-QOL Score of "Entertaining and Physical Activity" Segment		P-value
	Mean	Standard Deviation	
Gender			0.374
Male	45.1	20.60	
Female	39.50	24.90	
Educational levels			0.451
High school	48.01	20.95	
Bachelor's	42.52	20.84	
Postgraduate	46.83	23.86	
Marital Status			0.684
Single	43.85	20.84	
Married	45.56	22.02	

(*Continued*)

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Table 6 (Continued).

Factor	ACL-QOL Score of "Entertaining and Physical Activity" Segment		P-value
	Mean	Standard Deviation	
Monthly Income			0.425
<5000 SR	50.44	20.88	
5000 −10000 SR	44.68	16.18	
>10000 and < 15000 SR	43.83	22.16	
>15000 SR	39.17	27.26	
Site in which the injury occurred			0.020*
Synthetic playground	44.13	21.10	
Dirty court	49.79	22.42	
While practicing other activities	29.47	9.07	
Did you have complications after the operation?			0.183
No	45.71	21.00	
Yes	39.02	21.13	
Did you strengthen the muscles after the operation?			0.854
No	42.98	7.37	
Yes	44.51	21.72	
Was the operation repeated?			0.832
No	44.60	19.27	
Yes	43.47	29.16	
Lower risk of knee injury physical activities			0.461
Physical therapy	44.58	19.69	
Running	49.38	24.95	
Swimming	45.06	22.18	
Cyclic	36.04	15.70	
Correlation between ACL-QOL Score of "Entertaining and Physical Activity" Segment and age			
p-value	0.087		
Correlation coefficient	−0.162		
Correlation between ACL-QOL Score of "Entertaining and Physical Activity" Segment and BMI			
p-value	0.868		
Correlation coefficient	−0.108		
Correlation between ACL-QOL Score of "Entertaining and Physical Activity" Segment andScore of ACL-QOL "Social and Emotional" Segment			
p-value	< 0.001*		
Correlation coefficient	0.720		

Note: *Significant at level 0.05.

"Entertaining and physical activity" segment. Site in which the injury occurred was also significantly associated with the score of ACL-QOL "entertaining and physical activity" segment ($p = 0.020$). Tukey's post hoc test revealed that those who were injured in a dirty court had a significantly higher score than those who were injured while practicing other activities ($p < 0.05$). ACL-QOL "entertaining and physical activity" segment had a significant strong positive correlation with ACL-QOL score of "social and emotional" segment ($p < 0.001$, correlation coefficient = 0.720). Sex, education

Table 7 Factors Associated With ACL-QOL Score of "Social and Emotional" Segment

Factor	ACL-QOL Score of "Social and Emotional" Segment		P-value
	Mean	Standard Deviation	
Gender			0.785
Male	42.78	27.03	
Female	40.62	25.03	
Educational levels			0.820
High school	42.39	26.28	
Bachelor's	41.89	27.17	
Postgraduate	47.60	26.83	
Marital Status			0.770
Single	43.60	28.36	
Married	42.04	26.27	
Monthly Income			0.325
<5000 SR	42.63	28.04	
5000–10000 SR	42.00	21.91	
>10000 and <15000 SR	39.14	24.79	
>15000 SR	39.90	35.62	
Site in which the injury occurred			0.179
Synthetic playground	39.60	28.57	
Dirty court	48.17	25.79	
While practicing other activities	33.46	14.34	
Did you have complications after the operation?			0.417
No	43.54	26.74	
Yes	38.36	26.79	
Did you strengthen the muscles after the operation?			0.950
No	43.14	15.40	
Yes	42.19	27.34	
Was the operation repeated?			0.613
No	43.11	25.92	
Yes	39.68	30.92	
Lower risk of knee injury physical activities			0.811
Physical therapy	43.61	42.95	
Running	45.67	30.51	
Swimming	42.60	28.93	
Cyclic	35.83	18.16	
Correlation between ACL-QOL Score of "Social and Emotional" Segment and age			
p-value	0.469		
Correlation coefficient	−0.069		
Correlation between ACL-QOL Score of "Social and Emotional Segment and BMI			
p-value	0.255		
Correlation coefficient	−1.080		

Note: *Significant at level 0.05.

level, marital status, income, postoperative complications, strengthening muscle post-op, repeating operation, type of practiced lower risk of knee injury, physical activities, age, and BMI were not significantly associated with the ACL-QOL score.

"Entertaining and physical activity" segment.

Table 7 shows the factors associated with ACL-QOL score of "Social and emotional" segment. No significant association was found between ACL-QOL score of "social and emotional" segment and any of the following, gender, education level, marital status, income, site in which the injury occurred, post-op complication, strengthening muscle post-op, repeating operation, type of practiced lower risk of knee injury physical activities, age, and BMI.

Discussion

The sociodemographic profile revealed significant male predominance (88.5%). This is consistent with epidemiological studies that indicate higher rates of ACL injuries in males participating in sports.[18] However, it is essential to note that while the incidence of ACL injury is higher in males, primarily due to greater participation in contact sports, females are more prone to ACL injuries in certain sports such as basketball, team handball, and soccer when participating in the same sports.[19–22] The mean age of the participants was 31 years, consistent with previous research showing that ACL injuries most commonly occur in adolescents and young adults participating in sports, such as football.[18,21,23] Most participants held a bachelor's degree and were either single or married, with varied monthly income distribution. The mean BMI was 25.27, falling within the overweight range, a factor that could potentially affect post-surgical outcomes.[24] More than half of the injuries occurred on synthetic playgrounds, followed by dirt courts. The high incidence of injuries in these locations could be attributed to the physical activity of the participants, which was predominantly football (86.7%). The literature supports the association between football and a high risk of knee injuries, particularly ACL injuries.[25,26] A systematic review found that stiffer playground surfaces, such as synthetic turf, increase ACL injury risk compared to more cushioned natural grasses, likely because of increased joint resistance.[27] This finding underscores the importance of environment in sports-related injuries. Evidence suggests that different playing surfaces may have varying effects on the risk of ACL injuries.[28]

The rate of postoperative complications was relatively low (19.5%), with inflammation and pain being the most common. Consistent with the literature, inflammation is common after ACL surgery.[29–31] Prior research on ACL reconstruction techniques, such as graft type, tunnel position, and fixation methods, reported similar postoperative morbidity rates between 5–25%.[32] The reoperation rate was 16.8%, with most reoperations due to inflammation or other injuries. This re-operation rate is noteworthy and merits further investigation, as it could indicate potential issues with surgical techniques or postoperative care.[33] A significant number of patients (93.8%) reported postoperative muscle strengthening, which is beneficial for improving knee functionality.[34] The positive association of muscle strengthening postoperatively with functional outcomes on the KOOS aligns with evidence that quadriceps and hamstring rehabilitation improves recovery.[35] The analysis of the questionnaires showed that sex significantly affected the perceived importance of exercise scores, with males scoring higher than females did. This could reflect societal norms and attitudes towards physical activity, where men are generally more encouraged to participate in physical activity than are women.[36,37] The site of injury and reoperation also influenced this score, emphasizing the impact of these factors on patients' perceptions of exercise post-surgery.[37,38] Age was negatively correlated with the perceived importance of exercise scores, suggesting that younger patients may find exercise more essential in their recovery processes.[39] Previous studies have shown worse functional scores in older versus younger patients undergoing ACL reconstruction.[40] KOOS was significantly associated with postoperative muscle strengthening and negatively correlated with age. Notably, those who strengthened their muscles post-op had a significantly higher score than those who did not, emphasizing the importance of post-operative rehabilitation for improving patient outcomes.[41] The positive impact of rehabilitation on KOOS is supported by a meta-analysis that showed that physiotherapy improves short- and long-term outcomes.[42] This suggests that postoperative muscle strengthening enhances the development of knee injury, and that the outcome may worsen with age. Previous studies have shown that older adults are less likely to engage in physical activity than are younger adults.[43]

The ACL-QOL entertaining/physical activity scores were higher for injuries occurring on dirty than on synthetic playing surfaces. This novel finding may be related to athletes perceiving and valuing their activity participation differently depending on the setting. Interestingly, the score of the ACL-QOL "entertaining and physical activity" segment was significantly associated with the site of injury, underscoring the potential impact of the injury environment on patients' quality of life. Moreover, a strong positive correlation was found between the scores of the "entertaining and physical activities" and "social and emotional" segments of ACL-QOL, suggesting that patients who rated their physical activity

higher also had better social and emotional scores.[44] However, several factors were not significantly associated with the perceived importance of exercise, knee injury, osteoarthritis outcome, or ACL-QOL scores. These included education level, marital status, income, postoperative complications, type of practice, lower risk of knee injury, and BMI. This suggests that these factors may have less direct or significant impact on patient outcomes and perceptions after ACL repair.

Most patients experience favorable outcomes after ACL repair surgery. However, there were instances where some patients needed reoperation and registered lower scores on functionality and quality of life measures. Younger patients, males, and those who participated in post-operative rehabilitation generally had superior outcomes. These findings underscore the potential benefits of enhancement of post-operative muscle strengthening and recovery programs. By improving these aspects, it may be possible to improve function and quality of life after ACL repair. This study offers significant insights into the factors that shape patients' personal and psychological perceptions when resuming activities after ACL reconstruction. The results highlight the importance of a holistic approach to postsurgical care that accounts for the physical aspects of recovery and the psychological and social dimensions. Therefore, it is crucial to offer comprehensive care that addresses these varied facets of recovery to optimize patient outcomes.

Study Limitations

The study sample was relatively small and limited to patients from a single geographical location, which could limit the generalizability of our findings to other populations. A cross-sectional design limits the ability to establish causality or determine the directionality of observed relationships. The study relied on self-reported data, subject to recall and social desirability biases. The study did not assess the severity of the initial injury or the extent of ligament damage, which could have influenced the outcomes. Finally, confounding factors that must be accounted for in the analysis may have influenced the observed relationships.

Conclusion

This study of patients' return to activity after anterior cruciate ligament reconstruction highlighted the need for patient education and support. Key findings included correlations between injury location and exercise perception, indicating that education in safe environments could prevent future injuries, and between postoperative strengthening and improved outcomes, showing the importance of encouraging rehabilitative strength training. The study also suggested benefits from age- and sex-specific strategies, as older age was associated with lower scores, and men had higher exercise perceptions than women. The strong correlation between physical activity and emotional quality of life underscores the need for emotional support for physical rehabilitation. While factors such as education, income, complications, and BMI showed no significant associations, further research should explore their influences on patient beliefs, motivation, and provider communication when resuming activity after surgery. Optimizing rehabilitation may involve patient education on safe exercise, promotion of postoperative strengthening, tailoring strategies by age and sex, and offering emotional support alongside physical rehabilitation.

Institutional Review Board Statement

The study protocol was approved by the internal review board of the Ethics Committee of the Ministry of Health in the Jazan Region. Approval No. 22125; date: November 20, 2022.

Data Sharing Statement

Data are available upon request from the researchers. The first author was contacted privately via e-mail.

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically

reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

The authors declare no conflicts of interest in this work.

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