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Association between Anterior Cruciate Ligament Reconstruction Surgery and Health Related Quality of Life Among Football Players

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Abstract

Objective: Association between Anterior cruciate ligament reconstruction surgery and Health related quality of life among Football playersafter 24 months of surgery.
Method: 112 subjects were eligible to participate in study. Standardized questioner was used (OPPT). Various questions asked about symptoms and problems facing by the players, and analyzed on statistical package of social sciences 24.0 by using chi square test.
Result: Symptoms after ACL reconstruction have association with sports and recreational activities also showing association with frequency of giving way of knee and fear of giving way of knee p value (0.002). Psychological factors associate with sports and recreational activities. Results showed that Fear of reinjure of knee cause little bit difficulty during playing sports p value (0.005). Weakness is knee showed association with difficulty in go full out in sports p value (0.001), weakness in knee is associated with decrase in physical exercises p value (0.001).
Conclusion: Players having problem and trouble because of symptoms after 24 months of ACL reconstructions surgery and causing negative impacts on Life style of Athlete.

Key words: ACL reconstruction, Health related quality of life, Football players, pain

1. Introduction

Anterior cruciate Ligament provide stability throughout rotation of the knee it can be transverse as well as frontal plane because of its defined orientation(Raines et al., 2017). Injuries to ACL is cause many structures of body such as effusion of joints, disturbed knee kinematics and cause gait and muscle weakness and this result in reduced functional performance and ACL injury is the reason of worsening the condition of body such as chondral lesions meniscal tear and cause in development osteoarthritis (OA) (Ajuied et al., 2014; Atarod et al., 2015; Raines et al., 2017).

There are many injuries in knee and ACL injuries is most common, destructive and damaging injury of knee which is most found in Athletes(Kiapour et al., 2014). The ACL has poor healing capacity it take long time to repair even after surgery(Feagin JR & Curl, 1976; Kiapour et al., 2014).

ACL injury are most common found in Athletes but after ACL repair surgery 61 to 89 percent return to their sports (Gans et al., 2018). Most ACL tear in Athletes are due to cutting and pivoting sports and due to these injuries they cause 100,000 to 120,000 reconstruction of ACL per year in US. Its cost is around 1.7 billion US dollar per year which is huge amount(Duchman et al., 2017; Ellman et al., 2015).

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NCAA did a detailed inspection of data from 1988 to 2004. In that analysis it shows that most ACL rupture occur in women athletes who play soccer, basketball and gymnastic and in men athletes ACL rupture occur in men's soccer(Hootman et al., 2007).

Athletes who had previous ACL injury and is reconstructed by surgery gave high risk of reinjury then Athletes who have no history of ACL injury previously (Smith et al., 2012). Weather is biggest factor of ACL injuries for example athletes who play in wet or rainy season have high incidence rate of getting ACL injury due to less friction between shoes of athletes and playground(Orchard et al., 2003).

The ACL contain fibers which are called type 1 collagen fibers (Giuliani et al., 2009; Siegel et al., 2012).The major blood artery which supply blood to ligament is genicular artery with extra supply coming from the inferomedial and inferolateralgenicular arteries. There are many sensory receptors that are in ACL these sensory receptors respond to mechanical pressure these receptors are Ruffini corpuscles, Pacinian corpuscles, Golgi-like organs, and free nerve ends (Georgoulis et al., 2001; Siegel et al., 2012).

The main structure of ACL are anteroposterior and Mediolateral fibers the ACL fibers and PCL (posterior cruciate ligament). fibers almost have the same function (Diermann et al., 2009; Domnick et al., 2016).Mediolateral fiber of ACL may have different functions. When they are intact with knee these fibers resist the abnormal internal rotation of tibia(Domnick et al., 2016; Freeman & Pinskerova, 2005).The other collateral ligament of the knee also stabilize the knee against internal rotation when ACL is totally teared(Diermann et al., 2009; Domnick et al., 2016; Kim et al., 2013; Kondo et al., 2014).

The movement of knee flexion decreases because of decrease in joint pressure also rupture of ACL cause decrease in movement of knee flexion (Domnick et al., 2016; Gardinier et al., 2013; Hart et al., 2010).

The risk of Lateral meniscus is less than tear of medial meniscus during acute ACL rupture it may be cause by valgus internal trauma mechanism. It is found that there is higher risk of lateral meniscus injury when there are bruises exist on lateral side of bone it can be indicated on MRI (Domnick et al., 2016; Yoon et al., 2011). Osteoarthritis is seen frequently after ACL rupture (Ajuied et al., 2014; Domnick et al., 2016).

Our research is for physiotherapist physician's health care researchers. Now days the scope of sports is at peak in the Pakistan as well in world so the risk of injuries during playing sports increasing day by day and the ACL injury is one of them so we have to address issue and figure out to how we can prevent it. ACL injuries are mostly found in athletes who play soccer, rugby, basketball so my research is to spread awareness of this injury and tell them that what problem they can face during and after that reconstruction of ACL. After conducting this research, we will know that what effects will cause on people's daily routine life after 24 months of reconstruction surgery and what problems they are facing after reconstruction of ACL.

2. METHODOLOGY

2.1 Study Design: Observational cross-sectional study was conducted.

2.2 Place and Duration: The total of 112 participants were recruited from the Jinnah sports stadium Islamabad, Punjab stadium Lahore, Fatima Memorial Hospital, Shaikh Zayed Hospital Lahore, polyclinic hospital Islamabad, Rehabilitation center Shifa International Hospital. The study was completed within 2 months after the approval of synopsis.

2.3Sample Technique: Non-probability Convenient Sampling was used.

2.4 Subjects: Subjects were recruited from National Football stadiums and Hospitals Physiotherapy departments. Subjects were selected by using specific inclusion and exclusion criteria. Age between 18-25 and Male genders were included. Students with positive history of ACL reconstruction surgery, Data was collected from 112 football players.

2.5 Questioner:
Subjects asked questions about Quality of life after ACL reconstruction from optimal performance Physical therapy (OPPT) questioner.

2.6 Statistical Analysis:

Data was analyzed by SPSS software 24.0 version. Frequency and percentage of qualitative variables and other parameters were analyzed including physical complaints and symptoms, work related concerns, sports participants, life style activities, attitudes and feeling related to ACL-deficient knee. The Pearson Chi-square was used to assess the association between variables and parameters.

3. Results

The results show that 2 (1.8%) people are very frustrated when playing sports because of knee problems, 34 (30.4%) people are frequently frustrated when playing sports because of knee problems, 57 (50.9%) people are occasionally frustrated by knee problems, and only 19 (17.0%) people are not frustrated at all. A chi square test with a p value of (0.003) demonstrates the strong correlation between pain and discomfort in the knee and frustration when playing sports.

Table 1. Association between Pain and discomfort in knee and frustration due to knee when playing sports

Pain and discomfort	**Frequency**	**Percentage**
Severe	3	2.7%
Moderate	38	33.9%
Mild	60	53.6%
No pain	11	9.8%
Total	112	100%
Frustration	**Frequency**	**Percentage**
Extremely frustrated	2	1.8%
Often Frustrated	34	30.4%
Sometime Frustrated	57	50.9%
Not at all	19	17.0%
Total	112	100%
Pearson chi square test	48.260	
P value	0.003	

Figure 1. Frequency of frustration due to knee pain

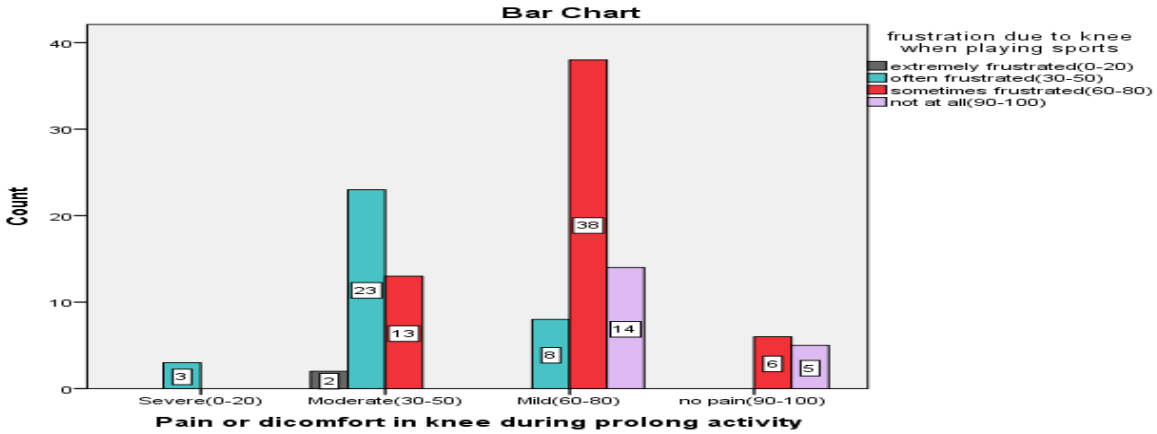


Table 2 displays a link between knee giving way frequently and Fear of knee giving way while participating in sports, with a (0.002) p value. Only 1 (0.9%) of the population is highly afraid of their knee giving way while they are practicing sports, whereas 25 (22.3%) are frequently afraid, 58 (51.8%) are occasionally afraid, and 28 (25.0%) are completely unafraid.

Table 2: Association between Frequency of giving way of knee and how Fearful of knee giving way during playing sports

Frequency of giving way	**Frequency**	**Percentage**
Constantly	6	5.4%
Often	28	25.0%
Sometimes	55	49.1%
Never	23	20.5%
Total	112	100%
Fear level	**Frequency**	**Percentage**
Extremely fearful	1	0.9%
Often	25	22.3%
Sometimes	58	51.8%
Never	28	25.0%
Total	112	100%
Pearson chi square	30.059	
P value	0.002	

Figure 2: Frequency of fear due to giving away of knee

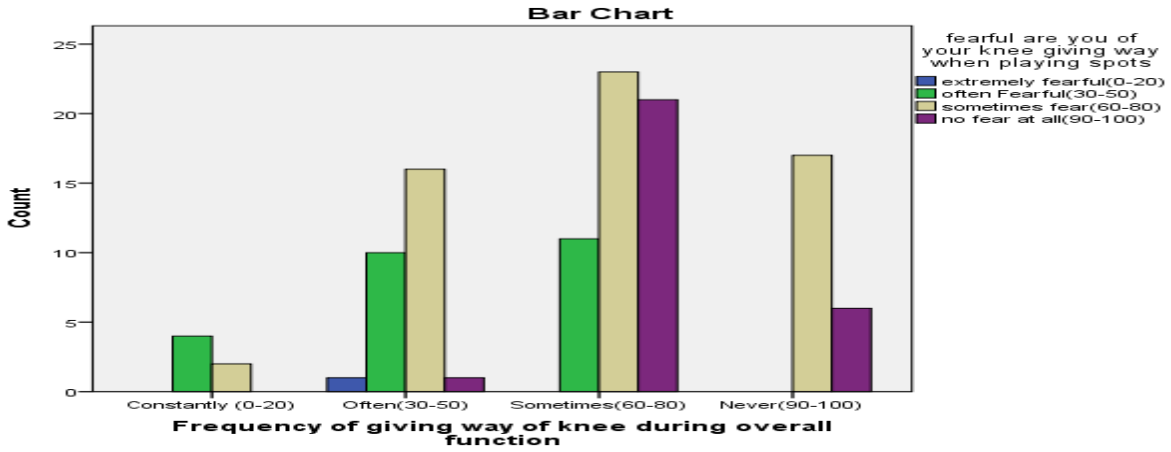


Table 3 shows p value between these two variables is (0.001) which shows association between weakness in knee and difficult to go out in sports. 2(1.8%) have extreme difficulty to go full out in sports, 37(33.0%) have moderate difficulty to go full out in sports, 57(50.9%) have little bit difficulty, and 7(6.3%) population have no weakness at all

Table 3: Association between Weakness in overall knee and difficult to go full out in sports

Weakness	**Frequency**	**Percentage**
Extremely weak	2	1.8%
Moderate	48	42.9%
Minor	55	49.1%
No weak at all	7	6.3%
Total	112	100%
Difficulty level	**Frequency**	**Percentage**
Extremely difficult	2	1.8%
More difficult	37	33.0%
Little bit difficulty	57	50.9%

No difficult at all	16	14.3%
Total	112	100%
Pearson chi-square	43.611	
P value	0.001	

Figure 3: Frequency of difficulty to go out at sports with overall knee function and muscle strength

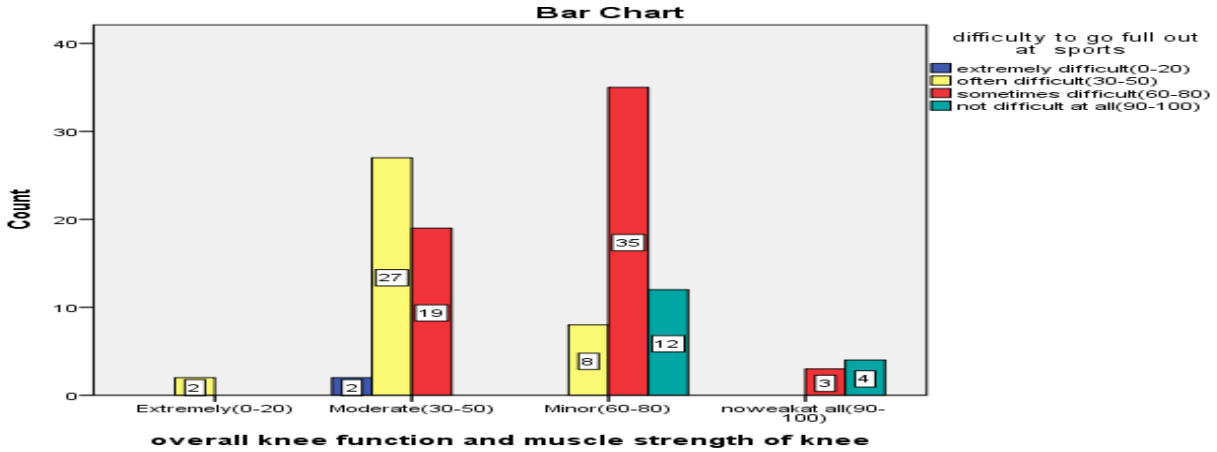
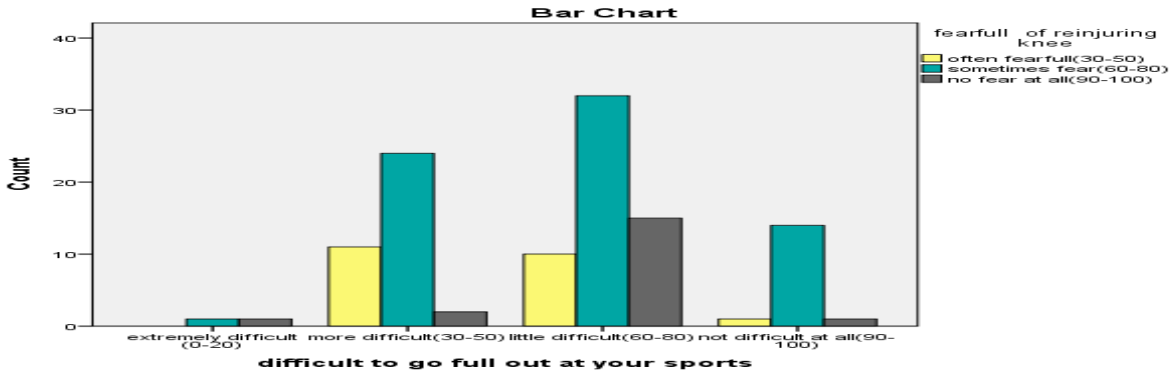


Table 4 shows24 people (21.4% of the population) frequently worry about reinjuring their knees, 69 people (61.6% of the population) occasionally worry about it, and 19 people (17.0%) have no fear at all. The p value between these two variables is (0.005). The inability to fully commit to athletics and the worry of ACL reinjury are related.

Table4:Association between Fear of reinjure of knee and Difficulty for you to go full out in sports

Fear level	**Frequency**	**Percentage**
All the time	0	0.0%
Often	24	21.4%
Sometimes	69	61.6%
None of the time	19	17.0%
Total	112	100%
Difficulty level	**Frequency**	**Percentage**
Extreme difficult	0	0.0%
Moderate difficulty	24	21.4%
Minor difficulty	69	61.6%
No difficulty at all	19	17.0%
Total	112	100%
Pearson chi-square	14.684	
P value	0.005	

Figure 4: Frequency of fear of reinjure of knee



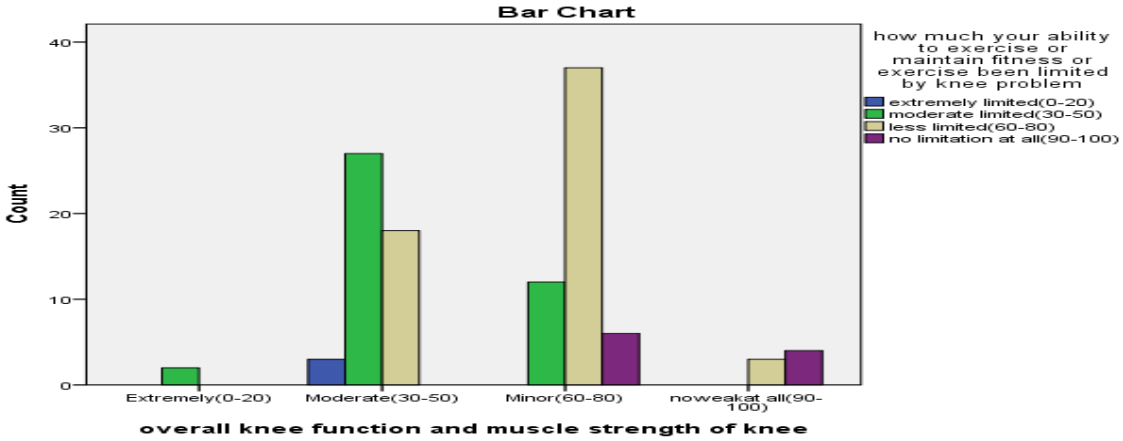
Results of table 5 shows, 3 (2.7%) exercise with serious limitations, 41 (42.9%) with moderate limitations, 58 (49.1%) with mild limitations, and 10 (8.5%) with no limitations at allin knee.

The chi-square test's p value for the relationship between knee weakness and muscle strength limitations brought on by the knee during activity is (0.001).

Table 5: **Association between Weakness in knee andLimitation in exercise due to knee problem**

Weakness level	**Frequency**	**Percentage**
Extremely weak	2	1.8%
Moderate	48	42.9%
Minor	55	49.1%
No weak at all	7	6.3%
Total	112	100%
Limitation level	**Frequency**	**Percentage**
Extremely limited	3	2.7%
Moderate limited	41	42.9%
Minor limited	58	49.1%
Not limited at all	10	8.9%
Total	112	100%
Pearson chi-square	45.617	
P value	0.001	

Figure 5: Frequency of exercise limitation by knee problem and muscle strength

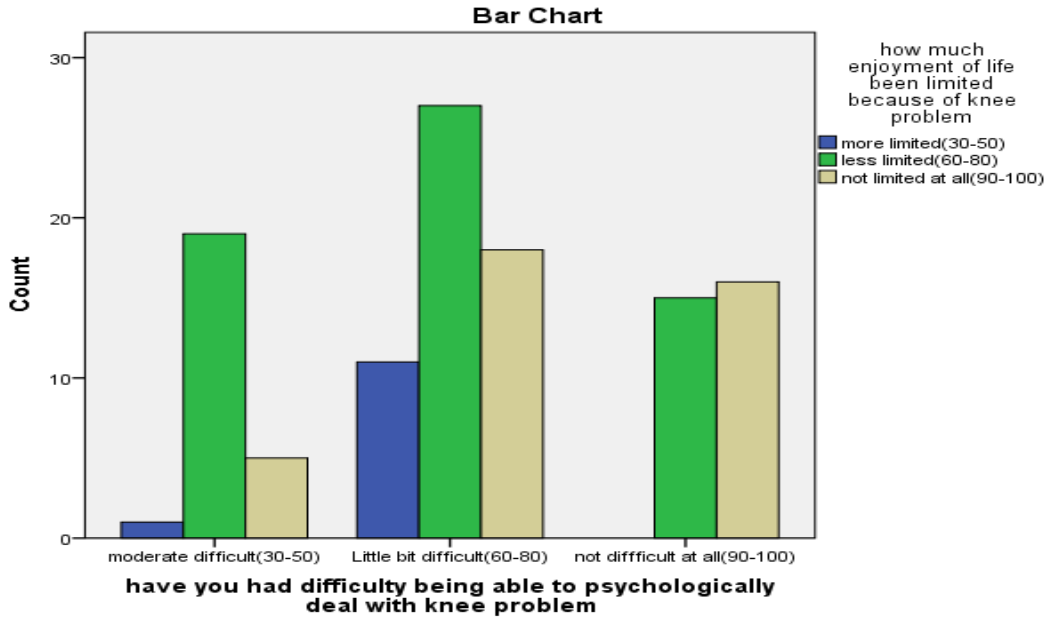


A psychological problem is something that 22.3% of people find moderately difficult to cope with, 56.0% of people have some difficulty with, and 27.7% of people have no trouble at all. There is a strong relationship between reduced enjoyment of life and trouble coping with psychiatric issues and has a P value of 0.004.

Table 6: Association between difficulty in dealing with psychological problems because of knee problem and how much enjoyment of life been limited because of knee

Difficulty level	**Frequency**	**Percentage**
Extreme difficult	0	0.0%
Moderate	25	22.3%
Little bit difficult	56	50.0%
Not difficult at all	31	27.7%
Total	112	100%
Limitation Level	**Frequency**	**Percentage**
Extreme limitation	0	0.0%
More limited	12	10.7%
Less limited	61	54.5%
No Limitation at all	39	34.8%
Total	112	100%
Pearson chi -square	15.483	
P value	0.004	

Figure 6: Frequency of limitation in enjoyment of life and difficulty in dealing with psychological issues



Discussion:

In this study, there is association between Frequency of giving way of knee and pain with quality of life as well as participation in sports and recreational activities. This study shows psychological problem due to knee may affects enjoyment of life of athletes, Most Participants facing minor trouble due to lack of confidence in knee. Mainwaring reports that subjects were afraid of reinjuring their knees and the fear cause decreased ability of recovery. A center of interests of athletes on the psychological impacts of the injury during treatment may help athletes in returning to activities before injury (Putukian, 2016).

In this study Joanna Kvist reported that psychological problem such as fear of reinjure is a reason for athletes not to return in sports 47% population not returned to sports because of fear of reinjuring of knee(Kvist

et al., 2005). Eva ageberg reported that Most of the population have mild trouble due to lack of confidence in knee(Ageberg et al., 2016). In this study Stephanie R. Filbay analysis the relationship between Quality of life and pain and have strong association between these two parameters(0.003) and with sports and recreational activity showed moderate association (0.04)(Filbay et al., 2014).

The purpose of our study was to determine the association between health-related quality of life and previous ACL reconstruction of ACL in football players. We took 112 sample size. our main observation showed that football players who have severe or moderate symptoms of ACL injury cause negative effects on Life style, it also causes negative effects on sports abilities and activities. In addition, person who have severe knee injury and symptoms have more emotional concerns and fear of reinjuring of knee.

Conclusion

We concluded from study that players having problem and trouble because of symptoms after 24 months of ACL reconstructions surgery and causing negative impacts on Life style of Athlete Psychological response to ACL reconstruction is very common as well as emotional response. There is association between symptoms and participation in sports as well as shows association between psychological problem with enjoyment of life. Athlete facing trouble infields due to psychological problem so physiotherapist , health care researchers and physician have to play a key role to detect psychological problems and make plan to diagnose and handle problems athlete facing after Surgery.

References:

Ageberg, E., Roos, E. M. J. j. o. o., & therapy, s. p. (2016). The association between knee confidence and muscle power, hop performance, and postural orientation in people with anterior cruciate ligament injury. 46(6), 477-482.

Ajuied, A., Wong, F., Smith, C., Norris, M., Earnshaw, P., Back, D., & Davies, A. J. T. A. j. o. s. m. (2014). Anterior cruciate ligament injury and radiologic progression of knee osteoarthritis: a systematic review and meta-analysis. 42(9), 2242-2252.

Atarod, M., Frank, C. B., & Shrive, N. G. J. T. K. (2015). Increased meniscal loading after anterior cruciate ligament transection in vivo: a longitudinal study in sheep. 22(1), 11-17.

Diermann, N., Schumacher, T., Schanz, S., Raschke, M. J., Petersen, W., Zantop, T. J. A. o. o., & surgery, t. (2009). Rotational instability of the knee: internal tibial rotation under a simulated pivot shift test. 129(3), 353-358.

Domnick, C., Raschke, M. J., & Herbort, M. J. W. j. o. o. (2016). Biomechanics of the anterior cruciate ligament: Physiology, rupture and reconstruction techniques. 7(2), 82.

Duchman, K. R., Lynch, T. S., & Spindler, K. P. J. C. i. s. m. (2017). Graft selection in anterior cruciate ligament surgery: who gets what and why? , 36(1), 25-33.

Ellman, M. B., Sherman, S. L., Forsythe, B., LaPrade, R. F., Cole, B. J., & Bach Jr, B. R. J. J.-J. o. t. A. A. o. O. S. (2015). Return to play following anterior cruciate ligament reconstruction. 23(5), 283-296.

Feagin JR, J. A., & Curl, W. W. J. T. A. j. o. s. m. (1976). Isolated tear of the anterior cruciate ligament: 5-year follow-up study. 4(3), 95-100.

Filbay, S. R., Ackerman, I. N., Russell, T. G., Macri, E. M., & Crossley, K. M. J. T. A. j. o. s. m. (2014). Health-related quality of life after anterior cruciate ligament reconstruction: a systematic review. 42(5), 1247-1255.

Freeman, M. A., & Pinskerova, V. J. J. o. b. (2005). The movement of the normal tibio-femoral joint. 38(2), 197-208.

Gans, I., Retzky, J. S., Jones, L. C., & Tanaka, M. J. J. O. j. o. s. m. (2018). Epidemiology of recurrent anterior cruciate ligament injuries in National Collegiate Athletic Association sports: the Injury Surveillance Program, 2004-2014. 6(6), 2325967118777823.

Gardinier, E. S., Manal, K., Buchanan, T. S., & Snyder- Mackler, L. J. J. o. O. R. (2013). Altered loading in the injured knee after ACL rupture. 31(3), 458-464.

Georgoulis, A. D., Pappa, L., Moebius, U., Malamou-Mitsi, V., Pappa, S., Papageorgiou, C. O., Agnantis, N. J., & Soucacos, P. N. J. K. S., Sports Traumatology, Arthroscopy. (2001). The presence of proprioceptive mechanoreceptors in the remnants of the ruptured ACL as a possible source of re-innervation of the ACL autograft. 9(6), 364-368.

Giuliani, J. R., Kilcoyne, K. G., & Rue, J.-P. H. J. T. j. o. k. s. (2009). Anterior Cruciate Ligament Anatomy–A Review of the Anteromedial and Posterolateral Bundles. 22(02), 148-154.

Hart, J. M., Ko, J.-W. K., Konold, T., & Pietrosimione, B. J. C. b. (2010). Sagittal plane knee joint moments following anterior cruciate ligament injury and reconstruction: a systematic review. 25(4), 277-283.

Hootman, J. M., Dick, R., & Agel, J. J. J. o. a. t. (2007). Epidemiology of collegiate injuries for 15 sports: summary and recommendations for injury prevention initiatives. 42(2), 311.

Kiapour, A., Murray, M. J. B., & research, j. (2014). Basic science of anterior cruciate ligament injury and repair. 3(2), 20-31.

Kim, Y. H., Purevsuren, T., Kim, K., & Oh, K.-J. J. P. o. t. I. o. M. E., Part H: Journal of Engineering in Medicine. (2013). Contribution of posterolateral corner structures to knee joint translational and rotational stabilities: a computational study. 227(9), 968-975.

Kondo, E., Merican, A. M., Yasuda, K., Amis, A. A. J. A. T. J. o. A., & Surgery, R. (2014). Biomechanical analysis of knee laxity with isolated anteromedial or posterolateral bundle–deficient anterior cruciate ligament. 30(3), 335-343.

Kvist, J., Ek, A., Sporrstedt, K., & Good, L. J. K. s., sports traumatology, arthroscopy. (2005). Fear of re-injury: a hindrance for returning to sports after anterior cruciate ligament reconstruction. 13(5), 393-397.

Orchard, J. W., Powell, J. W. J. M., sports, s. i., & exercise. (2003). Risk of knee and ankle sprains under various weather conditions in American football. 35(7), 1118-1123.

Putukian, M. J. B. J. S. M. (2016). The psychological response to injury in student athletes: a narrative review with a focus on mental health. 50(3), 145-148.

Raines, B. T., Naclerio, E., & Sherman, S. L. J. I. j. o. o. (2017). Management of Anterior Cruciate Ligament Injury: What's In and What's Out? , 51(5), 563.

Siegel, L., Vandenakker-Albanese, C., & Siegel, D. J. C. J. o. S. M. (2012). Anterior cruciate ligament injuries: anatomy, physiology, biomechanics, and management. 22(4), 349-355.

Smith, H. C., Vacek, P., Johnson, R. J., Slauterbeck, J. R., Hashemi, J., Shultz, S., & Beynnon, B. D. J. S. h. (2012). Risk factors for anterior cruciate ligament injury: a review of the literature—part 1: neuromuscular and anatomic risk. 4(1), 69-78.

Yoon, K. H., Yoo, J. H., & Kim, K.-I. J. J. (2011). Bone contusion and associated meniscal and medial collateral ligament injury in patients with anterior cruciate ligament rupture. 93(16), 1510-1518.