

## Pattern of musculoskeletal injuries among soccer and basketball players in a Nigerian university

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**Abstract.** Involvement in sports is recognized as a potential source of musculoskeletal injuries with variable patterns and severity. This study was conducted to investigate the occurrence, pattern of musculoskeletal injuries and treatment intervention used among soccer and basketball players of the University of Ibadan. A retrospective study was carried out through the administration of a self-administered questionnaire. Information on occurrence of injury, location and types of injury, causes of injury and treatment received were obtained.

Sixty four (80%) players out of a total of 80 players that participated in the study reported to have sustained injury over the period covered by the study. Players within the age range of 21 to 24 years have the highest occurrence of injury across both sports. Soccer players suffered injury most to their lower limb constituting over 50% of total injury sustained. Basketball players suffered most injury to their finger (n=8, 21.6%) and ankle (n=8, 21.6%). Strain is reported as most common type of injury among soccer players (n=15, 46.9%) while sprain was reported to be predominant among basketball players (n=20, 62.5%). Tackling from opposing players was reported as the major cause of injury among soccer players (n=13, 40.6%) while the major cause of injury among the basketball players was attributed to stumbling/fall. First aid was the most utilized form of treatment by the injured players across the two sports.

It was concluded that injuries are common in both sports, predominant cause of injuries among soccer players are due to contact while the predominant causes of injuries among basketball players are due to non-contact incidents. The pattern and location of injuries relate closely to the part of the body mostly involved with the giving sports.

**Key words:** pattern, musculoskeletal injuries, soccer, basketball players.

### Introduction

Musculoskeletal injuries in sports are a common yet unwanted aspect of participation in sports. These injuries result from complex interaction of extrinsic and intrinsic risk factors (2). They include injuries to bones, joints ligaments, muscles, tendons and other soft tissues (1-3). The existing data regarding the type nature and frequency of injuries demonstrate that specific injury pattern occur in different sports (1, 4, 5). Although, sport injuries cannot be entirely eliminated, consistent and professional evaluation of the pattern can provide a focus for the development of injury prevention strategies (6). Sports by its nature can be a meaningful occupation for many young adults and can give a lifelong interest in physical activity as an important healthy way of life and relaxation (7). Apart from its potential to cause musculoskeletal injuries, participation in sporting activities must be encouraged across age and gender span as a mean of engaging in beneficial physical activity.

Soccer and basketball are both recognized as vigorous sport that entails rapid acceleration, deceleration, pivoting, lateral and backward displacement as well as jumping and contact with other players (8, 9). The soccer commonly known as football is one of the most popular team sports in the world and continues to provide many young people with an opportunity for healthy exercise (10, 11). It is characterized as vigorous high intensity, ball and contact sport which put many demands on the technical and physical skills of the individual player (12).

The game of basketball is physically and mentally demanding. Basketball is characterized by intermittent bouts of high-intensity activity that occurs in the context of an endurance event (13-15). Although, basketball is considered as non-contact sport, but there is usually a high level of physical interaction between players on opposing teams, technically suggesting that basketball evolves into a semi-contact sport (9, 16).

According to Caine et al (9), contact alone is responsible for 52.3% of the game-related injuries in male and 46.0% of injuries in female collegiate players.

The functional activities of both sports have for long been a major challenge to sport medicine community. As a step towards injury prevention in any sport, the need therefore arises for the recognition of the injury type and an understanding of the associated risks (17). Although, there have been studies on the profile of injuries among sports like Basketball and football in Nigeria (2, 18, 19). However, these studies were conducted among professional sport men participating in league matches and not among amateur university undergraduate sport men. This study was thus carried out in order to determine the pattern of musculoskeletal injuries among undergraduate soccer and basketball male players of the University of Ibadan, Nigeria. The significant of the study is to provide an insight into the pattern of injury among the undergraduate soccer and basketball players which is desirable for designing appropriate injury prevention strategies.

### **Material and Method**

*Participants.* A total of eighty Soccer and Basketball male players of the University of Ibadan participated in this study. This number comprised of forty three soccer and thirty seven basketball players who have participated actively in the University football and basketball teams in the last one academic year preceding the time of the study. The participating players were recruited into the study through a purposive sampling technique. They were recruited from the football field and basketball court of the University of Ibadan sport stadium complex. These participants were also involved at multiple levels of playing such as playing for their various academic departments, faculties and halls of residence among others.

*Instruments.* A 26-item self-administered questionnaire containing nineteen open and seven close ended questions was used in the study. The questionnaire was adapted from the work of Cromwell (20) on the prevalence of injuries among elite Gaelic footballers. The questionnaire was pretested on ten soccer players and ten basketball players from two University halls of residence. The wordings of the questionnaire were modified for better clarity as some items were found to be poorly understood by the players. A pilot study gave the test retest reliability of the questionnaire to be  $r = 0.93$ .

Injury was defined in this study as injuries sustained on the field/court of play during training sessions or competitions for which treatment was received on/off the field/court of play in the last one academic season to the time of the study.

*Procedure.* Ethical approval for the study was obtained from the joint University of Ibadan/University College Hospital Ethical Review Committee before the commencement of the study. Permission was obtained from the director of sports and chief coaches before the administration of the questionnaires to the players. The rationale and procedure for the study were explained to the players and their consent to participate in the study was sought and obtained. The questionnaires were distributed to the players on the field/court of play during practicing session. The questionnaires were completed and collected on the same day. Health related questions from the players with respect to sport injuries prevention and management were allowed and answered by members of the research team.

*Statistical analysis.* Descriptive statistics of frequency and percentages were computed for prevalence of musculoskeletal injuries, nature of injuries, body parts injured causes of injuries and methods of management of injuries sustained by the injured soccer/basketball players.

### **Results**

Eighty players participated in the study; the participants consisted of 43(53.7%) soccer players and 37(46.3%) basketball players.

*Injury Profile.* Sixty four (80%) of all the participants reported having had musculoskeletal injuries during the last academic season. Occurrence of injuries among different age groups is as shown in table I. Players in the age group of 21-24 years were in the majority, accounting for 39.5% of soccer players and 37.8% of basketball players respectively. Table II show the parts of the body the players in the two sports sustained injuries. The region of lower limb from the groin to the foot was the most injured body part among soccer players accounting for 74.4% of the total injuries. With respect to basketball players injuries to trunk predominate although injuries to ankle and fingers were the most prevalent accounting for 21.6% each.

Table III show the occurrence of different types of injury among the participants. Sprains and strains were the most common types of injury among both soccer and basketball players while more serious injuries such as dislocation of joints and fractures were least in occurrence.

Table IV shows the common causes of injuries among soccer and basketball players. The results show that most soccer players incurred most of their injuries due to tackling (30.2%) and collision (11.6%), while stumbling/falls (18.9%) and contact with ball (13.5%) were responsible for most of the injuries among basketball players. Types of treatment received by the injured soccer and basketball players are as shown in table 5 with first aid treatment been the most prevalent.

**Table I.** Occurrence of injuries among Soccer and Basketball players using class interval of age

Age	Soccer (n=43)	Basketball (n=37)
17- 20	1(2.3%)	2(5.4%)
21-24	17(39.5%)	14(37.8%)
25-28	10(23.3%)	13(35.1%)
29-32	4(9.3%)	3(8.1%)
Total	32(74.4%)	2(86.5%)

Key: n = number of players in each group

**Table II.** Distribution of the Body parts injured among Soccer and Basketball Players

Body Part	Soccer (n=43)	Basketball (n=37)
Groin	5(11.6%)	0
Buttock	1(2.3%)	0
Thigh	5(11.6%)	2(5.4%)
Knee	3(7.0%)	5(13.5%)
Shin	11(25.6%)	1(2.7%)
Ankle	7(16.3%)	8(21.6%)
Shoulder	0	1(2.7%)
Elbow	0	1(2.7%)
Arm	0	2(5.4%)
Wrist	0	2(5.4%)
Fingers	0	8(21.6%)
Back	0	2(5.4%)

Key: n = number of players in each group

**Table III.** Occurrence of different types of injury among soccer and basketball players

Injury type	Soccer (n=43)	Basketball (n=37)
Strain	15(34.9%)	7(18.9%)
Sprain	13(30.2%)	20(54.1%)
Bruise/ Abrasion	1(2.3%)	0
Wound	2(4.7%)	0
Fracture	1(2.3%)	2(5.4%)
Dislocation	0	1(2.7%)

Key: n = number of players in each group

**Table IV.** Causes of Injury among soccer and basketball players

Mechanism	Soccer (n=43)	Basketball (n=37)
Collision	5(11.6%)	3(8.1%)
Running	4(9.3%)	2(5.4%)
Tackle	13(30.2%)	2(5.4%)
Stumble/fall	3(7.0%)	7(18.9%)
Jumping	0	3(8.1%)
Foul play	4(9.3%)	2(5.4%)
Twist/turn	1(2.3%)	1(2.7%)
Contact with ball	0	5(13.5%)
Kicking/Passing the ball	0	2(5.4%)

Key: n = number of players in each group

**Table V.** Types of treatment received by injured soccer and basketball players

Injury type	Soccer (n=43)	Basketball (n=37)
First Aids	12(27.9%)	11(29.7%)
Physiotherapy	9(20.9%)	12(32.4%)
Medical	9(20.9%)	5(13.5%)
Others	3(7.0%)	4(10.8%)

Key: n = number of players in each group

## Discussion

Data on musculoskeletal injuries among university students from Nigeria who involved in soccer and basketball games is scarce. The finding of this study revealed a high one year prevalence of musculoskeletal injuries among soccer players (74.4%) and basketball players (86.5%) respectively. There is high occurrence of musculoskeletal injuries among basketball players than soccer players in this study. This finding suggests that the game of basketball is more risky than the game of soccer or that basketball players are more prone to injuries. This finding is similar to the finding by Owwoye et al (1) in their retrospective study of sport injury pattern at the sports medicine centre in Lagos, Nigeria. It's also contrary to the finding by Akinbo et al (19) on the prevalence of injuries among professional soccer and basketball players in Nigeria. National Electronic Injury Surveillance System (21) also reported that musculoskeletal injuries are more common in the game of basketball than the game of soccer.

Injury was found to be most common among players in the age range of 21 to 28 years for both sports. This finding corroborates the findings of Steinbruck (22) who reported that sports related injuries reach a peak among players in the age range of 20 to 29 years. The factors responsible for the preponderance of injuries in this age group have not been well captured in the literature. However, it's possible that people from this age group are predominant in sporting activities or that training and competition are most intense at this age.

The anatomical distribution and the types of injuries, as found in this study corresponded with earlier findings (18, 19). Most injuries were to the lower limbs among soccer players while basketball players suffered injury more globally affecting the trunk, the upper and lower extremities than soccer players. This finding is consistent with previous findings (9, 16, 19). This distributions pattern of injuries among the players in these two sports seems to reflect the level of involvement of different parts of the body in the games of soccer and basketball respectively.

The shin was the most frequently injured part of the body among soccer players in this study followed by ankle. This finding is at variance with the findings of others (18, 22) who reported that knee joint was the most frequently injured part of the body among soccer players followed by ankle. Owwoye et al (1) however reported that the thigh is the most frequently injured body part followed by the knee joint. The vulnerability of shin to injuries as found among soccer players in this study is however supported by previous findings (23). The noted vulnerability of this part of the body to injuries among soccer and basketball players is seem to be facilitated by its exposed nature particularly if it is not appropriately protected by shin guard as recommended for soccer players (23). The predominance of injuries to the lower extremities, especially the shin, ankle, thigh and knee as found in this study is consistent with previous findings among male and female soccer players (8, 24-27) across different age groups. This may be a reflection that the game of soccer is highly dependent on the use of the lower extremities than any other body parts. The least injured parts of the body among the soccer players in this study were the trunk and upper extremity. This could have been due to minimal involvement of the trunk and upper extremity in the game of soccer by players who are not goalkeepers (18).

Among basketball players injury to the ankle and fingers were the most common followed by injury to the knee joints. This finding is in agreement with findings of Akinbo et al (19) with respect to frequency of ankle and knee injuries among their study population. However, it is at variance with findings of Barber-Foss (28) who reported the knee to be the most frequently injured body part among basketball players. However, according to some previous epidemiological studies (16, 29, 30) ankle was adjudged as one of the most vulnerable part of the body that basketball players usually sustain injuries.

Sprain, strain and other soft tissues injuries are the most common form of injuries found among soccer and basketball players in this study; while serious musculoskeletal injuries such as joint dislocation and fracture of bone were least reported in this study. This is consistent with previous findings (1, 19) this may be a reflection of intensity of physical interactions involved in the two sporting activities.

The most prevalent causes of injuries among the Soccer and Basketball players in this study were due to tackling, collision with other players or with the ball and foul play which can be viewed as contact related in mechanism while those due to noncontact events were running, stumbling/fall, twisting/turning which were fewer in occurrence. This finding is consistent with previous findings among soccer and basketball players irrespective of sex, age and skill (8, 18).

First aid treatment was the most utilized mean of managing the injuries sustained by the majority of the soccer and basketball players in this study. This finding is consistent with previous findings (18, 19) this may be due to the non-serious nature of most of the injuries and ready availability of this form of treatment on the field of play. However Physiotherapy was fairly common as a mode of treatment in the follow up phase of treatment outside the field of play. Equally self-care and self-medication is also reported to be employed by a number of injured soccer and basketball players. This option among the players could be a reflection of the non-seriousness of the injuries and a reflection of unrestricted access to off-the-shelf analgesic drug such as acetaminophen, aspirin, diclofenac, ibuprofen, or naproxen. It could also be due to the perception of the players about their injuries as a problem they could easily handle on their own with no recourse to health care professionals.

*Limitation.* This is a retrospective questionnaire survey which sought to provide an insight to the burden of injuries among non-elite University players with varying level of involvement in these two sports. The accuracy of diagnostic correctness in view of the retrospective nature of the study should be taken into consideration with respect to categorization of strain and sprain as reported in this study. The active use of protective devices was not captured by our study hence we could not comment on the influence of it on the outcome of this study. However, in view of its documented importance, its use should be emphasized.

## Conclusion

Musculoskeletal injuries are common in both sports, with the peak occurrence in the age group of 21 to 28 years. The predominant cause of injuries among soccer players are due to contact while the predominant causes of injuries among basketball players are due to non-contact incidents. The pattern and location of injuries relate closely to the part of the body mostly involved with the giving sports. The overall characteristics of the injuries reported are consistent with previous epidemiological studies on soccer and basketball without bias for level of participation.

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## References

1. Owoeye O, Odunaiya N, Akinbo S, Odebiyi D. (2008). A Retrospective study of Sports injuries reported at the National Sports Medicine Centre, Lagos, South-West, Nigeria. *The IJRH*.6: 1. <http://ispub.com/IJRH/6/1/5092>
2. Akinbo SRA, Salau MA, Odebiyi DO, Ibeabuchi NM (2007). Video Analysis of Musculoskeletal Injuries in Nigerian and English Professional Soccer Leagues: A Comparative Study. *Nig J of Health and Biomed Sci.*; 6(2); 85-89.
3. Alberta Injury Statistics and Costs (2000). Musculoskeletal injuries. *Workplace Health and Safety*; 6(30):1-5.
4. Hawkins RD, Fuller CW (1998). An examination of the frequency and severity of injuries and incidents at three levels of professional football. *Br J Sports Med*; 32(4):326-32.
5. Bahr R, Krosshaugh T (2005). Understanding injury mechanisms: A key component of preventing injuries in sport. *Brit J Sports Med*; 14: 286-290
6. Powell JW and Barber-Foss KD (1999). Injury Pattern in Selected High School Sports. *J Athl Train*; 34(3): 277-84.
7. Okuneye, R. O, Akeredolu, A.O, Agbonjimi, A.P and Amusa, L.O. (2001). Students' perception on specialization in Exercise Physiology. In Udoh, C.O. (Ed) Issue in Human Kinetics, *Health Promotion and Education*. Book of reading; pp. 27-34
8. Wong P, Hong Y (2005). Soccer injuries in lower extremities. *Br J Sports Med*. 39(8):473-482
9. Caine DJ, Harnner PA, Shiff M.2010. *Epidemiology of injuries in Olympic sports*. Blackwell Publishing Ltd.
10. American Academy of Pediatrics; American Academy of Orthopedic Surgeons (2000). *Care of the Young Athlete*. Sullivan JA, Anderson SJ, eds. Elk Grove Village, IL: American Academy of Pediatrics.

11. Owoeye O.B.A., Nwachukwu A.L., Akinbo S.R.A. (2012). Injuries in Nigerian National Female Footballers at the 2008 Beijing Olympic Games, China: A prospective case study *AJPARS*; 4(1 & 2): 57-61.
12. Sanya, A.O., Owotade, O. (1998). Comparison of Static Balance Performance in Nigeria Amateur and Professional Footballers. *Journal of the Nigeria Medical Rehabilitation Therapists*; 3: 41-44.
13. Dougherty KA, Baker LB, Chow M, Kenney W L (2006). Two Percent Dehydration Impairs and Six Percent Carbohydrate Drink Improves Boys Basketball Skills. *Med Sci in Sports Exerc*; 38(9):1650-1658.
14. Baker LB, Dougherty KA, Chow M, Kenney WL. (2007). Progressive Dehydration Causes a Progressive Decline in Basketball Skill Performance. *Med Sci in Sports Exerc*; 39(7): 1114-1123.
15. Maughan RJ, Shirreffs S M. (2010). Development of hydration strategies to optimize performance for athletes in high-intensity sports and in sports with repeated intense efforts. *Scand J Med Sci Sports*; 20(2): 59-69.
16. Cumps E, Verhagen E, Meeusen R. (2007). Prospective epidemiological study of basketball injuries during one competitive season: Ankle sprains and overuse knee injuries *Journal of Sports Science and Medicine*; 6: 204-211.
17. Owoeye OBA, Akinbo SRA, Olawale OA, Tella BA, Ibeabuchi NN (2013). Injury prevention in football: Knowledge and behaviour of players and availability of medical care in a Nigerian youth football league. *SAJSM*; 25 (3): 77-80
18. Hamzat TK, Adeniyi AF, Awolola OE et al (2004). Injury Pattern of FIFA, CAF and UEFA Soccer Tournament: A Retrospective Study of Selected 2002 Matches. *S Afr J Physiother*; 60(3): 10-14.
19. Akinbo SRA, Odebiyi DO and Adebayo A (2008). Pattern of Musculoskeletal Injuries in Professional Basketball League in Nigeria; *IJRH*. 5(1).
20. Cromwell F, Walsh J, Gormley J (2000). A pilot study examining injuries in elite Gaelic footballers. *Br J Sports Med*; 34(2):104-8.
21. U.S. Census Bureau, Statistical Abstract of the United States (2012) Table 1249. Participation in Selected Sports activities: 2009; Neiss Data Highlights 2012: <http://www.cpsc.gov/Research-Statistics/NEISS-Injury-Data/>
22. Steinbrück K. (1999). Epidemiology of sports injuries. 25-year-analysis of sports orthopedic-traumatologic ambulatory care. *Sportverletz Sportschaden*; 13(2): 38-52.
23. Gilchrist J, Saluja G, Marshall SW (2007). Interventions to Prevent Sports and Recreation-Related Injuries *Handbook of Injury and Violence Prevention*. Springer US. Online ISBN 978-0-387-29457-5; pp 117-134.
24. Soderman K, Adolphson J, Lorentzon R (2001). Injuries in adolescent female players in European football: a prospective study over one outdoor soccer season. *Scand J Med Sci Sports*; 11(5):299-304.
25. Faude, O., A. Junge, W. Kindermann and J. Dvorak (2005). Injuries in female soccer players: A prospective study in the German national league. *Am J Sports Med*; 33(11): 1694-1700.
26. Dvorak, J. and A. Junge (2007). Injuries in female football players in top-level international tournaments. *Brit J Sports Med*; 41 (Suppl 1):i3-i7.
27. Dvorak, J., A. Junge and K. Grimm (2009). FIFA Medical Assessment and Research Centre (F-MARC). *Football Medicine Manual*. 2nd Edition. FIFA-Strasse Switzerland.
28. Barber-Foss, KD; Myer GD, Hewett TE (2014). Epidemiology of Basketball, Soccer, and Volleyball Injuries in Middle-School Female Athletes. *Phys Sportsmed*. 42(2).
29. Starkey C. (2000). Injuries and Illnesses in the National Basketball Association: A 10-Year Perspective. *J Athl Train*; 35(2):161-167.
30. McKay GD, Goldie PA, Payne WR, Oakes BW (2001). Ankle injuries in basketball: injury rate and risk factors. *J Sports Med*; 35:103-108.

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