

Pattern of sports injuries among ball games athletes: a critical review

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Abstract

Introduction: Multifaceted oriented ballgames are contact sports that involve reasonably high risks & rates of injury in professional & non professional players during practices & competition.

Objective: The objective of this review is to determine the anatomical sites, types & severity of sports injuries among the ball games athletes.

Methods: A literature search was performed by Pub med, Google, Google Scholar & web of science online database without any year restriction. Title & abstracts were reviewed that were published in English, had a prospective or retrospective study & had a minimum study period of 1 (one) year. We exclude review article, case reports & articles in non-peer reviewed journals & not publish in English. To ensure that injury data were included according to the objective of this study.

Results: A total of 8466 patients were included & 14,551 injuries were observed. Most of the body part of the injuries were lower limbs with knee, ankle, groin, high & ankle/feet. Knee & ankle injury was the most common anatomical sites of sports injury among ball games players. The most common injury type was acute injury followed by overuse injury among ball games players. The majority of the type of the injuries was sprain, strain, contusion, tendinitis, concussion &

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fracture. Strain & sprain was the most common type of injury followed by contusion, tendinitis, concussion & fracture among ball games players. The highest of the injury was mild followed by moderate & sever injury.

Conclusion: *Most common injury sites were lower limb followed by upper limbs & strain, sprain & tendinitis ware the common type of injury among football, volleyball, basketball & handball players.*

Key words: sports injuries, patterns, ball games athletes

INTRODUCTION:

Sports have a very much helpful outcome on human health. On the other hand, sports injuries can be potentially harmful to the players. Any injury occurring during sports training or competition causing sports person to look for medical attention or fail to get the next match or sports training session is called sports injury.¹ Multifaceted oriented ballgames are contact sports that involve reasonably high risks & rates of injury in professional & non professional players during practices & competition.²⁻⁹ Sports injuries are common in athletes. Athletes are from time to time severe injury that affected their carrier in sports.¹⁰ Sports injury predictor is one of the most challenging issues in sports and an important part for injury prevention.^{11, 16} Sports injuries represent an unpleasant adverse effect that weakens the benefits of regular physical activity. Sports injury causes short & long term effect on both physical & mental health.¹⁶ Sport injuries in most ball sports occurred to the ankle and knee than in other parts of the body.^{12, 13} Pattern and anatomical sites of injuries was influenced by gender, types and characteristics of a sport.¹⁴ Study showed that ankle injuries are the most common areas affected in Basketball, Handball and Volleyball players.¹⁵ The objective of this review is to determine the anatomical sites, types & severity of sports injuries among the ball games athletes.

OBJECTIVE(S):

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METHODS:

A literature search was performed by Pub med, Google, Google Scholar & web of science online database without any year restriction. Title & abstracts were reviewed that were published in English, had a prospective or retrospective study & had a minimum study period of 1 (one) year. We exclude review article, case reports & articles in non-peer reviewed journals & not publish in English. To ensure that injury data were included according to the objective of this study.

RESULTS:

A total of approximately 100 articles were selected from the literature search and 23 articles meet the objectives of the study among ball games players. We extracted study information including authors name, year of publications, objective of the previous study, study design, samples, total number of injury, locations of injury, type of injury & severity of injury among football, volleyball, basketball & handball players.

A total of 8466 patients were included & 14,551 injuries were observed. Most of the body part of the injuries were lower limbs with knee, ankle, groin, high & ankle/foots. Knee & ankle injury was the most common anatomical sites of sports injury among ball games players. The most common injury type was acute injury followed by overuse injury among ball games players. The majority of the type of the injuries was sprain, strain, contusion, tendinitis, concussion & fracture. Strain & sprain was the most common type of injury followed by contusion, tendinitis, concussion & fracture among ball games players. The highest of the injury was mild followed by moderate & sever injury (Table-1 & 2).

In terms of anatomical sites of sports injury are noted in table-1 and types & severity of sports injuries are noted in table-2 as under:

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Table 1: Study included details with anatomical sites of sports injury among ballgames players

Authors	Objective of the study	Type of sports	Study design (Prospective or retrospective)	Samples	Total injury	Study Duration	Anatomical sites of injury
Bianco A et al. ¹⁶ (2016)	To determine the injury patterns of young professional football players	Football	Prospective study	A total of 80 male football players were recorded.	A total of 107 injuries were recorded.	July 2012- June 2013	Thigh (33.6%) & groin (21.5%) were the most common body parts of injury.
Miranda GE et al ¹⁷ (2015)	To identify the injury patterns and possible risk factors to the young athlete	Volleyball	Retrospective	A total of 210 athletes (M-105 & F-105) were recorded.	A total of 179 injuries were recorded.	1988-2004 years	Majority of the injury occurred in lower limbs (58%). Ankle was the most common site of injury.
Bere T et al ¹⁸ (2015)	To find out the risk and pattern of injury among world class volleyball players.	Volleyball	Prospective	-----	A total of 440 injuries were recorded	4 years	Ankle was the most commonly injured body part (25.9%) followed by knee (15.2%), finger/thumb (10.7%) & lower back (8.9%).
Foss KD et al. ¹⁹ (2014).	To evaluate the injury incidence and rates in female athletes.	Football, volleyball & basketball	Prospective study	A total of 268 female athletes (Football- 26, Volleyball- 80 & basketball- 162) were recorded.	A total of 134 injuries were recorded.	-----	The most common site of injury was knee (73.9%) followed by Ankle (16.4%).
Bastos FD et al ²⁰ (2014)	To find out the sports injuries among young basketball players	Basketball	Retrospective study	. A total of 581 athletes (M-350 & F-231) were recorded	A total of 167 interviewees reported 200 injuries	1 year	Most common anatomical sites of injury were knee & ankle/foot.
Bjømeboe J et al ²¹ (2014)	To monitor injury incidence and pattern in Norwegian male professional football players.	Football	Prospective	---	A total of 2365 injuries were recorded	6 years	The injury sites were Thigh (22%), ankle (18%), knee (16%) & groin (11%) respectively.
Dauty M et al. ²² (2011)	To find out the incidence and pattern of injury in French professional football players	Football	Prospective cohort	A total of 903 players were recorded.	A total of 173 injury was recorded	1995/96- 2009/2010 sessions	Majority of the injury occurred in lower limbs. Thigh (Hamstring muscle strain) was the most common site of injury.
Ekstrand J et al. ²³ (2011)	To find out the incidence & nature of muscle injuries in male professional footballers.	Football	Prospective cohort	A total of 2299 players were included.	A total of 2908 injuries were recorded.	2001-2009 (9 years)	The more common muscle injuries were hamstring (37%), groin (23%), quadriceps (19%) & calf (13%) respectively.
Piry H et al ²⁴	To investigate the injury	Handball	Retrospective study	A total of 40 players	A total of 96 injuries	2007- 2008 (1 year)	Majority of the injury were

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(2011)	incidence and mechanism of injuries in elite Asian handball players.			were included.	were recorded.		ankle (23.8%), knee (15.9% & shoulder (11.1%) respectively.
Olsen OE et al ²⁵ (2006)	To examine the injury incidence and pattern of injuries in youth female and male team handball players.	Handball	Prospective study	A total of 1080 players were included.	A total of 118 injury was recorded	----	Most common site of injury was knee (26%) followed by ankle (24%).
Hickey et al ²⁶ (1997)	To analyze the injuries among basketball players.	Basketball	Retrospective study	A total of 49 female players were recorded.	A total of 223 injuries were recorded	1990-1995 (5 years)	The more frequently site of injuries were the knee (18.8%), Ankle (16.6%), Lumber spine (11.7%) and lower legs (10.8%) respectively.
DuRant et al ²⁷ (1992)	To find out the athletic injuries requiring treatment by a physician.	Basketball	Retrospective study	A total of 228 athletes (M-132 & F-96) were recorded.	Injuries were reported by 29.5% of the athletes. A total of 52 injuries (M-20 & F-32) were recorded.	1989-1990 (1 year)	Knee & Ankle injury was the more frequent site of injury.
Yde J et al. ²⁸ (1990)	To find out injury patterns and to analyze injury situations and mechanisms in three popular and widespread ball games.	Football, Basketball & Handball	Prospective study	A total of 302 athletes were recorded.	A total of 119 injury was recorded	Sep 1985- Oct 1986	Finger sprain (32%), Ankle sprain (25%), strain thigh & leg (10%), Tendinitis (12%)

Table 2: Study included details with Types & severity of injury among ballgames players:

Authors	Objective of the study	Type of sports	Study design (Prospective or retrospective)	Samples	Total injury	Study Duration	Types & severity of injury
Rafnsson ET et al ²⁹ (2019)	To determine the incidence, type, location and severity of injuries in Icelandic elite male handball players.	Handball	Prospective cohort	A total of 158 players were included	A total of 86 injuries were recorded	-----	Acute injuries were more than overuse injuries. Acute injuries were most common in knee (26%), ankle (19%) and feet/toes (17%) but overuse injuries found in low back & pelvic region (39%), shoulders (21%) and knee (21%).
Bianco A et al. ³⁰ (2016)	To determine the injury patterns of young professional football players	Football	Prospective study	A total of 80 male football players were recorded	A total of 107 injury was recorded	July 2012- June 2013	Most common type of injury was strain (68.23%). Severe injury was found for 10.28% of the total injury.
Pastor MF et al ³⁰ (2015)	To find out the acute and overuse injuries among the male professional volleyball players.	Volleyball	Prospective	A total of 34 players were included	A total of 186 injuries were recorded	6 years	Acute injury was more than overuse injury. The players had most likely minor injuries.

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Bere T et al ¹⁸ (2015)	To find out the risk and pattern of injury among world class volleyball players.	Volleyball	Prospective	-----	A total of 440 injuries were recorded	4 years	The majority of the injuries were minimal to mild. Severe injuries were rare.
Buffet M et al ²¹ (2015)	To determine the incidence and characteristics of injuries within an elite women's basketball players.	Basketball	Prospective	-----	-----	2012-2013 sessions	The most frequent type of injury was thigh muscle lesion & ankle sprain. The majority of the injury was minor injury (73.1%).
Miranda GE et al ¹⁷ (2015)	To identify the injury patterns and possible risk factors to the young athlete.	volleyball	Retrospective	A total of 210 athletes (M-105 & F-105).	A total of 179 injury was recorded	1988-2004 years	Sprain & strain were the more common type of injury in both sexes. Mild injuries were more common in girls & moderate injuries were more frequently found in boys.
Bjomeboe J et al ²¹ (2014)	To monitor injury incidence and pattern in Norwegian male professional football players.	Football	Prospective	---	A total of 2365 injuries were recorded	6 years	The most common injury type was acute injury (70.4%) followed by overuse injury (29.6%). The majority injury was mild (50.4%) followed by moderate (27.5%) & severe (20.5%) respectively.
Ergun M et al ²² (2013)	To investigate the incidence and nature of injuries and the influence of age on injury pattern in elite youth football.	Football	Prospective	A total of 52 players were included	-----	3 years	Acute or traumatic injury was 52.3% & overuse injury was 47.7% respectively.
Ekstrand J et al. ²³ (2011)	To find out the injury incidence & injury patterns in professional football players	Football	Prospective cohort	---	A total of 4483 injuries occurred during 566000 h of exposure.	2001-2008 (8 years)	Hamstring strains were more frequent injury
Dauty M et al. ²² (2011)	To find out the incidence of injury in French professional football players	Football	Prospective cohort	A total of 903 players were recorded	A total of 173 injury was recorded	1995/96-2009/2010 sessions	Hamstring muscle injury represented the most frequent injury.
Ekstrand J et al. ²³ (2011)	To find out the incidence & nature of muscle injuries in male professional footballers.	Football	Prospective cohort	A total of 2299 players were included.	A total of 2908 injuries were recorded.	2001-2009 (9 years)	The two third injuries was acute or traumatic injury & one third injury was overuse injury. The minimal, mild, moderate & severe injury was 15%, 27%, 47% & 11% respectively.
Piry H et al ²⁴ (2011)	To investigate the injury incidence and mechanism of injuries in elite Asian handball	Handball	Retrospective study	A total of 40 players were included.	A total of 96 injuries were recorded.	2007-2008 (1 year)	15% of the total injury was severe. Acute injury was significantly much higher than chronic injury.

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	players.						
Borowski LA et al ²⁴ (2008)	To find out the injury rates and patterns among basketball athletes.	Basketball	Retrospective	-----	A total of 1518 injuries were recorded	2005-2007 (3 years)	The most frequent injuries were ligament sprain (44.0%), muscle/tendon strain (17.7%), contusion (8.6%), and fracture (8.5%) & concussion (7.0%) respectively
Malina RM et al. ²⁵ (2006)	To estimate the incidence and occurrence of injury in youth football.	Football	Prospective	A total of 678 players were included.	A total of 259 injuries were recorded	2000-2001 (1 Year)	Majority of the injury was minor (64%) followed by moderate (18%) & Major injury (13%).
Olsen OE et a ²⁵ (2006)	To examine the injury incidence and pattern of injuries in youth female and male team handball players.	Handball	Prospective study	A total of 1080 players were included.	A total of 118 injury was recorded	-----	Most common type of injury was acute injury (79%) followed by overuse injury (21%).
Deitch JR et al ²⁶ (2006)	To compare the injury rates in women's and men's professions basketball players	Basketball	Retrospective	A total of 1145 players were included	-----	1996-2002 (7 years)	Lateral ankle sprain & anterior Cruciate ligament injury was the most frequent type f sports injury.
Walden M et al ²⁷ (2005)	To find out the risk for injury and injury pattern in Swedish male elite football players.	Football	Prospective Study	A total of 310 players were included	A total of 715 injuries were recorded.	1 year	Thigh strain was the single most common injury. 32.5%, 27.5%, 30.5% & 9.5% were the slight, minor, moderate & major sports injury respectively.
Hickey et al ²⁸ (1997)	To analyze the injuries among basketball players.	Basketball	Retrospective study	A total of 49 female players were recorded	A total of 223 injuries were recorded	1990-1995 (5 years)	Ankle sprain (12.1%), Patellar tendinitis (6.7%), Lower limb stress fracture (5.4%), finger sprain (4.9%) & mechanical low back pain (4.5%) respectively

DISCUSSION:

The objective of this study is to determine the anatomical sites, types & severity of sports injuries among the ball games athletes by reviewing the peer reviewed literature. The feature of this study on anatomical sites, types & severity of sports injury among football, volleyball, basketball & handball varies to a great extent. The most important study design was retrospective & prospective study and had a minimum study period of 1 (one) year. A large number of articles reported that most common injury sites were lower limb followed by upper limbs among football, volleyball, basketball & handball players. Knee, ankle/foot, groin, thigh & finger were the

most common anatomical sites of injury among ball games players.^{16, 17, 19-28} There were a small number of articles that was found as negligible involving upper limb injury among football players. A good number of articles reported that Strain, sprain, tendinitis & contusion were the common type of injury among ball games players^{16, 17, 22, 23, 26} and acute injury was more common than over use injury.^{13, 21, 23} There were a small number of articles that was found as a least involving fracture type injury among ball games players. Most articles reported that majority injury were mild & moderate injury followed by severe injury among ball games players.^{16, 17, 21, 23, 24, 35}

CONCLUSION:

Most common injury sites were lower limb followed by upper limbs & strain, sprain & tendinitis were the common type of injury among ball games players. Majority of the injuries were mild & moderate injury followed by severe injury ball games players.

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