

Assorted Injuries during Sport Activities among Preclinical Medical Students: A Cross Sectional Study in a Medical College of Nepal

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Abstract: The main objective of the study was to find the different sport injuries found among medical students. This cross sectional study was carried out at Manipal Sanjeevani Clinic, Pokhara, Nepal from July 2008- June 2012. Chi square test and Logistic regression model were used for analytical purpose. Among 122 medical students 70.5% were male .Most common sport that provoked injuries were football 36.1%, basketball 28.7%, cricket 20.5%, volleyball 11.5% and badminton 3.3%. Lower limb was commonly affected in 63.9% cases. Joint that was involved was ankle joint 41.8% followed by wrist joint 19.7%. Contusion was the commonest form of injury 56.6% followed by sprain 37.7% and fracture 5.7%. In 25.4% of the cases hospitalization were required. Male students [OR 3.835(CI 1.695, 8.678) having lower limb injury as compared to females. Male students has [OR 8.095(CI 1.698, 38.595)], [OR 14.571(CI 1.472, 144.28)], [OR 41.286(4.572, 372.788)] and [OR 8.831(2.926, 26.651)] tendency of injury to elbow joint, shoulder joint, knee joint and ankle joint as compared to the females. With proper interventions such injuries can be restricted.

Keywords: Sport injuries, Nepal, Medical students ,Nepal , Contusion .

1. Introduction

Sport injury may be regarded as an inseparable part of sport activities. Sports or similar physical activities promote physical fitness and cognition [1-5]. These changes may boost academic profile of students [5]. Therefore students are often encouraged to participate in sports. Participating in sports may sometimes may

lead to sport injury . Males are generally more prone to sports injury in comparison to females [6]. Games like football, basketball are often found to be associated with sports injury [7-11]. Lower limbs seems to be more susceptible to sport injury [12]. Sprain, fracture , muscle strain, contusion ,etc are some well known sports injury [13]. Literature review showed that ,the data related to sport injuries is lacking in western region in particular and Nepal in

general. The main objective of the study was thus to find the commonest type of sport injuries that occurs to preclinical medical students of the Deep Campus of Manipal College of Medical Sciences (MCOMS). The specific objective of the study was to find out whether lower or upper extremities were commonly affected and the joint that is commonly involved during sport injuries, with an idea to reduce the disease burden with proper interventions in Western Development region of Nepal.

2. Materials and Methods

Participants and Data Collection: This research involves a cross sectional study which was conducted at Manipal Sanjeevani Clinic, Manipal College of Medical Sciences (MCOMS), Pokhara, Nepal, situated in Western Nepal. The study had approval from institutional ethical committee. The study was carried out between July 2008- June 2012 at Manipal Sanjeevani Clinic, Deep campus, Pokhara, Nepal. Information and data collected about different types of Sport activities viz. Football, Cricket, Basketball, Badminton and Volleyball during the annual sport meet. The collected data include-Demographic details such as gender (male and female), nationality (Indian, Srilankan, Maldivian and Nepalese), extremities involved (upper/ lower), type of injury (sprain, fracture and contusion), joint involved (wrist, elbow, shoulder, hip, knee, ankle), hospitalization required (yes/no). A total number of 122 cases who undergone any type of injuries during the annual sports meet were included in the study. All the clinical students were excluded as the research aims to study about the sport injuries among preclinical students from Deep Campus, Manipal College of Medical Sciences. For 95% confidence interval and significance level $\alpha=5\%$, $P=80\%$, $Q=20\%$, allowable error=10% of P, required sample size was 86. Prior to the study a pilot study was done in 20 patients found that 80% of the students were having contusion as a form of injury. We got adequate sample size of 122 [14]. The main outcome variable was the commonest type of sport injuries that occurs among preclinical medical students. The demographic and various sport injuries have been defined at individual level. Factors which were taken into consideration at individual level were gender (male and female), nationality (Indian, Srilankan, Maldivian and Nepalese), extremities involved (upper/ lower), type of injury (sprain, fracture and contusion), joint involved (wrist, elbow, shoulder, hip, knee, ankle), hospitalization required (yes/no) were taken into consideration.

Statistical analysis: The data collected was analyzed using Excel 2003, R 2.8.0 Statistical Package for the Social Sciences (SPSS) for Windows Version 16.0 (SPSS Inc; Chicago, IL, USA) and EPI Info 3.5.1 Windows Version. chi square test was used to observe

the difference between different variables and strength of the relationship with logistic regression. We calculated odds ratios and adjusted odds ratio) and their 95% confidence intervals (95% CI). $p < 0.05$ was considered as statistically significant [15].

3. Results

Out of 122 medical students who got sport injuries 70.5% were male students and rest were females. Most of them were Nepalese 36.9% followed by Indians 35.2%, Srilankan 26.2% respectively. Most common sport that provoked injuries were football 36.1%, basketball 28.7%, cricket 20.5%, volleyball 11.5% and badminton 3.3%. Lower limb was commonly affected in 63.9% cases. Commonest joint that was involved was ankle joint 41.8% followed by wrist joint 19.7%. Contusion was the commonest form of sport injury 56.6% followed by sprain 37.7% and fracture 5.7%. In 25.4% of the cases hospitalization were required (**Table 1**).

Table 1: Frequency of Demographic details, Sports and Injuries During Sport Activities

Demographic details and sport injuries		Frequency (n=122)	Percentage
Gender	Male	86	70.5%
	Female	36	29.5%
Nationality	Indian	43	35.2%
	Nepalese	45	36.9%
	Srilankan	32	26.2%
	Maldivian	2	1.6%
Sports	Badminton	4	3.3%
	Volleyball	14	11.5%
	Cricket	25	20.5%
	Football	44	36.1%
Site of Injury	Basketball	35	28.7%
	Upper Limb	44	36.1%
	Lower Limb	78	63.9%
Joint Involved	Wrist Joint	24	19.7%
	Elbow Joint	13	10.7%
	Shoulder Joint	7	5.7%
	Hip Joint	9	7.4%
	Knee Joint	18	14.8%
	Ankle Joint	51	41.8%
Type of Injury	Fracture	7	5.7%
	Sprain	46	37.7%
	Contusion	69	56.6%
Hospitalization	Yes	31	25.4%
	No	91	74.6%

Table 2: Cross Tabulation Between Demographic Details, Various Sports and Injuries During Sport

Sport Injuries	Site of Injury		Joint Involved						Type of Injury			
	Upper Limb	Lower Limb	Wrist	Elbow	Shoulder	Hip	Knee	Ankle	Fracture	Contusion	Sprain	
Gender	Male	23 (52.3)	63 (80.8)	7 (29.2)	10 (76.9)	6 (85.7)	6 (66.7)	17 (94.4)	40 (78.4)	7 (100)	43 (62.3)	36 (78.3)
	Female	21 (47.7)	15 (19.2)	17 (70.8)	3 (23.1)	1 (14.3)	3 (33.3)	1 (5.6)	11 (21.6)	0 (0)	26 (37.7)	10 (21.7)
	P value	0.002†		0.000†						0.03†		
Nationality	Srilankan	13 (29.5)	19 (24.4)	6 (25)	6 (46.2)	1 (14.3)	3 (33.3)	4 (22.2)	12 (23.5)	1 (14.3)	19 (27.5)	12 (26.1)
	Indian	15 (34.1)	28 (35.9)	8 (33.3)	2 (15.4)	5 (71.4)	1 (11.1)	7 (38.9)	20 (39.2)	2 (28.6)	25 (36.2)	16 (34.8)
	Nepali	15 (34.1)	30 (38.5)	9 (37.5)	5 (38.5)	1 (14.3)	5 (71.4)	7 (38.9)	18 (35.3)	4 (57.1)	24 (34.8)	17 (37)
	Maldivian	1 (0.8)	1 (1.3)	1 (4.2)	0 (0)	0 (0)	0 (0)	0 (0)	12 (0)	0 (0)	1 (1.4)	1 (2.2)
	P value	0.89×		0.658×						0.952×		
Sports	Badminton	3 (6.8)	1 (1.3)	3 (12.5)	0 (0)	0 (0)	0 (0)	0 (0)	1 (2)	0 (0)	4 (3.3)	0 (0)
	Volleyball	9 (20.5)	5 (6.4)	8 (33.3)	0 (0)	1 (14.3)	0 (0)	5 (27.8)	0 (0)	0 (0)	14 (20.3)	0 (0)
	Cricket	10 (22.7)	15 (19.2)	4 (16.7)	0 (0)	6 (85.7)	2 (22.2)	2 (11.1)	11 (21.6)	0 (0)	14 (20.3)	11 (23.9)
	Football	10 (22.7)	34 (43.6)	3 (12.5)	7 (53.8)	0 (0)	3 (33.3)	7 (38.9)	24 (47.1)	6 (85.7)	18 (26.1)	20 (43.5)
	Basketball	12 (27.3)	23 (29.5)	6 (25)	6 (46.2)	0 (0)	4 (44.4)	4 (22.2)	15 (29.4)	1 (14.3)	19 (27.5)	15 (32.6)
	P value	0.02†		0.000†						0.003†		

† p<0.05, statistically significant , × p>0.05, statistically not significant

It was found that male students were having more tendency of getting lower limb injury 80.8% as compared to females 19.2%. Female students were having 70.8% tendency of injury of wrist joint as compared to any other joint. In case of males it was the ankle joint 78.4% as compared to any other joint. Male students suffered from contusion 62.3% , sprain 78.3%. Among the various type of sport activities football caused 43.6% of injury followed by basketball 29.5% to the lower limb. Wrist joint was commonly affected by volleyball 33.3%, shoulder joint in cricket 85.7%, hip

joint in basketball 46.2%, knee joint and ankle joint were commonly affected in football 38.9% and 47.1% respectively. Fracture and sprain was most commonly seen in football 85.7% and 43.5% respectively whereas contusion was commonly seen in basketball 27.5% . All the findings were found to be statistically significant p<0.05 (**Table 2**). Male students has [OR 8.095(CI 1.698, 38.595)], [OR 14.571(CI 1.472, 144.28)], [OR 41.286(4.572, 372.788)] and [OR 8.831 (2.926, 26.651)] tendency of injury to elbow joint, shoulder joint, knee joint and ankle joint as compared to the females.All the findings was found to be statistically significant p <0.05.(**Table 3**).

Table 3: Determinants of Sport Injuries by Binary Logistic Regression Analysis

Sport Injuries		Male
		Odds ratio and Confidence interval
Site of Injury	Upper Limb	1
	Lower Limb	3.835 (1.695, 8.678) †
Joint Involved	Wrist Joint	1
	Elbow Joint	8.095(1.698, 38.595) †
	Shoulder Joint	14.571(1.472, 144.28) †
	Hip Joint	4.857(0.941, 25.084) ×
	Knee Joint	41.286(4.572, 372.788) †
	Ankle Joint	8.831(2.926, 26.651) †

4. Discussion

Findings from this study showed that sport injuries were common among the male students as compared to the females. Similar findings were seen in a study undertaken at Canada by Fridman et al. which also showed that male has more chances of sport injuries as compared to females [6]. This could be due to the fact that the male students participate more in sports as compared to the females. Most common sport that provoked injuries were football 36.1%, basketball 28.7%, cricket 20.5%, volleyball 11.5% and badminton 3.3%. Various studies across the globe also suggested that contact game like football, basketball has the highest chances of causing injuries [7-11]. Lower limb was commonly affected in 63.9% cases. A study by Goossens et al. also has reported that the lower limbs are commonly affected by sports [12]. Commonest joint that was involved was ankle joint followed by wrist joint. Contusion was the commonest form of injury followed by sprain and fracture. In about one fourth of the cases hospitalization were required as it was very severe form of injury. This finding is quite similar to the study done by Emery et al. who also showed that commonest form of injuries were sprain, contusion, concussion, fracture, and muscle strain [13]. It was found that male students were having more tendency of getting lower limb injury as compared to females. Female students were having more tendency of injury of wrist joint as compared to any other joint. In case of males it was the ankle joint was commonly involved as compared to any other joint. It is evident from this research that males are suffering from injuries to the lower limb whereas in case of the females it is the upper limb that is commonly affected. This could be due to the fact that males are interested to play the body contact

games viz. football and basketball whereas females were more interested in badminton and other non body contact games. Among the various type of sport activities football caused maximum chances of injury followed by basketball to the lower limb. This finding is parallel to a study by Lincoln et al. in 2011, which showed that football was associated with concussions [16]. Wrist joint was commonly affected by games like volleyball, shoulder joint in cricket, hip joint in basketball, knee joint and ankle joint were commonly affected in football. Fracture and sprain was most commonly seen in football whereas contusion was commonly seen in basketball. Similar findings were also reported from Canada by Fridman et.al [6]. A study conducted at school in Honolulu showed that among all the games football caused the highest injury as compared to any other sport [17].

5. Conclusion

It is concluded from this study that sports like football and basketball causes more chances of sport injuries. The findings of the study are important as it extended our knowledge in context to sports injury among medical students participating in sport activities. Awareness regarding the risks of sports injury and knowledge about its prevention should be promoted. This may reduce the disease burden among the students. Certain preventive measures like insoles, external joint supports and specific training programmes may reduce the risk of sports injuries¹⁸.

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