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Pattern of sports injury among the junior high school footballers in Dhaka city of Bangladesh

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Abstract:

Globally, football as a sport has recorded the highest rate of injury morbidity compared with other sports due to the high degree of contact between the players. Coaches play an important role in reducing injuries among the players. The objective of this study was to explore the pattern of football-related sports injuries among junior high school footballers in Dhaka, Bangladesh. A descriptive cross-sectional study was conducted between January 2019 to March 2019 in 20 junior high schools in Dhaka Metropolitan city. We observed 368 boys in the age range of 10 to 18 years old. A pre-structured questionnaire was provided to six trained junior physiotherapists to conduct the face-to-face interview with the boys in the school setting. Most students were from middle-income families. The injury prevalence of defenders was the most (157, 42.7%) followed by mid-fielders (132, 35.94%), forwards (63, 17.1%), and goalkeepers (16, 4.3%). Tackling was the main cause of injury in 21.1% of cases followed by foul play in 19.1% of the cases. In July, there were more injuries (69.0%) and associated muscle strain. Injured footballers did not visit sports physiotherapists as much as they did other health profession and the association was significant. When considering scientific knowledge, students were aware of fitness, flexibility & endurance (25.5%), sports massage (24.5%), the relation of body structure with sports Injury (21.2%), warm-up and/or cool down (19.6%). Based on the study, it was seen that students had no scientific knowledge of sports. As sports is a key activity for school-going children, comprehensive sports injury preventive knowledge is needed for students and sports teachers and coaches. Access to sports physiotherapists is also needed to prevent and manage sports injury at the field level and for rehabilitation.

Keywords: *Sports injury, health-seeking behaviour, junior school footballers, Bangladesh*

Introduction:

Globally, the burden of childhood unintentional injuries is highest in South-East Asia and Africa [1, 2]. In 2006, unintentional injury was ranked the leading cause of death [3]. The social costs resulting from injury are almost equal to the costs due to heart disease and cancer combined [4]. Unintentional injuries as a subset of injuries which included motor vehicle injuries, suffocation, drowning, poisoning, burns, falls, sports and recreation [5]. The health benefits of organized sports as part of a physically active lifestyle are undeniable; however, athletes are at risk for sustaining a

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wide variety of injuries [6]. An estimated 250,000 knee injuries occur at the high school level each year, a rate of 2.98 per 10000 athlete-exposures [7]. The economic costs of sports injuries among high school athletes in North Carolina were estimated to be $9.9 million in medical costs, $44.7 million in human capital costs and $144.6 million in comprehensive costs plus lost quality of life [3].

Football or soccer considered as the world's most popular sport with over 240 million regular participants (Fédération Internationale de Football Association (FIFA), 2008) [8]. As with other sports however, those participating in football are at risk for injury. Football and/ or soccer had the highest injury rate (4.36 injuries per 1,000 high school athletes) followed by wrestling (2.50) compared to the overall injury rate of 2.44 per 1,000 high school athletes [6]. Due to high degree of contact between players football has been recorded as highest rate of injury compare to other sports [7]. Lower extremity injuries accounted more than 50% of injuries, and more than 57% of football injuries resulted from player contact. In terms of the most common injured body part and injury types are knee internal derangements, ankle ligament sprains, upper leg muscle tendon strains, and concussions during football games and practices [8]. The annual incidence of direct catastrophic football injuries was 1.34 per 100,000 high school and college players [9]. Sports-related injuries are commonly seen in the emergency department (ED) setting and account for 23% of all injury-related visits with frequent lower extremity involvement [10]. Remarkable rates of cervical spinal cord injuries in USA found among the high school football players [11]. The similar study found, 88% internal derangement of the knee and 47% patellar injuries. 26% of the footballers with ligament injuries had further injury to the involved knee [12].

Although high school sports injuries need to be considered as a significant public health problem and should be approached from a prevention perspective, most previous studies have focused on assessing injuries through simple injury reporting systems or clinical aspects of specific sport injuries. In addition, very few studies have addressed sports injury prevention for high school athletes; those that have focused on limited issues, such as the development of safety rules and the importance of sports equipment. So, this study aimed to assess the pattern of sports injury among the junior high school footballer of Dhaka city of Bangladesh. Thus, the intent of this investigation was to evaluate the health seeking behavior and to understand the pattern of injury among the professional junior high school footballers in Bangladesh.

Materials and methods:

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Study population and place of the study:

Junior (boys) high school footballers were the study population of this study and those who were interested to give interview after the school hour and who had experiences to play at least one year with the school team. The study was conducted in Dhaka metro-politan city of Bangladesh. Twenty educational institutions were selected from north and south city corporations of Dhaka. Among the 20th schools 13 were selected from south and 7 from north city corporation. The names of the institutions are 1. Residential Model School & College, 2. Bir Shreshtha Noor Mohammad Rifles Public School & College, 3. Bir Shreshtha Munshi Abdur Rouf Rifles College, 4. Shaheed Ramizuddin School and College, 5. Will's little Flower High School, 6. Shourovi School, 7. ARBAN School, 8. Badda High School, 9. Kamlapur High School, 10. Purbo Jurain Adarsha High School, 11. Khilgaon Government Colony High School, 12. Baunia Bandh Ideal High School, 13. Polashnagar Model School, 14. UDC School, 15. Hermann Gmeiner School & College, 16. Shahid Smrity High School, 17. Government Laboratory High School, 18. Dhanmondi Government Boys High School, 19. Mohammadpur Government High School, 20. Nilkhet High School.

Study design and study duration:

A descriptive cross-sectional study design was adopted in this study from 01 January 2019 to 31 March 2019.

Sampling:

We have purposively selected 50 institutions where game teachers are available and they have the opportunity for organizing games and from us we send a letter for participation in this research study. Among them 20 institutions agreed to participate voluntarily in this study. We interviewed each football team from the selected schools and the average footballer found 18/ school.

Data collection procedure:

After getting written informed consent from junior high school footballers and their teachers, a pretested semi-structured questionnaire was used to collect the data. Six junior physiotherapists were involved in this study to conduct face-to-face interviews. The game teachers also assisted the students in completion of the interview if they faced any confusions. The average time of the interview was 10-15 minutes.

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All interview questionnaires were checked for completeness or correctness before the data entry. Data was then entered, cleaned and edited into the computer using the statistical software SPSS (Version 23).

Data Analysis:

Standard descriptive statistics were used to analyze the injury status of the adolescent school footballers. Sports injuries were presented by age, education, fathers' occupation according to the wealth index.

Result:

In this study we have interviewed a total 368 number of junior high school footballers (Table 1). Overall, most of the young school footballers (80.4%, n= 296) are from 13-15 years age group and majority of the respondents (38.6%) are from class VIII, 38.9% of their parents are either private employee and/or government employee. Junior high school footballers by their wealth quantile were Middle income group 32.3%, Lower middle-income group 29.1%, High income group 22.6% and Highest income group were 16% respectively and most of them (35.1%) reported that they got injured themselves three times in the past year during their football match or practices.

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Table 1: Socio-Demographic Status of the injured students

Characteristics	*N= 368*	%
Age Group		
10-12 years	36	9.8
13-15 years	296	80.4
16+ years	36	9.8
Student's Class		
Class VI	107	29.1
Class VII	119	32.3
Class VIII	142	38.6
Occupation of the parents		
Business	59	16.0
Doctor	12	3.3
Private employee and or Government employee	143	38.9
Teachers	84	22.8
Agriculture/Poultry farming	57	15.5
Retired/unemployed	13	3.5
Wealth quantile		
Lower middle-income group	107	29.1
Middle income group	119	32.3
High income group	83	22.6
Highest income group	59	16.0
Frequency of injury in the past year		
Once	103	28.0
Twice	107	29.1
Thrice	129	35.1
More than three times	29	7.9

**Education and occupation of the head of household*

In general, according to the injured sites 66.3% reported in the knee/ankle/foot region, 44.4% in the forearm/wrist/arm, 38.6% in the head/neck/spine and 28.7% in the hip/leg/thigh region. Muscle strain reported higher than the other types of injuries. Highest number of muscle strain found in the knee/ankle/foot region (40.2%) 33.7% were in the head/neck/spine areas, 28.0% muscular strain found in the forearm/wrist/arm and 10.4% in hip/leg/thigh region. Then torn in the cartilage, concussion and fracture in different parts of the body also reported (Figure 1).

Injury severity of the junior high school footballers was calculated by using indicators like anatomic and physiologic outputs of an injured student, post injury immobility, post-injury hospitalization, surgical treatment, and the number of days lost at school. The severity of junior

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high school footballers were categorized into tertiles—mild, moderate and severe. Results found that 77.1% of injured cases had moderate severity and 18.2% had mild severity. Only 4.7% had been severely injured during football matches or practices [13] (Table 2).

Figure 1: Distribution of injury types in % with injury site

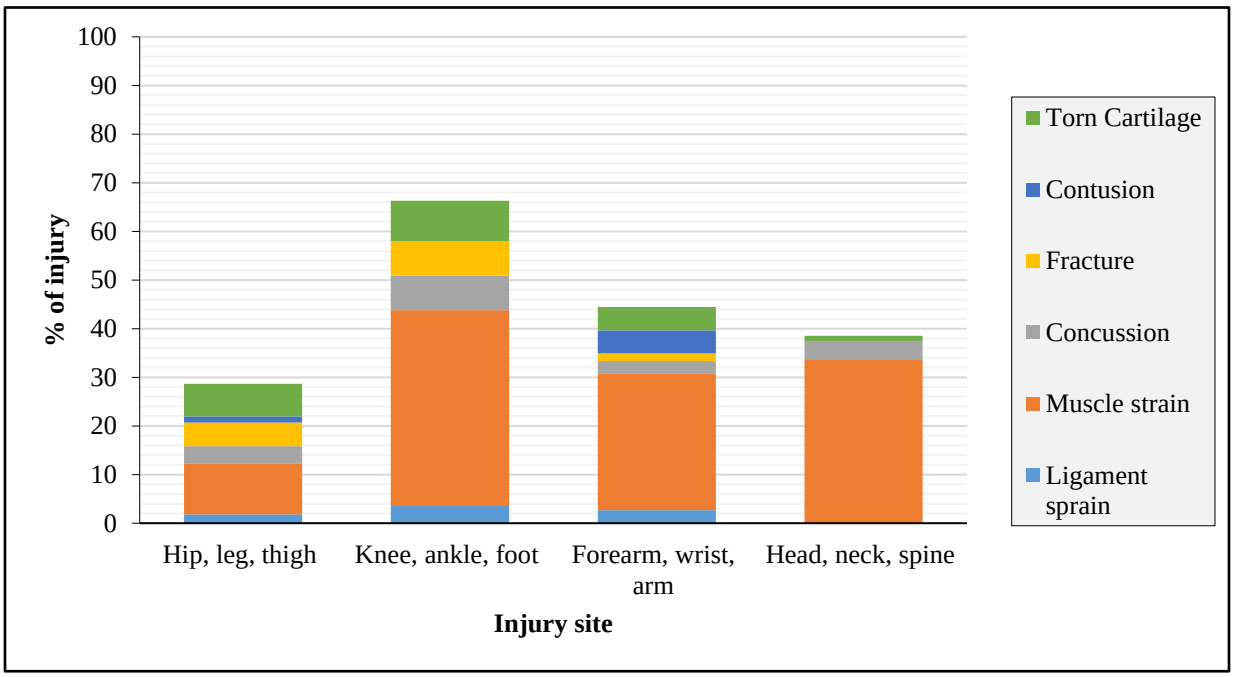

Table 2: Injury severity

Injury severity	n	%
Mild	50	18.2
Moderate	212	77.1
Severe	13	4.7

In terms of health seeking behaviour, most of the injured students or their parents seek health care services from a medical doctor (42.5%) (Table 3). There was also found that students try to take self-medications from pharmacy (22.5%) (Table 3). Treatment seeking behaviour from both sports physio/sports injury specialist and self/ from home remedies found 13 among the junior high school footballers.

Defenders experienced most of the injuries 42.7% and then midfielders 35.9% (Table 4). The common causes of sports injury found during tackling (21.1%), then while collision (20.8%) and foul play (19.1%) respectively (Table 4).

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Regarding sports injury related knowledge among the students found that fitness, flexibility & endurance knowledge found more than the others section of the sports science which was reported highest (25.5%) and then sports massage (24.5%) than other knowledge (Table 5).

Table 3: Injured students treatment seeking behavior

Health care service provider	n	%
Pharmacy	62	22.5
Medical Doctor	117	42.5
Orthopedic doctor	12	4.4
Neuro-medicine	12	4.4
Sports physio/sports injury specialist	36	13.1
Self/home	36	13.1

Table 4: Location of injuries by playing position and Causes of injury during football match

Variable	n	%
***Location of injuries by playing position**		
FW	63	17.1
MF	132	35.9
DF	157	42.7
GK	16	4.3
****Causes of Injury**		
Collision	183	20.8
Running	43	4.9
Tackle	185	21.1
Stumble/fall	112	12.8
Jumping	41	4.7
Foul play	168	19.1
Twist/turn	21	2.4
Contact with ball	39	4.4
Kicking/Passing the ball	86	9.8

***FW-Forward, MF-Midfielder, DF-Defender, GK-Goalkeeper; ****Multiple responses

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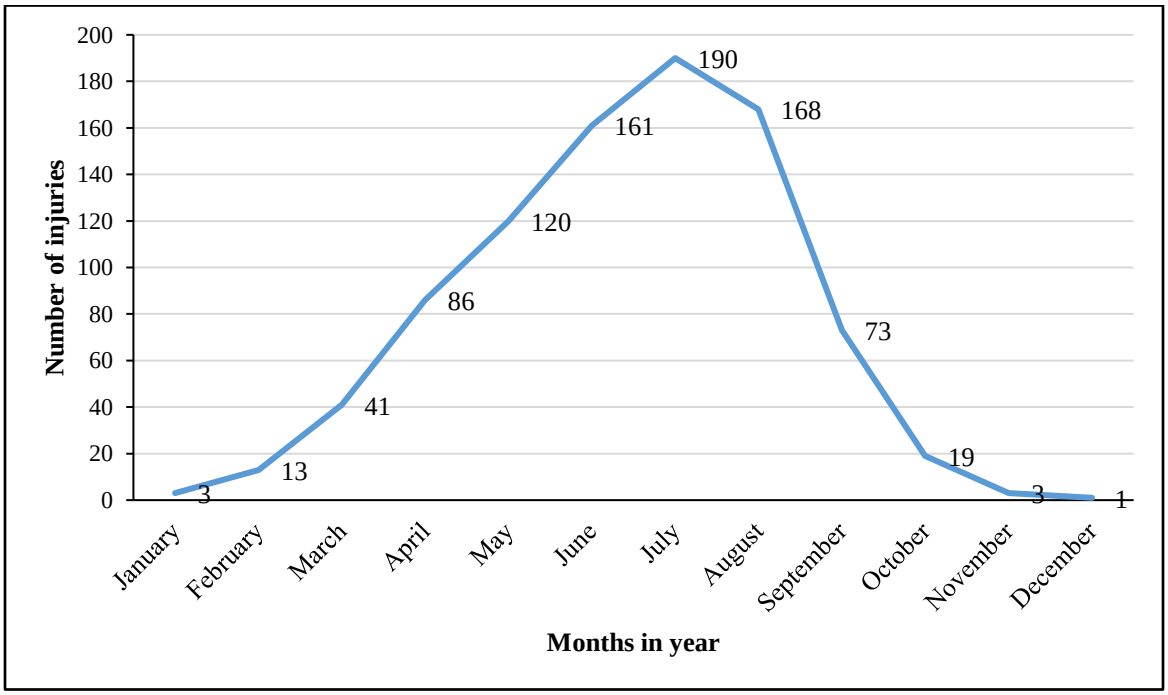
Table 5: Sports injury related knowledge among the students

Sports Injury related knowledge	n	%
Fitness, flexibility & Endurance	94	25.5
Relation of body structure with sports Injury	78	21.2
Sports gears	9	2.4
Warm up and/or cool down	72	19.6
Taping	16	4.3
Sports massage	90	24.5
Rehabilitation protocol	9	2.4

Maximum number of sports related injuries occurred in the rainy season of Bangladesh with a peak between May and September and highest was in the month of July (n= 190) (Figure 2).

Figure 2: Seasonal variation in injury incidence



Discussion:

More than three-fourth footballer received sports injury by last one year. Which is a crucial public health concern for the nation. Among 368 footballers, majority of there are group between 13-15

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years. The father's occupation of the footballers was government and private service in most of the cases.

A number of psychological factors associated with injuries in various sports have been concerned, such as anxiety, frustration, depression, low self-esteem, anger, depression, fatigue, insomnia, loss of appetite, disbelief and low coping skills those factors are influencing not return to sports participation. Post-injury are demotivation for lack of confidence and the fear of re-injury [2, 14]. Thirty percent of female footballers terminate their careers due to injury [15]. In this study, we revealed that, overall, 13-15 years students who studied in class VIII with middle income status participated more in study. Sport injury rate increases with the level of play (grade in school) like; player age, and experience [7]. The findings of this study are kind of similar to some of the previous studies. We found the lower extremity (knee, ankle and foot) is the highest frequently injured body part among the footballer and almost seventy-seven percent injuries are moderate type of severity including strain, sprain and torn cartilage. The similar findings observed in other studies [12, 16]. Injury prevalence based on position of play showed that defenders (157, 42.7%) were mostly affected followed by mid-fielders (132, 35.94%), forwards (63, 17.1%) and goalkeepers (16, 4.3%) as similar findings stated published article [17]. Tackling is the main cause of injury in 21.1% cases followed by foul play in 19.1% cases. July month found the pick (69.0%) level of injury among the twelve months season. Most of the researchers observed that a lower number of athletes consulted by the physiotherapists than physicians where physician managed 47.4% and athletes treated by physiotherapist 39.6% [18] In this study also found the least number visited to physiotherapy and highest numbers to others profession (Table-3). Sports knowledge specially Fitness, flexibility & Endurance (25.5%), sports massage (24.5%), Relation of body structure with sports Injury (21.2%), warm up and/or cool down (19.6%) and found higher compared to Sports gears, taping and rehabilitation protocol (Table-5).

Sport injury rate increases with the level of play (grade in school) like; player age, and experience [19]. The lower extremity (knee and ankle joints) is most frequently injured body part among the footballer and most injuries severity are mild, including contusion, strain and sprain [11, 12]. Remarkable rates of cervical spinal cord injuries in USA found among the high school football players [20].

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injuries seventy percent were ligament injuries; eighty-eight, internal derangement of the knee; and forty-seven, patellar injuries. Twenty-six per cent of the patients with ligament injuries had further injury to the involved knee [11].

In the current study, we revealed that, Overall, 13-15 years students who studied in class VII and whose fathers involved in service with middle income status were participated more in study compared to others categories. In terms of injury frequency in the past one-year 2018, the most injury frequency were three times. Once and twice also found higher compared to more than three (3+) times. The injury on hip/leg/thigh region found higher than that of others three body parts.

In cases of injury types in body parts, muscle strain experienced in most of the cases while contusion found least percentage on hip/leg/thigh compared to knee/ankle/foot and forearm/wrist/arm. The most of the footballers experienced moderate types of injury which was four to sixteen times higher than severe and mild types of injury severity. In terms of treatment seeking behavior, the most of the students received health care from medical doctors which was three to four times higher than individually pharmacy, orthopedic, neuro-medicine, sports physio and self. The most of the students experienced injury who played defense level one to nine times higher than goal keeper, mid field and forwards position. The most important cause of injury during tackling which was one to eight times higher than Collision, running, stumble/fall, jumping, foul play, twist/turn, contact with ball and kicking/Passing the ball. Fitness, flexibility & Endurance knowledge found more than the others section of the sports science which was the one to ten times higher than relation of body structure with sports Injury, sports gears, warm up and/or cool down, taping, sports massage and rehabilitation protocol respectively. Finally, the numbers injury fluctuated over the year. In January the injury was only (n=3) which gradually increase and pick in July (n=190) finally at the end of the year in December the injury again decreased drastically (n=1).

Conclusion:

The increasing trend of sports injury among the junior high school footballers are the public health concern in Bangladesh. This study found that more than one third of the students received sports injury in the last year. Most of the injuries occurred to forearm, wrist, arm, followed by to Knee, Ankle, Foot. By nature of injury severity majority were moderate type and highest type of injury

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were reported muscle strain. In treatment seeking behavior most of them visited medical doctor and 22.5% found took treatment from pharmacy. Knowledge on sports science and sports related injuries among the student also found poor. Further research is needed to explore the incidence to prevent sports injury among the junior high school footballers to prevent early drop-out as they might be the future of Bangladesh national football team.

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Competing interests: None declared

Contributors:

KH, AAB, AH and NY conceived the paper, contributed to the data analysis, and reviewed the final draft for intellectual content. KH and AAB wrote the initial drafts of the manuscript. AAB reviewed multiple drafts of the manuscript for intellectual content. KH, AAB, EA, HBA, AH and NY reviewed the final draft of the manuscript for intellectual content. All co-authors provided editing support in finalizing the manuscript.

Patient consent for publication: Not Required

Ethical approval:

Ethical issues were followed strictly during collecting information for the study during completion of Master in Public Health (MPH) program. The study proposal was approved by the Public Health department of State University of Bangladesh (SUB) (Reg. No. ERCSUB -2020-006), under the study Pattern of sports injury among the junior high school footballers in Dhaka city of Bangladesh and the information were given in an easy and local language (Bengali). The respondents were informed clearly that their personal identity would be kept confidential and the data would be used only for study purposes. Then a written informed consent was taken before the interview from the sports teacher of the respective schools and also from the parents of injured students. The respondent was allowed the right to quit the interview at any time before or once the interview has started. Confidentiality was strictly maintained. Neither any drug nor any invasive procedure was applied.

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Appendix 1:

Questionnaire:

1. ID No:
2. Name of School:
3. School Code:
4. Date of Data collection:
5. Age:
6. Which class you are reading?
7. What is your father profession?

(a). Business (b) Private Employee (c) Govt. employee (d) Others

8. What is your father's annual income?

(1). 1, 20, 000 – 1, 80,000 (2) 1, 80,000 – 2, 70,000

(3) 270,000 – 4, 05,000 (4) 4, 05,000 – Above

9. How is your housing condition?

(1) Tin shed (2) Semi Building (3) Rental house/apartment (4) Own building/ apartment

Pattern of sports injury as a body part

10. Have you ever got injury in hip /leg/thigh?

(1) Yes (2) No

11. Have you ever got injury in forearm/wrist/hand?

(1) Yes (2) No

12. Have you ever got injury in knee/ankle/foot?

(1) Yes (2) No

13. Have you ever got injury in head, neck and spine?

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(1) Yes (2) No

14. Which position you have played?

(1) Forward (2) Midfielder (3) Defender (4) Goalkeeper

15. How you got injured? (Multiple answer)

1. Collision 2. Running 3. Tackle 4. Stumble/fall 5. Jumping 6. Foul play 7. Twist/turn 8. Contact with ball 9. Kicking/Passing the ball

Question related to types of sports injuries

16. Put tick mark to the following types of injury you have gotten:

(1). Ligament sprain (2) muscle strain (3) Concussions (4) Fracture

(5) Nerve injury (6) Ligament tear (7) Contusion (8) Dislocation (9) Laceration

Question related to pattern of sports injuries

17. How many times have you got injured yourselves due to sports (football) in the last one year?

(1) One (2) Two (3) Three (4) More than three

18. How many days you were absent in the school due to sports (football) in the last one year?

Ans: …….. (in days)

19. Did you need to hospitalized?

(1) Yes (2) No

20, If yes, then how many days you were admitted in the hospital?

Ans: …….. (in days)

21. Did you need any surgery?

(1) Yes (2) No

22. How much many you spent for the hospital treatment?

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Ans: …….. (in thousands Taka)

23. Do you know what rehabilitation protocol is?

(1) Yes (2) No

Predisposing factors related Question

24. What is Fouls and misconduct in football?

(1) Ball passing back way (2) Ball touch on the face (3) Illegal body contact (4) Body contact without ball

25. Why have been given Yellow Card?

(1) It a caution that given to a player (2) It's a permission for enter the field.

(3) It's a sign of fair play (4) It's means this is hand ball.

26. Why have been given Red Card?

(1) Its means he/she is expelled from the match. (2) It's a permission for enter the field.

(3) It's a sign of fair play (4) It's means player did foul.

27. Which one is not including within the fair play?

(1) Play to win but accept defeat properly (2) Show red card to the illegally body contact player. (3) Respect everyone involved in the game. (4) Promote football's interests.

28. Fitness, Flexibility, Endurance can prevent sports injury?

(1) True (2) False

29. Body structure not related to the injury?

(1) True (2) False

30. Protective gears is important to put only for high risk competition?

(1) True (2) False

31. Warm up and Cool down is not a part of game?

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(1) True (2) False

32. Taping is use to perform well in the competition?

(1) True (2) False

33. Sports massage is need for only relaxation to the body muscle.

(1) True (2) False

Treatment seeking behavior related question

34. From where you have taken treatment after sports injury?

(1) Pharmacy (2) Medicine Doctor (3) Orthopedic Doctor

(4) Neuro-medicine (5) Sports Physio (6) Sports injury specialists (7) Others

---------- **END**----------