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Pattern of sports injuries among Nigerian school-age football players from selected secondary schools

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Abstract. Data on pattern and mechanism of sport injuries among Nigerian professional and amateur football players are sparse, despite its importance in designing injury prevention programs. This study was aimed to assess the pattern and mechanism of sport injury among school-age football players in Ile-Ife, Nigeria. *Material and Method.* A total of 70 school-age football players whose ages ranged from 13 to 19 years, who were drawn from four selected secondary schools in Ile-Ife, Osun State, South-West, Nigeria participated in this study. A 19-item self-administered questionnaire on the prevalence of injuries among elite Gaelic footballers containing open and close ended questions was used to collect data. Descriptive and inferential statistics were used to analyze the data. Alpha level was set at $p<0.05$. *Results.* A total prevalence of 74.3% was reported for sport injuries among the respondents with the knee (32.9%) and ankle (14.3%) being the most affected anatomical sites. Wounds (41.4%) and muscle sprain (14.3%) were the most reported type of sport injuries. These injuries were mostly associated with tackles (21.4%), foul play (14.3%) and condition of the pitch (35.7%) respectively. Injury sustained due to football were significantly associated with each of 'number of training sessions per week with school team' ($X^2=7.111$; $p=0.013$), 'warm up involvement with school team' ($X^2=3.127$; $p=0.024$) and 'protective equipment used' ($X^2=20.515$; $p=0.001$). However, injury sustained due to football were not significantly associated with each of participation in other sports, number of training sessions per week with other teams, warm up involvement with other teams and leg intended to kick the ball ($p>0.05$). *Conclusion*. There was high prevalence of injury sustained due to football among Nigerian school-age football players. These injuries were mostly due to physical contact while playing on poor pitches, inadequate warm up and unfriendly attack by opponents.
***Key words**: Nigeria, school-age, football, injury, prevalence.*

Introduction

For a long time, football has been and is still considered to be the most popular sport worldwide (1-3). The number of participants is still growing everyday according to the latest data from the FIFA (*Fédération Internationale de Football Association*), the number increased from 242 million (1.548 million teams) in 2000 to 265 million (1.752 million teams) in 2006 (4). In Nigeria, football development and modernization has increased exponentially (5) with Nigeria recording the highest number of footballers in Africa in both male and female category (4, 6). The aim of football is to keep or to have possession of the ball. Hence numerous collision and tackles occur during training and matches to be in possession of the ball. Also, football is a high intensity sport with frequent sprints and abrupt movement changes with high velocity during training and matches. These high intensity moments and the direct player to player contact are the main reasons for contracting injuries (1, 7). Accordingly, studies have shown that the prevalence of football related injuries is still increasing among the youth population (1, 8, 9). In line with the foregoing, a study by Owoeye et al. reported that injuries was high among Nigerian semi-professional football players (10), more specifically, that around 32.5% of male youth football players had positive history of injuries (11).

Globally, injury incidences during football are high among school-age football players as a result of high demand on their performance to become a professional in the game (12). Reports indicate that most of the injuries in school-age football player occur in the lower extremities especially in the knee and ankle, and are typically sprains, strains, contusions and at times fractures (1-3). Recording injuries from playing football

among school-age children is associated with loss of interest in football as a career, disqualification or withdraw from trials and time-loss after a competition due to lack of proper reconditioning (13). Understanding of pattern and mechanism of injuries sustained by the school-age football players are necessary to be able to design injury prevention programs and forestall drop-outs from football career among youths before it starts. Anecdotally, football is the leading sports for participation among Nigerian secondary school students. However, data on the pattern of injuries among school-age football players are sparse, hence this study.

Material and method

School-age football players from four selected government secondary schools in Ife Central Local Government Area, Ile-Ife, Osun State, South-West, Nigeria were recruited for this study. Selection of the schools was by convenience and was based on their high level of participation in local organized football competition. The schools involved in this survey were Oduduwa College, St. David Grammar School, Moremi High School and Seventh Day Adventist Grammar School. The respondents were between 13-19 years of age. Eligible football players that had not played in or practiced for any tournament in the proceeding one year to the study were excluded. The total population of football player in the selected schools was estimated at 80, and based on Cochran's Sample size formulae for proportions (14), 70 school-age football players were recruited for this study. A previously validated 19-item self-administered questionnaire on the prevalence of injuries among elite Gaelic footballers was employed in this study (15). The questionnaire contains both open and close ended questions. The questionnaire has also been found applicable in our setting based on the study by Ayanniyi et al. (16) on the pattern of musculoskeletal injuries among soccer and basketball players in a Nigerian university.

Ethical approval for this study was obtained from the Health Research and Ethics Committee of the Institute of Public Health, Obafemi Awolowo University Ile-Ife, Nigeria. Parental consent and assent were obtained from respondents who were below the age of 18 years. The purpose of the research work was explained to all the respondents and consent forms were given to the pupils to take home for parents/guardians endorsement. In order to maintain anonymity, respondents' name and address were not requested for in the consent form and questionnaire respectively. Principals and game masters of all the teams/schools were consulted for administrative permission and assistance with the study. The football coach of each school provided the list of players in the first and second teams; as well as the reserved players. The respondents were encouraged to fill the survey without allowing interaction with any other pupil who may have been invited to participate in the study. All the respondents provided information on age, pattern of injuries sustained, body parts injured, mechanism and effect of injuries on their performance.

Data analysis. Descriptive statistics of frequency and percentages were used to describe the pattern of football injuries, nature of injuries, body parts injured, causes of injury and types of injury sustained. Inferential statistics of Chi-square was used to determine the associations among variables. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp. was used for the analysis. Alpha level was set at $p < 0.05$.

Results

The mean age of the respondents was 16.18±1.33 years. The mean duration for the training and warm up were 1.19±0.62 hours and 28.86±17.84 minutes (Table I).

Table I. General characteristics of the respondents (N=70)

Variables	Minimum	Maximum	Mean	Standard deviation
Age (years)	13	19	16.19	1.33
Training Duration (school team) (hours)	0	2.0	1.19	0.62
Training duration (other teams) (hours)	0	2.5	1.28	0.74
Warm up duration (school team) (minutes)	0	90	28.86	17.84
Warm up duration (other teams) (minutes)	0	60	20.71	19.84

Table II shows the respondents' response to occurrence of sport injuries. Fifty-two (74.3%) of the respondents had sustained injuries while playing football, out of which knee injury was the most hit anatomical site, occurring in 23 (32.9%) respondents. This is followed by ankle injury 10 (14.3%). 57 (81.4%) of these respondents participate in other sporting activities apart from football (these include table tennis (18.6%) and lawn tennis (15.7%). Most respondents had two training sessions with the school team

(64.3%) and also participated in the warm up (88.6%). Most of the respondents used no protective devices (41.4%), while the use of knee brace and ankle support were by 34.3% and 15.7% of the respondents (Tables IIa and IIb).

Table IIa. Prevalence of Sport Injuries among School-Age Football Players

Variables	**(N)**	**(%)**
Participating in any sporting activity other than football		
Yes	57	81.4
No	13	18.6
Other sports participated in		
Athletic	1	1.4
Basketball	1	1.4
High jump	3	4.3
Javelin	1	1.4
Marching	4	5.7
Table tennis	13	18.6
Running	19	27.1
Tennis	11	15.7
Number of training per week (school team)		
None	8	11.4
Once	17	24.3
Twice	45	64.3
Number of training per week (other teams)		
None	11	15.7
Once	18	25.7
Twice	41	58.6
Warm up involvement (school team)		
Yes	62	88.6
No	8	11.4
Warm up involvement (other teams)		
Yes	50	71.4
No	20	28.6

Table IIb. Prevalence of Sport Injuries

Variables	***(N)***	***(%)***
Protective equipment used		
Ankle support	11	15.7
Gum shield	1	1.4
Hand support	1	1.4
Knee brace	24	34.3
Neck collar	1	1.4
None	29	41.4
Shin guard	3	4.3
Leg intended to kick ball		
Either	1	1.4
Left	4	5.7
Right	65	92.9
Have you sustained any injury due to football since playing?		
Yes	52	74.3
No	18	25.7
Location of injury		
Ankle	10	14.3
Back	4	5.7
Elbow	7	10.0
Hand	1	1.4
Head	5	7.1
Knee	23	32.9
Lower leg	1	1.4
Mouth	1	1.4
Neck	1	1.4
Not applicable	15	21.4
Wrist	2	2.9

Twenty-nine (41.4%) of respondents reported wounds and 10 (14.3%) had muscle sprain. 21.4% of the respondents linked their injuries to tackles while 14.3% reported it was due to foul play. Also, 35.7% indicated that the condition of the pitch contributed to their injuries (Table III). 61.4% of the injuries were reported to require treatment of which was mostly carried out by doctors (67.1%) and then by physiotherapists (7.1%). 27.1% of respondents opined that the injuries they sustained had major adverse effects on the abilities to participate in normal training and competitions (Table IV).

Table III. Types, mechanisms, causes of sport injuries and opinion on effects of sport injuries

Type of injury	**N**	**%**
Bruise	1	1.4
Fracture	3	4.3
Muscle strain	10	14.3
Not applicable	15	21.4
Sprain	6	8.6
Tendon injury	6	8.6
Wound	29	41.4
When was injury sustained		
1st Half	5	7.1
2nd Half	17	24.3
Training	29	41.4
Warm up	4	5.7
Not applicable	15	21.4
Side injured		
Left	6	8.6
Right	49	70.0
Not applicable	15	21.4
Cause of injury		
Collision	1	1.4
Fall	4	5.7
Foul play	10	14.3
Kicking the ball	3	4.3
Not applicable	15	21.4
Running	22	31.4
Tackle	15	21.4
Do you feel condition of the pitch contributed to injury?		
Yes	25	35.7
No	30	42.9
Not applicable	15	21.4
Absent from training or competition due to injury		
Yes	19	27.1
No	36	51.4

Table IV. Health practitioners that treated the respondents

Management of the injury	**(N)**	**(%)**
Was treatment required?		
No	12	17.1
Yes	43	61.4
Not applicable	15	21.4
Who carried out treatment?		
Doctor	47	67.1
Physiotherapist	5	7.1
None	2	2.9
Not applicable	16	22.9
Admission to the hospital?		
Yes	17	24.3
No	38	54.3
Not applicable	15	21.4
Reoccurrence of an old injury?		
Yes	31	44.3
No	24	34.3
Not applicable	15	21.4
Was football the original cause of the injury		
Yes	35	50.0
No	18	25.7
Not applicable	17	24.3

Table V. Perception on causes of sport injuries

Variables	Injury sustained due to football		X2	P-value
Participation in sports other than football	**No**	**Yes**		
No	2	11	0.892	0.324
Yes	16	41		
Number of training per week (school team)				
None	0	8	7.111	0.013
Once	8	90		
Twice	10	35		
Number of training per week (other teams)				
None	3	8	4.922	0.095
Once	8	10		
Twice	7	34		
Warm up				
No	0	8	3.127	0.024
Yes	18	44		
Warm up involvement (other teams)				
No	5	15	0.007	0.931
Yes	13	37		
Leg intended to kick ball				
Either	0	1	1.622	0.425
Left	2	2		
Right	16	49		
Right	16	49		
Protective equipment used	**No**	**Yes**		
Ankle support	0	11		
Gum shield	0	1		
Hand support	1	0		
Knee brace	3	21		
Neck collar	0	1		
None	11	18	20.515	0.001
Shin guard	3	0		

Discussion and Conclusion

The aim of this study was to assess the pattern and mechanism of sport injury among school-age football players in selected secondary schools in Ile-Ife, Nigeria. The prevalence of sport injuries among the school-age football players in this study was 74.3%. Studies have shown that prevalence of sports injuries among youth football players is high (1, 8, 9, 11, 12). The prevalence rate obtained in this study was similar to the rate obtained by Azubuike and Okojie (17) wherein 81.6% prevalence of football-related injuries was recorded among football players in Benin City, Nigeria but it was lower than the rate (32.5%) observed among sub-elite male football players in Nigerian youth football league (11). The difference could be attributed to the variations in the study design and population. The result of the study showed that the anatomical parts commonly injured among football players were the knee and ankle. Also the findings of the study revealed that players were mostly injured in their dominant lower limbs. These findings are in agreement with the reports of Egwu et al. (18) and Bello et al. (19) that dominant lower extremities of football players are more injury prone during soccer training and competition.

The most common types of injuries reported in this study were muscle strain, open wounds, fracture and ligament sprains. The same pattern was reported by Arnason et al. (20) when investigating patterns of sport

injuries in Iceland while Wong and Hong (21) had also reported that sprains, strains and contusions were the most common types of injuries sustained by football players on the pitch. Having a good knowledge of the mechanism of injury is of paramount when considering preventive measures (20). Many studies have classified injuries as contact and non-contact mechanisms (22-25). In this study, the results showed that contact with opponents is the major mechanism or cause of injuries. This is supported by reports of Hawkins and Fuller (26) and Hawkins et al. (27) that contact injuries represents 33-42% of all acute sport injuries among elite players. However, Luthje et al. (28) found much higher proportion of contact injuries to be 79%. According to several authorities (29, 30, 28, 26, 27), tackling is the most common cause of injury in football. Studies have also indicated that tackling is the most usual injury mechanism for ankle (43-67%) and knee (55%) injuries (29, 30). Tackling alone was responsible for 21.4% of all the causes of injuries in this study.
Non-contact type of injuries could also be sustained from sprinting, shooting or kicking the ball. It could also be as a result of pivoting, falling or slipping. Sprinting is the most usual non-contact injury mechanism, accounting for 20-24% of acute injuries in professional players and 9-27% in youth players (30, 26, 27). Muscle strains occur most frequently during sprinting, especially hamstring strains (29). Furthermore, shooting and kicking the ball have been found to be the mechanism of 9-10% of acute injuries among the elite players and 8-13% in youth players (30, 26, 27). Kicking was responsible for 4.3% of injuries among school-age football players that participated in this study.
Also, about a quarter of the respondents who were injured indicated that the bad condition of the pitch contributed to their injury. Reports have empirically shown that football injuries are associated with the condition of the playing pitch (31, 32). Moreover, there was a significant association between injury sustained due to football and number of training sessions and warm up involvement prior to playing football among the respondents. Those with little or no training session and warm up had more injuries incidents. Evidence has shown that under-training may increase injury risk in football (33) and that the risk of lower limb football injuries is decreased with adequate warm-up sessions (34).
A significant number of respondents have not had contact with physiotherapists despite the high prevalence of sport injuries. The nature of recorded injuries showed that physiotherapy is indicated in managing them; nevertheless only 5 out of 64 respondents with reports of injuries in this study received physiotherapy treatment for their injuries. Meanwhile 67.1% of the respondents with football-related injuries in this study had consulted doctors for their injuries. It has been reported earlier that utilization and supply of physiotherapy services in Nigeria is low (35, 36) and that inadequate knowledge of scope and role of physiotherapy, haphazard health seeking behavior of the populace, and poor referral from physicians contribute to low utilization of physiotherapy services in Nigeria (37-41).
This study is limited in scope to only school-age football players in Nigeria who are involved in semi-professional football participation. More studies may be needed to elucidate the pattern and mechanism of football injuries in Nigerian professional tournament and league football. Nonetheless, this study presents knowledge of pattern and mechanism of football injuries among semi-professionals football players in Nigeria which is before now sparse.
The prevalence of injury was very high among school-age football players and lower extremity was the most frequently injured anatomical body part. The mechanism of injuries was mostly due to physical contact. A significant proportion of the school-age footballers also opined that poor pitches, inadequate warm up and unfriendly attack by opponent were major factors that cause injuries. Furthermore, utilization of physiotherapy was very low in the treatment of injured footballers among school-age children. There is need for provision of adequate sporting facilities in Nigerian schools and employment and engagement of physiotherapy services in grassroots football in Nigeria.
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