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Research Article

Sport Injury during Premiere League of Ethiopia

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Abstract

Background: The purpose of this study was to investigate sports injuries of football players.

Design: A prospective cohort study design was employed.

Method: Using censuses method 469 male football players from 16 teams were participated. F-MARC form was used to record players injuries sustained during training and matches. Functional components of protective equipment's questionnaire and physical fitness tests were used. Data was analysed using descriptive statistics, such as frequency, percentage, mean and SD was used. Non-parametric tests like Kruskal-Wallis test and Spearman Rank order correlation employed.

Results: The most common injured body location during training was Thigh (52; 32.5%), followed by knee (39; 24.4%), Ankle (17; 10.6%), Groin (15; 9.4%) and Achilles tendon (8; 5%) and also during match, Thigh (56; 29.3%) followed by knee (34; 17.8%), Ankle (25; 13.1%), Groin (17; 8.9%) and the Lower Leg (15; 7.9%). The three most commonly injured body locations were thigh (108; 30.8%), knee (73; 20.8%) and Ankle (42; 12%). The playing position has indicated that, there was no a significant relationship with injured body part ($r = -0.091$, $r^2 = 0.0083$, $P < 0.089$). Moreover, team Performance/success (rank) has showed insignificant relationship with injured body parts ($r= -0.359$, $r^2 = 0.013$, $P < 0.$ 0.173) and with types of injury ($r=0.150$, $r=0.0225$, $P <0.580$).

Conclusion: The playing positions have contribution for injury occurrences. Protective equipment like short wear and weight of footwear have contribution for injury occurrences. Similarly, flexibility has effect on existence of injury.

Keywords: Football; Players; Premier League; Sport Injury

Introduction

Epidemiology of sports injury on male footballer has been documented that injury incidences were 10-35 injuries per 1000 game hours [1]. In overall rate of injuries in contact sports were assessed that 10 to 15 injuries per 1000 playing hours [2]. Those injuries are the most common cause of loss of training and match time and need proper prevention approaches [3]. In particular, the incidence of injuries in professional male soccer ranges from 2.1 to 19.2 injuries per 1000 hours of exposure, being much higher in matches (from 13 to 78.3 injuries per 1000 hours of match exposure) than in training (from 1.5 to 11.8 injuries per 1000 hours of training exposure) [4-6]. This incidence is much more pronounced in tournament matches with a national team, and can reach up to 101 injuries per 1000 hours of match exposure [5,7].

In professional level, the players may place at the greater risk of injury in the blend of maximum physical demands together with situations in which players derived into contact, technical advancement [8] and congested calendars [9]. A specific relationship between injury and player position has been referred as the greater the activity and covered distance during matches, may have the higher injury risk (due to rushing/slowing activity) [10]. According to the positional role defenders (34.3%) and attackers (31.4%) registered higher than other players (e.g.: goalkeepers (GK), 9.8%). The back defence line players accounts 36% and centre field players we call them midfield players account 35% of injuries most frequently than the forward players or strikers [11]. Higher incidence of lower extremity injuries are sustained by defenders followed by midfielders, attackers and GK. Midfielders and attackers seem to be at higher risk of thigh muscle injuries [12,13]. Injury risks pattern of goalkeepers do not shadow as field players like striker, midfield and defence players and an increased age [11]. Goalkeepers (who perform less running, more ball reaching, and more collisions with goalposts) show a higher rate of upper extremity, trunk and head injuries [14].

In the sense of epidemiology study, there have been a number of prospective cohort studies exploring in Asian countries the injuries sustained in soccer players since the end of the 1970s, and an agreement declaration on injury definitions and data collection procedures [15] appears to have improved the consistency and quality of research within the field. The study conducted in Africa, injury incidence and exposure time of professional football clubs in the premier league during football season of South Africa was conducted and 130 injuries were recorded in the season [16].

While, studies has not been conducted so far on the subject in Ethiopia. Therefore, the researchers aimed specifically to determine risk exposures and the mean absence time of training and match, due to injury, to show injury prevalence, incidence and patterns throughout the competitive season, in training session and match, to find out injury incidence differences between associated risk factors,

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Table 1: Players Baseline Performance.

Season 2017 / 2018	Minimum	Maximum	Mean	Std. Deviation
Body Fat in %	4.88	23.16	10.19	4.15
Modified Sit and Reach	-12	29	11.85	8.78
One min Sit-Up test	25	82	54.54	13.65
Press-Up test	15	87	41.07	16.02
Vertical Jump test	32	67	51.16	8.19
Illinois Agility test	14.07	18.07	16.17	0.83
35m Sprint test	4.16	5.67	4.95	0.3

to determine the relationship of injury incidences and associated Risk Factors and to examine the association of injury occurrences with team and players performance.

Materials and Methods

Design: Prospective cohort study design was employed throughout the competitive season from November 2017 to July 2018 of Ethiopian premier league football players.

Subjects: The subjects of the study was selected using a Census method refers to complete enumeration of all 469 male football players who signed and played in 2017/18 season from 16 teams of Ethiopian premier league. The players were well informed about the aim and the design of the study prior to the study; they engaged a verbal informed consent for participation.

The majority of the players were found in professional playing age category which is between 16 – 20 years old was 15 (3.2%), 21 – 25 years old was 175 (37.3%), 26 – 30 year old was 203 (43.3%) and 31 - 35 years old was 76 (16.2%). The player stature ranged from 1.60 - 1.92 m, with a mean value of 1.75 ± 0.05 m, the average weight of the players was 69.37 ± 6.37 kg, and ranged between 58 - 90 kg and BMI was ranged from 18.20 - 27.00 kg/m2, with a mean value of 22.57 ± 1.47 kg/m2. The players playing positions; 24.3% (114) were strikers, 31.8% (149) were midfielders, 32.8% (154) were defenses and the remaining 11.1% (52) were goalkeepers.

Instruments: FIFA Medical Assessment and Research Centre (F-MARC's) form was used in order to record players injury status during training and match [15]. Functional component of protective equipment questionnaire was used to assess the comfortably attractive appearance (aesthetic components) [17], overall satisfaction [18] and functional components (comfort, fit, mobility, and protection) of protective equipment's (Jersey, short, socks, shin guard and footwear) [19]. In line with this physical fitness tests were assessed in pre-season from conveniently available participant (Body Composition, Flexibility (Modified Sit and Reach test), Abdominal Strength and Endurance (one minute sit-up test), Arm Strength and Endurance (Press-up test), Explosive Power (Vertical Jump test), Agility (Illinois Agility Test) and Speed (35 meter sprint test)).

Statistical Analysis: Data was analyzed using descriptive statistics, such as frequency, percentage, central tendency (mean) and dispersion test (standard deviation) was used to determine average exposure time and the mean absence time of training and match, due to injury, baseline information and players performance. The non-parametric tests or distribution-free tests was employed for our data don't follow a specific distribution. Therefore, Kruskal-Wallis test was used to find out the differences of injury incidence between age groups, BMI categories and playing positions. Spearman Rank order correlation was also used to identify relationship between injury and associated Risk Factors (age, height, weight, BMI, preventive equipment (tops, shorts, socks, shin guard and footwear), playing position, risk exposure time, team performance (rank) and players' performance). The significance level was set at $p<0.05$. The statistical analysis was done by SPSS version 23 software.

Table 2: Pattern of injury by body locations in training and matches.

Anatomical Location	Training		Match		Total	
	f	%	f	%	N	%
Head / Face	2	1.3	7	3.7	9	2.6
Neck / Cervical Spine	1	0.6	2	1	3	0.9
Thoracic Spine	1	0.6	1	0.5	2	0.6
Lumbar Spine	0	0	5	2.6	5	1.4
Sternum / Ribs	1	0.6	3	1.6	4	1.1
Abdomen	5	3.1	0	0	5	1.4
Pelvis / Sacrum	3	1.9	1	0.5	4	1.1
Shoulder	0	0	7	3.7	7	2
Elbow	1	0.6	0	0	1	0.3
Forearm	0	0	1	0.5	1	0.3
Wrist	1	0.6	1	0.5	2	0.6
Hand	1	0.6	1	0.5	2	0.6
Finger	0	0	1	0.5	1	0.3
Thumb	1	0.6	1	0.5	2	0.6
Hip	4	2.5	1	0.5	5	1.4
Groin	15	9.4	17	8.9	32	9.1
Thigh	52	32.5	56	29.3	108	30.8
Knee	39	24.4	34	17.8	73	20.8
Lower Leg	6	3.8	15	7.9	21	6
Achilles Tendon	8	5	3	1.6	11	3.1
Ankle	17	10.6	25	13.1	42	12
Foot	2	1.3	4	2.1	6	1.7
Toe	0	0	5	2.6	5	1.4
Total	160	100	191	100	351	100

Result

Injury exposure time

The total coached sessions was 4444.21 hrs, divided between training (85.5%; 3800 hrs) and Match (14.5%; 644.21 hrs). Each player was exposed to an average of 275.07 ± 68.67 h. The minimum registered exposure was 92.67 h and the maximum was 336.50 h, corresponding to a range of 243.83 h. Every player was exposed, in average, to 234.92 ± 59.78 h of training, from 77.67 h to 291.50 h (range of 213.83 h). Match exposure showed a range of 30 h (minimum: 15.0 h and maximum: 45.0 h) and a mean of 40.15 ± 9.39 h of exposure. This can show that the mean training and match exposure times per player during the season were 234.92 hours and 40.15 hours, respectively.

Table 3: Cross tabulation of injury pattern by types of injury with body location.

Location / Type of Injury	Concussion	Fracture	Dislocation	Muscle Rup.	Tendon Rup.	Ligament Rup.	Meniscus Lis.	Sprain	Strain	Contusion	Bursitis	Tendinitis	Laceration / Abrasion	Others	Total
Head / Face	3	1	-	-	-	-	1	-	-	-	-	-	4	-	9
Neck/Cervical	-	-	-	1	-	-	-	-	2	-	-	-	-	-	3
Thora. Spine	-	-	-	-	-	-	-	-	-	1	-	-	1	-	2
Lumbar Sp.	1	1	-	-	-	-	-	-	-	1	-	-	-	2	5
Sternum/Ribs	-	-	-	-	-	-	-	-	-	3	-	-	-	1	4
Abdomen	-	-	-	-	-	-	-	-	-	-	-	-	-	5	5
Pelvis/Sacrum	-	-	-	-	-	-	-	-	-	4	-	-	-	-	4
Shoulder	-	-	3	1	-	-	-	-	1	-	-	1	1	-	7
Elbow	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
Forearm	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
Wrist	-	1	-	-	-	-	-	-	-	-	-	-	-	-	2
Hand	-	2	-	-	-	-	-	-	-	-	-	-	-	-	2
Finger	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1
Thumb	-	-	1	-	-	-	-	1	-	-	-	-	-	-	2
Hip	-	-	-	-	-	-	-	-	1	-	-	-	3	1	5
Groin	-	-	-	1	-	-	-	-	28	1	-	-	-	2	32
Thigh	-	-	-	4	-	-	-	-	104	-	-	-	-	-	108
Knee	-	-	-	-	2	12	18	12	-	-	26	1	2	-	73
Lower Leg	-	3	-	-	-	-	-	-	12	1	-	4	1	-	21
Achilles Tendon	-	-	-	-	-	-	-	-	-	-	-	11	-	-	11
Ankle	-	1	5	-	-	-	-	35	-	-	-	1	-	-	42
Foot	-	2	-	-	-	-	-	-	-	3	-	1	-	-	6
Toe	-	1	1	-	-	-	-	1	-	2	-	-	-	-	5
Total	4	13	11	7	2	13	19	50	148	16	26	19	12	11	351

Protective equipment

The players reported satisfaction of functional components of garment types with fit (51.8%), colour (51.6%), attractiveness (47.1%), comfort (46.7%), fibre content (40.9%) and brand names (40.5%). The remaining attributes rated pleasing to others (38.2), construction quality (37.7%) and fiberic quality only a 35.2% or less level of satisfaction. The data indicates that the respondents were neither satisfied nor dissatisfied with size assortment (35.8%) and styles (38.2%) of their uniform. Overall, impact protection in soccer protective garments appears as expected; soccer players indicated satisfaction with impact protection of tops (46.7%), shorts (47.1%), socks (57.6%), shin guards (62.5%) and footwear (73.1%). The result of this study indicates that the players satisfaction in impact of protection were higher in socks, shin guards and footwear, whereas medium satisfaction were reported in tops and shorts.

Players baseline performance

Table 1 show the players' body fat in % with a mean value of 10.19 ± 4.15 %. Flexibility was test was assessed using modified sit and reach sit test, the players scored a mean value of 11.85 ± 8.78 cm. The player abdominal strength and endurance were scored a mean value of 54.54 ± 13.65 sit ups/min. whereas, arm strength and endurance scored a mean value of 41.07 ± 16.02 press ups/min. The explosive power of the players was scored a mean value of 51.16 ± 8.19 cm. The agility of the players was scored a mean value of 16.17 ± 0.83 sec. and also the speed of the players was scored a mean value of 4.95 ± 0.30 sec.

Table 4: Distribution of injury severity.

	Training		Match		Total	
	N	%	N	%	N	%
Slight (o day)	5	3	39	20.4	44	12.5
Minimal (1 day)	25	16	8	4.2	33	9.4
Mild (2 days)	10	6.2	2	1	12	3.4
Minor (3-7 days)	26	16.2	44	23	70	19.9
Moderate (8–28days)	37	23	46	24.1	83	23.6
Severe (>28 days)	57	35.6	52	27.2	109	31.1
Total	160	100	191	99.9	351	100

Injury pattern

Table 2 presented, occurrence of injury in body location during training and match. The most common injured body location during training was Thigh (52; 32.5%), followed by the knee (39; 24.4%), Ankle (17; 10.6%), Groin (15; 9.4%) and Achilles tendon (8; 5%) and also during match, Thigh (56; 29.3%) followed by knee (34; 17.8%), Ankle (25; 13.1%), Groin (17; 8.9%) and the Lower Leg (15; 7.9%). Totally the three most commonly injured body locations were thigh (108; 30.8%), knee (73; 20.8%) and Ankle (42; 12%).

Table 3, illustrated that the types of injury in body location. Bursitis (26; 7.4%) was frequently occurred injury in Knee (26; 7.4%) joint. Lesion of meniscus also occurred injury in Knee, (19; 5.4%) joints and Tendinitis was occurred in Achilles tendon (11; 3.1%), Lower Leg (4; 1.1%), and Shoulder, Knee, Ankle & Foot (1; 0.3%). Ligamentous rupture (13; 3.7%) occurred in knee (12; 3.4%), wrist (1; 0.3%), in the same frequency Fracture (13; 3.7%) occurred in Lower Leg (3; 0.9%), Foot & Hand (2; 0.6%) and Head / Face, Lumbar Spine, Forearm, Wrist & Ankle (1; 0.3%). Ligamentous rupture and Fracture injuries have occurred in equal frequency. Dislocation (11; 3.1%) occurred in Ankle (5; 1.4%), Shoulder (3; 0.9%) and Elbow, Thumb & Toe (1; 0.3%) in the same frequency other injuries (11; 3.1%) occurred in Abdomen (5; 1.4%), Lumbar Spine & Groin (2; 0.6%) and Sternum / Ribs & Hip (1; 0.3%). Dislocation and other injuries have also occurred in equal frequency. Laceration / Abrasion (12; 3.4%) occurred in Head / Face (3; 0.9%), Hip (3; 0.9%), Knee (2; 0.6%) and Thoracic Spine, Shoulder & Lower leg (1; 0.3%). The lowest frequent types of injury was Tendon Rupture (2; 0.6%) occurred in knee (2; 0.6%), followed by Concussion (4; 1.1%) occurred in Head / Face (3; 0.9%) & Lumbar Spine (1; 0.3%), and Muscle Fiber Rupture (7; 2%) occurred in Thigh (1.1%), Neck / Cervical Spine, Shoulder & Groin (1; 0.3%).

The most frequent type of injury was Strain (148; 42.2%) and its patterns to Thigh (104; 29.6%), Groin (28; 8%), Lower Leg (12; 3.4%), Neck / Cervical Spine (2; 0.6%) and Shoulder & Hip (1; 0.3%). The result indicated that strain was a highly prevalent injury occurred on thigh, groin and low leg. The second frequent injury was Sprain (50; 14.2) and its patterns to Ankle (35; 10%), Knee (12; 3.4%) and Finger, Thumb & Toe (1; 0.3%). From the result we can understand that, ankle and knee joints were highly susceptible body part to sprain injury. In general, injuries occurred in the lower limb was 303 (86.3%), in the axial part 32 (9.1%) and in the upper limb 16 (4.6%). The result of the current study indicated that, football injuries were highly concentrated in the lower limbs.

Injury severity

Most injuries were severe (52; 27.2%), meaning that more than 28 days/ 4 weeks absence from match/training resulted from injuries. The remaining Moderate 46 (24.1%), Minor 44 (23%), slight 39 (20.4%), Minimal 8 (4.2%) and Mild 2 (1%) injuries were recorded. It was verified that much of injuries resulted in greater than 28 days / 4 week of absence from matches. As the percentage of injury severity changes, almost one third of training injuries were Severe 57 (35.6%). The remaining Moderate 37 (23%), Minor 26 (16.2%), Minimal 25 (16%), Mild 10 (6.2%) and Slight injuries 5 (3%) were also recorded. Greater number of injuries resulted in more than 28 days / 4 week of absence from match/training (Table: 4). Match was distributed between all the levels of injury severity. From the result we can understand that Injuries of all degrees of severity occurred more commonly both in match / training. Most frequent injuries involved sever (31.1%, >28 days/ 4 Weeks of time loss), moderate (23.6%, 8–28days/2 weeks of time loss) and minor severity (19.9%, 3-7 days/1 Week of time loss).

Injury variance in associated risk factors (Age, BMI and Playing Position)

Table 4 presented that the differences of injury type and the injured body parts between associated risk factors (age, BMI and playing positions). Kruskal-Wallis Test was conducted to examine the differences on age groups, BMI and playing position according to the injured body part and types of injury. The age of the players have four categories (16–20, 21–25, 26–30 and 31-35), which is the playing age categories in the professional level. No significant differences (Chi square=0.17 Players Baseline Performance, p=0.98, df=3) were observed among four age groups in injured body part, therefore, the H0: is accepted and also there was no significant differences (Chi square=1.22, p=0.747, df=3) were observed among four age groups in types of injury. The result can show that, the H0: was accepted.

Table 5: Kruskal-Wallis Test between associated risk factors (age, BMI and playing positions) of injury type and the injured body parts.

Independent Variables	Test Statistics[a,b]		
		Injured Body Location	Types of Injury
Age	Chi-Square	0.171	1.224
	df	3	3
	Asymp. Sig.	0.982	0.747
BMI	Chi-Square	1.849	1.773
	df	2	2
	Asymp. Sig.	0.397	0.412
Playing Position	Chi-Square	20.55	14.657
	df	3	3
	Asymp. Sig.	0	0.002

a. Kruskal Wallis Test, b. Grouping Variable: Age, BMI, Playing Position

Table 6: Relationship of Injury with Age, Ht, Wt, BMI and PP.

Spearman's rho		Injured Body Part	Injury Rate/Type
Age	Correlation Coefficient	0.018	-0.058
	Sig. (2-tailed)	0.731	0.277
Height	Correlation Coefficient	-0.161**	-0.036
	Sig. (2-tailed)	0.002	0.504
Weight	Correlation Coefficient	-0.095	0.004
	Sig. (2-tailed)	0.075	0.937
BMI	Correlation Coefficient	-0.07	-0.01
	Sig. (2-tailed)	0.191	0.853
Playing Position	Correlation Coefficient	-0.091	-0.117*
	Sig. (2-tailed)	0.089	0.028

**. Correlation is significant at the 0.01 and *. 0.05 level.

The BMI of the players have four categories (<18.5, 18.5–24.9, 25–29.9 and 30 & above), among those categories injury was not occurred in 30 & above category. The differences on BMI categories according to the injured body part and types of injury, insignificant differences (Chi square=1.85, p=0.39, df=3) were observed among four BMI categories in injured body part indicated that, the H0: is accepted and also no significant differences (Chi square=1.77, p=0.41, df=3) were observed among four BMI categories in types of injury it can show that, the H0: is accepted.

The playing position of the players were categorized in a broader way of striker, midfielder, defense and goalkeepers. The differences on playing position according to the injured body part and types of injury. The result indicated that, the H0: was rejected with a significant

Table 7: Relationship of Injuries with exposure time.

Spearman's rho		Injured Body Part	Injury Rate/ Type
min. of injury occurred	Correlation Coefficient	-0.088	0.065
	Sig. (2-tailed)	0.098	0.226
TTEH	Correlation Coefficient	-0.013	0.005
	Sig. (2-tailed)	0.814	0.93
TMEH	Correlation Coefficient	0.027	0.071
	Sig. (2-tailed)	0.609	0.184
TEH	Correlation Coefficient	-0.013	0.004
	Sig. (2-tailed)	0.811	0.942

**. Correlation is significant at the 0.01 and *. 0.05 level.

differences (Chi square=20.55, p=0.000, df=3) among four playing positions in injured body part and similarly, the H0: was rejected with a significant differences (Chi square=14.66, p=0.002, df=3) were observed among four playing positions in types of injury (Table 5).

Relationship of injury with age, height, weight, BMI and playing positions

The relationship of injury (injured body part and types of injury) with associated risk factors like players characteristics such as age, height, weight, BMI and playing position presented in Table 6. The result has shown that, insignificant relationship of the players age with injured body part (r=0.018, r^2=0.0003, P <0.731) and types of injury (r=-0.058, r^2=0.0034, P <0.277). The finding of the current study indicated that, injury has no relationship with age. The height of the players have strong inverse significance correlation with injured body parts (r=-0.161, r^2=0.026, P <0.002) at P <0.01 and insignificant correlation has been observed with types of injury (r=-0.036, r^2=0.0013, P <0.504). The result of the current study indicated that, the height of the players have a significant relationship with injured body part. While, the height of the players have insignificant relationship with types of injury. The weight of the players have shown insignificant relationship with injured body part (r=-0.095, r^2=0.009, P <0.075) and types of injury (r=0.004, r^2=0.000016, P <0.937). The finding of the current study indicated that, injury has no relationship with weight of the players. The BMI of the players have shown insignificant relationship with injured body part (r=-0.070, r^2=0.0049, P<0.191) and types of injury (r=-0.010, r^2=0.0001, P <0.853). The finding of the current study indicated that, injury has no relationship with BMI of the players. The playing position has indicated that, there was no a significant relationship with injured body part (r=-0.091, r^2=0.0083, P <0.089). While, weak inverse significance correlation was observed with types of injury (r=-0.117, r^2=0.014, P <0.028) at P <0.05. The finding of the current study indicated that playing position have no correlation with injured body part, but there was a relationship with types of injury.

Relationship of injury with exposure time

The relationship of injury (injured body part and types of injury) with associated risk factors like exposure times such as the minute (min) of injury occurred, Total Training Exposure Hours (TTEH), Total Match Exposure Hours (TMEH) and Total Exposure Hours (TEH) presented in Table 7. The injury occurred minute has showed insignificant relationship with injured body parts (r=-0.088, r^2=0.0077, P <0.098) and with types of injury (r=0.065, r^2=0.0042, P < 0.226), TTEH has showed insignificant relationship with injured body parts (r=-0.013, r^2=0.0002, P <0.814) and with types of injury (r=0.005, r^2=0.00003, P <0.930), TMEH has showed insignificant relationship with injured body parts (r=0.027, r^2=0.0007, P <0.609) and with types of injury (r=0.071, r^2=0.005, P <0.184) and TEH has showed insignificant relationship with injured body parts (r=-0.013, r^2=0.0002, P <0.811) and with types of injury (r=0.004, r^2=0.00002, P <0.942). The finding of the current study indicated that there was no relationship between injuries with exposure time.

Relationship of injury with preventive equipment

The relationship of injury (injured body part and types of injury) with associated risk factors of preventive equipment presented in Table 8. The preventive equipment were assessed by the satisfaction level and preferred materials the players were used, such as overall satisfaction soccer uniform, satisfaction of top/upper cloth, size of top/upper clothe, satisfaction of short/lower clothe, size of short/lower clothe, satisfaction of socks, length of socks, satisfaction of shin guards, desired weight of shin guards, satisfaction of footwear and desired weight of footwear. The result of this study showed that, insignificant relationship was observed between the types of injury and all items of the preventive equipment. The same result was also observed between injured body part and all items of the preventive equipment, except, the relationship with Short/lower cloth and desired weight of footwear. The finding of the current study was observed the players may be satisfied and appropriate preventive equipment's delivered by the respected clubs. The counter result of this study regarding the relationship of preventive equipment with injury indicated that, injured body part has significance weak inverse correlation with Satisfaction of Short/lower clothe (r=-0.109, r^2=0.012, P<0.040) at P <0.05. And also highly inverse correlation was observed between desired weight of footwear with injured body parts (r=-0.147, r^2=0.021, P <0.006) at P <0.001. The result of the current study indicated that there was an inverse relationship between desired weights of footwear with injured body parts.

Relationship of injury with players and team performances

The relationship of injury (injured body part and types of injury) with associated risk factors like players' performances and team performance presented in Table 9. BF % of the players have been showed insignificant relationship with injured body parts (r=0.056, r^2=0.0031, P <0.594) and with types of injury (r=-0.019, r^2=0.0004, P <0.855). The finding indicated that injury has no relationship with BF % of the players. Sit and Rich test of the players have been showed insignificant relationship with types of injury (r=-0.181, r^2=0.033, P <0.081), Whereas, Sit and Rich test of the players have been showed a weak positive significant relationship with injured body part (r=0.254, r^2=0.065, P <0.014). The result of the current study, showed that flexibility has not related with types of injury but, it has a relationship with the injured body parts. One min Sit-Up test of the players have been showed insignificant relationship with injured body parts (r=0.041, r^2=0.002, P <0.691) and with types of injury (r=-0.037, r^2=0.0014, P <0.720). The result of the current study indicated that abdominal strength and endurance have no relationship with injury. One min Push-Up test of the players have been showed insignificant relationship with injured body parts (r=-0.032, r^2=0.001,

Table 8: Relationship of Injury with preventive equipment.

Spearman's rho			
Assessment of soccer equip.		**Injured Body Part**	**Injury Rate/ Type**
Overall soccer uniform	Correlation Coefficient	-0.013	0.012
	Sig. (2-tailed)	0.804	0.827
Top/Upper Cloth	Correlation Coefficient	-0.012	0.054
	Sig. (2-tailed)	0.826	0.317
Size of Top/Upper Cloth	Correlation Coefficient	-0.008	0.008
	Sig. (2-tailed)	0.877	0.887
Short/lower cloth	Correlation Coefficient	-0.109*	0.018
	Sig. (2-tailed)	0.04	0.737
Size of Short/lower cloth	Correlation Coefficient	0.064	-0.072
	Sig. (2-tailed)	0.235	0.18
Socks	Correlation Coefficient	0.023	0.067
	Sig. (2-tailed)	0.674	0.211
Length of Socks	Correlation Coefficient	0.058	-0.066
	Sig. (2-tailed)	0.275	0.216
Shin guards	Correlation Coefficient	-0.016	0.08
	Sig. (2-tailed)	0.765	0.136
Desired weight of shin guards	Correlation Coefficient	0.041	-0.056
	Sig. (2-tailed)	0.449	0.293
Footwear	Correlation Coefficient	0.073	-0.063
	Sig. (2-tailed)	0.171	0.238
Desired weight of footwear	Correlation Coefficient	-0.147**	0.022
	Sig. (2-tailed)	0.006	0.68

**. Correlation is significant at the 0.01 and *. 0.05 level.

P <0.756) and with types of injury (r=-0.120, r^2=0.014, P <0.251). The result of the current study indicated that arm strength and endurance have no relationship with injury. Vertical Jump test of the players have been showed insignificant relationship with injured body parts (r=0.071, r^2=0.005, P <0.495) and with types of injury (r=-0.158, r^2=0.025, P <0.129). The result of the current study indicated that explosive power of the players have no relationship with injury. Illinois Agility test of the players have been showed insignificant relationship with injured body parts (r=0.152, r^2=0.023, P <0.144) and with types of injury (r=0.014, r^2=0.0002, P <0.893). The result of the current study indicated that agility of the players have no relationship with injury. 35m Sprint test of the players have been showed insignificant relationship with injured body parts (r=0.110, r^2=0.012, P <0.291) and with types of injury (r=-0.002, r^2=0.000004, P <0.988). The result of the current study indicated that speed of the players have no relationship with injury. Team Performance/success (rank) has showed insignificant relationship with injured body parts (r=-0.359, r^2=0.013, P <0. 0.173) and with types of injury (r=0.150, r^2=0.0225, P <0.580). The finding of the current study indicates that team performance has no relationship with injury.

Table 9: Relationship of injury with players' and team performance.

Spearman's rho		Injured Body Part	Injury Rate/ Type
BF %	Correlation Coefficient	0.056	-0.019
	Sig. (2-tailed)	0.594	0.855
Sit and Rich test	Correlation Coefficient	0.254*	-0.181
	Sig. (2-tailed)	0.014	0.081
1 min Sit-Up test	Correlation Coefficient	0.041	-0.037
	Sig. (2-tailed)	0.691	0.72
1 min Push-Up test	Correlation Coefficient	-0.032	-0.12
	Sig. (2-tailed)	0.756	0.251
Vertical Jump test	Correlation Coefficient	0.071	-0.158
	Sig. (2-tailed)	0.495	0.129
Illinois Agility test	Correlation Coefficient	0.152	0.014
	Sig. (2-tailed)	0.144	0.893
35m Sprint test	Correlation Coefficient	0.11	-0.002
	Sig. (2-tailed)	0.291	0.988
Team Performance	Correlation Coefficient	-0.359	0.15
	Sig. (2-tailed)	0.173	0.58

**. Correlation is significant at the 0.01 and *. 0.05 level.

Discussion

It is important that studies use similar methods to collect and report injury data to facilitate meaningful interpretation and comparison of results. It has been shown already that football shows higher injury risk (Injuries/1000 Exposure Hours (EH)) and absence from play due to injury than other sports.

Therefore, the current study, the coached mean training and match exposure times per player during the season were 234.92 hours and 40.15 hours, respectively. As compared with the study conducted in South Africa study indicated that the mean training and match exposure times per player during the season were ~204 hrs and ~31 hrs, respectively [16]. Whereas, the European studies, which have been reported that the mean training and match exposure times per player were 262 hrs and 40 hrs, respectively [20]. Therefore, the result can showed that Ethiopian premier league players have been coached with a higher exposure hours per annum than South African league but, not to European players.

The players reported satisfaction in impact of protection were higher in socks, shin guards and footwear, whereas medium satisfaction were reported in tops and shorts. In line with this result youth soccer players indicated satisfaction with impact protection of shin guards [19]. In contrast with this, dissatisfaction scores for shorts (49%) and tops (44%), indicated players are not satisfied with the limited protection found in these garment types [19].

The baseline performances of the studied subjects result were indicate that, according to the American Council on Exercise body-fat percentage categories the players were ranged between essential fat (2% to 5%) to acceptable fate (18% to 25%). The flexibility of the players average result showed that the players performance in modified sit and reach test indicates poor performance according to the normative data <15.0 for adults under 35 years of age. The player abdominal strength and endurance were they found in

excellent performance as compared with the normative data [21] in all age categories. While, arm strength and endurance average score showed that they were found in good performance as compared with the normative data in all age categories. The explosive power of the players' performance in Vertical Jump test indicates average performance compared with the normative data for adult athletes [22]. The agility of the players score indicates that they were found in above average performance as compared with the normative data is available for the Illinois Agility Run Test [23]. The players were found in a good performance of 35 m sprinting as compared with the provided rating for the 35m sprint test [23].

The three most commonly injured body locations were thigh (108; 30.8%), knee (73; 20.8%) and Ankle (42; 12%). These findings consistent with the previous studies that investigated injury characteristics within professional football players was the thigh, followed by the ankle and the knee [24,25,6].

In accordance with body location showed the highest rate of injuries to the lower extremities, particularly strain injury on the thigh, groin and lower leg, as well ankle and knee joints were highly susceptible body part to sprain. The finding of the current study supported with the previous studies reported as Ankle sprain was the most common injury type and 52% of sprains were recurrent [25-27,15]. However, one of the big limitation to the current study was discuses about together about Knee ligament injury. Therefore, the future researchers should consider Knee ligament injury ACL /MCL/ PCL study.

Based on the definition of injury severity the number of consecutive days that have elapsed from the date of injury to the date of the player's return to full participation in team training and availability for match selection indicate the degree of injury [15]. Match was distributed between all the levels of injury severity. From the result we can understand that Injuries of all degrees of severity occurred more commonly both in match / training. Most frequent injuries involved sever (31.1%, >28 days/ 4 Weeks of time loss), moderate (23.6%, 8–28days/2 weeks of time loss) and minor severity (19.9%, 3-7 days/1 Week of time loss). These results based on Ethiopian premier league players differ with the results based on the UEFA Champions League and the Major Football League showed that the maximum of injuries were severe (15%) [25,28]. The scientific works on modern football shows lower severity of injuries than our study found [6,24,25,28,29].

The age of the players have four categories (16–20, 21–25, 26–30 and 31-35), which is the playing age categories in the professional level. The injury type and injured body parts have no difference in age groups. Hereafter, the current finding supported with the previous study incidence of injuries in elite French youth soccer players showed there was no significant difference in injury frequency between age groups [30]. Another study also showed that, age might affect IR in some cases, but in some cases, no association between age and injury risk in general has been found [20].

The BMI of the players have four categories (< 18.5, 18.5–24.9, 25–29.9 and 30 & above), among those categories injury was not occurred in 30 & above category. The differences on BMI categories according to the injured body part and types of injury, insignificant differences were observed. In contrast with the current finding, the study conducted by [31] that injury patterns differed by BMI [31].

The playing position of the players were categorized in a broader way of striker, midfielder, defense and goalkeepers. The differences on playing position according to the injured body part and types of injury. The result indicated that, a significant differences were observed among four playing positions in types of injury. The previous studies also indicated that, the greater the activity and covered distance during matches, the higher the risk of a musculoskeletal injury (due to speeding up / slowing down activity) [32,33].

The relationship of injury (injured body part and types of injury) with associated risk factors like players characteristics such as age, height, weight, BMI and playing position. The finding of the current study indicated that, injury has no relationship with age. In line with this, the previous studies reported that, age might affect IR in some cases, but in some cases, no association between age and injury risk in general has been found [20]. Whereas, in contrast with this, the study conducted on risk factors for injuries in professional football players was shown that strong association observed between the age of the players and injury [34].

The height and weight of the players showed different results. The height of the players have a significant relationship with injured body part. While, the height of the players have insignificant relationship with types of injury. Whereas, the weight of the players have shown insignificant relationship with injured body part and types of injury. In line with this finding the previous study reported that, there was no relationship between weight and injury [35].

The BMI of the players have shown insignificant relationship with injured body part and types of injury. The finding of this study, supported in accordance with the previous studies BMI has no association to injuries on adult players [36,37].

The playing position indicated that, there was no a significant relationship with injured body part while, weak inverse significance correlation was observed with types of injury In line with this result, the previous study has been referred that, there was a specific relationship between injury and player position [38].

The relationship of injury (injured body part and types of injury) with associated risk factors like exposure times such as the minute (min) of injury occurred, Total Training Exposure Hours (TTEH), Total Match Exposure Hours (TMEH) and Total Exposure Hours (TEH). The finding of the current study indicated that there was no relationship between injuries with exposure time. In contrast of the current finding, the previous study conducted on professional male Basketball showed that there was a positive correlation between the total numbers of practices time with total injuries [39].

The relationship of injury (injured body part and types of injury) with associated risk factors of preventive equipment. The counter result of this study regarding the relationship of preventive equipment with injury indicated that, injured body part has significance weak inverse correlation with Satisfaction of Short/lower clothe. The result of this study was supported with a study conducted on influence of wearing impact protective garment on thermos physiological comfort of the wearer. The presence of segmented clothe in the impact protective dress collective could not reduce the insulation compared to ensemble without it [40].

And also highly inverse correlation was observed between desired weights of footwear with injured body parts. The result of the current study indicated that there was an inverse relationship between desired weights of footwear with injured body parts. While, in contrast with this finding, other recent study indicates there was no strong argument favouring extreme weight reduction of the soccer shoe, whether for comfort or for performance. Antagonistic, study approve a heavyweight shoe fixed with technical devices to improve protection, comfort and performance. The right balance between weight and technical features needs to be found [41].

The relationship of injury (injured body part and types of injury) with associated risk factors like players' performances and team performance. The finding indicated that injury has no relationship with BF % of the players. In contrast with the current finding, the previous study reported that the number of injuries is directly related with high levels of body fat percentage and low lean body mass [42]. The result of the current study, showed that flexibility has not related with types of injury but, it has a relationship with the injured body parts. In line and in contrast with the current finding the study conducted in top experienced soccer players in Belgium, 39% of the strains were re-injuries of the same type and location related with muscle tightness [43]. The result of the current study indicated that speed of the players have no relationship with injury. Team Performance/success (rank) has showed insignificant relationship with injured body parts) and with types of injury. In consistent with the current finding reported by other author higher injury rates were not associated with worse overall team performance [39]. In general, the finding of the current study indicated that, players and team performances have no relationship with injury except, with flexibility.

Conclusion

Based on the results the following points were concluded. Sever injuries were higher in training than match, while moderate injuries were higher in match than training. The playing positions have a contribution with the occurrence of the injury location and types. The protective equipment of short wear and desire weight of footwear have a contribution for injury occurrences. Similarly, flexibility has an effect with the existence of injury.

Thus, based on the above finding, the researchers suggested that, the coaching and medical staffs from football clubs must be emphasize to minimize the severity of injuries occurred during training and the playing position. The clubs should aware the effects of protective equipment and their weight. The fitness coach of the clubs should give emphasis on flexibility of the players. Finally, the future researcher can use the current study as a spring board and try to fill the gabs found as a limitation.

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