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RESEARCH ARTICLE

TRAINING RELATED AND SUPPORTIVE FACTORS FOR THE OCCURRENCE OF ACUTE INJURIES FOR JUNIOR ATHLETES AT ETHIOPIAN ATHLETICS TRAINING CENTERS.

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Abstract

Introduction:-

It is still an on-going debate among sport medicine professionals and coaches whether athletic injuries are an inevitable part of athletics, or whether they may be predicted or even prevented by utilization of advanced coaching strategies and technologically safe equipment. In relation to this several studies have investigated the risk factors for sports injuries in long-distance running .Those factors include age, anthropometrics, anatomical factors, training years, injury history, menstrual status, physical fitness, and psychological factors (Bahr, & Holme 2003; Taimela, Kujala, &Österman, 1990; van Mechelen, Hlobil, &Kemper, 1992;Murphy, Connolly, &Beynnon, 2003). The amount of exposure, sudden increased training or running distance (Collado, Sainani, &Fredericson, 2011; Taunton et al, 2002; Tenforde, Sayres, McCurdy, Walter, &Hart, 1990) or running volume (Lysholm, & Wiklander, 1987): Training errors without enough resting and recovery time and fatigue as well as equipment, such as shoes, skies and poles can also be risk factors for an injury. Further, training surface has been found to be associated with injury risk (Wen ,2007).

General Objectives

The general purpose of the study was to investigate and describethe causes of acute injuries in coaching practices of the five Ethiopian national Athletics Training Centers of Short,Middle and Long distance Athletes.

Design of the Study

Responses from the retrospective questionnaire were analyzed and interpreted in a complementary manner with relation to empirical evidences of training. Generally, a cross-sectional retrospective study design was used.

Samples and Sampling Procedures of the Study

Therefore, the participants of the study were Ethiopian athletics training centers Short, Middle and Long Distance Athletes and their team coaches. The training centers are namely Tirunesh Dibaba, Maychew, Debrebrehan, Bekoji, Hagerselam and Ethiopian youth sport academy of 2013 /14 athletes and coaches. All short, middle and long distance athletes and their main coaches were selected purposefully because of the assumption that they could provide relevant information due to their experience in the team and their small number. Census or 204 of total athletes and 12 coaches were included from five athletics training centers for the main study.

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Data Collection Instruments

Questionnaire was identified as pertinent tools of this study. In order to elicit the necessary data, a questionnaire was adopted for athletes from (Ristolainen, 2012). This questionnaire was adopted intentionally since the validity and reliability of the questionnaire was excellent or good. The questionnaire had earlier been validated by comparing questionnaire and interview responses after a one-week interval among 54 subjects from different sports. And the reliability of the background information questions was excellent: the intra class correlation coefficient (ICC) varied from 0.96 to 0.99 ($p<0.001$). The reliability of sports and training information was good or excellent (ICC = 0.81 to 0.95, $p<0.001$). The reliability of questions concerning acute and overuse sports injuries during twelve months varied from moderate to good (ICC = 0.75 to 0.88, $p<0.001$) (Karhula & Pakkanen 2005, Eloranta & Tittonen 2006).

Pilot Study

Before the actual data gathering, questionnaire questions were piloted in Ethiopian light and power agency sport club to check whether they can generate the expected information from the respondents and to see their consistency to the study. And the reliability of the background information questions was excellent: the intra class correlation coefficient (ICC) varied from 0.92 to 0.96 ($p<0.001$). The reliability of sports and training information was good or excellent (ICC = 0.88 to 0.94, $p<0.001$). The reliability of questions concerning acute and overuse sports injuries during twelve months varied from moderate to good (ICC = 0.77to 0.89, $p<0.001$).

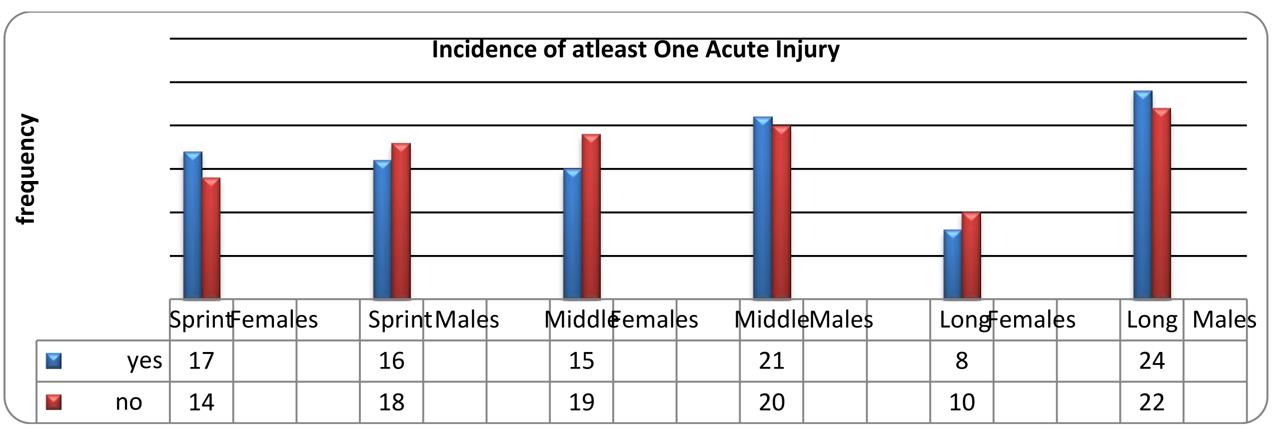
Method of Data Analysis

The following statistical procedures were employed for numerical interpretation.

1. Descriptive statistics like mean, grand mean, standard deviation and percentage were used to analyze basic information and distribution of scores. Charts, Graphs and histograms were used to clarify and elaborate differences.
2. Analysis of variance (ANOVA) was also applied to calculate statistical differences in rate of injuries distributions and locations between different athletics sports. Athletes without and with tendon, joint, muscle or all the other overuse injury rates were also included.
3. Logistic regression models were used to analyze the association between covariates and acute and overuse injuries. Gender and sports were used as covariates in all the logistic regression models. The associations were expressed using odds ratios (OR) and confidence intervals (CI). From a coach's point of view, It is categorised the significant training-related risk and supportive factors for an injury as well as coach's role in prevention of injuries.
4. Poisson regression was used to calculate the sports-adjusted training related acute and overuse injury incidences risk factors. The associations were also expressed using relative risks (RR) and their confidence intervals (CI).

Data Analysis and Discussion:-

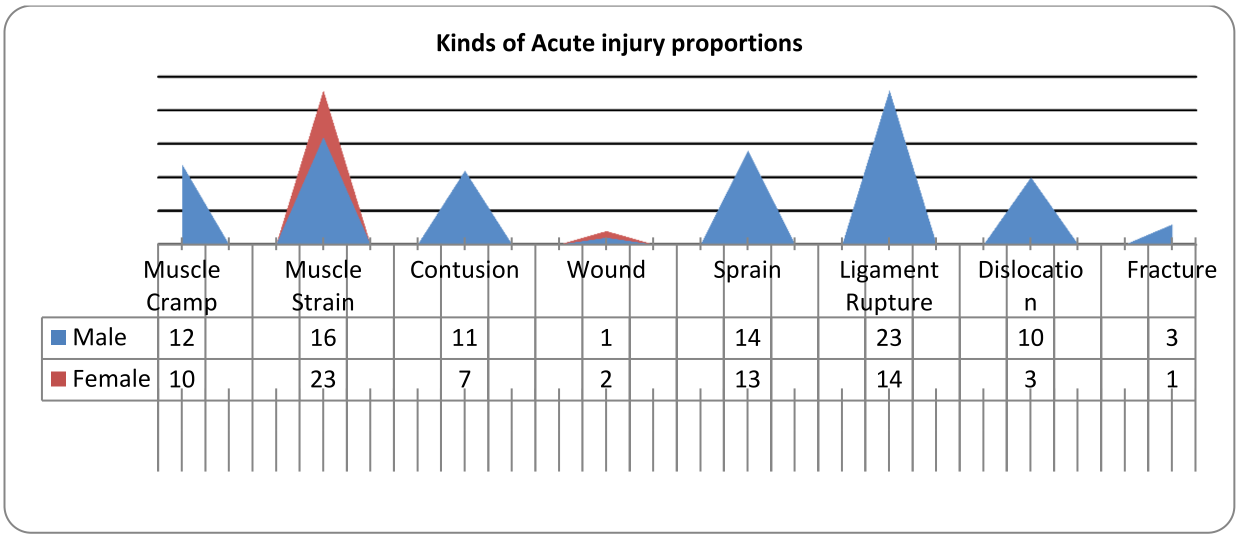
Occurrences of Acute Injuries



A total number of 101(49.5%) athletes get at least one acute injury. 40(48.2%) of total female athletes face at least one acute injury whereas 61 (50.4%) of male athletes have at least one acute injury. A chi square test for independent (with rates continuity correction) indicated no significant association between gender and the occurrence of Acute injury χ^2(1, n=204) =.03, .p=.87, phi= -.02. A Chi-square split event test for independence (with rates continuity correction) indicated no significance association as well for male short distance athletes with 47.1 %(16) and female short distance 54.8% (17) of at least one injury occurrence of χ^2(1, n=65) =.143, .p=.71, phi= -.08 Similarly A Chi-square split event test for independence (with rates continuity correction) indicated marginal significance association as well to middle distance athletes injury occurrence of males 51.2 %(21) and females 41.1 % (15) χ^2(1, n=75) =.145, .p=.7, phi= -.07.

A similar no significant difference was also shown for long distance athletes injury occurrence across gender of females 44.4%(8) and males 52.2% (n=24) χ^2(1, n=64) =.08, .p=.78, phi= -.07.
In accordance with our findings, earlier studies have found no gender differences in overall injury incidence in different sports after adjustment for exposure time (Lanese et al. 1990, Messina et al. 1999, Wolf et al. 2009).

Kind of Acute Injury



All kinds of acute injury had occurred for male and female athletes. The highest number of kind of acute injury sustained by male athletes was ligament Rupture whereas for females was muscle strain.A total number of 10(12%) female athletes got muscle cramp acute injury whereas 12(9.9%) of total male athletes got muscle cramp acute injury. A chi square test for independent (with rates continuity correction) indicated no significant association between gender and the occurrence of muscle cramp acute injury χ^2(1, n=204) =.064, .p=.801, phi= .034

On the other hand a total number of 23(27.7%) female athletes get muscle strain acute injury and 16(13.2%) of total male athletes got muscle strain acute injury. A chi square test for independent (with rates continuity correction) indicated a significant association between gender and the occurrence of muscle strain acute injury χ^2 (1, n=204) =5.78, .p=.017, phi= -.181. On the other hand a total number of 7(8.4%) female athletes got contusion acute injury and 11(9.1%) of total male athletes got contusion acute injury. A chi square test for independent (with rates continuity correction) indicated no significant association between gender and the occurrence of contusion acute injury as well χ^2(1, n=204) =5.78, .p=.017, phi= -.181

Similarly a total number of 13(15.7%) female athletes had sprain acute injury and 14(11.6%) of total male athletes had sprain acute injury. A chi square test for independent (with rates continuity correction) indicated no significant association between gender and the occurrence of sprain acute injury χ^2(1, n=204) =.41, .p=.52, phi= -.06

A total number of 14(16.9%) female athletes had ligament rupture acute injury and 23(19.1%) of total male athletes got ligament acute injury. A chi square test for independent (with rates continuity correction) indicated no significant association between gender and the occurrence of ligament acute injury χ^2 (1, n=204) =.043, .p=.84, phi= .027

On the other hand a total number of 3(3.7%) female athletes got dislocation acute injury and 10(8.3%) of total male athletes got dislocation acute injury. A chi square test for independent (with rates continuity correction) indicated no significant association between gender and the occurrence of dislocation acute injury as well χ^2 (1, n=204) =1.05, .p=.31, phi= -.092

Male athletes injured more commonly at ligament acute injury whereas females got more muscle strain acute injury. Tendon injury was also common among athletes. This finding is similar to the earlier findings (Kujala et al 2005; Kettunen et al. 2006).

Location of Acute Injuries Proportions

All locations of acute injuries were sustained by both male and female athletes. The highest number of injury was sustained at ankle injury for males and total athletes. However female athletes got injured more at the hamstring. A total number of 11(3.3%) female athletes and 18(14.9%) of total male athletes got ankle acute injury. A chi square test for independent (with rates continuity correction) indicated no significant association between gender and the occurrence of ankle acute injury χ^2 (1, n=204) =.01, .p=.9, phi= .02

However a total number of 16(19.3%) female athletes and 12(9.9%) of total male athletes got hamstring acute injury. A chi square test for independent (with rates continuity correction) indicated marginal significant association between gender and the occurrence of hamstring acute injury χ^2 (1, n=204) =2.9, .p=.089, phi=- .134

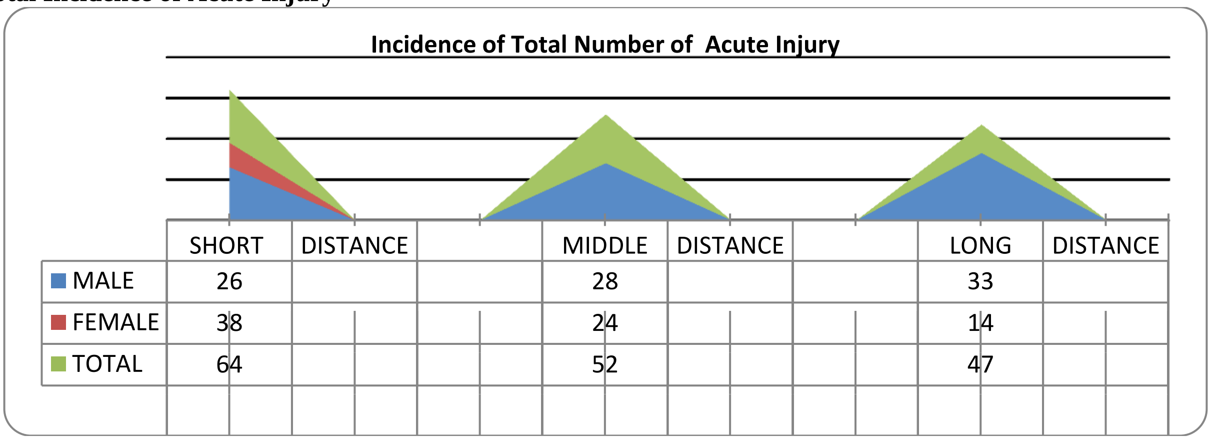
The Number of Acute Injuries in Different Anatomical Sites by Athletic Events

	Sprint		Middle		Long	
	M	F	M	F	M	F
Location	(34)	(31)	(41)	(34)	(46)	(18)
Foot	1	6	1	0	6	3
Achilles	0	1	2	1	5	0
Ankle	4	3	5	5	9	3
Calf	1	6	2	0	2	0
Lower leg	1	6	2	0	1	1
Knee	0	0	8	6	3	5
Hamstring	3	10	5	6	4	0
Thigh	9	4	3	4	0	0
Others	5	7	1	1	5	0
Lower back	3	0	0	1	3	0

A total number of 11(13.3%) female athletes and 11(9.1%) of total male athletes got knee acute injury. A chi square test for independent (with rates continuity correction) indicated no significant association between gender and the occurrence of knee acute injury χ^2 (1, n=204) =.507, .p=.48, phi=- .07

Generally, in earlier study Male athletes have been reported to have a higher risk for severe sport-related injuries than female athletes (Conn et al., 2003). Ankle injuries were common in this study; more athletes got acute injury around ankle. More male athletes got acute injury also at ankle location. This finding strengthens the earlier findings as in Rolf (1995) and Restelonine (2012). In this study there is no significance association between the gender and occurrence of ankle injury. Only a few gender differences in the anatomical locations of injuries were found. In relation to this, in a review, van Gent et al. (2007) reported that the overall injury rate in the lower extremities was similar in female and male runners. More female athletes injured at hamstring acute injury. In relation to this unlike earlier findings, a slightly more association was recorded between the occurrence of hamstring injury and gender. In an earlier study Specific to body location, female athletes have been reported to have more injuries to the hip (Sallis et al., 2001; Satterthwaite et al., 1999) .In marathon runners Satterthwaite et al. (1999) noticed that males had greater risk for hamstring and calf injuries than female runners. Female athletes got more injury around, lower leg and shoulder than male athletes, while males had more injuries in the thigh than females (Sallis et al., 2001).

Total Incidence of Acute Injury



There were a total of 163 acute injury incidences. Out of those total incidences around forty seven percent 76 (47%) were from females and 87 (53%) by male athletes. In addition the incidence of acute injury by male long distance 33 (20%) was not significantly higher than female long distance athletes Female short distance athletes 38 (23.3%) was also not significantly higher than males 26 (16%). To date, only a few sport injury studies have compared acute injury rates (Kujala et al., 1995) or overall injury rates (de Loes et al., 2000; Sallis et al., 2001) between the sexes. Previous studies have found similar overall injury rates in men and women (Lanese et al., 1990; Sallis et al., 2001).It seems that possible gender differences in the proportion of injuries may partly be explained by differences in exposure time.

Acute Injuries

Training and Supportive Factors Differences between Injured & Uninjured Athletes

Results of the two-independent samples t-test showed that mean age differs between injured (M = 18, SD = 1.95, n = 101) and uninjured (M = 16.71, SD = 1.61, n = 103) at the .01 level of significance (t = 2.59, df = 202, p< .01, 95% CI for mean difference .15 to 1.13). On average injured athletes tend to have higher age than uninjured... Similarly results of the two-independent samples t-test showed that mean training age differ between injured and uninjured athletes injured (M = 2.8, SD = 1.22, n = 101) and uninjured (M = 3.27, SD = 1.43, n = 103) at the .012 level of significance (t = 2.54, df = 202, p< .05, 95% CI for mean difference .15 to 1.13) . On average uninjured athletes tend to have longer training experience than injured. Results of the two-independent samples t-test shows that mean training hours per week differs between injured (M = 13.91, SD = 2.45, n = 101) and uninjured (M = 12.86, SD = 3.12, n = 103) at the .008 level of significance (t = 2.66, df = 202, p< .01, 95% CI for mean difference .27 to 1.82). On average uninjured athletes tend to have lower training hours per week than uninjured. Results of the two-independent samples t-test shows that mean training frequency per week differs between injured (M = 9.18, SD = 2.05, n = 101) and uninjured (M = 8.34, SD = 2.15, n = 103) at the .005 level of significance (t = 2.85, df = 202, p< .01, 95% CI for mean difference .25 to 1.42). On average injured athletes tend to have higher training frequency per week than uninjured.

Similarly results of the two-independent samples t-test shows that mean training annual number of competitions differs between injured (M = 3.8, SD = 1.47, n = 101) and uninjured (M = 4.3, SD = 1.3, n = 103) at the .006 level of significance (t = 2.77, df = 202, p< .01, 95% CI for mean difference -.92 to 1.54). On average injured athletes tend to have less annual competition number than uninjured. Results of the two-independent samples t-test shows that mean resting days per week differs between injured (M = 1.27, SD = .47, n = 101) and uninjured (M = 1.43, SD = .52, n = 103) at the .006 level of significance (t = 2.31, df = 202, p< .01, 95% CI for mean difference -.295 to .02). On average injured athletes tend to have less rest and recovery days than uninjured. Results of the two-independent samples t-test shows that mean worming up length differs between injured (M = 19.33, SD = .5.26, n = 101) and uninjured (M =27.08, SD = 4.73., n = 103) at the .00 level of significance (t = 2.31, df = 202, p< .01, 95% CI for mean difference -.295 to .02). On average injured athletes tend to have less worming up length than uninjured. On the other hand results of the two-independent samples t-test shows that mean annual exposure hours in training and exercise differs between injured (M = 718, SD = 131.04, n = 101) and uninjured (M =653.87, SD = 172.59., n = 103) at the .003 level of significance (t = 2.99, df = 202, p< .01, 95% CI for mean difference 21.77 to 106.5). On average injured athletes tend to have higher exposure hours than uninjured. In general there are both theoretical and measurable risks associated with intense, specialized training. Previous researches indicated that Injury rates in high school athletes have shown a direct relationship to exposure by h/wk. (Rose MS, Emery CA, Meeuwisse WH, 2008).In consistent to the current findings (higher training volumes16 hours per week) have consistently been shown to increase the risk of overuse injury in multiple sports(Valovich McLeod TC, Decoster LC, Loud KJ, et al.2011; Olsen SJ II, Fleisig GS, Dun S, et al.2006; Rose MS, Emery CA, Meeuwisse WH 2008; Emery C., 2003) .

Differences in Number and Rates of Acute Injury

A one way between groups analysis of variance was conducted to explore the impact of events on number of injuries .There was no statistical significant difference in number of injuries : F(2,201)=1.56, P=.213 .

A two way between groups analysis of variance was also conducted to explore the impact of sex and events on the rates of acute injuries exist. Subjects were divided in to three groups according to their events. The interaction effect between sex and events group were not statistically significant: F (5,198) =.899, P=.9 Post hoc test for short (M=.98, SD=1.18) Middle (M=.69, SD=.9) and long (M=.73, SD= 1.02) are not significantly differ each other.

Acute Injury Rates Across Worming

A one way between groups analysis of variance was conducted to explore the impact of Frequency of worming up before training or competition There were three groups according to frequency of worming up(Occasionally , Always and almost Never)on rates of acute injuries. There was no statistical significant difference in rate of acute injuries: F (2,201) =.69, P=.51

Injury Rates across Stretching

ANOVA					
Acute Injury Rates					
	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	36.009	3	12.003	5.971	.001
Within Groups	402.058	200	2.010		
Total	438.067	203			

A one way between groups analysis of variance was also conducted to explore the impact of weekly frequency of stretching effect towards rates of acute injuries .The group was four according to their frequency of stretching in a week(never=for who never stretch,>3 times to do stretching for more than 3 times, 2-3 times and ,< 2 times accordingly. There was a statistical significant difference rates of acute injuries: F (3,200) =5.97, P=.001. Despite reaching a statistical difference, the actual difference in mean scores between the groups was quite small. The effect size, calculated using eta squared, was .08.Post hoc comparisons using the sheffe test indicated that the mean score for > 3 times (M=.7, SD=1.2) was significantly different from the mean score of 1-3 times (M=1.3, SD=1.2) < 1 times (M=1.5, SD=1.2) and Never (M=2.14, SD=1.14)

A one way between groups analysis of variance was conducted to explore the impact of frequency of massage on rates of acute injuries. The group was four according to their frequency of massage in a week (never=for who never take massage, one times to do massage in a month, for less than 1 times in a week, every second week and once a week. There was a statistical significant difference in the rate of injuries: F (4,199) =3.64, P=.007.Despite reaching a statistical difference, the actual difference in mean scores between the groups was quite small. The effect size, calculated using eta squared, was .07.Post hoc comparisons using the sheffe test indicated that the mean score for once a week (M=1.8, SD=.28) was significantly different from the mean score of every second week (M=1.3, SD=1.2) but not < 1 times in a month (M=.88, SD=1.3) and Never (M=1.079, SD=1.59)Direct logistic regression was performed to assess the impact of a number of factors on the likelihood that respondents would report that acute injury occurred. The model contained nine independent variables (sex, event, training age, number of competition, rest days per week, worming up length, frequency of stretching, yearly exposure hours and mileage in the year). Long distance running is used as a reference for events and less than one times or never for frequency of stretching.

							95% C.I.for EXP(B)

Variables in the Equation	B	S.E.	Wald	Df	Sig.	Exp(B)	Lower	Upper
sex(1)	-.309	.411	.567	1	.452	.734	.328	1.642
Event short(1)	.914	.825	1.226	1	.268	2.494	.495	12.566
Event middle(1)	.216	.573	.142	1	.707	1.241	.403	3.817
Training age	-.200	.162	1.535	1	.215	.818	.596	1.124
Number of comp	-.181	.145	1.550	1	.213	.834	.627	1.110
Rest days /week	-.336	.425	.624	1	.429	.715	.311	1.644
Warm-up length	-.232	.038	38.214	1	.000	.793	.737	.853
Frequency of Stretching_ Always(1)	- 1.338	.499	7.193	1	.007	.262	.099	.698
freq_streatch_1_3(1)	-.636	.514	1.532	1	.216	.530	.194	1.449
Exposure hours	.003	.002	4.900	1	.027	1.003	1.000	1.006
Actual Mileage	.000	.000	2.651	1	.103	1.000	1.000	1.001
Constant	4.074	1.845	4.873	1	.027	58.780		

Risk Factors for acute Injury Occurrences

The full model containing all predictors was statistically significant χ^2 (11, N =204) = 111.58, P < .001), indicating that the model was able to distinguish between injured athletes and who didn't injured. The model as a whole explained between 42.3% (coxand snell R square) and 56% (Nagelkerke R square) of the Acute injury occurrence status and correctly classified 83.7% of cases. As shown in table, only three of the independent variables made a unique statistically significant contribution to the model (worming up length, Frequency of stretching, and exposure hours).The strongest predictor of reporting an occurrence of Acute injury was the frequency of stretching o.262 (95%, CI 0.99 to 0.698, P=0.007) is frequently stretching athletes were.262 times less likely to report having the occurrence of Acute Injury compared to those who never or less than one time do stretching per a week, controlling for other factors in the model.Controversial and inconsistent results had been found in this regard. Safran (1989) in his study found that stretching can reduce the risk for athletic performance. For years, it has been considered that stretching during warm-up had a positive effect on injury prevention (American College of Sports Medicine, 1998). However, several studies showed the opposite (van Mechelen et al., 1993; Cross, 1992; Pope et al., 2000).Obviously the current research is inconsistent with those findings. There was no either enough evidence of its predictive influence in the occurrence of injuries and needs further research in this regard. Similarly worming up is a preventive factor recording an odds ratio of 0.793 (95% , CI 0.74 TO 0.853 , P < .00) which is referring every additional minutes athletes reporting a worming up were .79 times less likely to report the occurrence of Acute Injury , controlling for other factors in the model. In this regard three studies (Bixler & Jones, 1992; Wedderkopp et al., 1999; Olsen et al., 2005) reported significant reductions in the number of injuries during physical activity after performing warm-up; the other study (Van Mechelen et al., 1993) did not observe any significant difference. The exposure hour is also the last predictor of the occurrence of acute injury, recording an odds ratio of 1.003 (CI 1.00 TO 1.006, P = .027). This indicated that athletes who had more exposure hour in the year more likely to report the acute injury. That is for every extra hour of training or exercise; athletes were 1.003 times more likely to face acute injury, controlling other factors in the model. However, Mileage were not associated to acute injury occurrences.

Poisson regression was performed to assess the impact of selected variables on the likelihood of the incidence rate of acute injuries occurred. The model contained two categorical and two continuous variables (Sex, Events, Exposure hours and Mileage).The full model containing all predictors was statistically significant x χ^2 (5,204)=22.87 , P<.00. As shown in the above table only exposure hour is a significant predictor .For every additional one hour of exposure in the training or exercise , the incidence rate of an overuse injury is 0.2% .Which refers to there is a 1.oo2 times likely incidence rate of overuse injury for every extra hour of training and competition. There is also a marginal significance in incidence rate of acute range between genders. We can imagine that there is a slightly 33% more injury rate of males compared to females

Predictors of the Incidence Rates of Acute Injuries

Parameter Estimates						
	B	Std. Error	95% Wald Confidence	Hypothesis Test	Exp (B)	95% Wald Confidence

Parameter			Interval						Interval for Exp(B)	
			Lower	Upper	Wald Chi-Square	df	Sig.		Lower	Upper
(Intercept)	-1.60	.4328	-2.454	-.758	13.772	1	.000	.201	.086	.469
[sex=.00]	.288	.1650	-.036	.611	3.040	1	.081	1.333	.965	1.842
[sex=1.00]	0[a]	.	.	.	.	.	.	1	.	.
[Event Middle=.00]	-.052	.2300	-.502	.399	.050	1	.822	.950	.605	1.491
[Event Middle=1.0]	0[a]	.	.	.	.	.	.	1	.	.
[Event Short=.00]	-.398	.3061	-.998	.201	1.695	1	.193	.671	.369	1.223
[Event Short=1.00]	0[a]	.	.	.	.	.	.	1	.	.
Annual Mileage	.000	.0001	.000	.000	.007	1	.934	1.000	1.000	1.000
expo.hrs	.002	.0005	.001	.003	16.435	1	.000	1.002	1.001	1.003
(Scale)	1[b]									
Dependent Variable: Number of Acute Injury Model: (Intercept), sex, Event middle, Event short, actual mileage, expo.hrs										
a. Set to zero because this parameter is redundant.										
b. Fixed at the displayed value.										

In general the current finding of the research indicated that annual exposure hour is a predictive variable for the occurrence of both overuse and acute injury occurrences. A similar predictive result was found for the incidence of both number of acute injury and overuse injury. Accordingly previous researches indicated that training variables that have been identified as contributing factors to running injuries are excessive running distance or intensity of the training program, rapid increases in weekly running distance or intensity, and the surface and shoes chosen for training (Jacobs, S. J., and B. L. Berson,1986, Marti, B., J. P. Vader, C. E. Minder, and T. Abelin,1988, Mckenzie, D. C., D. B. Clement, And J. E. Taunton,1991;, Messier, S. P., and K. A. Pittala.1988, Paty, J. G., Jr,1994).

Conclusions:-

1. There was no significant association between gender and the occurrence of different locations and kinds of acute injury. The interaction effect between sex and events group for the incidence of acute injury was not significantly differ each other. The highest number of kind of acute injury sustained by male athletes was ligament rupture and for females was muscle strain.
2. The highest number of acute injury was sustained at ankle injury for males and total athletes. However female athletes got acute injured more at the hamstring.
3. There was a difference in training related and supportive factors between acute injured and uninjured athletes (Age, training age, BMI, annual Training exposure hours, weekly training hours and frequency, annual mileage, Rest and recovery days per week and Worming up length and frequency). Athletes that stretch for more than three times a week had less acute injury than from those who did 1-3 times and < 1 times or Never per week. However acute injury had shown no differences in usage of massage.
4. Worming up length prevents the occurrence of Acute Injury. Frequently stretching preventsoccurrence of acute injury compared to those who stretch once or never in a week. Females are with a slightly higher risk of acute injury.

Recommendations

Based on the findings of this study, the following recommendations were made:

1. Intervention directed to training science of running to athletes and coaches in form health promotion programmes and current training findings through education to increase their knowledge and support in implementation of all prevention strategies either in training or in competition should be provided.

2. Athletics training centres should develop, implement and monitor a comprehensive sport safety plan paying particular attention to the development and implementation of policies covering issues that this study has identified as being poorly addressed.
3. Clubs should ensure that all safety measures are observed and implemented at both training session and during competition.
4. Governing bodies in Ethiopia, especially Ethiopian Sport Commission should develop and disseminate written sports safety policies and guidelines and supervise athletics training centres in their development, implementation and monitoring.
5. Training related risk factors should further be identified and roles of coaches and health officers training science intervention programs should be updated continuously through further researches in the canters by coaches and physicians.

Generally, there is a need to provide education to increase the general knowledge about the prevention of injuries in the running community and also overcome all the identified barriers that render the implementation difficult or impossible. There is also a need to support training centers to develop meaningful and relevant policies. The result of this study indicated that most training centers in Ethiopia had no safety policies with limited resources. More research into the role of menstrual disturbances and the risk of overuse injuries needs to be undertaken. The impact of dietary behaviors and habits on the incidence of injuries, particularly in women, needs to be determined. Guidelines for minimum safety requirements for Little Athletics meetings and other running events should be developed and widely disseminated. · Improved data collection about the occurrence of running injuries and their associated factors needs to be developed and maintained. Information about preventing running injuries should be disseminated widely through shoe points of sale, running magazines and more general magazines.

References:-

1. Aagaard et al., (2007) exercise physiology for health and performance: lipkon Williams.Scandinavian Journal of Medicine and Science in Sports, 30: 351- 359.
2. Aaltonen S, Karjalainen H, Heinonen A, Parkkari J, Kujala UM. (2007). Prevention of injuries:
3. Alonso JM, Junge A, Renstrom P, Engebretsen L, Mountjoy M, Dvorak J. (2009).Sports injuries surveillance during the (2007) IAAF World Athletics Championships. Clin J Sport Med 19 (1), 26-32.
4. Arnason A, Sigurdsson SB, Gudmundsson A, Holme I, Engebretsen L, Bahr R. (2004). Risk factors for injuries in football. Am J Sports Med 32 (Suppl 1), S5-S16.
5. Bahr R, Holme I. 2003.Risk factors for sports injuries--A methodological approach. Br J Sports Med 37 (5), 384-
6. Bahr R, Andersen SO, Loken S, Fossan B, Hansen T, Holme I. (2004). Low back pain among endurance athletes with and without specific back loading A cross-sectional survey of cross-country skiers, rowers, orienteerers, and nonathletic controls. Spine 29 (4), 449-454.
7. Basler RS, Hunzeker CM, Garcia MA.(2004). Athletic skin injuries: Combating pressure and friction. Phys Sportsmed 32 (5), 33-40.
8. Hreljac A. 2004 (). Impact and overuse injuries in runners. Med Sci Sports Exerc 36(5), 845-
9. Hägglund M, Waldén M, Ekstrand J. (2003). Exposure and injury risk in Swedish elite football: A comparison between seasons 1982 and 2001. Scand J Med Sci Sports 13 (6), 364-
10. Junge A, Dvorak J. (2000). Influence of definition and data collection on the incidence of injuries in football. Am J Sports Med 28 (Suppl 5), S40-S46.
11. Khan KM, Cook JL, Bonar F, Harcourt P, Astrom M. (1999).Histopathology of common tendinopathies. Update and implications for clinical management. Sports Med 27 (6), 393-
12. Knobloch K, Yoon U, Vogt PM. (2008). Acute and overuse injuries correlated to hours of training in master running athletes. Foot Ankle Int 29 (7), 671- 676.
13. Kujala U, Orava S, Parkkari J, Kaprio J, Sarna S. (2003). Sports career-related musculoskeletal injuries: Long-term health effects on former athletes. Sports Med 33 (12), 869-875.
14. Murphy DF, Connolly DA, Beynnon BD. (2003). Risk factors for lower extremity injury: A review of the literature. Br J Sports Med 37 (1), 13-29. Ristolainen, L., Heinonen, A., Turunen, H., Mannström, H., Waller, B.,Kettunen, Sainani KL, Fredericson M. (2011). Overuse injuries in high school runners: Lifetime prevalence and prevention strategies. PM R 3 (2), 125-131. Thelin N, Holmberg S, Thelin A. (2006). Knee injuries account for the sports related increased risk of knee osteoarthritis. Scand J Med Sci Sports 16 (5), 329-333.Van Gent RN, Siem D, van van Mechelen W, Hlobil H, Kemper HC. (1992). Incidence, severity, aetiologyand prevention of sports injuries. A review of concepts. Sports Med 14 (2), 82-99.

15. Waldén M, Hägglund M, Ekstrand J. (2005). Injuries in Swedish elite football a prospective study on injury definitions, risk for injury and injury pattern during (2001). Scand J Med Sci Sports 15 (2), 118-125.
16. Waldén M, Hägglund M, Magnusson H, Ekstrand J. (2011). Anterior cruciate ligament injury in elite football: A prospective three-cohort study. Knee Surg Sports Traumatol Arthrosc 19
17. Walter SD, Hart LE. (1990). Application of epidemiological methodology to sports and exercise science research. Exerc Sport Sci Rev 18, 417-448.
18. Weldon EJ, 3rd, Richardson AB. (2001). Upper extremity overuse injuries in swimming. A discussion of swimmer's shoulder. Clin Sports Med 20 (3),423-438.
19. Yard EE, Collins CL, Comstock RD. (2009). A comparison of high school sports injury surveillance data reporting by certified athletic trainers and coaches. J Athl Train 44(6), 645-652
20. Winter, D. A.(1983) Moments of force and mechanical power in jogging. J. Biomech.
21. Wilber, C. A., G. J. Holland, R. E. Madison, and S. F. LOY.An epidemiological analysis of overuse injuries among recreational cyclists.Orthop.Clin. Sci. 16:201–206, 1995.
22. Williams K. Biomechanical relationships in middle distance running. Track Coach 1995:4269- 42754269-4275.
23. Yackzan, L., Adams, C. and Francis, K.T. (1984). The eVects of ice massage on DOMS. American Journal of Sports Medicine, 12, 159±165.
24. Yard EE, Collins CL, Comstock RD. (2009). A comparison of high school sports injury surveillance data reporting by certified athletic trainers and coaches. J Athl Train
25. Yeung and Yeung (2001) A randomized trial of pre-exercise stretching for prevention of lower-limb injury.Med. Sci.Sports Exerc. 32(2): 271–277, 2000.
26. Zhenya (2003) The mechanical efficiencies of running and bicy-Journal of Sports Medicine 148.