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Assessment of knowledge, attitudes and practices in coaches regarding musculoskeletal sport injuries and sports safety measure use among sports participants

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Abstract

Coaching is an interactive process that helps sport participants & athletes to learn, improve, or take performance to better level. Sports participation has risks of sports injury which can be devastating for their hard earned fitness and performance level. A descriptive study was carried out to evaluate knowledge of 40 voluntarily participated coaches regarding sports injury & mechanism causing it in sports participants along with their attitude towards injuries and prevention practices.

Result: The direct condition enquiry questionnaire revealed that all 40 coaches had observed musculoskeletal injuries in past one year, of which maximum i.e. 85% was during competition. Sprain or strain or pulled muscle/ligament was common injury noted by 92.5% coaches. Specific sports action which involved skilled movement (100%) and running (80%) was identified mechanism of injury. Ankle joint (75%) was commonly injured area and poor technique (80%), lack of flexibility (75%), inadequate warm up (70%) and poor field conditions were the noted risk factors causing musculoskeletal sports injuries in participants. None of the coach had undergone the specific training for injury prevention and was neither acquainted with Cardiopulmonary resuscitation (CPR) technique. Though coaches had knowledge of protective gear use, but still 32.5% allowed sports participants to practice without sports gear.

Conclusion: There is need for appropriate measures and education for the coaches in sports injury prevention and proper sports injury registration.

Keywords: Sports, Coach, Sports Injury, Musculoskeletal, Ankle, Cardiopulmonary Resuscitation (CPR), Sports Equipment, Protective Gears.

Introduction

Sports has become the strength and pride of nation which depends on performance of sports participants and Coaches in competitions. Coaching in sports is an interactive process that helps athletes to improve and take performance to the better level.

In organized sports coaches are working for the sports skill development of its sports participants. But sports participation has inherent risks of sports injury that are sustained during sporting activity or exercise.[1-4]

Sports injuries can be devastating for the hard earned fitness and performance level of the sports participant. The prevalence of sport injuries in India varies from 58.9% to 73.4% which is much higher compared the studies in other countries[5] with increasing injury rate with advancing age.[6]

There are intrinsic and extrinsic predicting factors that are elements that predispose athletes to sports injuries and raise the injury risk.[4] Knowledge of Physiology of sports injuries and the Physiologic processes after injuries and repair process is important for early rehabilitation, recovery and achievement of performance level.[7]

Injury prevention initiatives, may contribute to lower injury rates in sports persons. Many authors in their sports studies have successfully worked in identification of the problems in terms of incidence and severity of sports injuries and worked on direct measures at their prevention.[8-10] Knowledge directly influences injury prevention behavior.[11] It is found that gaps in injury knowledge and beliefs differed for coaches and players.[11,12] Though knowledgeable of the protective gears physical trainers did not recommend its usage.[13]

Sports participants rely on coaches, as Knowledge of coaches about the sports injury prevention can brings about the behavioral changes thus modifying the causative factors of injury.[14-16] So the present study was aimed to evaluate knowledge of coaches regarding sports injury & mechanism causing it, attitude towards injuries and preventive measures practiced by them.

Methods

A descriptive study was carried out with purposive sampling among the Sports coaches (sports trainers) during a month of February to May 2016 in Dhule city of Maharashtra State, India. Institutional Ethical approval was availed before the commencement of the study. 40 voluntarily participated coaches were included in the study. The data was collected through individual interviews of coaches. The coaches were interviewed using a condition enquiry Questionnaire and observations were noted following training sessions in the normal dynamics and routine of the sport training. Coach's observation of the occurrence of injury and its characteristics in his or her sports participants in the

previous 12 months of training and/or competition were inquired. The inquiry questionnaire contained personal data such as age, gender, coaching sports, experience and coached groups. For the acquisition of information on observed injuries, the inquiry posed questions on the anatomic site affected, injury mechanism and moment of injury. The moment of occurrence of the injury was analyzed based on the specific phase of training or competition. For the present study, sports injury was defined as any impairment of the musculoskeletal system with signs and symptoms stemming from the practice of the sport in either training or competition phase that compromised normal training in terms of form, duration, intensity or frequency. Attitude of the coaches towards the sports injury development and preventive strategies along with their actual practices were also noted. Descriptive statistics were used for the analysis of the data using Statistical Package for Social Sciences (SPSS) version 16 statistical software.

Results

In present KAP observational study, mean age of coaches was 36.4 years (3.9 years SD) with mean duration of 10.8 years (3.6 years SD) coaching experience.

Table 1: Baseline characteristics of coaches and their sports injury observation (n=40)

Characteristics	Frequency	Percentage
A)Age Group of coaches		
25 to 35 years	10	25
36 to 45 years	25	62.5
45 to 55 years	4	10
More than 55 years	1	2.5
B) Gender		
Male	37	92.5
Female	3	7.5
C) Age Group of sports participants coached		
8-12 years	18	45
13-17 years	16	40
>17 years	6	15
D)Observed musculoskeletal injuries	40	100
During Pre competition practice	32	80
During competition	34	85
Post competition practice	31	77.5
E) Type of musculoskeletal Injuries {n=45}		
Cut/ open wound	29	72.5
Bruises/black and blue marks	23	57.5
Sprain, strain or pulled muscle/ligament	37	92.5
Broken bone	1	2.5
Overuse/stress related	2	5

Maximum coaches in the study were within 36 to 45 years age as well as 25% were within 25 to 35 years old. 92.5% male coaches participated in the study. Coaching by 45% coaches was to 8 to 12 years old children while 40% coached sports participants within 13 to 17 years of age. All 40 coaches had observed sports injuries in their sports participants. Maximum sports injuries according to 85% coaches were observed during competitions. Most common type of sports injury by 92.5% coaches was sprain, strain or pulled muscle or ligament while by 72.5% was the cut or open wounds. 2.5% coaches had observed the broken bone and 5% overuse or stress related sports injuries in their sporting carrier. (Table 1)

The participant 40 coaches were coaching for 10 different sports. Cricket coaches, badminton, table tennis, basketball coaches were more than other type of sports. Table 2, shows specific type of injuries noted by the coaches in their coaching sports during practicing and competitions. In all sports the injuries were mainly observed by coaches during the competitions. (Table 2)

Each sport had its specific skill related technique. The specific skill or action specific for the sports some or the other times were observed to causes sports injuries by the coaches. 80% coaches noted injuries in running, 40% during jumping and impact was cause according to 27.5% coaches. (Table 3)

Chances of reinjures was accepted by 22 coaches while others considered that once recovered from injury the athletes usually alters the game plan and he avoids to do same mistake.

Commonly injured musculoskeletal area according to 75% coaches was ankle, by 65% it was either knees or hamstring. Cause of musculoskeletal injury according to 80% coaches was poor technique and according to 75% it was either lack of fitness or lack of stretching or flexibility. Also, most coaches i.e. 70% believed that inadequate warm up or poor field conditions and according to 40% not using of protective gears during sports was the cause of musculoskeletal injuries in sports participants. Maximum i.e. 85% of coaches blamed players to be responsible for sports injury and for its prevention. 75% coaches thought that prevention of sports musculoskeletal injury is the responsibility of coaches and organizers while 45% considered the right time intervention by the referees can prevent the occurrence of sports injuries. (Table 4)

All 40 coaches believed that injury do occur and were confident that musculoskeletal injuries are preventable. But 12 specific sports coaches believed that injuries can be completely prevented while others believed injury to be unavoidable. For injury prevention coaches believed in stretching or flexibility, strength

training, warm up, equipment and proper skills and techniques. All 40 coaches had complete believed in regular warm up during sports participation and correct technique can prevent the occurrence of the musculoskeletal sports injuries. (Table 5)

The knowledge of sports injury in coaches was through curriculum in 25%, 75% from experience, 12.5% collected information from internet. None of the coaches had undergone specific training for sports injury prevention while there was no Injury reporting and registration system known to them.

Related to capability of Sports injury risk minimization, 25% were confident of application of preventive and post injury taping, bracing and padding, protective equipment selection, fitting and use, making appropriate play/no-play decisions. Maximum coaches were not confident of timing of call to medical expert while none was acquainted with Cardiopulmonary resuscitation (CPR) while all thought themselves to have knowledge of medical first-aid.

Observation of Coaches during actual practices of sports revealed that, 32.5% coaches allowed sports participants to play without sports gear, none of them checked the protective gears while 27.5% allowed without proper warm-up exercises. 35% were not keen in correction of mistakes by sports participants, as they were not able to pay proper vigilance and pays attention to every participant. All of the coaches had first aid kit but no standby medical services. Timely rest breaks were advised by only 40% coaches to the players.

Table 2: Sport specific common type of musculoskeletal Injuries observed by Coaches

Injuries	Sports Coaching									
	Cricket	Badminton	Table tennis	Basket ball	Volley ball	Skating	Athlete	Foot ball	Swimming	Lawn tennis
	n=7	n=6	n=6	n=5	n=4	n=4	n=3	n=2	n=2	n=1
Cut/scrap =29	7	3	0	5	4	4	2	2	0	1
Practice	7	0	0	5	4	3	1	2	0	0
Competition	6	3	0	5	4	4	2	2	0	1
Contusion=23	7	1	0	3	4	4	2	2	0	0
Practice	4	0	0	1	3	2	1	1	0	0
Competition	5	1	0	3	3	4	2	2	0	0
Sprains/strains=37	7	6	5	5	4	4	2	2	1	1
Practice	3	4	4	5	4	3	1	2	0	0
Competition	6	6	4	5	4	4	2	2	1	1
Fractures=1	1	0	0	0	0	0	0	0	0	0
Practice	1	0	0	0	0	0	0	0	0	0
Competition	0	0	0	0	0	0	0	0	0	0
Overuse/ stress related=2	0	1	0	0	0	0	0	1	0	0
Practice	0	0	0	0	0	0	0	0	0	0
Competition	0	1	0	0	0	0	0	1	0	0

Table 3: Musculoskeletal injury mechanism identified by coaches mechanism of injury

Musculoskeletal injury mechanism identified by coaches mechanism of injury	No's (%)
1. Running	32 (80%)
2. Jumping	16(40%)
3. Impact-Direct contact / Collision with opponent	11(27.5%)
4. Specific Actions i.e. Kicking, Dribbling, Heading, Smash etc.	40(100%)

Table 4: Beliefs of coaches about common musculoskeletal sports injury area, risk factor and prevention responsibility

A) Commonly injured areas	No's	Percent
1. Knees	26	65
2. Ankles	30	75
3. Hamstring	26	65
4. Thigh	2	5
B) Injury risk factors		
1. Inadequate warm up	28	70
2. Lack of stretching/ flexibility	30	75
3. Inappropriate practice and competition time	16	40
4. Poor field condition	28	70
5. No protective gears	16	40
C) Responsible for injury prevention		
1. Coach	30	75
2. Player	34	85
3. Parents	18	45
4. Organizers	30	75
5. Referee	18	45
6. Medical personnel	1	2.5
6. Aggression / risk taking	12	30
7. Lack of fitness	30	75
8. Body Contact	18	45
9. Poor muscle strength	14	35
10. Poor technique	32	80
11. Poor nutrition {15}	25	62.5

12. Fatigue	15	37.5

Table 5: Common musculoskeletal injuries believed to be preventable

Measures of prevention	Muscle injury	Knee injury	Ankle injury
Stretching or flexibility	34 (85%)	34(85%)	30(75%)
Strengthening	38(95%)	36(90%)	28(70%)
Warm-up	40(100%)	40(100%)	40(100%)
Equipment	12(30%)	10(25%)	12(30%)
Technique	40(100%)	40(100%)	40(100%)

Discussion

An observation study of knowledge, attitudes and practices in 40 coaches regarding musculoskeletal sport injuries and sports safety measure use among sports participants in Dhule, Maharashtra (India) was done during February to May 2016.

Early injuries to the locomotors apparatus can affect future motor actions and even jeopardize the continuity in the athletic career, so proper identification and preventive strategies need to be practiced by the sports participants and coaches. In this study 100% coaches had observed musculoskeletal sports injuries in sports participants.

According to coaches in our study, Ankle (75%), Knee & Hamstring (65%) were the most common region affected. Similar to our findings high rate of lower limb sport injuries was observed by Bastos et al,[10]Vanderlei et al.,[9] mainly at knee and ankle joints.[5,6,11]

In our study, 92.5% coaches observed sprain, strain or pulled ligament/muscle as common type of musculoskeletal injury. Similarly other authors had noted Sprains/strains,[8] abrasion[5] and cut and scrape[14] as most common lower extremity injuries across all sports in practice and competition.[1]

Musculoskeletal injuries resulting in the necrosis of muscle fibers was the most common cause of severe longterm pain and physical disability, around the world and causing majority of all sport-related injuries.[6]

Cause of injury in this study according to 75% coaches was either lack of fitness or lack of stretching or flexibility. Also most of coaches,i.e. 70% believed that inadequate warm up or poor field conditions were the cause of musculoskeletal injuries in sports participants.

Herman et al.,[9] in his systematic review highlights several practical neuromuscular warm-up strategies effectively reduce the risk of lower limb injuries. Sports which involve high degree of sudden turns and forceful jumping[6] was causing frequent injuries. Sports injuries are most commonly caused by poor training methods; structural abnormalities, weakness in muscles, tendons, ligaments and unsafe exercising environments. The most common cause of injury was poor training.[4]

Participation in pivoting sports such as football, basketball, and soccer are associated with a rising number of sport-related cartilage injuries.[7] Direct contact was the main causes of injuries by Vandelei et al.,[9] in volleyball sports. It is also noted that increase in the time spent practicing sport-specific skills without ample opportunity for preparatory conditioning exercises led to injury.[2] Similarly study found poor playing conditions and lack of proper training as one of the cause of sports injuries.[6] Lack of proper technical expertise increases the risk of being injured during sports.

Authors have found that injury rates in specific sports such as football, basketball, and wrestling, were higher in competition.[1] Higher rate of injuries was also noted in competition (4.63) than in practice.[1] In our study maximum i.e. 85% coaches observed injuries during the competition and 80% during practice. This may be due to increased play intensity, increased physical contact, and increased exposure to high-risk activities during competition as observed by other authors.[1] But Vanderlei et al had noted most injuries occurred during training.[9]

The lack of muscle extensibility or the high tone of the antagonist muscle, are factors that enhance muscular sports injuries.[8] Strained skeletal muscle is capable of self-regeneration, the healing process is slow and often incomplete, resulting in strength loss and a high rate of reinjures at the site of the initial injury.[17] Neglecting physiological processes in an injured tissue can often lead to inappropriate therapeutically interventions followed by un-functional regeneration.[7]

The prevalence of sport injuries was more among those who did not had received any formal training for the sport they actively engaged in.[6] Responsibility of injury prevention according to 85% Coaches was on players while 75% held the coach of sports participant responsible for injury prevention also noted by other author.[11]

Maximum coaches in our study relied on warm-up, proper technique, stretching and flexibility for injury prevention. Coaches believed stretching would prevent injuries at baseline or postseason, indicating that coaches may have accurate beliefs about the value of stretching, but do not effectively transmit this knowledge to players. Inadequate warm-up was identified as a risk factor by coaches for reducing injuries.[11]

In our study coaches lacked complete knowledge of sports injury prevention because of no formal training. A study showed that only 69.3% athletes had received the information of protective aids from coach.[5] Though physical instructors had knowledge on the protective effectiveness of mouth guards because of unavailability and its improper fitting did not recommend it.[14] But result of a survey showed a need of education and information on sports injuries to coaches.[18]

Finding in our study of important barrier for coaches to receiving more training was cost and lack of time. Coaches need the diligent use of appropriate protective equipment in practice and competition for injury

prevention. Attitude towards injury risk and prevention are associated with the uptake of preventive measures among coaches which has shown to influence prevention behaviors in a variety of competitive and recreational sports.[1]

Conclusion

The study identifies a gap between knowledge and practices by the coaches for utilization of preventive measuresto reduce the musculoskeletal sports injury. Findings in study indicate need of appropriate measures and education to coaches in sports injury prevention. We suggest responsible coaching to encourage the sports participant and sports achievements by athletes.

References

1. Rechel Julie A., Yard Ellen E., Comstock R. Dawn. An Epidemiologic Comparison of High School Sports Injuries Sustained in Practice and Competition. Journal of Athletic Training 2008;43(2):197–204.
2. Sports Medicine Handbook. 2013-14 NCAA. Sports Medicine Guidelines. The National Collegiate Athletic Association, Indianapolis, Indiana.US Twenty-fourth Edition. Available online at NCAA.org.
3. Van Mechelen W, Hlobil H, Kemper HCG. Incidence, severity, aetiology and prevention of sports injuries. A review of concepts. Sports Med. 1992;14(2):82-99.
4. Juan Carlos et al. Prediction of Sports Injuries by Mathematical Models, An International Perspective on Topics in Sports Medicine and Sports Injury, (2012) Dr. Kenneth R. Zaslav (Ed.), In Tech, Available from: http://www.intechopen.com/books/an-international-perspective-on-topics-in-sports-medicine-and-sportsinjury/prediction-of-sports-injuries-by-mathematical-models.
5. Kumar V, Mangal A, Yadav G, Raut DK, Singh S. Prevalence and pattern of sport injuries among college students in Delhi, India. Saudi J Sports Med 2014;14:109-14.
6. Dorje C, Gupta R. K., Goyal S, Jindal N ,Vivek Kumar, Masih G.D . Sports injury pattern in school going children in Union Territory of Chandigarh. Journal of Clinical orthopaedics and trauma.2014:5;227-232.
7. Kelc R, Naranda J, Kuhta M, Vogrin M. The Physiology of Sports Injuries and Repair Processes; Current Issues in Sports and Exercise Medicine, 2013, Chapter 2; 43-86. http://dx.doi.org/10.5772/54234.
8. Lam K C, Valier S A R, Valovichmcleod T C. Injury and Treatment Characteristics Of Sport-Specific Injuries Sustained in Interscholastic Athletics: A Report from The Athletic Training Practice-Based Research Network. Sports Health. 2015;7(1):67-74.
9. Vanderlei F M, Bastos F N, Tsutsumi G Y C, et al. Characteristics and contributing factors related to sports injuries in young volleyball players. BMC Research Notes 2013 6:415.
10. Bastos F N, Vanderlei F M, Vanderlei M L C, Júnior J N, Pastre M C**.** Investigation of characteristics and risk factors of sports injuries in young soccer players: a retrospective study. International Archives of Medicine 2013;6:14.
11. McKay CD, Steffen K, Romiti M, Finch C.F, Emery C A. The effect of coach and player injury knowledge, attitudes and beliefs on adherence to the FIFA 11+ programme in female youth soccer. Br J Sports Med;2014;0:1–7, Online First, published on June 13, 2014 as 10.1136/bjsports-2014-093543.
12. Yard EE, Collins C L, Comstock R. D. A Comparison of High School Sports Injury Surveillance Data Reporting by Certified Athletic Trainers and Coaches. Journal of Athletic Training 2009;44(6):645–652.
13. Neeraja G. Bharadwaj S, Shah K, Subramaniam P. Knowledge, attitude and practices about orofacial protective devices among physical instructors in Bangalore. Journal of International Oral Health 2014;6(3):0-0.
14. www.safekids.org.Coaching our kids to fewer injuries: A report on Youth Sports safety. 2012. Safe kid worldwide, Washingtone D.C.
15. Priya M, Sharmin D, Amarlal D, Thomas E, Pooja Y (2016) Knowledge and Attitudes of Coaches Regarding Sports Related Oro-facial Injuries in Chennai, India. Dentistry 6:383. doi:10.4172/2161-1122.1000383.
16. Jang, Siwon, "The Relationship between High School Coaches' Beliefs about Sports Injury and Prevention Practice Readiness" (2013). *Graduate Theses and Dissertations.* http://scholarcommons.usf.edu/etd/4694.
17. Huard J, Li Y, Fu FH. Current concepts review - Muscle injuries and repair: Current trends in research. J Bone Joint Surg Am. 2002 May;84A(5):822-32.
18. Perunski S, Lang B, Pohl Y, Filippi A. Level of information concerning dental injuries and their prevention in Swiss basketball – a survey among players and coaches. Dental Traumatology 2005;21:195–200.