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Analysis of Selective Functional Movement Assessment in Professional Karate Players

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Abstract:
Background: This study aims to rule out the injuries sustained during training period with the help of Selective Functional Movement Assessment Scale in Professional Karate Players so that the injury can be treated before the injury leads to further dysfunction or disability. With the help of selective functional movement assessment scale every joint was assessed in professional karate players with different years of practice, both male and female and from 5 to 16 years of age.
Methodology: Prior to the assessment, in this study, demographic data including the participant's name, age, gender, occupation, address, and contact information as well as the Selective Functional Movement Assessment Scale were collected.
Results: From 117 participants majority of them reported that the following movements were functional but also painful: 12% (right-5 & left-7) in Seated Active Ankle Inversion/Eversion and Seated Passive Ankle Inversion/Eversion, 11% (right-5 & left-6) in Prone Passive Plantar-Flexion, 13% (right-7 & left-6) in Toe Walk, 17% (right-8 & left-9) in Prone Passive Dorsi-Flexion and Heel Walks, 18% in Supine Knee To Chest Holding Thighs, Supine Knee To Chest holding Shin and Interlocking Fingers Behind the Neck Squats, 17% in Assisted Squats, 18% (right-9 & left-9) in Half-Kneeling Dorsi-Flexion.
Conclusion: The outcome of this study is that injuries were first identified during the training period. The following exercises, Vestibular & Core (Left Quadruped Diagonals and Half-Kneeling Narrow Base), Single Leg Stance Ankle, and Over Head Deep Squat were painful for the participants. Most players found it difficult and painful to perform the Single Leg Stance Ankle and Overhead Deep Squat throughout the entire range of motion.

Keywords: Karate players, Selective Functional Movement Assessment, Years of Practice, Ankle Injury, Knee Injury.

Introduction

One of the most popular martial arts, both inside and outside of India, is karate. Basic moves like punching, kicking, blocking, and hitting are practiced with body motions in a variety of formal postures. This method

can also be practiced in a stationary position, such as simply being still while standing in one spot. Kata is another part of traditional karate. A form known as a kata is composed of a series of defensive and attacking movements and techniques. Sparring is another style of karate that is practiced. The act of sparring involves using both offensive and defensive strategies while moving freely against the opponent. Professional karate players cross train in addition to receiving regular instruction by engaging in a variety of demanding activities including weight training and running.

Karate means "empty hand", but it also means sparring between two people without any aid of martial art weapons. Punches and kicks are used in a technique in proper intervals which includes not injuring the opponent or stopping before touching challenger's body. In this sport uncontrolled hits are considered as foul and penalties are issued.

Karate athletes practice strength and conditioning techniques as part of their competitive preparation. A recent study showing that both upper- and lower-body muscle power are higher in winners as compared with defeated international level karate athletes emphasizes the importance of this training characteristic. The speed, acceleration, and power of karate techniques are likely influenced by the strength of the upper- and lower-body muscles, which helps athletes perform well in competition. As a result, training methods that aim to increase muscle power may be quite beneficial for karate practitioners. To improve training methods, particularly regarding the exercise style and loads that should be used to increase karate technique speed, power, and acceleration, it is important to identify the physical capacities associated to karate practices.

Selective Functional Movement Assessment (SFMA) is a diagnostic tool which is used by experts for people who experience pain during movement. This scale is used to rule out movement restriction with or without pain by Stimulate the symptom with the help of movements. SFMA has been improved and created to assist the Healthcare associates in musculoskeletal assessment, diagnosis and treatment focusing on best rehabilitation and therapeutic methods.

The incidence of several injuries during the competition and training period is a regular sight among karate practitioners in the general public. It could result in additional issues like muscle permanent damage, musculoskeletal dysfunction, etc., which would reduce performance during competitions. Numerous studies have previously focused on the rate of injuries occurring during competitions; the investigator, however, conducted the survey on injuries occurring during the training period.

It is crucial to understand the types of injuries suffered by athletes from various age groups, genders, and practice periods during the training session. The selective moment assessment scale can help us rule out specific sorts of injuries, which will simplify treatment and let us take preventative measures to avoid them. By using the Selective Functional Movement Assessment Scale on professional karate players, the current study intends to rule out injuries incurred during training so that they can be addressed before they cause further dysfunction or impairment.

As per the author Andrew Busch, SFMA can also be used in other sports for Musculoskeletal assessment.[9]

Material And Methodology

After getting approval, from **Institutional ethical** committee the study was initiated in the month of September 2022. The study was conducted in Sports Club in Pimpri-Chinchwad, Pune, India.

The observational study was conducted on Professional Karate Players in Vishwa Sports Academy, Pimpri-Chinchwad, Pune, India. The players were asked to perform movements based on Selective Functional Movement Assessment Scale as per the symptoms and injuries were ruled out. The samples

were taken based on inclusion and exclusion criteria.

In this study before assessment demographic data was taken which included participants name, age, gender, occupation, address and contact number along with Selective Functional Movement Assessment Scale.

The SFMA is a movement-based diagnostic method for clinical usage. This method is used by professionals working with patients suffering pain on movement. The aim of the SFMA is to observe and capture the patterns of posture and function for evaluation against a baseline. It uses movement to aggravate symptoms, determine limitations, and offer evidence concerning movement pattern deficiency associated to the patient's primary complaint. The SFMA uses a sequence of movements with a specific structural method to rank the excellence of functional movements and, when suboptimal, recognize the cause of aggravation of symptoms during movement. The SFMA has been advanced and expanded to help the health care professional in musculoskeletal examination, diagnosis, and treatment geared in the direction of selecting the optimal rehabilitative and therapeutic interventions. It helps the therapist to identify the maximum dysfunctional movement patterns, which are then assessed in detail. By identifying all aspects of dysfunction within various patterns, specific targeted therapeutic interventions designed to capture or brighten tightness, weakness, poor mobility, or poor stability can be selected. Thus, the aspects of movement identified to most signify or define the dysfunction and thereby affect movement can be able to be addressed. Manual therapy and corrective exercises are focused on movement dysfunction, not pain.

Results and Observation:

The analysis was done using SPSS v 21 and Microsoft Excel software in which 117 professional karate players with age 5-16 years respectively was analyzed. It consists of 66% of Male and 36% of Female.

From total 117 participants majority of them complained of pain in Single Leg Stance Ankle Movement: 12% (right-5 & left-7) in Seated Active Ankle Inversion/Eversion and Seated Passive Ankle Inversion/Eversion, 11% (right-5 & left-6) in Prone Passive Plantar-Flexion, 13% (right-7 & left-6) in Toe Walk, 17% (right-8 & left-9) in Prone Passive Dorsi-Flexion and Heel Walks were Functional but Painful Movements; and Overheads Deep Squats: 18% in Supine Knee To Chest Holding Thighs, Supine Knee To Chest holding Shin and Interlocking Fingers Behind the Neck Squats, 17% in Assisted Squats, 18% (right-9 & left-9) in Half-Kneeling Dorsi-Flexion participants had Functional Painful Movements while completing the Full Range Of Motion. The Assessment was done with the help of SFMA (Selective Functional Movement Assessment).

	Functional Painful N (%)	Functional non-painful N (%)	DP N (%)	DN N (%)
Ankle Seated Passive Ankle Inversion/Eversion				
Right	6 (5)	111 (95)	0	0
Left	8 (7)	109 (93)	0	0
Seated Ankle Inversion/Eversion				
Right	6 (5)	111 (95)	0	0
Left	8 (7)	109 (93)	0	0
Prone Passive Plantarflexion				
Right	6 (5)	111 (95)	0	0
Left	7 (6)	110 (94)	0	0
Toe walk				
Right	8 (7)	109 (93)	0	0
Left	7 (6)	110 (94)	0	0
Prone passive dorsi flexion				
Right	9 (8)	108 (92)	0	0
Left	10 (9)	107 (91)	0	0
Heel walks				
Right	9 (8)	108 (92)	0	0
Left	10 (9)	107 (91)	0	0

	Functional Painful N (%)	Functional non-painful N (%)	DP N (%)	DN N (%)
Overhead Deep Squat Supine Knee to Chest Holding Thighs				
	21 (18)	96 (82)	0	0
Supine Knee to Chest Holding Shin	21 (18)	96 (82)	0	0
Half-kneeling Dorsiflexion				
Right	11 (9)	106 (91)	0	0
Left	11 (9)	106 (91)	0	0
Assisted Squats	20 (17)	97 (83)	0	0
Interlocking Fingers Behind the Neck Squats	21 (18)	96 (82)	0	0

Discussion:

Karate is a martial art form in which Hands and Legs are used in attack and defend in tough times or competitions. The word Karate comes from Japanese origin which means “Empty Hand Defence”. Karate is distributed into 5 different styles namely Shotokan, Shito-Ryu, Goji-Ryu, Zensu-Ryu and Wado-Ryu. This martial art form was originated in Japan. Shotokan Karate style is the most explosive dynamic and toughest form of karate. This martial art is divided into Kihon, Kata and Kumite is practiced in martial art form, where Kihon means Blocks and attacks using stances. Kata means group of Kihon’s and Kumite means sparing. Karate is also an International Sports which is Practiced in more than 100+ nations across the world including India. WKF(World Karate Federation) is the governing organization for Karate at International Level.

The objective of this was to study professional karate players with the minimum 2 years of practice with different Age group varied form 5-16 years, with different Gender both Male and Female and different Years of Practice with 2 or more years. The Study was to assess professional karate players with the help of Selective Functional Movement Assessment. The SFMA is Divided into total 4 categories such as Functional Painful, Functional Non-Painful, Dysfunctional Painful and Dysfunctional Non-Painful respectively. As per results the association between Passive Prone Elbow Flexion Right (80°) and Active Prone Elbow Flexion Right (70°) is 0.049, with Faber Right is 0.048, Prone Passive Plantar Flexion Right and Toe Walk Left is 0.050 which is considerable correlation.

It is important to rule out the injuries as they might affect the performance of the player during competition. Usually, the professional players ignore minor injuries as they focus more on practice but in turn these small unhealed injuries create major injuries making the player affect its intense training and unable to participate in any of the competitions.

Conclusion:

Thus, this study's conclusion is that the training phase was when injuries were discovered. The exercises that caused pain for the participants included the following: Vestibular & Core (Left Quadruped Diagonals and Half-Kneeling Narrow Base), Single Leg Stance Ankle, and Over Head Deep Squat. Most players found it challenging to do the Single Leg Stance Ankle and Overhead Deep Squat, and they felt pain throughout the whole range of motion.

Future scope:

- Further studies can be done on individual muscle injuries.

Limitations:

- Players older than 16 years were not taken into consideration for this study.
- Players hurt during a match were excluded from this study.
- Specific movements were evaluated during research that focuses on a group of muscles; however, this study did not focus on individual muscles.

References:

1. Naserpour H, Mirjani M. The Prevalence and Etiology of Ankle Injury in Professional Karate Players in Iran. J Sport Biomech. 2019; 4 (4) :2-15
2. Laura P, Dariusz M, Natalia G. Sport Injuries in Karate Kyokushin Athletes. Biomed J Sci & Tech Res 15(1)-2019. BJSTR. MS.ID.002653.
3. Rahimi M., Halabchi F., Alibakhshi E., Kalali N., Sport injuries of Karatekas at international competitions; Iranian Journal of Military Medicine Winter 2012
4. Irineu Loturco, Guilherme Giannini Artioli, Ronaldo Kobal, Saulo Gil, And Emerson Franchini, Predicting Punching Acceleration from Selected Strength and Power Variables In Elite Karate Athletes: multiple Regression Analysis; Journal of Strength and Conditioning Research 2014 National Strength and Conditioning Association
5. Barbara J. Hoogenboom, Michael L. Voight, Gray Cook, and Greg Rose, Functional Movement Assessment, Movement Screening versus Specific Functional Performance Tests; 2013
6. Claire Destombe, Laurent Lejeune, Yannick Guillodo, Anne Roudaut, Sandrine Jousse, Valérie Devauchelle, Alain Saraux , Incidence and nature of karate injuries; Joint Bone Spine; 2005
7. Kaori Teshima, Hiroyuki Imamura, Yoshitaka Yoshimura, Seiji Nishimura, Noriko Miyamoto, Yoichi Yamauchi, Hitoshi Hori, Chinatsu Moriwaki and Tomoko Shirota; Journal of Physiological Anthropology and Applied Human Science; 2002.
8. Glaws KR, Juneau CM, Becker LC, Di Stasi SL, Hewett TE. Intra- and inter-rater reliability of the selective functional movement assessment (sfma). Int J Sports Phys Ther. 2014 Apr;9(2):195-207. PMID: 24790781; PMCID: PMC4004125.
9. Busch AM, Clifton DR, Onate JA, Ramsey VK, Cromartie F. RELATIONSHIP OF PRESEASON MOVEMENT SCREENS WITH OVERUSE SYMPTOMS IN COLLEGIATE BASEBALL PLAYERS. Int J Sports Phys Ther. 2017 Nov;12(6):960-966. PMID: 29158957; PMCID: PMC5675371.