138 - COMPARISON BETWEEN THE OLYMPIC ATHLETES OF TAEKWONDO MEDALISTS AND NOT MEDALISTS OF SYDNEY 2000 AND BEIJING 2008 AND THE ANALYSIS OF THESE SPORTS EVOLUTION THROUGH THE GAMES

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INTRODUCTION

Taekwondo is a recent sport, which has its roots in traditional Korean martial art. A significant development of Taekwondo as combat sport began with the foundation of the World Taekwondo Federation (WTF). Although currently there is also another organization that controls the practice of Taekwondo, the International Taekwondo Federation (ITF), for scientific studies it is more interested WTF, as the organization of events with high performance is under its rules. To ITF is reserved the most traditional part of Taekwondo[11]. As a Korean martial art Taekwondo has its origins 1500 years ago. Originally it was used for war, self defense and physical conditioning. Came growing through the centuries and it is estimated that currently have 75-120 million practitioners, among children and adults, around the world[17]. Currently, participation in martial arts in general registers an annual growth average of 20-25% an year[2]. Recent data show that Taekwondo is practiced in over 140 countries, and that 120 nations are official members of the WTF[7]. Even with all this growth over the years Taekwondo only reached the category of Olympic sport in Seoul (1988), participating as a demonstration sport, and has become an official Olympic sport in 2000, at the Olympic Games in Sydney, counting for medals[17].

Very little is known about the best form to prepare the athlete, the physiological characteristics of the sport and the physical, physiological and anthropometric characteristics that determine a successful athlete[7]. This is due to the fact that still be found little literature on the sport and most studies focused on injuries (Zetaruk et al., 2005; Beis et al., 2001; Chuang and Lieu, 1992; Philips et al., 2001; Pieter et al., 1998a; Pieter and Lufting, 1994; Serina and Lieu, 1991; Zemper and Pieter, 1989). Another consequence due to Taekwondo be a recent Olympic is the fact that it still be in constant evolution. From the Olympics in Sydney (2000) to Beijing (2008), many rules have changed, in an attempt to make the fights more dynamic. Among the rules might be mentioned the decrease in area of the ring and in the time of the rounds (3 minutes for 2 minutes), a bigger number of lateral arbitrators making the marking of the point more rigid, the start of the limit of 12 points on the scoreboard and 7 points of difference, among others. Also, when a fight ends in a tie, this is no longer immediately decided by arbitrator's summary of superiority, as in Sydney, because athletes now have in this case a fourth round, with the same two minutes, and the athlete who makes the first point wins. If alter this extra round neither of them obtained a point, the winner of the fight going to be decided by the same general outline of superiority as before[22]. It is for scholars try to understand these changes and the trend towards determine which tendency this sport go for, in high yield, to make a efficient strategy to fight and do a better selection of athletes.

Understand the anthropometric and physiological characteristics in each field are an important, decisive and influential factor in the performance of athletes. To know these characteristics is essential to compare an athlete with its last performance and the result of other athletes, to find the weaknesses and remove them and to be able to decide the best form of exercises and preparation. Taekwondo requires, among other physical and physiological abilities, explosive power, agility and speed, and is characterized by rapid and explosives kicks (Zar A. et. al., 2008).

The aim of this study was to analyze and compare the average height and age of medalists (MED) and not medalists (NMED) athletes in Sydney (2000), when Taekwondo stars as an official Olympic sport, and Beijing (2008), the most recent Olympics. It would also analyze the fight itself, in regard to penalties, techniques used to score and the difference of points on the final scoreboard, among others, aimed to understanding the evolution of the sport through the Games. Therefore, it was guided athletes and technicians in its task of make an efficient strategy and appoint to some characteristics that may determinates a successful athlete of Taekwondo or not.

METHODOLOGY

Sample's identification

There were analyzed 102 of Taekwondo athletes from Sydney, being 54 men and 48 women, and 128 athletes from Beijing, being 56 males and 56 females.

Collecting data

For further analysis and comparison of data from this study all the information collected and these were caught in the official web sites of the Olympic Games in Sydney and Beijing, which contained: a list athletes and their weight categories, height, date of birth, country of origin; misconduct; kick and punch points; points of AT and CAT; final score of each fight; forms of decision of tie; list about referees and judges; some observations if something other than the usual occurred. Data from Athens were not studied because they are not available and due to the fact that these Olympics are included in a transitional phase, serving for this study only the first Olympiad and the most recent.

Statistical treatment and study's delimitation

The study is characterized by cross observational descriptive (THOMAS, Nelson, 2002). It was used descriptive statistics with measures of central tendency and dispersion and one-way ANOVA to calculate the analysis of variance, in order to characterize and compare variables. The sample was observed and divided by gender, weight division and mainly by MED and NMED in the Olympics. This fact becomes relevant since in all categories and groups to be compared, the rate of MED has always been lower than that of NMED.

RESULTS AND DISCUSSION

Height and age of athletes

The average age of athletes MED and NMED in Sydney and Beijing is presented in Table 1, divided by sex.

Table 1: Athletes average age.

Athletes	MED Sydney	NMED Sydney	MED Beijing	NMED Beijing
Males	24,4ÿ3.3	25.2ÿ4.3	25,26ÿ1,55	24,8ÿ2,37
Females	23.1ÿ3,9	24,9ÿ4,7	22,9ÿ1,72	22,86ÿ2,15

In general the age average of women is relatively lower than the age of men. In both the Olympic Games mean age between MED and NMED remained very close, both for men and women. Meanwhile, the average age of MED was lower than NMED for both genders, in Sydney, while in Beijing the average age of NMED was lower than MED. In Sydney this fact seems to be justified as a result of the recent inclusion of Taekwondo in the Olympic Games, which led to the exposure of the sport for young athletes as well as the application of scientific principles of training, which can lead athletes to a rapid development (Kazemi et al, 2005). The fact that explains the average age of MED higher than the other athletes in Beijing would be that Taekwondo have a greater development and more experienced athletes since the first Olympic, a characteristic that, according Olds and Kang (2000), is considered more important than some physical and physiological characteristics to improvement the performance. The ANOVA showed that the comparison of age in Beijing between MED and NMED females has no statistically significant difference (p = 0.917) and between males MED and NMED there is no significant difference (P = 0.263) also. In Sydney there is a significant difference statistically between the ages of women NMED and MED (P = 0.031), but again it was not happened for males (P = 0.310).

The height average of the athletes MED and NMED in the Beijing Olympics Games is presented in table 2, divided by sex.

Table 2: Height average of Beijing athletes divided by weight categories

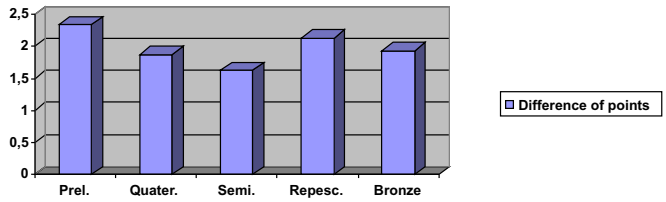
Weight division (em kg)	General average	MED average	NMED average
Less than 49 female	165,82ÿ5,77	163,02ÿ7,23	166,94ÿ5,08
Less than 58 male	174,46ÿ4,97	177,63ÿ4,76	173,67ÿ4,89
Less than 57 female	173,3ÿ5,12	177,8ÿ1,9	171,95ÿ5,04
Less than 68 male	179ÿ3,07	180,3ÿ0,86	179,85ÿ3,44
Less than 67 female	177,34ÿ4,04	170,23ÿ7,51	177,71ÿ2,78
Less than 80 male	185,58ÿ6,07	189,47ÿ6,6	184,29ÿ5,57
More than 67 female	179,46ÿ2,44	177,47ÿ3,1	180,19ÿ1,82
More than 80 male	192,84ÿ7,01	196,06ÿ7,04	191,88ÿ7,08

Both in Sydney and Beijing the majority categories showed an average height between MED and NMED very close, making clear that this is not a decisive feature, perhaps by the fact that the experience of athletes is more important than that physical characteristic. Meanwhile, in Sydney, the average height of MED athletes was higher than NMED, in average, although it was not significant statistically[7]. It was supposed that the height was something that would influence the fight, mainly due to the technical belief that the taller athletes in its weight division have more chance of success because of its long-range and higher lever arm of the lower limbs, what helps them to cover a greater distance than their opponents (Kazemi, 2005). The ANOVA of MED and NMED athletes heights at the Olympic Games in Beijing showed the following values and a statistically significant difference in those categories: less than 57Kg female (FEM) (P = 0.004), less than 67kg FEM (P = 0.002), more than 67kg FEM (P = 0.004), less than 80kg male (P = 0.018). The categories that showed no significant differences were: less than 49kg FEM (P = 0.091), less than 58kg male (P = 0.28), less than 68kg male (P = 0667); more than 80kg male (P = 0140).

Difference of points on the scoreboard

The difference of points on the scoreboard at the end of each fight was analyzed in Beijing. The same was not done in Sydney because it was supposed that Taekwondo still be developing as sport and so a comparison of the two Olympics would not be valid. The finals were not considered due to the fact only remain the two best athletes of the categories, not serving to the wanted comparison.

Chart 1: Average of difference in scores.

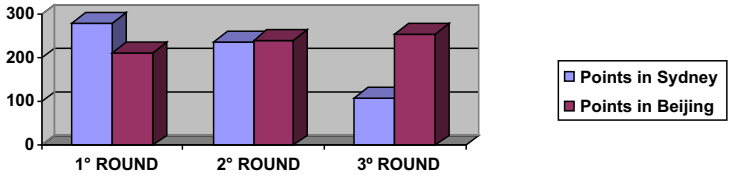


When analyzing the difference of points by round was supposed that, as the athletes progress in the bracket, the difference of points would getting lower due to the fact that the technical level of athletes usually become very similar. It was hoped to find a greater difference in points in the preliminary rounds and less difference, but similar, at the repechage, which in fact occurred, probably because the technical level of athletes was, depending on the braket, uneven. However, a gradual decline the difference in points with the breakthrough in the bracket did not occur, because the average of difference of points on the scoreboard of the bronze was higher than the quarter-finals and semifinals, for reasons that still need to be clarified.

Total points

The number of points considered in each round in both Olympics Games analyzed is presented in chart 2.

Chart 2: Points considered in each round in Sydney and Beijing



The sum of all points considered in Beijing totalized 710 points, ignoring the fourth round, when there were. Of the total

number of points there was a total of 395 points of CAT (55.63%), while the points of AT totalized only 314 (44.22%). Furthermore, when observed the total points computed by athletes winners of each fight, there was a total of 52.72% of the fights that the winner athlete scored more CAT, against 29.72% of fights in which the winners scored more with offensive techniques. The fights in which the winner scored in the same amount of AT and CAT represented only 17.56% of the total. In Sydney, from the total of 626 points computed, 52% of the techniques considered were a point of AT, however, NMED male had a bigger percentage of offensive strikes (63%) (Kazemi M. et. al., 2006).

The analysis of points per round is important to show the athletes strategy to prefer the CAT than AT, since this seems to be more efficient and because arbitration tends to mark more the defensive points, witch is more evident in an exchange of kicks. This hypothesis is reinforced by the fact the winning athletes in Beijing scored more with CAT. The distribution of points per round in Beijing seems to be justified because that the first round is mainly of athletes studies, to try to find out what is the possible actions of the adversary, and also because the third round was decisive, witch makes many athletes, who are in disadvantage, try the AT point without cares about de CAT of the opponent. In Sydney, one of the hypotheses that seem to justify the higher number of points have occurred in the first round is that, at the beginning, the Taekwondo did not involve so much tactical strategy as now, and most athletes opt for just decide soon the final result.

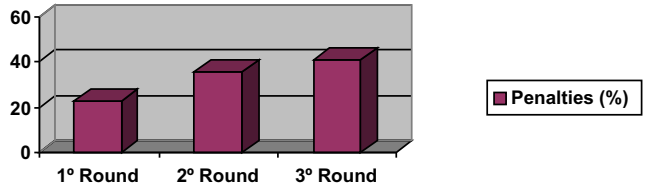
Ways of scoring

Taekwondo is composed mainly of kicks and, to a punch be considered a point, it is necessary that the opponent feel the coup, so that judges can consider a point. At Sydney, second Kazemi et. al. (2006), the punches represented only 2% of all points considered. At Beijing that percentage fell even more, representing only 0.28%. About the ways of scoring it is obvious that the kick, which characterizes the Taekwondo, will always have a higher percentage from total points than the punches, not least because this punch has been used in more defensive, aimed at preventing the attack the opponent, not for the purpose of marking point. As the rule for be considered a point of punch has became more rigid during the years, this is probably the reason for the decrease in the percentage of punch when comparing these two Olympics.

Penalties

In Sydney, MED medalhistas had received more penalties and warnings that the NMED. From 244 penalties received in all de fights, 151 (61.8%) were committed by MED and 93 (38.1%) by NMED. In Beijing, although the total number of penalties was higher (303), most of them continued to be committed by MED, so that these athletes have more penalties in 46.62% of total fights, while in 23.64% the largest number of penalties was committed NMED and, in 29.72% of fights, by both of them. The analysis of the amount of penalties in each round in the Olympics in Beijing is represented in chart 4.

Chart 4: Penalties percentage in each round in Beijing



The distribution of penalties by round appears to confirm the theory that the first round is primarily of studies, when few movements happen. It is expected that most penalties have occurred due to a lack of combativeness by the athletes. The high number of penalties in the third round appears to be linked to the fact than, when some athletes are losing, many of them decided for attacking without taking care with the defense of the opponent, as explained before.

Golden point

In Sydney, as the form of decision by golden point does not exist yet, these data can not be analyzed. In Beijing, from all the 30 GP happened, seven (23,33%) were decided by an AT point, fifteen (45,45%) by an CAT point and eight (24,24%), as none athlete has made a point, were decided by superiority. This distribution might be because CAT is more evident and athletes here do not take a risk without sure.

Country representation

In 2000, second Kazemi et. al. (2006), South Korea was the country witch has earned more medals, having 3 gold medals and one silver medal. In Beijing this was happened the same: this country was earned the majority medals, with 4 gold medals. Can be observed, analyzing the medals distribution in general, that the Asiatic continent still having the best representation, however, medals started to be more distributed, including Europeans, Africans and Americans countries.

CONCLUSION

Regarding the athletes age average MED were younger than NMED in Sydney; in the Beijing happened the reverse of this fact. Taking into account only the MED, they were younger in Sydney than in Beijing, but the NMED were older in Sydney. In the comparison and analysis of profiles of Olympic athletes MED and NMED could be observed that the height and age did not influence as much as experience, witch was corroborated by analysis of variance, where both variables did not had a significant difference ($p>0,05$). While in Sydney, generally speaking, there was not a significant difference about height between MED and NMED, in Beijing there was a significant difference ($p<0,05$) in the following weight divisions: less than 57kg FEM, less than 67kg FEM, more than 67kg FEM and more than 80kg males. Through the analysis of the fights can be observed that the changes in Taekwondo from Sydney to Beijing seems to be positive, talking about evolution of these sport, becoming more scientific in the preparation training and fights strategy. Although some things seems to be the same, as the majority of points be made by kicks and de majority of penalties be committed by the winners athletes, the CAT is now more efficient than de AT and the biggest number of points happen in the third round, not even more in the first. However, another researches might be done to verify if there is physiological, psychological or another characteristics that can influence a fight result, and if the fight characteristics observed in Beijing is confirmed by others worlds championships.

KEY WORDS: Taekwondo; analysis of fighting; profile of athletes.

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COMPARISON BETWEEN THE OLYMPIC ATHLETES OF TAEKWONDO MEDALISTS AND NOT MEDALISTS OF SYDNEY 2000 AND BEIJING 2008 AND THE ANALYSIS OF THESE SPORTS EVOLUTION THROUGH THE GAMES

ABSTRACT:
Taekwondo is recent in the Olympics, resulting in little knowledge about its preparation, development and profile of the successful athletes. The aim of this study was to compare and to analyze the height and age of Taekwondo athletes medalists (MED) and non-medalists (NMED) and to analyze the characteristics of the Olympics fighting in Sydney and Beijing. The sample consisted of 102 fighters in Sydney and 128 in Beijing. The following characteristics were studied for athletes: weight division, height, age and country of origin. The fights was analyzed in the following topics: penalties, points of kick and punch, points of attack (AT) and counterattack (CAT), final score of each fight. All data were captured in the official internet site of Olympics, and were analyzed using descriptive statistics and analysis of variance. It was found that in Sydney the age of men and women MED was lower than NMED; in Beijing happened the opposite. However, in both is not obtained significant difference between MED and NMED ($p > 0.05$). The average height of athletes showed no significant difference for MED and NMED in Sydney ($p > 0,05$); in Beijing there was significant difference for some weight divisions. In Sydney the AT represented 52% of all the valid points, while in Beijing the CAT accounted for 55.63%. The punches were 2% in Sydney and Beijing in 0.28% of all points. In Sydney there was not the decision of tie through the golden point (GP), but in Beijing 45.45% of the GP decisions were by a CAT point. In Sydney the majority part of penalties occurred in the first round, while in Beijing it was in the third, both mainly by winner. It was concluded that the height and age does not influence the achievement of medals, the CAT was more efficient to score, the penalties have been committed mainly by the winner of the fight and punch is becoming less used.
KEY WORDS: Taekwondo; analysis of fighting; profile of athletes.

COMPARAISON ENTRE LES ATHLÈTES OLYMPIQUES DU TAEKWONDO ET MÉDAILHISTES DE NON-MEDALHISTES DE NE SYDNEY 2000 ET BEIJING 2008 ET DE L'ANALYZE DE L'ÉVOLUTION DU SPORT PAR LE BIAIS DE JEUX.

ABSTRACT:
Le taekwondo est récente dans les jeux olympiques, ce qui entraîne peu de connaissances sur le développement et le profil de la réussite des athlètes. L'objectif est de comparer et analyser l'hauteur et l'âge des athlètes de Taekwondo medalhistes

(MED) et dês non- medalhistes (NMED), en analysant les luttes des Jeux olympiques de Sydney et Beijing. L'échantillon est constitué de 102 combattants à Sydney et 128 à Beijing. Ont eté étudiés les caracteristiques suivantes: taille, âge et pays d'origine. En ce qui concerne les luttes: les défauts, coup de pied et coup de poing dans l'attaque (AT), contre-attaque (CAT), score final de chaque affrontement. Toutes les données ont été capturés dans les pages olympiques officiels de l'Internet. Ont été utilisés des statistiques descriptives et ANOVA. On a été constaté que, à Sidney l'âge des hommes et des femmes MED a été inférieure à la NMED, à Beijing,vice-versa. Toutefois, tous les deux il n'y a pas de différence significative entre MED et NMED (p> 0,05). La hauteur moyenne des athlètes ne présentaient aucune différence significative pour MED at NMED à Sydney (p>0,05). À Beijing différence significative dans certaines chambres de poids. À Sydney,les ATs ont représenté 52% de tous les coups calculés,tandis qu'à Beijing, les CAT ont représenté 55,63%. Les coup de poings ont été de 2% à Sydney et 0,28% à Beijing du total de coups. À Sydney, il n'y a pas eu le departage par le point d'or (PA), mais à Beijing, 45,45% ont été décidés par PA avec un point de CAT. À Sydney, la majorité des défauts ont arrivés dans le premier tour, à Beijing, à la troisième, pour la majorité gagnant. On a été conclu que la hauteur et l'âge n'a pas d'influence sur la réalisation de médailles, la contre-attaque a été plus efficace au score, les défauts ont été commises surtout par le gagnant de la lutte, coup de poing est de moins en moins utilisé.

MOTS-CLÉS: Taekwondo; analyze de luttes; profil dês athlétes.

COMPARACIÓN ENTRE LOS ATLETAS OLÍMPICOS DE TAEKWONDO MEDALLISTAS Y NO-MEDALLISTAS DE SIDNEY 2000 E PEKÍN 2008 Y ANALIZE DE LA EVOLUCIÓN DE LO DESPORTE LO LARGO DE LOS JOGOS

RESUMEN:

El Taekwondo es reciente en las Olimpíadas, dando por resultado poco conocimiento científico acerca de su preparación, el desarrollo y el perfil de los atletas bien-tenidos éxito. El objetivo de este estudio es comparar y analizar la altura y la edad de los atletas de Taekwondo medallistas (MED) y los no-medallistas (NMED) y analizar las características de las luchas de los Juegos Olímpicos en Sidney y Pekín. La muestra fue compuesta de 102 combatientes en Sidney y 128 en Pekín. Cuánto a los atletas, se estudiaron las características siguientes: categorías, altura, edad y país de origen. Ya en lo que respecta a las luchas: mala conducta (falta), puntos de chute y puñetazo, ataque (AT) y el contraataque (CAT) y la pontuación final de cada enfrentamiento. Todos los datos fueron capturados en las páginas oficiales de los Juegos Olímpicos de Internet. Para la análisis de los datos se utilizó estadística descriptiva y ANOVA. Se verificó que en Sidnei la edad de los hombres y de las mujeres MED fue inferior que de los NMED; en Pequim tal hecho ocurrió a la inversa. Pero en ambos no se presentó diferencia significativa entre MED y NMED (p>0.05). La altura media de los atletas también no difieren significativamente de NMED y MED en Sidney (p>0.05). Em Pekín algunas habitaciones de peso no mostrón diferencias significativas. En Sidnei los ATs representaron 52% del total de golpes computados, mientras que en Pequim el CAT había representado 55.63%. Los puñetazos fueron 2% en Sidney y Pekín 0.28% del total de los golpes. En Sidney no tenía la decisión del desempate a través del punto del oro (PA), pero en Pekín, 45.45% de las decisiones por PA habían sido determinados con un punto del CAT. En Sidnei la mayoría de las malas conductas (faltas) había ocurrido en primero *round,* en Pekín, en el tercero, ambas em mayoría por el ganador. Se llegó a la conclusión de que la altura y la edad no influye en la consecución de medallas, el contraataque fue más eficiente puntuación, las faltas se han cometido principalmente por el ganador de la lucha, el puñetazo es cada vez menos utilizado.

LA PALABRA IMPORTANTE: Taekwondo; análisis de las luchas; perfil de los atletas.

COMPARAÇÃO ENTRE OS ATLETAS OLÍMPICOS DE TAEKWONDO MEDALHISTAS E NÃO MEDALHISTAS DE SIDNEI 2000 E PEQUIM 2008 E ANÁLISE DA EVOLUÇÃO DO ESPORTE ATRAVÉS DOS JOGOS

RESUMO:

O Taekwondo é recente nas Olimpíadas, resultando em pouco conhecimento científico sobre sua preparação, desenvolvimento e perfil dos atletas bem-sucedidos. O objetivo deste estudo foi comparar a altura e idade dos atletas de Taekwondo medalhistas (MED) e não-medalhistas (NMED) e analisar características das lutas das Olimpíadas de Sidnei e Pequim. A amostra era composta por 102 lutadores em Sidnei e 128 em Pequim. Foram estudadas as seguintes características dos atletas: altura, idade e País de origem. Já no que se refere às lutas: faltas, pontos de chute e soco, de ataque (AT) e contra-ataque (CAT) e placar final de cada confronto. Todos os dados foram capturados nas páginas oficiais dos Jogos Olímpicos na internet. Para análise dos dados foi utilizada a estatística descritiva e ANOVA. Verificou-se que em Sidnei a idade dos homens e mulheres MED foi menor que dos NMED; em Pequim tal fato ocorreu inversamente. Em ambos não se obteve diferença significativa entre MED e NMED (p>0,05). A altura média dos atletas não apresentou diferença significativa para MED e NMED em Sydney (p>0,05); em Pequim houve diferença significativa para algumas categorias. Em Sidnei os AT representaram 52% do total de golpes computados, enquanto que em Pequim os CAT representaram 55,63%. Os socos representaram em Sidnei 2% e em Pequim 0,28% do total dos golpes. Em Sidnei não havia a decisão de desempate através do ponto de ouro (PA), mas em Pequim 45,45% das decisões por PA foram decididas com um ponto de CAT. Em Sidnei a maioria das faltas ocorreu no primeiro *round;* em Pequim, no terceiro; ambas majoritariamente pelo vencedor. Concluiu-se que a altura e idade não influenciam da obtenção de medalhas; o CAT vem sendo mais eficiente para pontuar; faltas são cometidas majoritariamente pelo vencedor do combate; soco cada vez é menos utilizado.

PALAVRAS- CHAVE: Taekwondo; análise das lutas; perfil dos atletas.