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ORIGINAL

FACTORS THAT AFFECT THE SPORT DEVELOPMENT OF OLYMPIC JUDOKAS

FACTORES QUE INFLUYEN EN EL PROCESO DE FORMACIÓN DE LOS JUDOKAS OLÍMPICOS

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ABSTRACT

With the aim of analyzing the factors that have an influence on the sports training process of the olympic Spanish judokas, a semistructured interview of 52 questions grouped in 6 aspects was carried out: Sports Context, Social Context, Training Process, Psychological Condition, Technical-Tactical Condition and Physical Condition). The results show that olympic judokas began practising judo at the age of 6.90 ± 3.02 years. Specifically, women started at the age of 6.80 ± 2.88 , and men slightly later, at the age of 7 ± 3.42 years. 95% (n=19) of them were mainly influenced by a relative. Moreover, it is to be highlighted that none of the interviewees won a medal in low categories. For 75% (n=15) of the olympic judokas, it is very important that technical-tactical training, physical condition training and psychological aspects be synchronised in an integrated way.

KEY WORDS: judo, interview, sport development, Olympic Games.

RESUMEN

Con el objetivo de analizar los factores que influyen en el proceso de formación deportiva de los judokas españoles olímpicos, se aplicó una entrevista semiestructurada de 52 preguntas agrupadas en 6 dimensiones (Contexto Deportivo, Contexto Social, Proceso de Formación, Psicológica, Técnico-táctica, Condición Física). Los resultados muestran que los judokas olímpicos se iniciaron en la práctica del Judo a los $6,90 \pm 3,02$ años, concretamente las mujeres a los $6,80 \pm 2,88$ años y los hombres algo más tarde, a los $7 \pm 3,42$ años, el 95% (n=19) influenciados, fundamentalmente, por un familiar. Además, destaca que ninguno de los entrevistados consiguió medalla en categorías inferiores. Para el 75% (n=15) de los judokas olímpicos es muy importante llevar una sincronización del entrenamiento técnico-táctico, de la condición física y de los aspectos psicológicos de forma integrada.

PALABRAS CLAVES: Judo, Entrevista, Formación Deportiva, Juegos Olímpicos.

INTRODUCTION

Since the late 20th century, many research studies have pointed out that reaching high sport performance level depends on many factors, apart from the number of hours spent on training. In this regard, biological, psychological, perceptive-cognitive and social factors, which are in constant interaction, must be also considered (Singer & Janelle, 1999). On one hand, the concern to better understand the elements that determine whether athletes will reach the top level and, on the other hand, the fact that many young athletes who possess the characteristics of sport talents do not reach sport excellence, has fostered a change of perspective in talent detection. According to Lorenzo and Calleja (2010), most approaches to talent detection have taken the need of certain abilities as a reference and have tried to detect them as soon as possible in young athletes. This classical top-down talent detection model has not proved to be very effective. In relation to this, we agree with Lorenzo (2001), who considered that traditional talent detection, only focused on the monitoring of the best, has proved to be clearly ineffective in the last few years. On the other hand, there is a bottom-up discovering approach with the aim to analyse elite athletes' sport development process in order to find the optimal conditions for skill development that can be applied to new talents (Regnier, Salmela & Russell, 1993).

In agreement with Ruiz and Salinero (2011), nowadays, athletes and their performance cannot be understood without a comprehensive approach to themselves and their environment. Consequently, their success in sport can hardly be perceived exclusively as a personal achievement. This environment may be influenced, as mentioned above, by lots of elements, among which the most important are: coach (Giménez, 2003), family (García-Moya, Moreno, Rivera, Ramos & Jiménez-Iglesias, 2011) and peers (Lorenzo & Sampaio, 2005). Genetic factors (Baker, Horton, Robertson-Wilson & Wall, 2003) and psychological aspects (Mujika, 2010) are also noteworthy. The knowledge, study and research of all these variables may contribute to athletes having a more comprehensive and rigorous development process and may optimise their performance, thus increasing their possibilities of achieving better sport results (Gimeno, Buceta & Pérez-Llantada, 2007). In this regard, various types of study may be found in the specialised literature: research on judokas' personal characteristics to predict performance (Ruiz, 2008), psychological assessment and intervention with talents in judo (Abalde & Pino, 2016; Gimeno & Guedea, 2001), studies that analysed the relationship between the judoka and his/her coach (Ruiz, 2007), research that aimed to determine the most relevant physical fitness aspects in elite judokas (Franchini, Del Vecchio, Ferreira & Candau, 2015; Pion et al., 2015), and research that analysed the importance of technical-tactical training for athletes (Osipov et al., 2016). Besides, there are also studies that analyse the perception of elite judokas' coaches regarding training and competition management (Santos, Fernández-Río, Almansba, Sterkowicz & Callan, 2015) and psychological training (Sava & Ciuntea, 2013). In light of the aforementioned studies, we advocate the study and analysis of athletes' sport development process, with the purpose to gain knowledge on the elements that mostly affect the achievement of sport excellence throughout their careers, in order to take them into consideration in the training of future elite

athletes. In line with this, the influence of the sport and social contexts, the development process followed, the psychological, technical-tactical and physical fitness aspects will be studied. These factors have been previously researched in the scientific literature (Gimeno, Buceta & Pérez-Llantada, 2007). However, there is a lack of studies concerning the sport development process of judokas who reached the top level, as well as regarding the influence of the environment throughout their sport career from the athletes' perspective, what may be illuminating. Nonetheless, similar studies have been conducted in sports such as football (Pazo, 2010), basketball (Sáenz-López et al. 2006) or athletics (Palao, Ortega, Calderón & Abrales, 2008). For all these reasons, the aim of this study was to analyse the factors that affected the sport development process of the Spanish judokas who represented Spain in the 21st century Olympic Games: Sydney 2000, Athens 2004, Beijing 2008, London 2012 and Rio de Janeiro 2016.

MATERIAL AND METHOD

Participants

Spanish elite judokas who had competed at least once in a 21st century Olympic Games participated in this study (Table 1).

Table 1. Olympic Games and participants.

Olympic Games	Female participants	Male participants	Total number of participants
Sydney 2000	6	5	11
Athens 2004	4	6	10
Beijing 2008	4	2	6
London 2012	4	2	6
Rio de Janeiro 2016	3	2	5

It must be noted that some athletes may have participated in more than one Olympic Games. A total of 25 judokas (15 women, 10 men) had competed in the 21st century Olympic Games. The final sample consisted of 20 judokas (80%): 12 women (60%) and 8 men (40%).

Instrument

Given the study's characteristics, a qualitative research methodology (Anguera, 2008) was used for data collection. It allowed for detailed description of the research context, maximum objectivity and appropriate data collection, so that it could generate explanatory knowledge that matched the aim established. The research tool was a semi-structured interview designed and validated by Robles et al. (2016), which consists of 52 questions divided into six dimensions:

Sport context. Aimed at gaining knowledge on how the judokas started out in judo, what made them try to become a top-level athlete and whether they practised other sports besides judo when they started.

Social context. Its purpose is to analyse the influence that the athletes' immediate environment (family, coaches, friends, etc.) may have had on their sport development and performance.

Development process. Its aim is to know what training methods the judokas have followed throughout their sport development, from what age they have competed and for what reasons they do it, what are the reasons of success in their sport career and why many young promises disappear and do not reach the top level.

Psychological. To know whether the athletes have worked with a psychologist and, in case they have, how they have done it, and what psychological aspects they regard as most important.

Technical-tactical. To know how important these aspects are for the athletes, whether they think they have worked on them adequately throughout their sport development process and in which phase they consider it would be necessary to go deeper into them.

Physical fitness. Its purpose is to gain knowledge on how the athletes have trained it, who has been responsible for it, what physical qualities they consider most important and how they think fitness training should be addressed throughout the sport development.

This study will focus on the most relevant aspects of every dimension analysed.

Procedure

First of all, the data base of the Royal Spanish Judo and Associated Sports Federation (in Spanish, RFEJYDA) was checked to verify the number of Spanish judokas that had competed in an Olympic Games in the 21st century. The total population consisted of 25 athletes. Subsequently, the RFEJYDA board members were requested the Olympic judokas' contact details, keeping their confidentiality. Once the interview was prepared and all contact details were collected, the athletes were contacted. This initial contact was made via email, where they were informed about the study and requested to participate. After their acceptance (20), the judokas were contacted by phone in order to set a date and time for the interview. Finally, they were interviewed on the phone. The interviewees were informed about the aim of the study and confidentiality was ensured according to the Spanish law on personal data protection (Ley Orgánica 15/1999, de 13 de diciembre, sobre la Protección de Datos de Carácter Personal).

The interviews were transcribed and analysed with the specialised software for qualitative research MAXQDA 10. The coding was conducted by four coders, so that the analysis process was more reliable. The coders were experts in the interview coding field, since they had used this research tool in their respective doctoral theses, as well as in other studies. Internal reliability among coders was estimated by means of the interobserver agreement (IOA) (Thomas &

Nelson, 2007). Optimal interobserver reliability (86.76%) (Goetz & LeCompte, 1984) was obtained, what allowed the coders to code the interviews individually. Moreover, Kappa index (Cohen, 1960) was calculated to reduce the effect of random agreements. The software SPSS 18.0 was used to calculate it, yielding a value of 0.833 ($p < 0.001$), regarded as almost perfect (Landis & Koch, 1977). Lastly, with the purpose to reach higher validity, the interviews were distributed among the coders, so that every interview was analysed by two experts.

RESULTS

Sport context dimension

This dimension aimed at gaining knowledge on how the judokas started out in judo, what made them try to become a top-level athlete and whether they practised other sports besides judo when they started. These Olympic judokas started out in judo at the age of 6.90 ± 3.02 years; women at 6.80 ± 2.88 and men slightly later, at 7 ± 3.42 years old. The main reasons to start practising judo were: direct influence from some relative ($n=7$), influence from peers ($n=3$), recommended by their physical education teacher ($n=3$), and to practice a sport that could help as self defence ($n=1$). The judokas highlighted the following characteristics of the coaches they had during their sport development: they always knew how to motivate athletes ($n=9$), they had profound knowledge of the sport discipline ($n=4$), and they encouraged athletes to reach top-level sport ($n=3$).

My coaches are the ones who trusted me and encouraged me to achieve what I achieved (Participant 3, paragraph 14).

My coach made me like this sport and helped me find my place and feel good on the tatami (Participant 17, paragraph 15).

Social context dimension

This dimension aimed to analyse the influence that athletes' immediate environment (family, coaches, friends, etc.) may have had on their sport development and performance. 95% ($n=19$) of the Olympic judokas reported to have received great family support, especially from their parents and siblings, during their sport development. Coaches and friends had also been present, but to a lesser extent. The same happened once they reached the top level.

The most important, because my parents have always supported me, they have taken me to competitions and have bought, within their possibilities, everything I needed to practice judo (Participant 14, paragraph 14).

The social environment is very important. If my family and partner had not respected me, it would have been harder to lead a top-level sport life. It is very important in order to perform at maximum level (Participant 17, paragraph 27).

55% (n=11) of the interviewed judokas acknowledged that having a close relative who had successfully practised judo or another sport at high level had positively influenced their sport development process to reach the top level. 90% (n=18) of the judokas stated that their families considered academic education very important. Besides, 100% (n=20) of the participants acknowledged that it is essential to combine judo and education, mainly to have better employment opportunities when they retire from top-level sport (n=18). On the other hand, despite dedicating most of their time to sport, 95% (n=19) of the interviewees regarded social relationships as crucial. The most relevant reasons given by the judokas were that they allowed them to disconnect and clear their minds (n=9), as well as to feel protected and supported by their family and friends (n=7).

I think it is important, because sometimes it is good to disconnect from judo, we are the whole day thinking of judo and sport...I think social relationships help you clear your mind and disconnect a bit, which is also good (Participant 8, paragraph 23).

Only 30% (n=6) of the judokas felt pressure from their environment. Most of them (n=4) regarded this pressure as positive. Moreover, 100% (n=20) of the judokas explained that it would be advisable to request the help of a sport psychologist in order to reduce this pressure.

Development process dimension

The aim of this dimension was to analyse the Olympic judokas' sport careers from the beginning, what were, in their opinion, the reasons for their success, and why many young promises did not reach the top level. None of the interviewees won a medal at a national-level competition in the youngest categories, i.e., before 14-15 years old. 60% of the judokas made their first achievements at national level around 15-16 years old. Success in sport was mainly due to psychological aspects such as determination (n=8) or self confidence (n=4), and due to the coach's good job on technique and tactics (n=8) or physical fitness (n=6). Failure in sport, according to the interviewees, was mainly due to the athlete's lack of effort (n=8), the coach's lack of knowledge (n=5), and the little financial support received from institutions (n=3).

Well, I think there are people with very good conditions and abilities, but they do not make the most out of them. They have easily made some achievements, but they are not willing to sacrifice other things in life and spend 'x' hours on training (Participant 9, paragraph 65).

Psychological dimension

In this case, the aim was to know whether the athletes had worked with a psychologist and what psychological aspects they regarded as most important.

All the interviewees pointed out that psychological aspects have a great importance in order to reach the top level. 95% (n=19) agreed that at high level, where levels are so similar, the athlete who is in the best psychological state during competition is the most likely to win. Moreover, they considered it essential to be psychologically strong in order to resist the large number of hard training hours and to bear the pressure during relevant competitions. The judokas emphasised perseverance (n=8), determination (n=7), capacity to sacrifice (n=6) and self confidence (n=5).

I am very determined, very persevering. I am determined and persevering when I am tired but continue, when I set a goal and try to achieve it (Participant 12, paragraph 30).

The psychological training was conducted by either a sport psychologist or the coach. Regarding the feelings they remembered during competition, nine judokas stated that they were more nervous during national than international-level championships, due to the pressure to achieve a good result and classify for international competitions. When asked about the main psychological characteristics that an elite judoka should have, the interviewees highlighted determination (n=10), self confidence (n=5) and capacity to sacrifice (n=4).

Technical-tactical dimension

This dimension aimed to know how important technical-tactical aspects were for the athletes, whether they thought they had worked on them adequately throughout their sport development process and in which phase they considered it would be necessary to go deeper into them. In this regard, 95% (n=19) of the interviewees considered technical work very important. However, 45% (n=9) of the judokas thought that it should only be present in the training from 12-14 years old, while 40% (n=8) believed that technique should be developed from the beginning of the sport practice.

I believe that, in the case of judo, technique is the basis of the sport. It is like a building foundation, from which you can continue learning; if you don't have a good technical basis, it will be difficult to keep learning (Participant 2, paragraph 45).

80% (n=16) of the interviewees were satisfied with the technical work done throughout their sport development process. Those who were not (n=4) considered that they had worked a lot on technical aspects, but without paying attention to the quality of this work. 100% (n=20) of the participants regarded tactical work throughout their sport development process as very important. Nevertheless, many of them believed that judokas should work on them in a later developmental phase, from 14 (n=8) or 16 (n=7) years old. Besides, 75% (n=15) of the interviewees reported to be satisfied with the tactical work done throughout their sport development process.

Physical fitness dimension

Finally, the purpose of this dimension was to gain knowledge on how the judokas had trained physical fitness throughout their sport development process, who had been responsible for it, what physical qualities they consider most important and how they think physical fitness should be developed. Thus, 60% (n=12) of the judokas stated that fitness training should begin from 14 years old. Furthermore, 75% (n=15) of the Olympic athletes believed that it should be developed combined with the technical-tactical work. It is also noteworthy that, according to 90% (n=18) of the participants, the coach had been responsible for their fitness training. The judokas considered that the most important physical qualities to reach the top level were strength (n=14) and endurance (n=14) in their various types.

I believe that physical conditioning should be embedded in the training, this is, on the tatami with ropes, with kimonos, this is, all combined on the tatami with rings and things like that (Participant 11, paragraph 62).

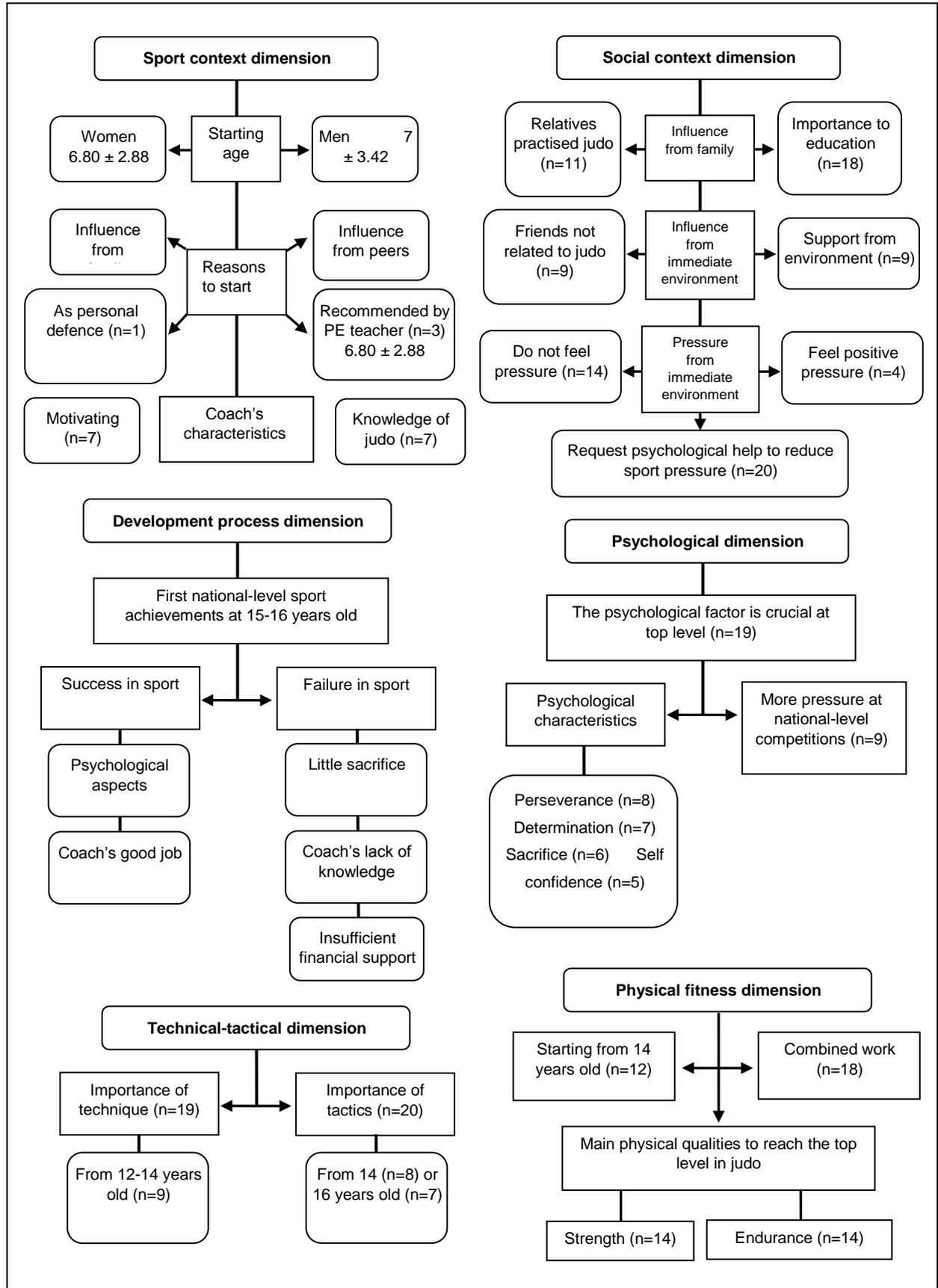


Figure 1. Factors that affect the sport development process of Olympic judokas.

DISCUSSION

The present study revealed that Spanish Olympic judokas started out in judo at age 6-8, in keeping with García, Campos, Lizaur and Pablo (2003). At this age, the beginning of judo practice was mainly influenced by the family, since relatives are usually a relevant model for boys and girls (Sánchez-Miguel et al., 2013). The group of peers or friends also affected the judo practice, in agreement with Lorenzo and Calleja (2010). The recommendations of physical education teachers also showed to play a role, what is in line with Moreno and Cervelló (2004). Nevertheless, judokas regarded their parents and siblings as the most important people of their environment. Parents usually have the role of introducing, supporting and keeping their children in the sport practice (Amenabar, Sistiaga & García, 2008), as well as providing them with the best conditions for education and development (Côté, Baker & Abernethy, 2003). This role was especially relevant in our study, given that most interviewees have a close relative (father, mother or sibling) who had won a medal at national or international-level in some sport, mostly judo. Besides, in agreement with other studies (Gimeno & Guedea, 2001; Weiss & Stuntz, 2004), the interviewees stated that their coach was a relevant piece of their immediate environment, his/her motivational and supportive role being as important as their parents'. Likewise, friends and training mates were also important, since social relationships entail great social and emotional interaction (Serra, Zaragoza & Generelo, 2014). Furthermore, they believe that not feeling pressure from their family or coach is essential to achieve success in sport, which is in keeping with Anderson, Funk, Elliot and Smith (2003). The majority of the judokas interviewed agree with Torregrosa, Sánchez and Cruz (2004) in giving great importance to academic education. They consider it necessary due to its relevance for their personal development, and due to the employment opportunities that education will provide them once they retire from the top level, what is in line with Álvarez, Pérez-Jorge, González and López (2014).

Most Olympic judokas began to achieve success in sport between 15 and 17 years old. This agrees with studies conducted in various sports (Forteza, 2009; Leonard, 1996), where most of the athletes who reached the top level were not the best in the youth categories. Therefore, it seems to be more advisable for an athlete not to aim at high performance until they approach the senior category. Spanish Olympic judokas started to compete at top level at age 17-18. In this regard, Wylleman and Lavallee (2003) stated that the advanced training phase of elite athletes begins at approximately 20 years old. Studies like those conducted by Gullich (2007), with athletes who competed at Athens Olympic Games, and by Schumacher, Mroz, Mueller, Schmid and Ruecker (2006), regarding the sport development of professional cyclists, confirmed that most elite athletes begin to compete at international level when they reach the junior (U18) or even senior category.

Psychological aspects are a determining factor for Olympic judokas, who even consider that the athlete who is in the best psychological state during competition is the most likely to win. Moreover, they believe that it is crucial to be psychologically strong in order to resist the large number of hard training

hours and to bear the pressure during relevant competitions, what has been addressed in several studies (Abalde & Pino, 2016; Callister, Callister & Staron, 1991; Ferreira, Gomes, Borges, Routen & Almeida, 2015; Santos et al., 2015). The interviewees referred to certain individual psychological aspects as the key to achieve success, emphasising perseverance, determination, capacity to sacrifice and self confidence, as also pointed out by Ferreira et al. (2015). Although most judokas have undergone some kind of psychological training, not all of them have done it with a professional sport psychologist. Instead, in some cases the coach is responsible for this type of work, what makes it necessary that he/she acquires knowledge on psychological training, as suggested by several authors (Acosta, 2012; Capetillo, 2011; Contreras, Rojas & Palomino, 2012; Sava & Ciuntea, 2013). The judokas highlighted motivation as one of the most important psychological aspects, a child's continuation in sport depending on it to a great extent, as explained by Piñar and Cárdenas (2010). Besides, the interviewed athletes believe that not being able to manage pressure or not having high levels of self confidence and motivation prevents many judokas from optimising their performance and reaching the top level. In regard to this, there are studies that have proved that experiencing potentially stressful situations and being able to manage pressure guarantees success (Hernández, 2007).

The interviewed judokas believe that technical training is extremely important for sport development, since they consider that technique is the basis on which judo is built on the way to high performance, in agreement with Santos et al. (2015) and Osipov et al. (2016). On the other hand, more than half of the judokas regarded tactical training as not very relevant for sport development, starting from 14-16 years old and gaining importance as a judoka grows and progresses through the sport development phases. Nonetheless, a large number of authors defend that judo should be based on tactics from the earliest stages, since it helps develop intuition, anticipation and perception (Carratalá, 2000; Méndez, 1998; Molina & Castarlenas, 2002; Terrisse, 1996; Terrisse et al., 1995). In relation to this, Osipov et al. (2016) think that it is necessary to emphasise tactical training for judokas to achieve success in competition, which does not mean leaving technical training aside. Avelar and Figuereido (2009) stated that learning through tactics needs some minimum technical motor fundamentals to allow for execution of tactical decisions organised upon basic motor skills. Therefore, both aspects (technique and tactics) are crucial in the sport development of elite judokas (Osipov et al., 2016; Santos et al., 2015).

The interviewed judokas considered physical fitness important for sport development, although they would not advise to work on it from early stages, but from 14-16 years old, the developmental phase. This means that we should wait until the young athlete has reached biological maturity not to produce harmful effects on the processes related with adaptation to physical activity, growth and maturation (Díaz & Romero, 2007). Regarding the fitness training methods applied during their sport development, all judokas reported to have done it in combination with technical-tactical aspects, which is in line with several authors (Capetillo, 2011; Chiroso, Chiroso & Padial, 2010; Gallo, Gobbi & Ayala, 2013; Robles, 2003). The interviewees stated that the coach was in all cases responsible for physical conditioning, not having a fitness coach until

having reached the top level. Besides, the majority of the interviewees think that the most important physical qualities for top-level judokas are strength and endurance in their various types. This agrees with a number of studies (Bonicht, 2007; García, 2004; Franchini et al., 2015), but not with the study by Pion et al. (2015), in which young elite judokas stood out for their speed and agility.

CONCLUSION

The aim of this study was to gain knowledge on the sport development process followed by the Spanish judokas who had represented Spain in an Olympic Games in the 21st century. Among the conclusions of the present study, it is noteworthy that the Olympic judokas started out in sport at the age of approximately seven years old, in most cases due to the influence from their family or friends. Besides, the judokas began to achieve relevant results and to win their first national and international-level medals when they approached the junior category.

The judokas' immediate social environment was crucial for them throughout their sport development, as well as when they reached the top level. Among the people they regarded as most important within this social context, their parents and siblings provided greatest emotional support, both in good and bad moments. The coaches were also essential, since they continually provided motivation and fostered sport improvement. Likewise, friends helped them disconnect when they were physically or psychologically overloaded. The interviewees considered academic education important for their own personal enrichment and future employment opportunities. Furthermore, the Olympic judokas considered it very important to combine technical-tactical, fitness and psychological training. The interviewees also believed that the most important physical qualities are strength and endurance in their various types and that perseverance, capacity to sacrifice and determination are decisive. It is noteworthy that the Olympic athletes stated that, in general, the most physically complete judokas rank best in the early stages, although the achievement of good results in the early stages does not guarantee success in the senior category. Therefore, we can conclude that the analysis of the Olympic judokas' sport development process has allowed us to gain knowledge on the most relevant aspects that have affected their achievement of sport excellence.

The major limitations of the present study are related with the lack of this type of study in judo and with the interviewing procedure. A large number of judokas were already retired and did not participate in official competition anymore, so it was complicated to bring them all together in one same place (competitions, training stages, etc.). Moreover, some of the participants resided out of Spain. Future studies could address the sport development of the judokas participating in forthcoming Olympic Games and find similarities and differences with the present research. Furthermore, case studies would allow for deeper knowledge by means of interviews to family, friends and coaches.

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