

Judo athletes' perceptions of two training models

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- ✓ A Study Design
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Abstract

Background & Study Aim:

Training process planning and application is, first and foremost, the result of coach's thinking. Subjective measures of training loads are useful tools which should be used with confidence by coaches. The aim of study the knowledge about judo athletes' perceptions, after two different training models, of the following indicators: motivation, pleasure, fatigue, understanding, competitive specificity, physical fitness, tactical-technical preparation, randori variability, creativity, problem-solving and general evolution.

Material & Methods:

Twenty-four athletes from the U-18 (n = 14) and U-21 (n = 10) were randomly separated into two groups of 12 subjects. For two weeks, each group underwent both training models: Traditional Training (TT) and Functional Units Training (FUT). After the two weeks, an interview was conducted in order to collect athletes' perceptions of both training models regarding each indicator.

Results:

Study participants considered that FUT was more efficient in the following categories: motivation; pleasure; understanding; competitive specificity; technical-tactical preparation, randori variability; creativity; problem-solving and general evolution, while TT was perceived as superior in the other two categories analysed: fatigue and physical fitness.

Conclusions:

After the two training processes, study participants considered FUT to be the most effective model for judo training.

Keywords:

combat sports • overtraining syndrome • performance • training loads

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INTRODUCTION

Coach – *noun* someone who trains sports players or athletes; verb to train someone in a sport [51].

Athlete – *noun* 1. someone who has the abilities necessary for participating in physical exercise, especially in competitive games and races 2. a competitor in track or field events [51].

Training – *noun* the process of improving physical fitness by exercise and diet [51].

Combat sports – *noun* a sport in which one person fights another, e.g. wrestling, boxing and the martial arts [51].

Judo Functional Units

Training – division of the judo fight in various units: Approach, Contact, Opportunity Creation, Unbalance, Application, Projection, Transitioning and Floor combat. Each unit has a predetermined start and end, but completes and influences the whole [2] title: "Pedagogia complexa do judô: um manual para treinadores de equipes de base.", type: "book", uris: ["http://www.mendeley.com/documents/?uuiid=fd321c37-38b8-4016-8208-b5b1175d1db3"]}], mendeley: {"formatted Citation": "(29)"}.

Judo Traditional Training

– training traditionally performed in the daily life of various athletes [2] title: "Pedagogia complexa do judô: um manual para treinadores de equipes de base.", type: "book", uris: ["http://www.mendeley.com/documents/?uuiid=fd321c37-38b8-4016-8208-b5b1175d1db3"]}], mendeley: {"formatted Citation": "(29)"}.

Overtraining syndrome – *noun* same as unexplained under performance syndrome [51].

Randori – sparring in judo in which both participants practice attacking and defending [52].

Training process planning and application is, first and foremost, the result of coach's thinking [1]. Nevertheless, we must take into consideration the increasingly demands of contemporary sports. More importantly when referring to high-performance, in which human beings are pushed to their limits by rigorous training sessions, both physically and psychologically, in order to achieve envisaged goals. As a consequence of such demands, added to the pressure to obtain positive results and a saturated competitions calendar, training programs require thoughtful control of the process, because performance improvement only happens with sufficient stimuli and adequate recovery prior to the next training load [2].

Sport or Physical training consists of a multidimensional demand of psychobiological nature [3, 4] and consequently monitoring also comprises tools for subjective effort control, like the rating of perceived exertion (RPE) scale [5], in a considerably effective manner in the process of training control [6-8] and as a tool for overtraining identification [9].

Despite the fact that many studies have investigated RPE [10-12] and used different forms of internal training load through subjective instruments [13-16], they have favoured approaches which relied on physiological indicators, directing less attention to the influence of other factors constituting training process, such as individual personality, emotional state, previous experiences, preferences, motor issues, techniques and tactics [17].

Specifically about judo, such matters may be enhanced because there are controversial points regarding its training process which is increasingly influenced by academic production in the field of sports sciences [18, 19], while keeping its strong bond to traditional issues which are intrinsic to this sport modality and influential in sports preparation in judo [20, 21]. In addition, it is important to consider judo training competitive specificities from physical [22-24], technical and practical perspectives [25-28], and their application towards planning, which are paramount for competitive success [29, 19].

We have noticed a lack of research on athletes' perceptions towards multiple constituting training and which could contribute to

a more appropriate intervention, taking into account affective, emotional, technical and tactical aspects, previous experiences and personal preferences. Even if we assume the coach's responsibility towards the process, in respect for their background education and knowledge or firsthand experience, acknowledging athletes' understanding of the process may be valuable to designing and implementing individual training for judo, and to optimize training loads and avoid overtraining syndrome.

Recognizing that subjective measures of training loads are useful tools which should be used with confidence by coaches [4], in these studies we rely on indicators considered important throughout the development process of the modality [29].

The aim of study the knowledge about judo athletes' perceptions, after two different training models, of the following indicators: motivation, pleasure, fatigue, understanding, competitive specificity, physical fitness, tactical-technical preparation, randori variability, creativity, problem-solving and general evolution.

MATERIAL AND METHODS

The present study was conducted with 24 athletes, of whom 5 compete at international level, 5 at national level, and the other 14 at state level; 11 of them were female athletes and 13 were male, competing at two different categories, namely U-18 (n = 14) and U-21 (n = 10). All the athletes signed an Informed Consent Form (ICF) agreeing to participate in the research, and being aware of its risks and benefits.

Minor athletes had to be authorized by their parents. The present research is registered at the Research Ethics Committee (CAAE: 53686516.7.0000.5398).

The sample was randomly separated into two groups of 12, and each group underwent two different training models. Each group underwent one model a week. Hence, all subjects underwent both models after 14 days. One athlete did not complete the training, so the analyses were based upon 23 participants. Training sessions were conducted as follows:

1. Traditional training (TT): based upon what is commonly developed in judo area.

Warm Up Routine (WU): 15 min of running and rolling break falls; 15 min of static UCK (effort-pause relationship 1:1 ratio); 15 min of dynamic UCK (effort-pause relationship 1:1 ratio); RAN: 10 x 4 min / 1 min recovery in between fights.

2. Functional Units Training (FUT): based on Olívio Jr & Drigo (2015) in which fight is split into different units: Approach, Contact, Opportunity Creation, Unbalance, Application, Projection, Transitioning and Floor combat. Each unit has a predetermined start and end, but completes and influences the whole. WU: 15 min of gymnastic exercises; UCK based on the FU - Opportunity Creation; Application and Projection (effort-pause relationship 1:4 ratio, 20 min total); RAN with tactical aims (12 x 2 min / 2 min recovery in between fights).

After undergoing both training models, athletes were interviewed and their perceptions collected through the following semi-structured tool.

Data analysis

In order to best decode the investigated phenomenon, analytical categories were created. Such

categories aimed at facilitating quantitative and qualitative analysis, allowing us to also observe underlying meanings in athletes' answers. Despite also using a quantitative approach, including numerical data should not alter the qualitative character of the research [30]. Such "categorical approach" considers the text wholeness, classifying it according to the presence or absence of units of meaning through which one may identify significant discursive elements, leading to inference of order in the apparent disorder [31].

The aforementioned procedure suits a multi-method approach, for both quantitative and qualitative analyses were performed in order to stimulate discussion over presented data. In other words, from quantitative analysis a descriptive analysis of the social phenomenon reality was carried out [32]. Hence, the researcher becomes the main instrument of analysis, assuming responsibility for a holistic analysis derived from long term contact with the object of study [33].

The analysed categories are described in Chart 2.

After interviews were transcribed, data analysis guided categorization. Athletes' discourse analysis revealed that their perceptions towards one

Chart 1. Interview Guide.

1. Talk about your perceptions towards each of the experienced training models.
2. In which week did you feel more motivated before and after training? The first or the second week?
 - 2.1 (If necessary). In which week was training more pleasant for you?
 - 2.2 (If necessary). In which week did you feel more fatigued? The first or the second week?
3. Regarding your perceptions towards competition, in which week did training routines more closely reflect competition reality?
 - 3.1. (If necessary). In which week was it easier to understand the exercises proposed by the coach?
 - 3.2. (If necessary). In which week did you feel best physically prepared for competition?
4. Do you consider it important to create and tackle issues that resemble competition during your training routine? Please talk about it.
 - 4.1. (If necessary). In which week were you more encouraged to do so?
5. Did you achieve any technical or tactical goals throughout these weeks? In which of them were you more successful?
 - 5.1 (If necessary). Regarding attacks variation, actions and scores, were you more successful in one week than the other?
 - 5.2. (If necessary). In which week did you feel a greater possibility to develop more wholly as an athlete?

Note: Interviews were conducted by a professional from the field of Behavioural Psychology with experience in sports data collection.

Chart 2. Categories for analysis.

1. **Motivation:** refers to athlete's motivation towards training routines.
2. **Pleasure:** refers to athlete's perception of pleasure stemming from training.
3. **Fatigue:** refers to athlete's perception of fatigue stemming from training.
4. **Understanding:** refers to athlete's perception of their own understanding of what was proposed.
5. **Competitive specificity:** refers to athlete's perception of how close training was from real competition.
6. **Physical Fitness:** refers to athlete's perception of how effectively training was in physically preparing them.
7. **Tactical-technical Preparation:** refers to athlete's perception of how effectively training was in tactically/technically preparing them.
8. **Randori Variability:** refers to athlete's perception of how variable were their moves and scoring throughout fighting practices, in each training model.
9. **Creativity:** refers to athlete's perception of how much their creativity was stimulated by proposed training.
10. **Problem-solving:** refers to athlete's perception of how encouraged they were to tackle specific fighting issues by proposed training.
11. **General Evolution:** refers to athlete's perception of how much the training proposed may contribute to their wholly development as athletes.

training model pointed out to some of the categories, or that both training models were the same in relation to the categories. None of the athletes considered that the proposed training models did not fit the above-mentioned categories, probably because of the research object construction. It is important to emphasize that athletes were unaware of which categories were being analysed and, in accordance with what is advocated by this type of research, there was no intention to pass judgement on what was correct or incorrect [34].

RESULTS

Results are presented in Table 1.

As we analyse the answers, fatigue stands out being pointed out by 95.6% as higher in relation to TT. That may explain why few athletes (21.7%) consider it a pleasant training model. 91.3% of the participants felt more stimulated in relation to creativity and problem-solving by FUT, which corroborates

the perceptions of moves variability and punctuation during RAN (73.9%) in FUT. 56.5% of the subjects reported higher motivation during FUT while 34.8% considered themselves more motivated in TT.

More than half of the subjects (60.8%) perceived TUF as best for their understanding of coach's requests and instructions, while 26% of the them did not perceive any differences between the two models regarding this category. 21.7% of the subjects affirmed both training models contributed equally to their technical-tactical preparation, while 60.8% attributed best development of these categories to TUF.

Regarding physical fitness, 56.5% of the athletes considered that TT contributed more for this category, and 21.7% evaluated that the contribution was the same in both training models.

FUT offered better general evolution in a competitive level according to 65.2% of the athletes, while 30.4% pointed TT as the more indicated

Table 1. Athletes' perceptions of the two training models.

CATEGORIAS	TT	TUF	TT/TUF
Motivation	8 (34.8%)	13 (56.5%)	2 (8.7%)
Pleasure	5 (21.7%)	18 (78.3%)	0
Fatigue	22 (95.6%)	1 (4.4%)	0
Understanding	3 (13%)	14 (60.8%)	6 (26%)
Competitive specificity	8 (34.8%)	14 (60.8%)	1 (4.4%)
Physical Fitness	13 (56.5%)	5 (21.7%)	5 (21.7%)
Tactical-technical Preparation	4 (17.4%)	14 (60.8%)	5 (21.7%)
Randori Variability	2 (8.7%)	17 (73.9%)	4 (17.4%)
Creativity	2 (8.7%)	21 (91.3%)	0
Problem-solving	2 (8.7%)	21 (91.3%)	0
General Evolution	7 (30.4%)	15 (65.2%)	1 (4.4%)

TT: Traditional Training; **FUT:** Functional Units Training.

model. Also, 60.8% of the study participants perceived FUT as closer to competitive specificity, against 34.8% who regarded TT as being closer.

DISCUSSION

As significant members of sports preparation process, athletes should be acquainted with what coaches propose, even if the aim is not to require mastery of the psychobiological concepts underlying training routines evaluation, planning and prescription; as those are the coach's, or team's, responsibility to manage the process. Thus, we believe that the perception of what athletes experience is given more, or less, acceptance in accordance with their understanding of what is proposed, contributing to athletes' participation and performance improvement, as well as physical and psychological health maintenance of those involved in the long-term process of sports training.

Training loads are a combination of mechanical, physiological and psychological stressors. Daily life hassles might impact one's performance significantly, and should be taken into consideration when prescribing training, since there is evidence that inappropriate load management, with consequent maladaptation, is an important risk factor for sports injury and opportunistic diseases resulting from inadequate recovery [2, 35].

Contextualizing subjective perception data and tools for physiological, motor and psychological analyses can be a helpful guidance for the coach

to implement their methodology [36] grounded in parameters which meet athletes' social and environmental variables, and also to adjust individual training load, which is seen as a consensus in contemporary literature [37]. Therefore, some findings of the present study should be discussed in light of contemporary sports literature so that works in this line of research may contribute to the process.

By acknowledging fatigue perception after TT, we can observe that this model may exert detrimental effects in the long term, since there is noteworthy association between excessive fatigue and overtraining [9, 38, 39], and direct relationship with psychological parameters which may be determined by how pleasant a training process can be [40]. It is important to highlight that athletes in individual sports are most prone to depressive symptoms [41], and variation in an athlete's psychological stressors should advise prescription of training and competition load [2].

Still concerning fatigue, exhausting training and better physical fitness seem to bear a relationship according to study participants. That may be associated with cultural and social factors which are very present in judo [42] and, at times, are related to precocious abandonment of the sport modality [18]. Despite equal results in intensity measurement by lactate concentration between training sessions in both models [43], athletes perception of fatigue after TT was considerably higher, and physical fitness was perceived as more effective. Regarding preparation, athletes perceived FUT as a model in which creativity

and problem-solving were more encouraged. Such factors are noticeably relevant in athletes' tactical development [29, 44-46], which is corroborated by most athletes' perception of better technical-tactical preparation after FUT in relation to TT. Some researchers also link autonomy, derived from problem-solving practices, to motivation [46, 47] although motivation is multifaceted, athletes' performance responses are also improved by problem-solving practices and they seem to be an important step in sports preparation process [44].

Perceived less fatigue, together with higher emphasis in problem-solving and higher stimulus for creativity, seemed to have contributed to a perception of improved performance in fight simulation (*randori*) throughout the weeks when athletes underwent FUT, showing more variation of techniques and punctuation. As RAN is closest to competitive specificity [27, 49], performance in this type of training should be enhanced in accordance with contemporary literature in the field of training, which has increasingly emphasized the specificity of each action executed in sports training, including judo [23, 50]. Most of the study participants perceived FUT as closer to competitive reality and more adequate towards their general evolution as athletes.

The present study encourages reflection upon training methodologies applied to judo, especially with respect to TT, often based on empiricism and master to disciple knowledge transmission, with little or no scientific background [21]. Different methodologies should be implemented, focusing

not only at performance improvement, but also at athletes' physical and psychological health. Hence, even if athletes' perception should not be the only indicator to coaches, it is important to any methodology implementation, since the athlete is the main object of sports preparation.

Importantly to say, the load is multifactorial and no single marker was validated so as to identify when an athlete reached a state of maladaptation to training. Contemporary literature recommends it be comprehensively monitored, controlling external and internal load, taking different aspects into account, namely injury history; physiological, psychological (related to sports or not), biochemical, environmental, genetic and social loads [2, 35] and that is why other aspects should be studied in order to contribute to best control of training process in judo and other sports, with the objective of choosing a methodology which best supports the process. Thus, further studies should be conducted in this area so as to stimulate discussion.

CONCLUSIONS

Athletes' perceptions of different indicators involved in sports training were the following: FUT was perceived as the best training model in the following categories: Motivation; Pleasure; Understanding; Competitive specificity; Technical-tactical preparation, Randori variability; Creativity; Problem-solving and General evolution; TT was perceived as superior in the other two categories analysed: Fatigue and Physical fitness.

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