

## Normization of knowledge and competence questionnaire in karate trainers of Alborz province

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### ABSTRACT / EXECUTIVE SUMMARY

The aim of the current research was to standardize the knowledge and competence questionnaire of coaches in sports. The statistical population of this research was made up of karate coaches in Alborz province, among whom 284 people were selected in the form of available sampling. The measurement tool used was the 20-question questionnaire by Ricardo et al. (2018), which has three components (professional knowledge, interpersonal knowledge, and intrapersonal knowledge). The scoring method for the questions was based on a five-point Likert scale (1=very low to 5=very high). The statistical methods used were descriptive indices to describe the data, Cronbach's and Raykov's alpha coefficients to determine internal consistency, and exploratory factor analysis and confirmatory factor analysis to determine construct validity in SPSS, LISREL, and Stata statistical software. The research findings showed the reliability ( $\alpha=0.945$ ) for the knowledge and competence questionnaire of teachers. Regarding the construct validity and based on the relationship and T-value, all the questions had a significant relationship with the factors and could be a good predictor for their factor. The ratios of  $\chi^2$  to df (4.1), RMSEA=0.091, CFI=0.96, AGFI=0.90, RMR=0.048, NFI=0.94 and GFI=0.92 show the model fit confirmed. Also, regarding the relationships of factors with the concept of knowledge and competence of trainers, the results showed that all factors could be good predictors for the concept of knowledge and competence. As a result, the validity and reliability of the "Knowledge and competence of coaches in sports" model was confirmed.

**Keywords:** knowledge, competence, questionnaire, coach, sport.

### 1. INTRODUCTION

Coaching is recognized as a complex social system that involves dynamic interactions in the ongoing interaction between coach and athlete (Jones et al., 2016). Sports coaches play an important role in improving athlete performance (Kelholts and Millet, 2019) and share positive attitudes and behaviors in training/competition situations, which helps the development of sports clubs and teams. Takamatsu and Yamaguchi, 2018).

According to the stated contents, in order to provide empirical support from the point of view of educators, valid tools are needed to measure the psychological characteristics of educators' knowledge (Santones and Meskiuta, 2010). Coaches are usually evaluated through the concepts of professional knowledge, which is only part of the basis of coaching effectiveness. However, there is a major gap in the growing body of educators' knowledge, and that is the lack of a valid and reliable measurement tool to measure the amount of educators' knowledge in different

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dimensions. As a result, if there is an available tool that has confirmed validity and reliability, it will lead to an increase in the speed of conducting researches as well as reducing the costs of conducting researches. Considering that the need to pay attention to the knowledge of coaches during training and competition in order to provide suitable solutions is more visible than in the past, and on the other hand, considering the extent of conducting research in sports environments, especially in the matter of sports coaches, it is necessary. It is to use reliable information tools to collect comprehensive information. Therefore, in this research, the researcher seeks to standardize the questionnaire of coaches' knowledge in sports in order to achieve the objectives of the case.

## **2. ANALYSIS**

In determining the internal reliability of the teachers' knowledge and competence questionnaire, Cronbach's alpha coefficient as an index of internal consistency of all questions was equal to ( $\alpha=0.94$ ), which shows that only 6% of the variance of the scores was due to measurement error. It is consistent with the research results of Ricardo et al. (2018) and Griffo et al. (2019). Also, the internal reliability of the components of professional knowledge ( $\alpha=0.87$ ), interpersonal knowledge ( $\alpha=0.81$ ) and intrapersonal knowledge ( $\alpha=0.86$ ) were obtained. In this way, the internal reliability of all three components is higher than the quorum (0.70), which shows that it was at an optimal level, so the measurement error was at a minimum. Finally, it is clear that the Persian and English versions of the questionnaire of knowledge and competence of coaches in sports have acceptable internal consistency, which makes it clear that the questionnaire of knowledge and competency of educators in different cultures and statistical societies has a favorable internal consistency.

## **3. ALTERNATIVES, RECOMMENDATION AND DISCUSSION**

Since the criterion of Cronbach's alpha coefficient is a traditional criterion for determining the reliability of structures, therefore composite reliability is also used. Therefore, to check the composite reliability (CR), Verts et al.'s criterion (1974) was used, which calculates the reliability of the structures not in an absolute way, but according to the correlation of their structures with each other, and if the composite reliability for each structure is above 0.7, it indicates the internal stability suitable for the measurement model. Therefore, according to the results obtained from the composite reliability (Dillon-Goldstein coefficient) for the components of professional knowledge (CR=0.934), interpersonal knowledge (CR=0.841) and intrapersonal knowledge (CR=0.812). (CR=0) are acceptable

In order to determine convergent validity, Fornell and Larcker (1981) criterion was used. Fornell and Larcker have introduced the criterion of variance extracted from constructs (AVE) as 0.50 and Magner et al. (1996) have introduced the criterion above 0.40 to obtain convergent validity. Therefore, the results showed that the variance extracted from the constructs for the components of professional knowledge (AVE=0.635), interpersonal knowledge (AVE=0.611) and intrapersonal knowledge (AVE=0.557), therefore, considering that the average variance extracted for all constructs is above 0.5, it is concluded that the convergent validity of the constructs is confirmed. On the other hand, to check divergent validity, Fornell and Larcker (1981) state that divergent validity is acceptable when the AVE for each construct is greater than the shared variance between that construct and other constructs (i.e. the square of the correlation coefficients between constructs) in the model, therefore, according to the obtained results, the divergent validity of the teachers' knowledge and competence questionnaire is also confirmed.

Regarding the construct validity of the questionnaire and the predictive power of the questions, the results of the T-Value values and the amount of relationships in the confirmatory factor analysis showed that all 20 questions were able to predict meaningfully (T-Value= $\pm 1.96$ ). be

for their components. Therefore, all 20 questions have confirmed the theoretical structure of the questionnaire of knowledge and competence of educators. As a result, with the values (T-Value) specified for the questions, the external validity and the estimation values of the "relationship" of the internal validity of the questions are confirmed. Also, in the examination of the relationship between components with the concept of knowledge and competency of trainers, all components of professional knowledge (Value-T=21.73, PC=0.94), interpersonal knowledge (Value-T=19.19, PC=0.91) and intrapersonal knowledge (Value-T=17.01, PC=0.84) had a significant relationship with the concept of knowledge and competence. Therefore, all three components have been able to be good and suitable predictors for the "Knowledge and Competence of Trainers" questionnaire. As a result, the internal and external validity of the model (knowledge and competency of trainers) is confirmed.

#### **4. CONCLUSION**

Finally, according to the findings of this research, the questionnaire of knowledge and competence of coaches is a reliable and valid tool that can be used to evaluate the knowledge and competence of coaches and obtain reliable and stable results. In other words, the data collected through this questionnaire provides reliable information about the knowledge and competence of the trainers. Also, researchers in the field of sports management can use the questionnaire of knowledge and competency of coaches based on the three-component model as a desirable and appropriate questionnaire in other different sports fields. Therefore, it is suggested to increase the level of the professional knowledge component among the trainers by holding continuous training and clarification classes. On the other hand, using sports psychologists, he taught the coaches communication skills and the ability to communicate with others to increase their level of interpersonal knowledge. Also, in the component of intrapersonal knowledge, conditions should be provided for coaches who can increase their experiences in various dimensions and types of regional, national and international competitions and can help to increase their level of thinking and self-awareness.

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