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Analysis of the self-efficacy of ice hockey referees

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ABSTRACT

The objective of this study was to analyse the self-efficacy of ice hockey referees and the factors that contribute to their self-efficacy. We used the quantitative study design (survey model). The study group included 97 ice hockey referees (26 females, 71 males) actively working in Erzurum, Ankara, İzmir and İstanbul Provinces. The "Referee Self-Efficacy Scale (REFS)" was used to measure the self-efficacy of the referees participating in the study. We used the Statistical Program for the Social Sciences (SPSS) for data analysis. A p-value of < 0.05 was considered statistically significant. The results of our study showed that there was no statistically significant difference in the referee self-efficacy scale scores according to the gender and education level variables ($p > 0.05$), but there was a statistically significant difference in the communication sub-dimension of the referees in the age variable (in favour of athletes aged 22-24 years) ($p = .025$). A statistically significant difference was also found in the game knowledge ($p = .013$) and decision making sub-dimensions ($p = .017$) in the refereeing status variable, and also in the decision making ($p = .025$) and communication sub-dimensions ($p = .033$) in the referee region variable. There was a remarkable difference between the referees living in Kocaeli in terms of the region, while there was a significant difference between the referees living in Erzurum in the communication sub-dimension ($p < 0.05$). In conclusion, demographic variables are a determining factor in the self-efficacy of the referees, as well as the factors such as the referees' area of training, match experience, and referee experience.

KEYWORDS

Ice Hockey; Ice Hockey Referee; Self-efficacy; Sport Psychology

1. INTRODUCTION

Thoughts about who the individual is, what he/she means and can do are expressed as self-concept (Çüm et al., 2020). The concept of self is defined as an acquired skill that is not congenital, but it is a whole of many concepts such as the individual's perception of himself/herself, the feelings and thoughts he/she attributes to himself/herself (Rosenberg, 1975; Mead, 1967; Gander & Gardiner, 2001; Burns, 1982; Marshall, 1989; Wall, 1986; Chen et al., 2006). "Self-efficacy", a variable in Bandura's Social Learning Theory, is expressed as thoughts that affect whether or not individuals make certain choices, but it has also an important place in human life as performance experiences, emotional state, indirect experiences, verbal persuasion, and motivation (Çüm et al., 2020; Bandura, 1997; Bıkmaz, 2004). Self-efficacy belief is analysed in two different dimensions: personal self-efficacy and result expectancy (Bıkmaz, 2004). The concept of trust, which is a factor in the formation of the concept of self-efficacy, plays an active role in many different disciplines such as education, health and sports.

One or more of the sources such as verbal persuasion included in the concepts of performance, experience, psychology, imagination and self-efficacy are used in the sense of trust felt by the athlete (Karageorghis & Terry, 2017). It is thought that sportive confidence and self-efficacy are positively correlated with performance, anger control and sports achievement, and negatively correlated with anxiety, stress, and anger (Martin & Gill, 1991; Mowlaie et al., 2011; Guillen et al., 2019). Self-efficacy theories are expressed as views on how the individual feels in the face of the difficulties they face, how they think and how they motivate themselves in order to be successful. However, the positive or negative perceptions of the athletes indicate that the competence and skill of the athlete will be affected in the same direction (Bandura, 1997; Bandura, 1994; Harter, 1978). Collective prediction in team sports can show a common sense of belief due to the level of representation (Myers & Feltz, 2012). The role of the concept of self-efficacy in athletic performance is very effective in sports psychology research (McAuley & Gill, 1983). The concept of performance does not only apply to athletes, but referees should also have some sports and psychological skills, such as self-confidence, success, and self-efficacy.

In the job descriptions of referees, it is very important to observe the game closely, solve problems, make quick decisions and ensure control over the athlete, as there are many repeated decisions in the game (Tuero et al., 2002; Samuel et al., 2020). Regarding the concept of refereeing, it is very important in technical equipment as well as some physical and mental skills. A successful referee includes factors such as correct communication skills, body language, communication with

the athlete at critical points, athlete control, clarity of decisions, awareness (alertness), clarity of referee signals, ability to cope with psychological pressure, observing the game carefully and sportive performance. Referees, who perform continuously like athletes, are required to have the concept of self-efficacy due to the variety of situations that may occur.

Referee competency is expressed as the beliefs of referees to perform their work successfully. Experience, knowledge and training of the referee, physical and psychological factors influence the competence of the referee (Guillen & Feltz, 2011). Ice hockey is one of the fastest team sports in the world, consisting of 3 periods of 20 minutes, with 5 players and 1 goalkeeper in each team on the ice (Aygün and Öztaşyonar, 2019; Aygün, 2019; Aygün & Murathan, 2020). Thus, the purpose of this study is to analyse the self-efficacy of ice hockey referees and the factors that contribute to their self-efficacy.

2. METHODS

2.1. Study Design and Participants

We used the quantitative study design (survey model). Studies aiming to collect data in order to determine certain characteristics of a group are called survey models (Fraenkel et al., 2012). The study population included ice hockey referees in Turkey, while the sample consisted of 97 referees (26 females, 71 males) actively working in Erzurum, Ankara, İzmir and İstanbul provinces. Within the scope of the study, the ethics committee decision numbered E-67796128-000-2000031927 was taken by the Scientific Publication and Ethics Committee of Ardahan University.

2.2. Instrument

The "Referee Self-Efficacy Scale (REFS)" was used to measure the self-efficacy of the referees participating in the study. It was developed by Myers et al. (2012) and its Turkish adaptation was made by Karaçam & Pulur (2017) by adding the physical competency factor (Myers et al., 2012; Karaçam & Pulur, 2017). The scale is evaluated on a 5-point Likert type and consists of 18 items and 5 sub-dimensions: physical competence, game knowledge, decision making, pressure and communication. High scores from each factor of the scale present that self-efficacy in that factor is high. The reliability coefficient of the scale was found to be between .71 and .90 in terms of sub-dimensions (Karaçam & Pulur, 2017a). Information on independent variables formed by the researcher, and demographic variables such as gender, age, educational status, referee status and the region of the referee were also included.

2.3. Statistical Analysis

We used the Statistical Program for the Social Sciences (SPSS) for data analysis. The scores obtained from the sub-dimensions of the referee self-efficacy scale were compared in terms of gender, age, education level, referee status and the province (region) variable of refereeing using descriptive statistics. Normal distribution, homogeneity of variances and assumptions of linearity were tested, and it was understood that the assumptions were satisfied. T-test and ANOVA were used to compare the means of the groups. T-test was used for independent groups, and ANOVA was used for comparisons required for cases where the assumptions are given. Tukey's test was conducted to determine from which group the significant difference originated. A p-value of < 0.05 was considered statistically significant.

3. RESULTS

General information about the demographic characteristics of the referees participating in the study is presented in Table 1. Overall, 26.8% (n = 26) of the study group were female, while 73.2% (n = 71) were male. A total of 24.7% (n = 24) of them were between 18 and 21 years old, 23.7% (n = 23) between 22 and 24 years old, 23.7% (n = 23) between 25 and 27 years old, and finally 27.8% (n = 27) between 28 years old and older. A total of 54.3% (n = 12) have a high school diploma, 21.2% (n = 59) have a bachelor's degree, and 23.5% (n = 26) have a post-graduate degree. Regarding the refereeing region, 37.1% (n = 36) of the participants are active referees in Erzurum region, 27.8% (n = 27) in Ankara region, 19.6% (n = 19) in İstanbul region and 15.5% (n = 15) in Kocaeli region.

Table 2 shows the results of the Referee Self-Efficacy Scale (REFS) sub-dimensions according to gender differences.

There is no statistically significant difference in the sub-dimensions results of physical competency, game knowledge, decision making, pressure and communication according to gender variable ($p > 0.05$). As for Table 3, it presents the results of the Referee Self-Efficacy Scale (REFS) sub-dimensions according to the age variable.

Looking at Table 3, it can be seen that there is no statistically significant difference in physical competency, game knowledge, decision making and pressure sub-dimensions according to age groups ($p > 0.05$), however there is a statistically significant difference in the communication sub-dimension of the referees ($p = .025$). Although the variance analysis result was found to be significant, there was no significant difference between the groups in the post hoc test result.

Table 1. Characteristics of Participants

Demographic Variables		**N**	**%**
Gender	Female	26	26.8
	Male	71	73.2
Age	18-21 years old	24	24.7
	22-24 years old	23	23.7
	25-27 years old	23	23.7
	28 years old and above	27	27.8
Education Level	High School	12	54.3
	Undergraduate	59	21.2
	Postgraduate	26	23.5
Refereeing Status	Candidate Official	42	43.3
	Province Official	18	18.6
	National Official	26	26.8
	International Official	11	11.3
Refereeing Region	Erzurum	36	37.1
	Ankara	27	27.8
	İstanbul	19	19.6
	Kocaeli	15	15.5
	Total	97	100.0

Table 2. Results of the REFS sub-dimensions according to gender differences

Sub-dimensions of REFS **Gender**		**N**	$\bar{X}$ **±S**	**t**	**SD**	**p**
Physical Competency	Male	71	21,22 ±3,17	0.723	95	.843
	Female	26	20,69 ±3,31			
Game Knowledge	Male	71	12,91 ±1,44	-0.859	95	.610
	Female	26	13,19 ±1,29			
Decision Making	Male	71	12,70 ±1,59	0.834	95	.834
	Female	26	12,23 ±1,68			
Pressure	Male	71	13,35 ±1,77	0.835	95	.835
	Female	26	12,80 ±1,78			
Communication	Male	71	17,77 ±1,76	0.928	95	.928
	Female	26	18,00 ±1,72			

REFS: Referee Self-Efficacy Scale

Table 3. Results of the REFS sub-dimensions according to the age variable

Sub-dimensions of REFS	**Age**	**N**	$\bar{X}$ **± S**	**df**	**f**	**p**
Physical Competency	18-21 years old	24	22.25 ±2.48	3 - 93	1,714	.169
	22-24 years old	23	20.95 ±3.29			
	25-27 years old	23	20.95 ±3.64			
	28 years old and above	27	20.25 ±3.16			
Game Knowledge	18-21 years old	24	12.87 ±1.19	3 - 93	,209	.890
	22-24 years old	23	13.08 ±1.56			
	25-27 years old	23	12.86 ±1.45			
	28 years old and above	27	13.11 ±1.45			
Decision Making	18-21 years old	24	12.50 ±1.38	3 - 93	1,056	.372
	22-24 years old	23	12.30 ±1.69			
	25-27 years old	23	12.39 ±1.26			
	28 years old and above	27	13.03 ±1.99			
Pressure	18-21 years old	24	13.08 ±1.38	3 - 93	3,246	.843
	22-24 years old	23	14.13 ±1.42			
	25-27 years old	23	12.60 ±2.18			
	28 years old and above	27	13.20 ±1.78			
Communication	18-21 years old	24	17.45 ±1.50	3 - 93	,638	.025*
	22-24 years old	23	18.13 ±1.60			
	25-27 years old	23	17.78 ±1.75			
	28 years old and above	27	17.96 ±2.06			

REFS: Referee Self-Efficacy Scale

Regarding the results of the Referee Self-Efficacy Scale (REFS) sub-dimensions according to the education level of participants, Table 4 shows that there is no statistically significant difference in all sub-dimensions according to the educational level variable (p >.05).

Table 5 shows the results of the Referee Self-Efficacy Scale (REFS) sub-dimensions according to the refereeing status variable. We find a statistically significant difference in the game knowledge (p =.013) and decision making sub-dimensions (p = .017) (the relationship is present between all groups in the sub-dimensions of game knowledge and decision-making).

Finally, the results of the REFS sub-dimensions according to the referee region variable (Table 6), show that there is a statistically significant difference in the decision making (p =.025) and communication sub-dimensions (p = .033). While there is a relationship between Kocaeli and Istanbul in the decision-making sub-dimension, there is also a relationship between Erzurum and Istanbul in the communication sub-dimension.

Table 4. Results of the REFS sub-dimensions according to the education level variable

Sub-dimensions of REFS / Education Level		N	$\overline{X}$ ± S	df	f	p
Physical Competency	High School	12	21.25 ±2.83	2 - 94	2.428	.094
	Undergraduate	59	20.55 ±3.58			
	Postgraduate	26	22.19 ±2.03			
Game Knowledge	High School	12	12.58 ±1.16	2 - 94	2.611	.079
	Undergraduate	59	12.84 ±1.44			
	Postgraduate	26	13.50 ±1.30			
Decision making	High School	12	12.16 ±1.74	2 - 94	1.025	.363
	Undergraduate	59	12.50 ±1.63			
	Postgraduate	26	12.92 ±1.54			
Pressure	High School	12	12.91 ±1.67	2 - 94	.179	.837
	Undergraduate	59	13.25 ±1.88			
	Postgraduate	26	13.23 ±1.65			
Communication	High School	12	18.00 ±1.59	2 - 94	.060	.942
	Undergraduate	59	17.81 ±1.76			
	Postgraduate	26	17.80 ±1.83			

Table 5. Results of the REFS sub-dimensions according to the refereeing status variable

Sub-dimensions of REFS / Refereeing Status		N	$\overline{X}$ ± S	df	f	p	Tukey
Physical Competency	Candidate Official	42	21.23 ±3.19	3 - 93	1.260	.293	
	Province Official	18	22.11 ±3.49				
	National Official	26	20.53 ±3.30				
	International Official	11	20.09 ±2.25				
Game Knowledge	Candidate Official	42	12.85 ±1.55	3 - 93	3.775	.013*	1-2 1-3 1-4
	Province Official	18	12.77 ±1.16				
	National Official	26	12.80 ±1.13				
	International Official	11	14.27 ±1.19				
Decision making	Candidate Official	42	12.50 ±1.54	3 - 93	3.567	.017*	1-2 1-3 1-4
	Province Official	18	12.22 ±1.26				
	National Official	26	12.34 ±1.74				
	International Official	11	14.00 ±1.61				
Pressure	Candidate Official	42	13.50 ±1.81	3 - 93	.899	.445	
	Province Official	18	13.16 ±1.29				
	National Official	26	12.76 ±1.81				
	International Official	11	13.18 ±2.27				
Communication	Candidate Official	42	18.00 ±1.68	3 - 93	1.692	.174	
	Province Official	18	18.16 ±1.15				
	National Official	26	17.19 ±1.98				
	International Official	11	18.18 ±2.04				

REFS: Referee Self-Efficacy Scale

Table 6. Results of the REFS sub-dimensions according to the referee region variable

Sub-dimensions of REFS Region		N	$\bar{X} \pm S$	df	f	p	Tukey
Physical Competency	Erzurum	36	20.16 ±3.90	3 - 93	1.742	.164	
	Ankara	27	21.92 ±2.35				
	İstanbul	19	21.42 ±2.83				
	Kocaeli	15	21.33 ±2.82				
Game Knowledge	Erzurum	36	12.86 ±1.75	3 - 93	.872	.459	
	Ankara	27	13.18 ±1.11				
	İstanbul	19	12.68 ±1.24				
	Kocaeli	15	13.33 ±1.04				
Decision Making	Erzurum	36	12.86 ±1.79	3 - 93	3.274	.025*	3-4
	Ankara	27	12.40 ±1.18				
	İstanbul	19	11.73 ±1.40				
	Kocaeli	15	13.26 ±1.79				
Pressure	Erzurum	36	13.47 ±1.76	3 - 93	.577	.631	
	Ankara	27	13.07 ±1.63				
	İstanbul	19	12.84 ±2.24				
	Kocaeli	15	13.26 ±1.48				
Communication	Erzurum	36	18.44 ±1.64	3 - 93	3.041	.033*	1-3
	Ankara	27	17.51 ±1.42				
	İstanbul	19	17.10 ±1.94				
	Kocaeli	15	17.86 ±1.92				

REFS: Referee Self-Efficacy Scale

4. DISCUSSION

According to our study results, there was no statistically significant difference in the sub-dimensions results of physical competency, game knowledge, decision making, pressure and communication according to gender variable ($p < 0.05$). For example, in the study of Karaçam & Pulur (2017), it was observed that only women obtained a high average score in the pressure sub-dimension, while men obtained a higher average score in other sub-dimensions.

According to a study conducted by Adıgüzel (2018) for basketball referees, male referees achieved a higher average in all sub-dimensions. The studies by Karacam & Pulur (2019) are also consistent with our study. In contrast to the emerging results, there were no similarities with our study in the studies by Dereceli et al. (2019); Karacam & Pulur (2017b); Diotaiuti et al. (2020); Koçak (2019).

In the communication sub-dimension of the self-efficacy level of ice hockey referees, it is obvious that referees aged 22-24 achieve the highest average score. However, it was observed that the referees over the age of 24 had a higher average compared to the referees between the ages of 18-21 in the communication sub-dimension. Based on the results, it was hypothesised that this outcome

is normal when considering the active social interaction and communication skills of referees aged 22-24 years compared to other sub-dimensions. In the literature, it can be understood that refereeing skills, experience and self-confidence increase by age according to the study of Koçak (2019) on analysing the referee self-efficacy levels of volleyball referees. This is partially similar to our study since the communication sub-dimension is significant. Contrary to this situation, it was observed that there was no significant difference between the age variable and self-efficacy in the study of Dereceli et al. (2019).

Considering the existence of a sense of belief at the basis of the concept of self-efficacy, it is thought that differences in education level are not a factor in self-efficacy. This also supports our work. While in the literature, the study of Karacam & Pulur (2019) between the variable of self-efficacy and educational status is consistent with our study, the study of Koçak showed a significant difference only in the sub-dimension of pressure, while no significant difference was found in the other sub-dimensions. Therefore, the work of Koçak (2019) partially supports our work. In contrast, the studies by Dereceli et al. (2019) were not comparable to our study. When the self-efficacy levels of ice hockey referees were examined according to the refereeing status variable, it was seen that international ice hockey officials received high average in the sub-dimensions of decision making and game knowledge. Considering the international referees' long years of experience and gains, it is thought that their self-efficacy will play a more effective role. In the literature, the studies of Koçak (2019); Eskiyecek et al. (2019), who stated that the time spent in refereeing is directly proportional to the self-efficacy of the referee, were not similar to our study.

It was observed that the referees in Kocaeli province in the decision-making sub-dimension and the referees in Erzurum in the communication sub-dimension had a high average in the refereeing region variable. This result is thought to be due to regional differences and referee background.

5. CONCLUSIONS

It can be concluded that variables such as the age of hockey referees, their refereeing status, and the region in which they referee are an important factor in referees' self-efficacy, while the variables of gender and education level are not a determining factor in this study group.

When the referee self-efficacy of ice hockey referees is analysed in line with various demographic variables, different studies should be carried out and re-analysed in order to determine the reason for the referee self-deficiency levels. In the refereeing dimension, it is assumed that the individual's athletic background, the referee's knowledge, individual characteristics (physical and

mental), and education are factors for all variables. Therefore, considering different study groups and variables will contribute to all studies and literature.

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AUTHOR CONTRIBUTIONS

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CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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