

A Study on Women Athletes: The Relationship Between Cognitive Distortions and Physical Self-Perception

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Abstract

Sports, by its nature, can provide an environment where athletes can be exposed to stressors related to sports and sports environments. In stressful situations, athletes may develop a bias in their perception of some processes. These biases are stated as cognitive distortions in the literature. This study aims to examine whether cognitive distortions predict physical self-perception among women athletes or not. The fact that the variables that may affect performance in sports are not studied much under the science of psychology makes this study more critical. The sample of the study consists of 102 women athletes between the ages of 18–26. The data has been collected only online from women athletes. A snowball sampling method was used. Before data was collected about the study's purpose and conditions, an informed consent form was given to the women athletes online. In this study, women athletes were given a demographic information form, the Cognitive Distortions Scale, and the Physical Self Perception Scale. The data obtained from the structural equation model showed that cognitive distortions predicted the physical self-perception in women athletes, and cognitive distortions explained 25% of the variance in physical self-perception ($p<0.001$).

Keywords: Cognition, self-perception, sports, athletes, women

Öz

Kadın Sporcular Üzerine Bir Çalışma: Bilişsel Çarpıtmalar ve Fiziksel Benlik Algısı İlişkisi

Spor, doğası gereği sporculara, spor ve çevresi ile ilgili stresörlere maruz kalınabilen bir ortam sağlayabilmektedir. Stresli durumlarda ise sporcular bazı süreçleri algılamada yanlışlıklar geliştirebilirler. Literatürde bu yanlışlıklar bilişsel çarpıtmalar olarak belirtilmektedir. Bu çalışmanın amacı kadın sporcularda bilişsel çarpıtmaların fiziksel benlik algısını yordayıp yordamadığını incelemektir. Spor alanında performansa etkisi olabilecek değişkenlerden biri olan bilişsel çarpıtmaların, spor psikoloji bilimi altında çok fazla araştırılmaması bu çalışmayı daha önemli hale getirmektedir. Araştırmanın örneklemini 18–26 yaş arasındaki 102 kadın lisanslı sporcu oluşturmaktadır. Kadın sporculardan toplanan veriler sadece online olarak toplanmıştır. Kartopu örnekleme yöntemi kullanılmıştır. Veriler toplanmadan önce online ortamda kadın sporculara araştırmanın amacı ve çalışmaya katılma koşulları hakkında bilgilendirilmiş onam formu verilmiştir. Bu çalışmada kadın sporculara demografik bilgi formu, Bilişsel Çarpıtmalar Ölçeği ve Fiziksel Benlik Algısı Ölçeği uygulanmıştır. Yapısal eşitlik modelinden elde edilen veriler, bilişsel çarpıtmaların kadın sporcularda fiziksel benlik algısını yordadığını ve bilişsel çarpıtmaların fiziksel benlik algısına dair varyansın %25'ini açıkladığını göstermiştir ($p<0,001$).

Anahtar Kelimeler: Biliş, benlik algısı, spor, sporcu, kadın

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Received / Geliş: February 14, 2021

Accepted / Kabul: October 26, 2021

Online published / Çevrimiçi yayın:
November 01, 2021

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<http://www.jcbpr.org/>

INTRODUCTION

Sports may help people to feel unconcerned about their bodies. However, this situation may differ for high-level athletes and women athletes (Varnes et al., 2013). Women athletes have felt pressure to change their body, weight, or appearance when they face sociocultural and sport-specific pressure (Reel et al., 2013). In this way, facing bodily

dissatisfaction can be risky for them (Kantanista et al., 2018). Body dissatisfaction results from inconsistencies between one's perception of the ideal and the actual body with negative feelings and thoughts about one's body (Grogan, 2016).

In cognitive structure, if expectations and beliefs that determine the perspective and interpret the world are distorted or unfunctional, individuals start to face problems (Türkçapar, 2011). When psychological distress is experienced, systematic errors in reasoning become apparent in a primitive information processing system. These errors are called cognitive distortions (Beck, 1967). Cognitive distortions involve intrinsic conversations that can cause mental, emotional, and behavioral problems experienced and lead to unreasonable adverse inferences and evaluations (Bonner & Rich, 1998). In other words, cognitive distortions comprise biased thoughts which support each other, the self-perception of a situation, and distorted internal conversations about the current and future state of the outside world (Blackburn, 1996). The negative perception of the persons having lower adaption and solution skills increases significantly during stressful situations. (Beck, 2005).

Sports-related cognitive distortions have not been studied sufficiently. However, there are studies about irrational beliefs or cognitive biases linked with the psychological distress (Visla et al., 2016; Turner et al., 2019), anxiety and depression (Hallion & Ruscio, 2011; Buschmann et al., 2018) also problem-solving skills and levels of despair (Ağır, 2007).

Athletes need to perceive abilities enough to be successful or to evaluate them – positively due to references to their successes and failures (Koca et al., 2003). Recently, physical self-perception is another psychological variable seeking the relationship with sport participation. The physical self is the essential factor of self-esteem and the concept of self (Fox, 1990). According to Fox's (1990) study, the physical self-perception includes the individual's perception in the elements of psychomotor dimensions such as strength, endurance, physical appearance. In the sports science, studies associated with physical self-perception focus on the comparison with athletes and non-athletes, a branch of sport and gender (Aşçi, 1996; Koca et al., 2003; Altıntaş & Aşçi, 2005 ; Hausenblas & Fallon, 2006; Can, 1990 as cited in Akyol et al., 2015; Bayköse et al., 2018). While athletes are expected to have positive body perception, some studies

provide the opposite results. Especially, women athletes display perceived dysfunctional body image (Peñas-Lledo' et al., 2002; Abbot & Barber, 2011) and show more malnutrition behaviors than men and non-athlete women (Wolf & Akamatsu, 1994). The study results showed that females showed worse scores in physical self-perceptions than males which conducted with adolescents (Maiano et al., 2004). At the point of developing eating disorders and having negative body image, those groups are at risk: elite athletes and dancers (Hulley & Hill, 2001; Smolak et al., 2000), women in the sport branches which appearance is important (Parsons & Betz, 2001) and young women with intense physical activity (Tiggemann & Williamson, 2000). In Abakay et. al.'s (2017) study, results showed that women athletes' perceptions differ from male athletes. Thus, this study focused on women athletes.

According to these findings, this study is an original one for studying cognitive distortions and physical self-perception. In the light of what is stated in the text, how perception and thought processes appear to be related to women athletes were aimed to examine in the study. The purpose of this study is to examine cognitive distortions as a predictor variable on physical self-perception among women athletes between ages 18–26. The hypothesis of the study is that cognitive distortions predict physical self-perception in women athletes. The model of the study is given in Figure 1.

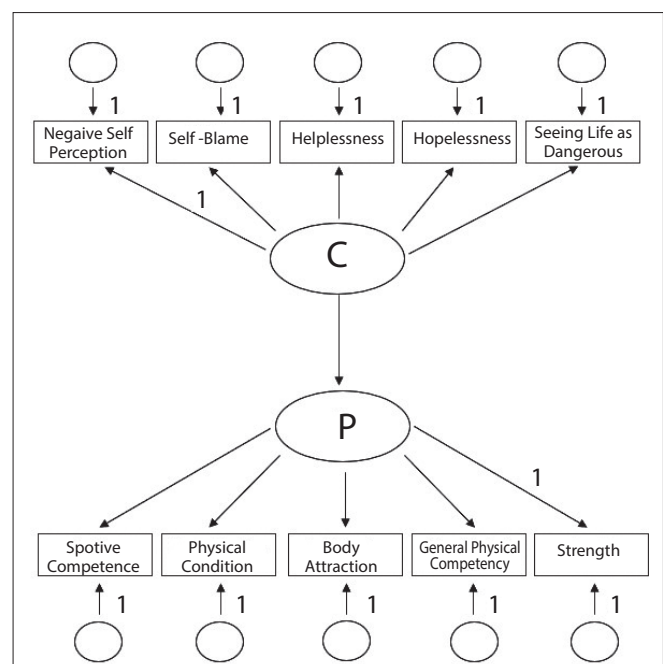


Figure 1. Conceptual Model

METHODS

Participants

The sample size of the study was made using the G*Power program. When accepted with $A=0.05$ Type I error and $B=0.95$ Type II Error, the sampling size is calculated as 74. To increase the power, the study conducted with 102 women athletes having sports licenses whose ages between 18–26 ($M=20.7$, $SD=2.1$) consist of different branches (volleyball, taekwondo, synchronized ice skating, basketball, shooting, fencing, running, tennis, karate, kickboxing, boxing, wrestling, rowing, football, judo) with min. 2 years and max. 17 years of sport experience ($M=8.6$). Other demographic characteristics of athletes are shown in Table 1. The data was collected online with Google Forms selecting with a snowball sampling method.

Table 1: Sociodemographic characteristics of women athletes					
		<i>N</i>	%	<i>M</i>	<i>SD</i>
Characteristics					
Athlete age		102		20.7	2.1
Sport age		102		8.6	3.8
Marital status					
	Single	83	81.4		
	Has relationship	18	17.6		
	Married	1	1.0		
Educational level					
	Two-year degree	10	9.8		
	Undergraduate	68	66.7		
	Graduated	20	19.6		
	Graduate	4	3.9		
Living place					
	With family	81	79.4		
	In dorm	6	5.9		
	Own house	12	11.8		
	Others	3	2.9		
National team experience					
	Yes	45	44.1		
	No	57	55.9		

A athletes' license is a document that athletes must obtain a visa every year and cannot participate in competitions without it. To get a license, the athletes must have a certain year of experience in their branches. For some components, they must be at a particular generation level and a certain age by taking the generation exams. For this

reason, in our research, it has been accepted that having a license is one of the criteria that shows that they are doing sports for purposes other than hobby and that they are active.

MATERIALS

Demographic Information Form

It is a study-oriented form developed by researchers, including questions about socio-demographic properties like age, gender, education, and life histories of the participants.

Physical Self Perception Profile

Inventory, which measures self-perception in 4 sub-dimensions (sportive competence, physical condition, body attraction, strength) and general physical competency dimension, consists of 30 items in total with 6 items in each subscale. Each item provides the expression that defines two different people. After deciding which one of these other groups is similar from the person, it makes the degree of this resemblance by using the words "Perfectly Fit Me" or "Pretty Reasonable for Me". The scoring of items is between 1 and 4. "4" represents of high qualification, and "1" represents of low capability (Fox & Corbin, 1989). The validity and reliability study of this inventory was done by Aşçi et al. (1999). According to Pearson Product Moments Correlation analysis, the test-retest reliability coefficient ranges from 0.75 to 0.82 for men and 0.73 to 0.84 for women. In this study, the Cronbach's alpha internal consistency coefficient of the sub-dimensions is 0.73 for the sport competence, 0.76 for the physical condition, 0.66 for body attractiveness, 0.61 for the general physical competency, and 0.77 for the strength sub-dimension.

Zero-order correlation results supported the hierarchical structure of physical self-perception. The highest correlation for women was between physical self-worth and body attractiveness ($r=0.60$, $p<0.05$). In contrast, the lowest and nonsignificant correlation for women was between strength and physical self-worth ($r=0.12$). These correlations for males were 0.41 ($p<0.05$), between physical self-worth and strength, and for physical self-worth and sport competence were 0.34 ($p<0.05$). Principal Components Analysis with oblique rotation determined four factors: sport competence, strength, body attractiveness, and physical condition. The items link with the physical self-worth

scale were excluded from factor analysis. The study data for women reveals four factors that explain 56.3% of the variance among the scale items and 52.8% of the variance in the data for males.

Cognitive Distortion Scale

The cognitive distortion scale, developed by John Briere, consists of 40 questions expressing non-functional cognitive thoughts collected in 5 sub-dimensions. Sub-dimensions of the scale are self-evaluation (negative self-perception and inadequate self-perception), self-blame, helplessness, hopelessness, and seeing life (future) as dangerous (Briere, 2000). The self-perception dimension characterizes negative and low— self-perception of individuals and self-dissatisfaction, self-blame dimension characterizes extreme responsibility and guilt about the results of events. The sub-dimension of desperation characterizes the meaninglessness of effort to produce a change in the course and outcome of the events, the sub-dimension of despair characterizes the pessimistic, negative perceptions and evaluations about the future, life-threatening sub-dimension characterizes beliefs that they will have negative experiences and may be harmed by other people. The scale was prepared as a 5-point grading scale, 1 (never) and 5 (very often). The cognitive distortion scale has 8 questions (items) in each dimension (Briere, 2000). The validity and reliability study of this scale in Turkish form done by Ağır & Yavuzer (2018). In the statistical analysis in the Turkish validity and reliability study, Kaiser-Meyer– Olkin value was found to be 0.923, and the Bartlett test result yielded a significant result at $p < 0.001$. The Cronbach's alpha internal consistency coefficient of the sub-dimensions of the scale varies between 0.913 and 0.783. The results of the analysis showed significant relations between all sub-dimensions at $p < 0.001$ level. These values are 0.675 from 0.435 to 0.435 (Ağır & Yavuzer, 2018). In this study, the Cronbach's alpha internal consistency coefficient of the sub-dimensions is 0.81 for the negative self-perception, 0.90 for the self-blame, 0.89 for the helplessness, 0.92 for the hopelessness, and 0.81 for seeing life as a dangerous sub-dimension.

Cognitive Distortion Scale (CDS) Kaiser-Meyer-Olkin value was found to be 0.923. Statistically 0.001 as a result of the Bartlett test. It is understood that the cognitive distortion continuous variable comes from a multi-dimensional variable in the universe parameter. In the study, factor analysis was performed on five sub-dimensions as in the original form of the scale. A statistically

significant relationship at the level of 0.001 was obtained between all sub-dimensions. These values vary between 0.675 and 0.435. The construct validity of the scale has been proven. The relationships between the Cognitive Distortion Scale (CDS), and Beck Depression Scale and the Automatic Thoughts Scale were calculated to test the criterion validity of the test. Beck Depression and Automatic Thoughts Scales and all sub-dimensions of CDS. Statistically significant results at the level of 0.001 were obtained between the two, and these results prove the validity of the criterion.

Design

Since this study represents a relational scanning model, the participants answered the selected scales for the research question. A snowball sampling was used to determine participants. The predictor variable is the cognitive distortion, whereas the dependent variable is the physical self-perception in the study.

Procedure

Before collecting data, ethical approval was taken from the ethical committee of the Ankara Yildirim Beyazit University. The study code is 2020–270. All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000. Informed consent was obtained from all patients for being included in the study. First, women athletes answered the demographic information form, cognitive distortions scale, and physical self-perception inventory. To reduce the harmful effects of the word 'distortion' on the participants, it was informed that the study is related to cognitive processes. Since the study was conducted with women athletes, the athletes who may be in the menstrual period were asked to answer the study questions later to decreased the effects on answers. The women athletes answered informed consent, demographic information form, and scale via Google Forms.

Data Analysis

Data entry and required statistical analysis performed by using the Statistical Package for Social Sciences (SPSS) version 25 and AMOS 25 after the data collection. The structural equation model was used for analysis. Structural Equation Modeling (SEM) has become a valuable

statistical tool for a broad scientific community. Because of its flexible scale structure, SEM provides opportunities to undertake useful, useless, and even harmful things. Many statistical analyses such as multiple regression, factor analysis, ANOVA or MANOVA, and so on can perform with SEM. SEM, which is also used in psychology-based research, analyzes latent variables and relationships and provides the opportunity to analyze the dependencies of psychological constructs without measurement errors (Nachtigall et al., 2003). Thus, in this study SEM were preferred to run the required analysis. There is an ongoing debate about the required sample size for the structural equation model. According to Wolf et al. (2013) study, sample size requirements ranging from 30 (Simple CFA with four indicators and loadings around 0.80) up to 450 cases (mediation models). Thus, even though there were limitations to reaching more women athletes in the study, such as pandemic conditions, participants' size was considered acceptable.

Additionally, missing variables were replaced after the data entrance. As stated in the article on the Physical Self-Perception scale, some questions were reverse coded in the data entry. The sub-dimensions of the scales used after data entry were created as specified in the scale articles. For all the sub-dimensions, Cronbach's alpha internal consistency coefficient was calculated.

Normality, linearity, and the homogeneity of the sample variances (homoscedasticity) and multicollinearity are the basic assumptions of statistics before data analysis. Furthermore, whether the data had excessive scores was examined. Multivariate extreme values as a result of the analysis Mahalanobis distance ($p < 0.001$); univariate extreme values are evaluated according to the z distribution

($z \geq 3.30$) and no participants with excessive scores in the data has been seen. Determination of normality, other than statistical tests, graphic drawings, comparison of means, etc., can also be determined. In normality, the arithmetic means, mode, and median values are equal (Karagöz, 2019: p. 121). When the values of the dependent variable sub-dimensions in the study are examined, it can be said that it is a normal distribution. When the Q-Q plot tables of the variables are examined, it is observed that there is a normal distribution.

If the number of data in the study is 29 and more than 29, the Kolmogorov-Smirnov test is used (Kalayci, 2010). For this reason, Kolmogorov-Smirnov test results were examined. The p values of each sub-dimension are as follows; It is sportive competence 0.06, physical condition 0.08, body attraction 0.005, general physical competency 0.003, and strength 0.003. However, considering that normality cannot be determined with a single value, skewness and kurtosis values were also examined. According to George & Mallery (2016), the value of kurtosis with a value of skewness between +2 is acceptable. According to other researchers also acceptable limits are between ± 2 (Trochim & Donnelly, 2006; Field, 2000; Gravetter & Wallnau, 2014). By looking at the values in the study, it was decided that the data were normally distributed.

RESULTS

Analysis was performed to test the hypothesis of the study. The results of the correlation analysis conducted to determine the relationships between the variables in the research are shown in Table 2.

Table 2: Correlations between sub-dimensions of cognitive distortions and physical self-perception

1. Negative self perception	-								
2. Self blame	0.784**	-							
3. Helplessness	0.712**	0.709**	-						
4. Hopelessness	0.690**	0.711**	0.878**	-					
5. Seeing life dangerous	0.639**	0.779**	0.746**	0.746**	-				
6. Sportive competence	-0.388**	-0.372**	-0.404**	-0.403**	-0.288**	-			
7. Physical condition	-0.240*	-0.242*	-0.285**	-0.272**	-0.146	0.753**	-		
8. Body attraction	-0.465**	-0.440**	-0.409**	-0.358**	-0.296**	0.513**	0.564**	-	
9. General physical competency	-0.412**	-0.414**	-0.440**	-0.412**	-0.342**	0.596**	0.601**	0.710**	-
10. Strength	-0.406**	-0.430**	-0.430**	-0.358**	-0.271**	0.710**	0.655**	0.490**	0.566**

* $p < 0.05$, ** $p < 0.01$.

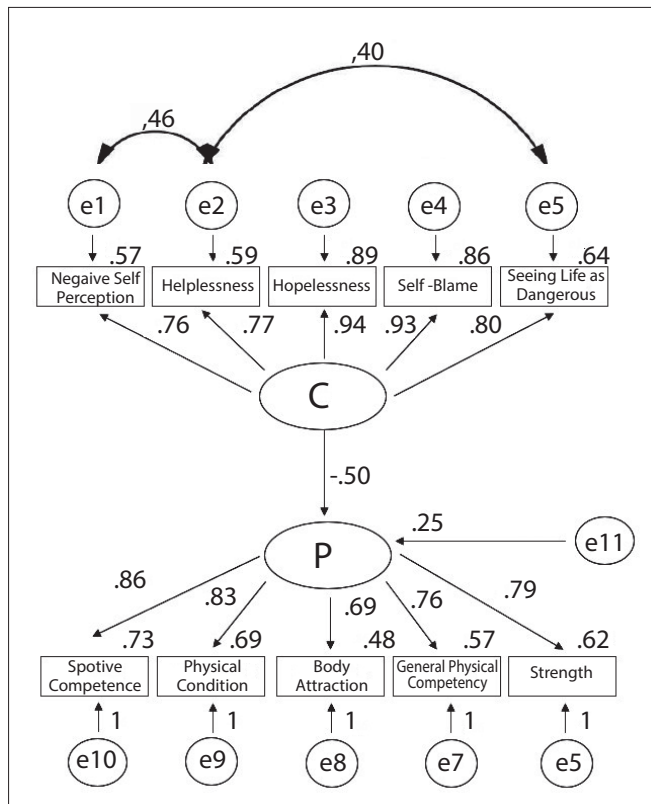


Figure 2. Structural Equation Model

As seen in Table 2, sub-scales of cognitive distortions are negatively correlated with the sub-dimensions of physical self-perception ($p < 0.01$). The tested model is shown in Figure 2.

In the structural equation model, which examines the relationship between cognitive distortions and physical self-perception in women athletes, sub-dimensions of the scales were used as the observed variable, and analyzes were conducted by creating latent variables of cognitive distortions and physical self-perception. Fit indices for

the first model created between variables are $\chi^2/sd=2.9$, $p < 0.000$, GFI=0.83, CFI=0.91, NFI=0.87, TLI=0.88, RMSEA=0.14, SRMR=0.07. When the questions content of the sub-dimensions were examined, it was thought that they were similar dimensions, and some modifications were made in the model due to the high correlation between negative self-perception and self-blame ($r=0.78$, $p < 0.01$), as well as the high correlation between self-blame and seeing life as dangerous ($r=0.77$, $p < 0.01$) dimensions. So, after the modification, fit indices for the second model are $\chi^2/sd=1.8$, $p < 0.000$, GFI=0.90, CFI=0.96, NFI=0.92, TLI=0.95, RMSEA=0.09, SRMR=0.07. The chi-square test evaluating the general fit of the model shows the fit of the model with the data obtained as a result of the research, and the chi-square p value should not be significant. As a result of this research, the chi-square value was found to be significant, but in cases where the Chi-square value is significant, it is stated that the model can be accepted if the division of the chi-square value to the degrees of freedom is less than 3 (Karagöz, 2019). In addition, the acceptable range of the RMSEA value in model fit indices is between 0 and 0.08, but a study revealed that RMSEA values between 0.08 and 0.10 could be accepted as mediocre fit, whereas values > 0.10 are not acceptable (Schermelleh-Engel & Moosbrugger, 2003).

For the mentioned reasons, it can be said that the model is compatible with the data. It is seen that the other fit indices obtained are also within acceptable limits. The data on the fit values of the model are shown in Table 3.

The results obtained from the structural equation model (see Table 4) were found to cognitive distortions predict the physical self-perception among women athletes and this explains 25% of the variance ($\beta = -0.50$, $t = -4.476$, $p < 0.001$).

Table 3: Fit indexes obtained for the tested model

Model Fit Indexes	Model Fit Values 1	Model Fit Values 2	Fit Values	
			Acceptable	Good/Very Good
X ² /sd	2.9	1.8	0 < X ² /sd < 5	0 < X ² /sd < 3
RMSEA	0.14	0.09	0.0 ≤ RMSEA ≤ 0.10	0.0 ≤ RMSEA ≤ 0.05
GFI	0.83	0.90	0.90 ≤ GFI ≤ 1	0.95 ≤ GFI ≤ 1
NFI	0.87	0.92	0.90 ≤ NFI ≤ 0.1	0.95 ≤ NFI ≤ 1
TLI	0.88	0.95	0.90 ≤ TLI ≤ 1	0.95 ≤ TLI ≤ 1
CFI	0.91	0.96	0.90 ≤ CFI ≤ 1	0.95 ≤ CFI ≤ 1
SRMR	0.07	0.07	0 ≤ SRMR ≤ 0.08	0 ≤ SRMR ≤ 0.05

RMSEA, root mean square error of approximation; AGFI, adjusted goodness of fit index; GFI, goodness of fit index; NFI, normed fit index; TLI, Tucker-Lewis index; CFI, comparative fit index; SRMR, standardized root mean square residual.

Table 4: Structural equation model on the relationship between cognitive distortions and physical self-perception in women athletes

<i>Dependent variable</i>	<i>Predictor variable</i>	<i>Direct affect</i>	<i>S.E.</i>	<i>t value</i>
Cognitive distortions	Physical self-perception	-0.50	0.08	-4.476***
S.E., Standard error. *** $p < 0.001$				

DISCUSSION

The primary purpose of this study was to investigate the relationships between cognitive distortions and physical self-perception among women athletes. The result of the structural equation model showed that cognitive distortions explained% 25 variances in physical self-perception. This result supported the hypothesis of this research. On the other hand, when looking at the correlations between all sub-dimensions, it was found that variables were negatively correlated. It can be said that the results are expected. Women athletes who have faced many stressful situations throughout their sports careers may have developed cognitive distortions due to their experiences. These distortions and physical self-perception, another perception process that is a crucial element for performance in sports, have been strongly correlated with the study results.

Considering the results obtained, the scarcity of studies on these variables in the literature causes difficulties in evaluating the results. However, the study results were tried to assess through some other variables related to the study variables. According to Williamson (1996), negative or distorted self-schemata led to distorted body image. This negative structure of self also affects attention, perception, and recall of information related to the body (Chen and Jackson, 2015). When distorted thinking calls cognitive distortions increased, women athletes perceive their physical self negatively. Vitousek and Hallon (1990) explain this situation due to the interpretation of negative past experiences or stimuli concerned about the body, increasing attention to the flaws, and a biased information processing process. Body image distortions are conceptualized as overestimated body size as a form of perception. In his study, Williamson (1996) stated that body dissatisfaction is related to cognitive biases of attention, memory, and selective interpretation. Considering these explanations, it is not surprising that a women athlete who has cognitive biases perceives herself as physically unfavorable in all dimensions. There are also studies in the literature that examine the effects of cognitive processes on body image or body-size perception and find a significant degree of effectiveness (Fuller, 1994; Page et al., 2005).

Studies on physical self-perception and physical activity in the literature (Brustad, 1993; Paxton et al., 2004) are available. However, almost no study has examined the effect of a variable that may affect this relationship. This situation makes the study critical. For example, Rodgers & DuBois (2016) stated in their research that body image and cognitive biases are essential and examining these processes can provide new treatment targets. In addition, the findings of the standardization study about cognitive distortions in the ideas of the person about his physical self (Luchinkina et al., 2019) also predict the results of the study model. In this study results, negative self-perception was found negatively correlated with all physical self-perception sub-dimensions. Although no specific studies investigate the relations with those variables, a study showed a significant relationship between body issues and negative perception toward a person's body. For instance, Makara-Studzińska et al. (2013) concluded that stigmatizing about body led to negative body image and low self-esteem. Studies on the sub-dimensions of cognitive distortions are mostly related to body image or eating disorders. From this perspective, a study revealed the relationship between helplessness, hopelessness variables, and perceived body type with impaired eating behaviors (Ward & Hay, 2015). It is thought that another mediator variable can explain the results that are directly related to the model results in future studies. For instance, It is seen that the variable of hopelessness is mainly studied concerning stressful events in women such as breast cancer (Gumus et al., 2011; Brothers & Andersen, 2008; Mohabbat et al., 2015), posttraumatic stress disorder (Machado et al., 2011; Ozdemir et al., 2015). It has been found that these stressful events increase the level of hopelessness in women. As stated above, the use of cognitive distortions may increase in stressful situations. Hopelessness is strongly associated with all physical self-perception sub-dimensions in this study. By looking at the study results on perception and stress, these relationships with the stress variable can be examined in the future. When the correlation of other sub-dimensions is reviewed, it is seen that physical condition, sportive competence, general physical competency, strength, and body attraction sub-dimensions have

a strong correlation with the others except seeing life as a dangerous cognitive distortion. Thus, physical activity and well-being variables come to the fore (Lapa, 2015; Tamminen et al., 2020); studies showed that well-being increases in direct proportion to physical activity. Thus, it is concluded that more extensive studies are needed to discuss the results related to cognitive distortions.

CONCLUSION

Cognitive distortions affect the physical self-perceptions of women athletes. These processes affect the athlete's belief in her physical strength, attractiveness, and adequacy before the performance. When working with women athletes in sports psychology, cognitive distortions should be considered, and intervention programs should be created.

Limitations

As mentioned in the study's introduction and found in one study, males scored better than women students in all physical self-perception sub-dimensions. Women are more reserved about physical self-confidence and are more prone to develop psychological problems (Ruiz-Montero et al., 2020). Therefore, the study focused only on women participants. Working in sports is to examine the effect of the inconsistency between the physical characteristics of sports and the expectations of the women's body in society on women athletes. Another limitation of this study is that information such as the history of psychiatric diagnosis or treatment and disability history was not obtained from the athletes within the scope of the research. The inclusion of this information in future studies may be considered.

Recently, it is seen how significant the effect of psychological factors in sport is, and there is an increase in the number of employed sports psychologists in Turkey. For these developments to be meaningful in theory and practice, academic studies on psychological factors, which can be effective on performance, should be given importance.

Study results examining the social aspects of the sport (Elmas et al., 2018) showed that 89.9% of studies were conducted in sports science departments. On the other hand, 10.2% of studies were completed in other social sciences. According to those findings, this research is essential because it contains a variable whose relationship

with physical self-perception has not been studied before. It is a study related to sports from the field of psychology. It is observed that limited studies are investigating the relationship between psychological factors and physical self-perception.

It is recommended that it is necessary to increase the studies on athletes from the social sciences such as psychology to ensure that sport psychology develops in the practical field.

Ethics Committee Approval: The study was approved by the Ankara Yıldırım Beyazıt University Ethics Committee (date and number of approval: 2020 / 270).

Informed Consent: Informed consent was obtained from all individual participants included in the study.

Peer-review: Externally peer-reviewed.

Conflict of Interest: The authors declare no conflict of interest.

Financial Disclosure: No financial disclosure was received.

REFERENCES

- Abakay, U., Alıncak, F., & Ay, S. (2017). Üniversite öğrencilerinin beden algısı ve atılganlık düzeylerinin incelenmesi. *Uluslararası Türk Eğitim Bilimleri Derg*, 9, 12-18. <https://dergipark.org.tr/tr/download/article-file/405367>
- Abbott, B.D., & Barber, B.L. (2011). Differences in functional and aesthetic body image between sedentary girls and girls involved in sports and physical activity: does sport type make a difference?. *Psychology of Sport and Exercise*, 12(3), 333-342. <https://doi.org/10.1016/j.psychsport.2010.10.005>
- Ağır, M. (2007). Üniversite öğrencilerinin bilişsel çarpıtma düzeyleri ile problem çözme becerileri ve umutsuzluk düzeyleri arasındaki ilişki. Yayınlanmamış Doktora Tezi, İstanbul Üniversitesi Sosyal Bilimler Enstitüsü. <http://nek.istanbul.edu.tr:4444/ekos/TEZ/42800.pdf>
- Ağır, M.S. & Yavuzer, H. (2018). Bilisel çarpıtma ölçeğinin türkçe formunun geçerlilik ve güvenirlik çalışması. *Akdeniz Eğitim Araştırmaları Derg*, 12(26), 175-198. <https://doi.org/10.29329/mjer.2018.172.10>
- Akyol, P., Erım, V., Yamak, B. (2015). Beden eğitimi öğrencileri, öğretmenleri ve dansçıların fiziksel benlik algılarının karşılaştırılması. *Ondokuz Mayıs University Journal of Sports and Performance Researchers*, 6(2), 109-120. <https://doi.org/10.17155/spd.25937>
- Altıntaş, A. & Aşçı, F.H. (2005). Fitness uzmanlarının bedenlerine yönelik algıları. *SPORTMETRE Beden Eğitimi ve Spor Bilimleri Dergisi*, 3(3), 101-104. https://doi.org/10.1501/Sporm_0000000051
- Aşçı, F. (1996). Genç erkek milli basketbolcuların kendini fiziksel algılama ve beden imgelerinden hoşnut olma profilleri. *Spor Bilimleri Derg*, 7(4), 13-20. <https://dergipark.org.tr/tr/download/article-file/151492>
- Aşçı, F. H., Aşçı, A., & Zorba, E. (1999). Cross-cultural validity and reliability of physical self-perception profile. *Int J Sport Psychology*, 30(3), 399-406. https://yunus.hacettepe.edu.tr/~alper.asci/Akademik-yayin_5-1-2014/7.1_uluslararasi-SCI-dergilerde-makale/7.1.2.pdf

- Bayköse, N., Saraç, H. ve Yavuz, S. A. (2018). Cinsiyet ve fiziksel algı: sporcularda cinsiyet farklılıkları fiziksel algı düzeylerinin farklı olmasının nedeni olabilir mi? *Gaziantep Üniversitesi Spor Bilimleri Derg.* 3(3), 1-9. <https://doi.org/10.31680/gaunjs.425154>
- Beck, J. S. (2005). *Cognitive therapy for challenging problems: What to do when the basics don't work.* Guilford.
- Blackburn, I. M. (1996). Depresyon ve başa çıkma yolları. İkinci basım. Çeviren: N. H. Şahin ve R. N. Rugancı. Remzi Kitabevi.
- Bonner, R. L., & Rich, A. R. (1988). Negative life stress, social problem-solving self-appraisal, and hopelessness: Implications for suicide research. *Cogn Ther Res*, 12(6), 549-556. <https://doi.org/10.1007/BF01205009>
- Briere, J. (2000). *Cognitive distortion scales.* PAR Psychological Assessment Resources, Inc. Printed in the U.S.A.
- Brothers, B. M., & Andersen, B. L. (2009). Hopelessness as a predictor of depressive symptoms for breast cancer patients coping with recurrence. *Psycho-Oncology: J Psychol Soc Behav Dim Cancer*, 18(3), 267-275. <https://doi.org/10.1002/pon.1394>
- Brustad, R. J. (1993). Who will go out and play? Parental and psychological influences on children's attraction to physical activity. *Pediatric Exercise Sci*, 5(3), 210-223. <https://doi.org/10.1123/pes.5.3.210>
- Buschmann, T., Horn, R. A., Blankenship, V. R., Garcia, Y. E., Bohan, K. J. (2018). The relationship between automatic thoughts and irrational beliefs predicting anxiety and depression. *J Rational-Emotive Cognitive-Behavior Ther*, 36, 137-162. <https://doi.org/10.1007/s10942-017-0278-y>
- Chen, H., & Jackson, T. (2005). Are cognitive biases associated with body image concerns similar between cultures?. *Body Image*, 2(2), 177-186. <https://doi.org/10.1016/j.bodyim.2005.03.005>
- Elmas, S., Açıköz, S., & Aşçı, F.H. (2018). Sporda sosyal alanlarda yapılan lisansüstü tezlerde araştırma paradigmalarının incelenmesi. *Spor Bilimleri Dergisi*, 29(2), 53-66. <https://doi.org/10.17644/sbd.309203>
- Field, A. (2000). *Discovering Statistics Using SPSS for Windows.* London - Thousand Oaks - New Delhi. <https://dergipark.org.tr/tr/download/article-file/156632>
- Fox, K. R., & Corbin, C. B. (1989) The Physical Self-perception Profile: development and preliminary validation. *J Sport Exercise Psychology*, 11(4), 408-430. <https://doi.org/10.1123/jsep.11.4.408>
- Fox, K. R. (1990). *The Physical Self Perception Profile Manual.* De Kalb, IL: Northern Illinois University Office for Health Promotion.
- Fuller, R. D. (1994). Selective information processing of body size and food related stimuli in women who are preoccupied with body size. *LSU Historical Dissertations and Theses*. 5871. https://digitalcommons.lsu.edu/gradschool_disstheses/5871
- George, D., & Mallery, P. (2016). *IBM SPSS Statistics 23 Step by Step: A Simple Guide and Reference (14th ed.).* Routledge. <https://doi.org/10.4324/9781315545899>
- Gravetter, F., & Wallnau, L. (2014). *Essentials of Statistics for the Behavioral Sciences*, 8th ed., Belmont, CA: Wadsworth. <http://xn--webducation-dbb.com/wp-content/uploads/2019/09/Frederick-J-Gravetter-Larry-B.-Wallnau-Essentials-of-Statistics-for-the-Behavioral-Sciences-Cengage-Learning-2013.pdf>
- Grogan, A. (2016). *Body image: understanding body dissatisfaction in men, women and children*, Routledge, 3rd ed. <https://doi.org/10.4324/9781315681528>
- Gumus, A. B., Cam, O., & Malak, A. T. (2011). Relationships between psychosocial adjustment and hopelessness in women with breast cancer. *Asian Pac J Cancer Prev*, 12(2), 433-438. http://journal.waocp.org/article_25538_f99c96cb271df5b74713a6e6080fe06b.pdf
- Hallion, L. S., & Ruscio, A. M. (2011). A meta-analysis of the effect of cognitive bias modification on anxiety and depression. *Psychol Bull*, 137(6), 940-958. <https://doi.org/10.1037/a0024355>
- Hulley, A. J., & Hill, A. J. (2001). Eating disorders and health in elite women distance runners. *Int J Eating Disord*, 30, 312-317. <https://doi.org/10.1002/eat.1090>
- Hausenblas, H. A., & Fallon, E. A. (2006). Exercise and body image: A meta-analysis. *Psychology Health*, 21(1), 33-47. <https://doi.org/10.1080/14768320500105270>
- Kalayci, Ş. (2010). *SPSS uygulamalı çok değişkenli istatistik teknikleri*, 5. Baskı. Asil Yayın.
- Kantanista, A., Glapa, A., Banio, A., Firek, W., Ingarden, A., Malchrowicz-Mosko, E., ..., & Maćkowiak, Z. (2018). Body image of highly trained female athletes engaged in different types of sport. *BioMed Res Int*, 1-8. <https://doi.org/10.1155/2018/6835751>
- Karagöz, Y. (2019). *SPSS 23 ve AMOS 23 uygulamalı istatistiksel analizler.* Nobel Yayıncılık.
- Koca, C., Aşçı, F.H., & Oyar, Z. B. (2003). Elit sporcuların denetim odağı ve fiziksel benlik algısının cinsiyete, yapılan spor branşına ve spor deneyimine göre karşılaştırılması. *Gazi Beden Eğitimi ve Spor Bilimleri Derg.* 8(4), 3-10. <https://dergipark.org.tr/tr/download/article-file/292354>
- Kordacova, J., & Kondás, O. (1998). Irrationality in the youth-structural differences in irrational beliefs in relation to age. *Studia Psychologica*, 40(4), 282-286.
- Lapa, T. Y. (2015). Physical activity levels and psychological well-being: A case study of university students. *Procedia-Soc Behav Sci*, 186, 739-743. <https://doi.org/10.1016/j.sbspro.2015.04.122>
- Luchinkina, A., Senchenko, V., & Dayrabaeva, A. (2019). Cognitive distortions in the ideas of the person about his physical self: standardization of the method. *SHS Web of Conferences*, 70, 08026. <https://doi.org/10.1051/shsconf/20197008026>
- Machado, C. L., De Azevedo, R. C., Facuri, C. O., Vieira, M. J. N. & Fernandes, A. M. S. (2011). Posttraumatic stress disorder, depression, and hopelessness in women who are victims of sexual violence. *Int J Gynecol Obstet*, 113(1), 58-62. <https://doi.org/10.1016/j.ijgo.2010.10.016>
- Maiano, C., Ninot, G., & Bilard, J. (2004). Age and gender effects on global self-esteem and physical self-perception in adolescents. *Eur Phys Educ Rev*, 10(1), 53-69. <https://doi.org/10.1177/1356336X04040621>
- Makara-Studzinska, M., Podstawka, D. & Goclón, K. (2013). Factors influencing self-perception of overweight people. *Pol Merkur Lekarski*, 35(209), 313-315. <https://pubmed.ncbi.nlm.nih.gov/24575656/>
- Mohabbat, B. S., Golzari, M., Akbari, M. E & Moradi, J. M. (2015). Effectiveness of group logo therapy on decreasing hopelessness in women with breast cancer. *Iran Q J Breast Dis*, 8(1), 49-58. <https://www.sid.ir/en/Journal/ViewPaper.aspx?ID=440869>

- Ndika, N. A., Olagbaiye, F., & Agiobu-Kemmer, I. (2009). Age differences in irrational beliefs, self-efficacy and self-confidence of adolescents in a Nigerian secondary school. *Psychol Educ*, 46(3), 16. https://www.researchgate.net/publication/287885026_Age_differences_in_irrational_beliefs_self-efficacy_and_self-confidence_of_adolescents_in_a_Nigerian_secondary_school
- Nachtigall, C., Kroehne, U., Funke, F., & Steyer, R. (2003). Pros and cons of structural equation modeling. *MPR Online*, 8(2), 1-22. https://www.researchgate.net/publication/240622131_Why_Should_we_use_SEM-Pros_and_cons_of_Structural_Equation_Modelling
- Ozdemir, O., Boysan, M., Ozdemir, P. G., & Yilmaz, E. (2015). Relationships between posttraumatic stress disorder (PTSD), dissociation, quality of life, hopelessness, and suicidal ideation among earthquake survivors. *Psychiatry Res*, 228(3), 598-605. <https://doi.org/10.1016/j.psychres.2015.05.045>
- Page, R. M., Lee, C. M., & Miao, N. F. (2005). Self-perception of body weight among high school students in Taipei, Taiwan. *Int J Adolesc Med Health*, 17(2), 123-136. <https://doi.org/10.1515/IJAMH.2005.17.2.123>
- Parsons, E. M., & Betz, N. E. (2001). The relationship of participation in sports and physical activity to body objectification, instrumentality, and locus of control among young women. *Psychol Women Q*, 25, 209-222. <https://doi.org/10.1111/1471-6402.00022>
- Paxton, R. J., Estabrooks, P. A., & Dziewaltowski, D. (2004). Attraction to physical activity mediates the relationship between perceived competence and physical activity in youth. *Res Q Exercise Sport*, 75(1), 107-111. <https://doi.org/10.1080/02701367.2004.10609139>
- Peñas-Lledo, E., Sancho, L., & Waller, G. (2002). Eating attitudes and the use of alcohol, tobacco, and exercise among male and female adolescents. *Eating Behav*, 3(2), 101-111. [https://doi.org/10.1016/S1471-0153\(01\)00047-2](https://doi.org/10.1016/S1471-0153(01)00047-2)
- Reel, J. J., Petrie, T. A., SooHoo, S., & Anderson, C. M. (2013). Weight pressures in sport: Examining the factor structure and incremental validity of the weight pressures in sport—Females. *Eating Behav*, 14(2), 137-144. <https://doi.org/10.1016/j.eatbeh.2013.01.003>
- Rodgers, R. F., & DuBois, R. H. (2016). Cognitive biases to appearance-related stimuli in body dissatisfaction: A systematic review. *Clin Psychology Rev*, 46, 1-11. <https://doi.org/10.1016/j.cpr.2016.04.006>
- Ruiz-Montero, P. J., Chiva-Bartoll, O., Baena-Extremuera, A., & Hortigüela-Alcalá, D. (2020). Gender, physical self-perception and overall physical fitness in secondary school students: a multiple mediation model. *Int J Environ Res Public Health*, 17(18), 6871. <https://doi.org/10.3390/ijerph17186871>
- Schermelleh-Engel, K., Moosbrugger, H., & Müller, H. (2003). Evaluating the fit of structural equation models: Tests of significance and descriptive goodness-of-fit measures. *Methods Psychol Res Online*, 8(2), 23-74. <https://psycnet.apa.org/record/2003-08119-003>
- Smolak, L., Murnen, S. K., & Ruble, A. E. (2000). Female athletes and eating problems: A meta-analysis. *Int J Eating Disord*, 27, 371-380. [https://doi.org/10.1002/\(SICI\)1098-108X\(200005\)27:4<371::AID-EAT1>3.0.CO;2-Y](https://doi.org/10.1002/(SICI)1098-108X(200005)27:4<371::AID-EAT1>3.0.CO;2-Y)
- Tamminen, N., Reinikainen, J., Appelqvist-Schmidlechner, K., Borodulin, K., Mäki-Opas, T., & Solin, P. (2020). Associations of physical activity with positive mental health: a population-based study. *Ment Health Phys Act*, 18, 100319. <https://doi.org/10.1016/j.mhpa.2020.100319>
- Thompson R. A., & Sherman, R. T. (2011). *Eating disorders in sport*, Routledge, NY.
- Tiggemann, M., & Williamson, S. (2000). The effect of exercise on body satisfaction and self-esteem as a function of gender and age. *Sex Roles*, 43, 119-127. <https://doi.org/10.1023/A:1007095830095>
- Trochim, W.M. and Donnelly, J.P. (2006) *The research methods knowledge base*. 3rd Edition, Atomic Dog, Cincinnati, OH.
- Turner, M. J., Aspin, G., Gillman, J. (2019). Maladaptive schemas as a potential mechanism through which irrational beliefs relate to psychological distress in athletes. *Psychology Sport Exercise*, 44, 9-16. <https://doi.org/10.1016/j.psychsport.2019.04.015>
- Türkçapar, H. (2011). *Bilişsel terapi, temel ilkeler ve uygulama*. HYB Yayıncılık.
- Ward, R. M., & Hay, M. C. (2015). Depression, coping, hassles, and body dissatisfaction: Factors associated with disordered eating. *Eating Behav*, 17, 14-18. <https://doi.org/10.1016/j.eatbeh.2014.12.002>
- Williamson, D. A. (1996). Body image disturbance in eating disorders: A form of cognitive bias?. *Eating Disord*, 4(1), 47-58. <https://doi.org/10.1080/10640269608250075>
- Wolf, E. M., & Akamatsu, T. J. (1994). Exercise involvement and eating-disordered characteristics in college students. *Eating Disord*, 2(4), 308-318. <https://doi.org/10.1080/10640269408249129>
- Wolf, E. J., Harrington, K. M., Clark, S. L., & Miller, M. W. (2013). Sample size requirements for structural equation models: an evaluation of power, bias, and solution propriety. *Educ Psychol Measurement*, 73(6), 913-934. <https://doi.org/10.1177/0013164413495237>
- Varnes, J. R., Stellessen, M. L., Janelle, C. M., Dorman, S. M., Dodd, V., & Miller, M. D. (2013). A systematic review of studies comparing body image concerns among female college athletes and non-athletes, 1997-2012. *Body Image*, 10(4), 421-432. <https://doi.org/10.1016/j.bodyim.2013.06.001>
- Visla, A., Flückiger, C., grosse Holtforth, M., David, D. (2016). Irrational beliefs and psychological distress: A meta-analysis. *Psychother Psychosom*, 85, 8-15. <https://doi.org/10.1159/000441231>
- Vitousek, K. B., & Hollon, S. D. (1990). The investigation of schematic content and processing in eating disorders. *Cogn Ther Res*, 14(2), 191-214. <https://doi.org/10.1007/BF01176209>