Investigation Effects of Self-Efficacy Levels of Athletes Students on Academic Achievement by Logistic Regression

Tayfun ŞİRİN[1] , Yeliz ERATLI ŞİRİN[2] , Özge AYDIN

[1]Kahramanmaraş Sütçü İmam Üniversitesi, Spor Bilimleri Fakültesi Kahramanmaraş/Türkiye

[2]Çukurova Üniversitesi Spor Bilimleri Fakültesi, Adana/ Türkiye

[3]Çukurova Üniversitesi Sağlık Bilimleri Enstitüsü Beden Eğitimi ve Spor Anabilim Dalı, Adana/ Türkiye

Abstract

Athlete-students faced with both athletic and academic demands may identify more strongly with their academic or athletic roles, depending on a number of influential factors. The aim of this study is to examine the effects of self-efficacy, gender and age of athletes-students on their academic achievement. In the research, the self-efficacy scale adapted to Turkish by Öcal (2022) and the academic achievement averages of the athletes-students were used as data collection tools. The data were collected from a total of 290 university licensed athletes-students studying at the university's faculty of sports sciences. Logistic regression analysis method was used in the analysis of the data. The results showed that high self-efficacy levels of athlete students are an important predictor of their academic achievement. As the age of the athletes increases, their academic success rates also increase; It was found that female athlete students were more likely to fail than male students. Another result is that the more the athletes' perceptions of confidence in their abilities increase, the more likely they are to be academically successful. These results revealed that age, gender, and confidence in their abilities are the determinants of academic success, and athlete self-efficacy is an important factor in the academic success of students during their education. It can be said that the results of the research are an important factor in guiding future research and educational prevention and intervention efforts for athletes.

Keywords: Athlete-Student, Self-Efficacy, Academic Success, Logistic Regression

Corresponding Author: Yeliz ERATLI ŞİRİN

yelizsirin75@gmail.com

Sporcu - Öğrencilerin Öz yeterlik Düzeylerinin Akademik Başarıya Etkisinin Lojistik Regresyon Analizi İle İncelenmesi

Öz

Hem atletik hem de akademik talepleriyle karşı karşıya kalan sporcu-öğrenciler, bir dizi etkili faktöre bağlı olarak akademik veya atletik rolleriyle daha güçlü bir şekilde özdeşleşebilirler. Bu çalışmanın amacı, sporcu-öğrencilerin öz-yeterlik, cinsiyet ve yaşlarının akademik başarılarına etkisini incelemektir. Araştırmada veri toplama aracı olarak Öcal (2022) Türkçeye uyarladığı özyeterlik ölçeği ve sporcu-öğrencilerin akademik başarı ortalamaları kullanılmıştır. Veriler, üniversitenin spor bilimleri fakültesinde öğrenim gören toplam 290 üniversite lisanslı sporcu-öğrenciden toplanmıştır. Verilerin analizinde lojistik regresyon analiz yöntemi kullanılmıştır. Sonuçlar, sporcu öğrencilerin yüksek öz-yeterlik düzeylerinin akademik başarılarının önemli bir yordayıcısı olduğunu göstermiştir. Sporcuların yaşı arttıkça akademik başarı oranları da artmaktadır; Kız sporcu öğrencilerin erkek öğrencilere göre başarısız olma olasılıklarının daha yüksek olduğu bulunmuştur. Diğer bir sonuç ise, sporcuların yeteneklerine güvenme algıları arttıkça akademik olarak başarılı olma olasılıklarının da arttığıdır. Bu sonuçlar yaş, cinsiyet ve yeteneklerine güvenmenin akademik başarının belirleyicisi olduğunu ve sporcu öz yeterliliğinin öğrencilerin eğitimleri süresince akademik başarılarında önemli bir faktör olduğunu ortaya koymuştur. Araştırma sonuçlarının sporculara yönelik gelecekteki araştırmalara ve eğitimsel önleme ve müdahale çabalarına yön vermede önemli bir faktör olduğu söylenebilir.

Anahtar kelimeler: Sporcu-Öğrenci, Öz-Yeterlik, Akademik Başarı, Lojistik Regresyon

Introduction

Participation in sports for young people provides psychosocial and health benefits and ensures the development of young people. Numerous research findings suggest that youth participation in sports is associated with increasing exercise levels in adulthood (Eime et al., 2013) and emphasizes that it is associated with positive psychological outcomes and skills such as increased self-esteem, emotional control, academic achievement, and leadership.

Self-Efficacy and Academıc Success

When it comes to success in education, "Academic Success" should be understood, which is the expression of knowledge or skills that are generally gained in the courses taught at school and determined by grade, exam score or both (Carter, 1973). Student athletes have certain challenges that most other students don't. Athlete students need to balance their potentially burgeoning athletic careers with academic demands. For example, these two roles that an athlete student assumes often conflict in order to achieve potential success in sports or education, and athletes are forced to make a choice. Studies have shown that athlete students have worse academic results than other students (Van Rens et al., 2016).

Self-efficacy, which Bandura defines as "the individual's belief that he/she can do a certain task", is defined as "the belief that an individual can fulfill what he/she needs to do with the required quality and quantity". Self-efficacy is about self-regulation and is understood as controlling and changing one's behavior to achieve goals (Zimmerman, 2000; Gao, Lee, and Harrison, 2008). Many studies on self-efficacy belief show that there is a positive relationship between academic achievement and self-efficacy belief (Bandura et al., 1996; Zajacova, Lynch, and Espenshade, 2005). Malpass et al., (1999) also found that there is a high correlation between self-regulation, goal orientation, self-efficacy and mathematics achievement of high school students who are talented in mathematics. Studies have shown that self-efficacy belief increases academic achievement. In other words, it was found that there is a relationship between self-efficacy and student success (Akbaba 2004). While much research on self-efficacy has focused on its impact on academic performance, the theory of self-efficacy has also been explored in many other fields, including in sports.

Athlete Self-Efficacy

While sports physically open the doors of a healthy life to people, it also brings with them emotions and behaviors such as winning and losing, taking responsibility, sharing, complying with social life norms, and self-confidence. In this context, it can be said that the level of self-efficacy is a factor that will increase the motivation levels of the athletes during the competition and affect their performance (Cengiz et al., 2012). Athlete self-efficacy is a complex process in which athletes

develop and master skills related to their own branch or chosen position (Bandura, 1997). Athlete self-efficacy is defined as an athlete's belief in his ability to achieve his goal, adapt to worsening situations, change, and ability to perform.

Feltz and Weiss [7] stated that the concept of self-efficacy in sports is one of the most effective psychological structures that mediate success in sports. Athletes who are less talented but have a high sense of athletic self-efficacy tend to perform better than athletes who are more talented but have a lower sense of athletic self-efficacy. Athletes with similar skill sets and abilities will often perform at different levels depending on their athletic self-efficacy level. Goal setting is important for improving athletic self-efficacy (Bandura, 1997). While many studies have found that participation in physical activities has positive effects on academic achievement, there are also studies indicating that participation in these activities has a negative effects on academic achievement (Cheung and Kwok, 2009). At the same time, physical activity and joining sports teams can provide youth with discipline, self-esteem, and general life skills that may be related to cognitive space and improved academic achievement (Eime et al., 2013). Accordingly, when self-efficacy is examined within the scope of special fields, it finds meaning. For this reason, the relationship between self-efficacy perception and academic achievement should be examined within the scope of teaching various disciplines.

One of these disciplines is sports science. Examining the relationship between Athlete Self-efficacy and academic achievement is important in terms of creating the necessary intervention programs. The effect of self-efficacy on student achievement and the effects of some variables on self-efficacy can be a starting point for intervention programs that can be planned in terms of improving success.

The present study aims to investigate whether student athletes can transfer their athletic self-efficacy developed from sports performances to academic performances. It is thought that the results of these studies will help to understand the strengths that support the academic success of student-athletes and the obstacles they face.

At the same time, it is thought that the obtained findings will contribute to the increase of academic and sports achievement self-efficacy of the athlete students are intertwined with sports throughout their academic education period.

Method

Statement of the Problem

The inability of students to balance their academic and active sports lives can cause increased stress, dissatisfaction, personal and academic problems, and failure in both areas. If academic

achievement and athlete self-efficacy are related to the demographics of a student-athlete, educators and coaches will have the opportunity to change the way they work with these students to achieve the best results both on and off the field. This study aims to examine the effects of perceived athlete self-efficacy, age and gender on achievement, as a measure of how effective student-athletes are in the academic achievement of university life.

The research hypotheses to be discussed in the study are structured as follows:

H1: "As the self-efficacy perceptions of the athlete-students increase, their academic success also increases."

H2: The academic success rates of athlete students differ according to their demographic characteristics.

Purpose of the Study

In this study, it was aimed to investigate the factors affecting the academic success of the athlete students in the relationship between athlete self-efficacy and academic success, with the expressions of gender, age and self-efficacy. In this study, both scanning (descriptive) and relational models were used.

Population and Sample

The sample of the research consists of athletes-students studying at Çukurova University and Kahramanmaraş Sütçü İmam Unıversıty Sports Sciences Faculties in the 2021-2022 academic year. The sample consists of 290 licensed athletes-students, 130 women and 160 men, studying in the coaching and teaching departments of the mentioned faculty. The sports sciences faculties were contacted and the athletes-students were asked whether they were willing to participate in the research. Participation was voluntary, athlete- students provided written consent to participate.

Measures

Variables to determine the demographic characteristics of the participants and the Self-Efficacy Scale were used as the data collection tool of the study. The scale developed by Riggs, Warka, Babasa, Betancourt and Hooker (1994) to measure individuals' belief in their own capacity, was adapted into Turkish by Öcel (2022). The scale consists of 10 items. Participants made a 5-point Likert-type (strongly disagree, disagree, undecided, agree, strongly agree) evaluation to indicate to what extent they agree with the statements in the items. Analysis of research data was tested with logistic regression analysis.

In the analysis of the data, the dependent and independent variables were determined in the first step. These determined variables are stated below:

Dependent Variables: The dependent variable y, which is the grade point average of the students, was taken as unsuccessful (0) for students with a grade point average between 0-1.99, and as successful (1) for students with a grade point average between 2.00-4.00. The selected covariates were used in a logistic regression model to estimate a propensity score for each student.

The defined independent variables are:

X1: I am confident in my abilities as an athlete

X2: As a player, I have some shortcomings.

X3: Sometimes I don't play badly because of my lack of skill

X4: I do not doubt my abilities as an athlete

X5: I have all the skills required by my sport

X6: The vast majority of those who do the sport I do can do this job better than me.

X7: I am very good at sports

X8: There is no future for me in this sport due to lack of skills

X9: I am proud of my skills and abilities related to my game

X10: Gender

X11:"Age" determined as.

Statistical analyses

The purpose of using logistic regression analysis is to create a well-fitting and biologically meaningful model that can accurately describe the relationship between the outcome variable and the independent variable, using the least number of variables (Şahin and Efe, 2018; Eratlı Şirin and Şahin, 2020; Tahtalı, Şahin and Bayburt, 2020; Yalçınöz and Şahin, 2020; Yavuz et al., 2019). Logistic regression analysis is an alternative to differential analysis and cross-charts (contingency table) in case of various assumptions such as not having a normal distribution, not having a common covariance.

Logistics model,

$$\ell(\mathbf{x_i}) = E(y_i \mid \mathbf{x_i}) = \log[\,P(\mathbf{x_i})/(1-P(\mathbf{x_i}))] = \sum_{k=0}^{p} \beta_k x_{ik} \tag{1}$$

can be represented by the equalty ($i=1, 2, ..., n$; $k=1, 2, ..., p$; $x_{i0}=1$). Here the probability P(xi),

$$P(\mathbf{x_i}) = \frac{e^{\sum \beta_k x_{ik}}}{1+e^{\sum \beta_k x_{ik}}} = \frac{e^{\ell(\mathbf{x_i})}}{1+e^{\ell(\mathbf{x_i})}} \tag{2}$$

It is in the form (Elhan, 1997; Heise et al., 1996). This equation is called the "logistical function".

Estimation of parameters

For parameter estimations in logistic regression, the maximum likelihood method is widely used. In order to apply this method, firstly, the maximum likelihood function should be created. This function gives the probability of the observed data as a function of unknown parameters.

Contribution of the (xi, yi) pair to the likelihood function,

$$P(y_i \mid x_i) = P(x_i)^{y_i} [1-P(x_i)]^{1-y_i} \tag{3}$$

can be expressed by the equation.

Since the observations are assumed to be independent of each other, the likelihood function is obtained by multiplying the terms in equation (3) for "n" observations. (Chatfield and Collins 1980). Thus, the likelihood function is written as;

$$L(y \mid x, \beta) = \prod_{i=1}^{n} P(x_i)^{y_i} [1-P(x_i)]^{1-y_i} \tag{4}$$

Significance test of logistic regression coefficients

Using the likelihood function, the comparison of the observed values with the predicted values is done with the following expression.

$$D = -2\log\left(\frac{\text{Feasibility of a Reduced Model}}{\text{Likelihood of the Whole Model}}\right) \tag{5}$$

The expression in parentheses indicates the likelihood ratio (Gibbons et al., 1996). If the log is written in terms of likelihood function,

$$D = -2\sum_{i=1}^{n}\left[y_i \log\left(\frac{\hat{P}_i}{y_i}\right) + (1-y_i)\log\left(\frac{1-\hat{P}_i}{1-y_i}\right)\right] \tag{6}$$

obtained. Here is $\hat{P}_i = \hat{P}(x_i)$ (Hosmer et al., 1989). The D statistic plays an important role in deciding the goodness of fit.

In order to decide the importance of an independent variable, the D values in the equation with and without that independent variable are compared. The change in D due to the presence or absence of the independent variable,

G = D (For reduced model) – D (for all model)   (7)

expressed in the form.

Interpretation of coefficients

"*odds*" and "odds ratio" are used to interpret the coefficients in logistic regression. Odds ratio is the ratio of the odds value calculated for (Ω), x=1 to the odds value calculated for x=0. Accordingly, the odds ratio,

$$\Omega(1,0) = \frac{P(1)/[1-P(1)]}{P(O)/[1-P(O)]}$$ (8)

It can be written as. Accordingly, in logistic regression, if the independent variable is binary and coded as 0.1, the odds ratio (Scott and Wild,1990),

$$\Omega = e^{\beta_1}$$ (9)

is in the form.

Determination of goodness of fit Hosmer-Lemeshow's test statistics were used to determine the model goodness of fit and,

$$\hat{C} = \sum_{m=1}^{t}\left[\frac{(g_{1m}-b_{1m})^2}{b_{1m}} + \frac{(g_{0m}-b_{0m})^2}{b_{0m}}\right]$$ (10)

(m: risk group) can be calculated as. $\hat{C}$ test statistic shows *t*-2 degrees of freedom χ^2 distribution

Results

In order to determine the candidate variables for the multivariate logistic regression model, the results of simple univariate logistic regression analysis for each of the variables are given in Table1.

Table 1

Simple Logistic Regression Analysis of Achievement and Independent Variables

Effect	$\hat{\beta}$	$SE(\hat{\beta})$	$\hat{\Omega}$	%95 CI	Chi-Square	-2 Log Possibility	P
Stable	-0,441	0,012					
G	-0,674	-0,268	0,510	(0.125, 0.785)	6,33	398.125	0,011*
AGE	1,096	0,240	2,992	(1.022, 0.478)	20,78	391.103	0,001*
ME	-0,002	0,125	0,998	(0.789, 2.152)	0,001	339.614	0,986
FE	0,100	0,123	1,105	(0.974, 2.415)	2,68	351.515	0,261
NAF	0,053	0,127	1,054	(0.745,1.987)	0,17	355.524	0,677
AA	0,287	0,310	1,332	(0.545, 1.978)	0,86	359.255	0,353
NT	-0,205	0,124	0,815	(0.512, 1.845)	2,72	391.104	0,099*
CAA	0,5113	0,194	1,667	(0.963, 2.634)	6,99	381.144	0,008*
ISS	-0,084	0,126	0,919	(0.615, 2.549)	0,45	357.518	0,502
BPT	-0,379	0,183	0,684	(0.189, 2.452)	4,1	387.311	0,043*
TD	-0,174	0,134	0,840	(0.044, 1.405)	1,69	399.917	0,044*
SS	-0,179	0,118	0,836	(0.045,3.987)	2,33	361.478	0,129
BA	-0,058	0,117	0,944	(0.051, 2.961)	0,19	371.459	0,661
SCS	0,274	0,120	1,315	(0.944, 1.875)	5,19	392.415	0,022*
NFS	0,014	0,133	1,014	(0.563, 3.614)	0,012	346.478	0,912
PSA	0,233	0,128	1,262	(0.398, 2.918)	3,31	395.598	0,068*
WM	-0,416	0,782	0,660	(0.018, 1.002)	5,46	396.897	0,019*

*** Slope Coefficient ($\hat{\beta}$),standard error of slope coefficient ($SE(\hat{\beta})$),odds ratios ($\hat{\Omega}$), 95% CI, P* values; *G:Gender; AGE: Age; ME: Mother's Education; FE: Father's Education; NAF; Number of athletes in the family; AA: athletic age; NT: number of training; CAA: confidence in athletic abilities; ISS: As an athlete, I have some shortcomings; BPT: Bad Playıng Thought; TD: Talent Doubt; SS: I have Sports skills; BA: There are better athletes than me; SCS: I'm Successful in Sports:NFS: No Future In Sports; PSA: I am proud of my skills and abilities;WM: I'm worried about people watching me*

As seen in Table 1, ME, FE, NAF, AA, ISS, SS, BA and SCS variables will not be included in the multivariate model because they are found to be statistically insignificant (p>0.10). Multiple logistic regression analysis results are given in Table 2.

Table 2

Multiple Logistic Regression Analysis

Effects	$\hat{\beta}$	$\hat{\Omega}$	$SE(\hat{\beta})$	Chi-Square	p
Stable	-3.4781	0.031	1.5625	4.96	0.0260
G	-0.6653	0.514	0.3520	3.57	0.0487
AGE	1.6693	5.308	0.3355	24.76	0.0001
NT	-0.2901	0.748	0.1745	2.76	0.0064
CAA	0.9236	2.518	0.2607	12.55	0.0004
BPT	-0.6093	0.544	0.2604	5.47	0.0193
TD	-0.5155	0.597	0.1938	7.08	0.0078
SCS	0.6300	1.878	0.1644	14.69	0.0001
PSA	0.5975	1.818	0.1792	11.12	0.0009
WM	-0.8686	0.420	0.2214	15.38	0.0001

* α=0.05 statistically significant at error level.

The logistic regression model estimation for any subject from the "final model" in Table 2, can be written as

$$\hat{\ell}(\text{success})$$

$$= \hat{\beta}_0 + \hat{\beta}_1(\text{G}) + \hat{\beta}_2(\text{AGE.}) + \hat{\beta}_3(\text{NT}) + \hat{\beta}_4(\text{CAA.}) + \hat{\beta}_5(\text{BPT})$$

$$+ \hat{\beta}_6(\text{TD}) + \hat{\beta}_7(\text{SCS}) + \hat{\beta}_7(\text{PSA}) + \hat{\beta}_7(\text{WM}) \quad (11)$$

According to Table 2, "Age, "Gender", "number of trainings per week" (NT), "confident about athlete abilities" (CAA), "playing badly due to lack of talent" (BPT), "doubt about abilities" (TD), "being very good in sports (SCS)", "being proud of my skills and talents" (PSA), athlete self-efficacy expressions were determined to be effective on success.

According to the Multiple logistic regression analysis; It is seen that the most influential factor is AGE ($\hat{\Omega}$=5.308), followed by CAA ($\hat{\Omega}$=2.518) in the second place.

According to Table 2, it is seen that the coefficients of the GENDER, NT, BPT, TD and WM variables are in the negative direction. When the results are examined, academic failure increases as NT (number_of_training_week), BPT (thoughts of playing badly), TD (doubt about their abilities), WM (uneasy to watch people) increase.

According to the gender variable; It was concluded that women were 0.514 times more likely to fail than men. As the number of weekly training (NT) increases, it was seen that the probability of academic failure is 0.748 times higher than the probability of success; the higher the thought of playing badly (BPT), the probability of failing was found to be 0.544 times more likely to be successful; As another result, as the doubt of their abilities (TD) increased, the probability of academic failure was found to be 0.597 times higher than the probability of success; As the perception of being uncomfortable with people watching (WM) increases, the probability of academic failure is found to be 0.420 times higher than the probability of success.

Goodness of fit of the model

Ten risk groups (n/t=360/10=36) were formed by obtaining the logit estimate, P(xi) and 1-P(xi) values for each subject. The observed and expected frequencies of the ten risk groups are given in Table 3.

Table 3

Observed and Expected Frequencies for Ten Risk Groups with Fixed Subject Numbers

Value of Binary Dependent Variable Y	Ten Risk Groups (R$_m$)										
	1	2	3	4	5	6	7	8	9	10	Σ
y=1	9	14	17	11	19	3	20	25	16	21	155

	7,4	21	15,2	13,6	17,7	2,7	21,7	22,3	15,9	17,5	155
y=0	20	15	12	18	10	26	9	4	13	8	135
	15,9	17,8	13,5	21,6	13,4	15,8	7,9	3,2	14,5	11,4	135
Σ	29	29	29	29	29	29	29	29	29	29	290

According to equation (10) from Table 3,

$$\hat{C} = \frac{(9 - 7.4)^2}{7.4} + \frac{(14 - 21)^2}{21} + \dots\dots.\frac{(8 - 11.4)^2}{11.4}$$
$$= 14.019$$

is obtained, and since $\hat{C}=14.019<X_{(t-2,\alpha)}^2=X_{8,0.05}^2=15.51$ it can be said that the final model created fits the data well.

Discussion

In this study, logistic regression analyzes based on gender, age and average success were conducted to determine the relationship between the academic achievement of university athletes-students and their self-efficacy perceptions. The results of the research showed that demographic characteristics such as gender, age, and some expressions of self-efficacy were significant predictors of students' academic achievement. (see Table 2).

In the study, it was concluded that the higher the age of the athletes and the higher the perception of being confident about their athletic abilities from the expressions of self-efficacy, the academic success rates increased in the same direction. This result can be interpreted as experienced athlete students become more conscious as their age increases and their success rates increase by making more effort in terms of graduation. Accordingly, it can be said that as the sportive self-efficacy of the athlete-student increases, their self-confidence and, accordingly, their academic success will increase. The biggest feature of sports is a developed self-discipline, self-confidence, psychological resilience and the power to influence general life skills that can pass from participation in sports to academic success. Raalte et al., (2019), in their research on the academic achievement and self-efficacy of student-athletes, concluded that when athletes feel highly skilled, their performance is likely to increase in an academic and athletic setting. Similarly, Eime et al., (2013) suggest that participation in sports is linked to greater social skills and functioning, which can aid overall school success. Boekel et al., (2016) stated in their study that students who participate in sports have higher academic averages.

Another important result of the research is that the gender of the athlete students and the number of weekly training sessions negatively predict their academic success. When the results were analyzed by gender, it was found that female students were more likely to fail academically than male students. The results of this research support the results obtained in our study. This result can be interpreted as the deterioration of study opportunities or concentration due to fatigue caused by study

intensities, affecting the success of female students. Aktop and Erman (2006) stated in their study that the academic achievement levels of male athletes who do active sports increase as their age and experience increase.

As a result of the research, it was concluded that as the number of weekly training increases, the academic success of the athlete students decreases. This result can be interpreted as the deterioration of study opportunities or concentrations due to the fatigue caused by the training intensities of the athlete students, negatively affecting their success. Similarly, in their study on the academic performance of elite athletes, Cosh and Tully (2014) reported that athletes plan their lessons according to their training programs, but it is very difficult for them to attend university courses. Thus, a large amount of time spent playing sports and an inflexible academic schedule may be potential underlying causes of poor academic performance observed in young elite athletes (Tessitore et al., 2021). For example, in a national survey of more than 10,000 student-athletes, 20% of students reported that practice and playtime kept them from working in academia (Wolverton, 2007).

According to the answers given to the self-efficacy statements of the athlete students, it was seen that as the perceptions of playing badly, doubting their abilities, and being uneasy from people watching increased, their academic failures also increased. As a result of the research, it was concluded that as the athletes' self-efficacy perceptions decrease, their academic success rates decrease at the same rate. In general, studies have shown that higher self-efficacy levels are positively associated with increased academic achievement (Chemers et al., 2001). Catina and Iso-Ahola (2004) determined that how an athlete perceives his abilities has both direct and indirect effects on his actual success in competition and academic success through the expectation of success.

When the results of the research are evaluated, athlete self-efficacy may be the key to addressing academic perspectives and strengthening the student-athlete equation in order to prepare students in the best way for life outside the active sports period. The idea that self-efficacy depends on context is vital for understanding how to work with students to increase their athlete and academic self-efficacy. Coaches and academic staff can use student-athlete self-efficacy feelings to identify which areas need intervention and which identity role needs to be strengthened. Previous research has found that athlete performance predicts self-efficacy judgments, which in turn influence other future performances. (Elias and MacDonald, 2007).

In addition, academic counseling to students directly contributes to the daily academic life of student-athletes. At the same time, student-athletes can get support from sports departments, coaches, teammates, sports trainers, friends, family, community members, fans, trainers, classmates.

Conclusion

Our study is one of the first studies to investigate in more detail the effects of university athlete-students on their athletic self-efficacy, levels, gender and age on their academic achievement.

Thus, in this kind of study, we tested the reflections of university athlete- students' athlete self-efficacy levels on academic achievement and academic self-efficacy. In our study, it was concluded that the academic success of the athletes who are older and confident in their abilities is higher. Moreover, it was revealed that the adjustment of the training numbers, the negative items of athlete-self-efficacy, such as the thought of playing badly, doubting one's abilities, and being uneasy about being watched by the fans, had a negative effect on their academic failures. Since the level of failure of female athlete students is higher, interventions can be made specifically for female athlete-students. The findings of the study can be used to guide future research and educational prevention and intervention efforts for athlete-students.

Ethical Approval

Ethics evaluation committee: Çukurova University Faculty of Medicine Non-Invasive Clinical Research Ethics Committee

Ethics evaluation certificate date: 04.03.2022

Ethics evaluation document issue number: 120

Authors' Contribution

The contribution of the first author is 40%, the second author is 30% and the third author is 30%.

Conflict Statement

There was no statement of conflict between the authors regarding the research.

References

Akbaba, S. (2004). *Psychological health protective guidance and psychological counseling.* (3th ed.). (pp.149). Ankara: Pegem Academy.

Aktop, A., & Erman, K. A. (2006). Relationship between achievement motivation, trait anxiety and self-esteem. *Biology of Sport*, *23*(2),127-141. https://doi.org/10.1501/Sporm_0000000361

Bandura, A. (1997). *Self-efficacy: The exercise of control.* Freeman, W.H., Ed.; Times Books, Henry Holt & Co: New York, NY, USA.

Bandura, A., Barbaranelli, C., Caprara, C. V., & Pastorelli, C. (1996). Self-Efficacy beliefs as shapers of children's aspirations and career trajectories. *Child Development*, *72*(1), 187–206.

Carter, V. E. (1973). *Good, dictionary of education*. (4th ed.) New York: McGraw Hill Book Company,

Catina, P., & Iso-Ahola, S. (2004). Positive illusion and athletic success. *International Sports Journal, 8*, 80–93.

Cengiz, R., Aytan, K.G., & Abakay, U. (2012). The relationship between self-efficacy levels and leadership qualities that the taekwondo athlete perceive; *E-Journal of New World Sciences Academy*, 7(4). https://dergipark.org.tr/tr/pub/nwsaspor/issue/20131/213778

Chatfield, C., & Collins A. (1980). *Introduction to multivariate analysis.* (1st ed.) Routledge, New York.

Chemers, M. M., Hu, L., & Garcia, B. F. (2001). Academic self-efficacy and first year college student performance and

adjustment. *Journal of Educational Psychology, 93*(1), 55–64. https://doi.org/10.1037/0022-0663.93.1.55

Cheung, C. K., & Kwok, S.T. (2009). Activities and academic achievement among collage students, *The Journal of Genetic Psychology*, *159(*2), 147-162. https://doi.org/10.1080/00221329809596142

Cosh S., & Tully P. J. (2014) "All I Have to Do Is Pass": A discursive analysis of student athletes' talk about prioritising sport to the detriment of education to overcome stressors encountered in combining elite sport and tertiary education. *Psychol. Sport Exerc.,* 15, 180–189. doi: 10.1016/j.psychsport.2013.10.015.

Eccles, J. S., Adler, T. F., Futterman, R., Goff, S. B., Kaczala, C. M., Meece, J., & Midgley, C. (1983). Expectancies, values and academic behaviors. In J. T. Spence (Ed.), *Achievement and achievement motives* (pp. 75–146). San Francisco, CA: W. H. Freeman

Eime, R. M., Young, J. A., Harvey, J. T., Charity, M. J., & Payne, W. R. (2013). A systematic review of the psychological and social benefits of participation in sport for children and adolescents: Informing development of a conceptual model of health through sport, *International Journal of Behavioral Nutrition and Physical Activity,* 10, 98. https://doi.org/10.1186/1479-5868-10-98

Elhan, A. H. (1997). *Review of Logistic Regression Analysis and Implementation in Medicine*. PhD Thesis in Biostatistics Ankara Universty, 4-29, Ankara

Elias, S. M., & MacDonald, S. (2007). Using past performance, proxy efficacy, and academic self-efficacy to predict college performance, *Journal of Applied Social Psychology*, *37*(11), 2518-2531. https://doi.org/10.1111/j.1559-1816.2007.00268.x

Eratlı Şirin, Y., & Şahin, M. (2020). Investigation of factors affecting the achievement of university students with logistic regression analysis: School of physical education and sport example, *Sage Open*, *10*(1). https://doi.org/10.1177/2158244020902082

Feltz, D. L., Short, S. E., & Sullivan, P. J. (2008). Self Efficacy in sport: Reserch and strategies for working with athletes, teams, and coaches. *International Journal of Sports Science and Coaching*, *3*(2), 293-295. https://doi.org/10.1260/174795408785100699

Gao, Z., Lee, A. M., & Harrison, L. (2008). Understanding students' motivation in sport and physical education: From the expectancy-value model and self-efficacy theory perspectives. *Quest, 60*, 236–254. https://doi.org/10.1080/00336297.2008.10483579

Gibbons, R. D., & Hedeker, D. (1997). Random effects probit and logistic regression models for three-level data, *Biometrics*, 53, 1527- 1537.

Heise, M. A., & Myers, R.H. (1996). Optimal designs for bivariate logistic regression, *Biometrics,* 14, 613-623.

Hosmer, W. D., & Lemeshow, S. (1989). *Applied logistic regression*. John Wiley & Sons, America.

Lindner, K. J. (1999). Sports participation and perceived academic performance of school children and youth, *Pediatric Exercise Science*, 11, 129–143. https://doi.org/10.1123/pes.14.2.155

Malpass, J. R., O'neil, J., Harold, F., & Hocevar, D. (1999). Self-regulation, goal orientation, self-efficacy, wory and high stakes math achievement for mathematically gifted high school students, *Roeper Review*, 21 (4), 281–290. https://doi.org/10.1080/02783199909553976

Öcel, H. (2002). *The relationships of collective efficacy beliefs, self efficacy beliefs and group cohesiveness with success evaluations and expectancies in sports teams.* Master's thesis, Hacettepe University, Ankara

Raalte, L. J., & Posteher, K. A. (2019) Examining social support, self-efficacy, stress, and performance, in U.S. Division I collegiate student-athletes' academic and athletic lives. *Journal for the Study of Sports and Athletes in Education,* 13, 2, 75-96, Doı: 10.1080/19357397.2019.1635419

Rankin, S., Merson, D., Garvey, J.C., Sorgen, C.H., Menon, I., Loya, K., & Oseguera, L. (2016). The Influence of Climate on the Academic and Athletic Success of Student-Athletes: Results from a Multi-Institutional National Study. *The Journal of Higher Education 87*(5), 701-730. https://doi.org/10.1080/00221546.2016.11777419

Riggs, M. L., Warka, J., Babasa, B., Betancourt, R., & Hooker, S. (1994). Development and validation of self-efficacy and outcome expectancy scales for job-related applications. *Educational and Psychological Measurement, 54*(3), 793–802. https://doi.org/10.1177/0013164494054003026

Şahin, M., & Efe, E. (2018). Determining the factors affecting birth weight by using logistic regression method, *Black Sea Journal of Health Science*, *1*(2), 22-27. https://dergipark.org.tr/tr/pub/bshealthscience/issue/38738/451235

Scott, A, & Wild, C. J. (1990). Fitting logistic regression models in stratified case-control studies. *Biometrics*,47, 497-510.

Tahtalı, Y., Şahin. M., & Bayburt, L. (2020). Comparison of different growth curve models in romanov lambs, *Kafkas University Veterinary Faculty Journal*, *26*(5),609-615. https://doi.org/10.9775/kvfd.2020.23954

Tessitore, A., Capranica, L., Pesce, C., De Bois, N., Gjaka, M., Warrington, G., ... & Doupona, M. (2021). Parents about parenting dual career athletes: A systematic literature review. Psychology of Sport and Exercise, *53*, 101833. https://doi.org/10.1016/j.psychsport.2020.101833

Van Boekel, M., Bulut, O., Stanke, L., Zamora, J. R. P., Jang, Y., Kang, Y., & Nickodem, K. (2016). Effects of participation in school sports on academic and social functioning. *Journal of Applied Developmental Psychology, 46*, 31-40. https://doi.org/10.1016/j.appdev.2016.05.002

Van Rens, F.E., Elling, A., & Reijgersberg, N. (2015). Topsport Talent Schools in the Netherlands: A retrospective analysis of the effect on performance in sport and education. *Int. Rev. Sociol. Sport*, *50*, 64–82. https://doi.org/10.1177/1012690212468585,

Wolverton, B. (2007). Athletes question effectiveness of NCAA rule: Progress requirement designed to punish delinquent students causes headaches for some high achievers. *Chronicle of Higher Education*, *53*(18), A33−A34.

Yalçınöz, E., & Şahin, M. (2020). Modelıng of egg productıon curves in poultry. *Kahramanmaraş Sütçü İmam University Journal of Agriculture and Nature. 23*(5), 1373 – 1778. https://doi.org/10.18016/ksutarimdoga.vi.691069

Yavuz, E., Önem, A. B., Kaya, F., Çanga, D., & Şahin, M. (2019). Modeling of individual growth curves in Japanese quails. *Black Sea Journal of Engineering and Science, 2*(1), 11-15. https://dergipark.org.tr/en/pub/bsengineering/issue/42084/479709

Zajacova, A., Lynch, S. M. & Espenshade, T. J. (2005). Self-Efficacy, Stress, and Academic Success in College. *Res High Educ, 46*, 677–706. https://doi.org/10.1007/s11162-004-4139-z

Zimmerman, B. J. (2000). Self-efficacy: An essential motive to learn. *Contemp. Educ. Psychol., 25*, 82–91. https://doi.org/10.1006/ceps.1999.1016