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A Competition Period Evaluation Concerning Seasonal Variables of Elite Track and Field Athletes in Vertical Jumping Events: A Different Insight for Coaching Education

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Abstract

Aim of this study was to determine variables of elite athletes' competition seasons in vertical jumping events and to determine relationships between these variables. Also, to constitute prediction models of season best (SB) and season performance average based on season first performance to offer a new insight for coaching education. Research group consisted of male and female elite athletes who ranked in the top 100 in high jump (HJ) and pole vault (PV), during 2018 season. Athletes' competition information was reached from 2018 world rankings. Ages, total number of days in season, days between competitions, total number of competitions, number of competitions that season's best score was performed, ratio of SB to total number of competitions, percentages of first, end, average scores were calculated. Statistical comparison of gender groups was analyzed using Independent Samples t-Test. Pearson correlation coefficients were used to express relationships. Polynomial regression analysis was used to find coefficients of determination for relationships. Quadratic equations

were calculated to predictive SB performance and season average performances according average of first two performances by gender/events. In PV, there were differences between genders for season first, end, and average percentages calculated according to SB ($p < 0.05$). Strong relationships were determined between season average and season first performances in female athletes. Predicted models created according to season first performance may be considered as early evaluations for coaches. Coach can use these prediction models as a new and different education material for their training plans. By doing so, in case of calculating a prediction far away from the coach's aim it is possible that coach can take necessary measures at the beginning of season.

Keywords: Coaching education, Periodization, Competitive phase, Athletics, Season best, Prediction equation

1. Introduction

There are many different events in athletics and recently jumping events has become more popular among these events thanks to social media. High jump (HJ) is classified in the group of complex cyclic-acyclic movements, and the main objective of the HJ is to bring the jumper's center of mass to a maximum height when crossing the bar (Coh & Supej, 2008). Over the past 100 years, the pole vault (PV) has evolved into one of the most dynamic and challenging events in track and field (Rebella et al., 2008) with the introduction of the elastic pole in the late 1960s energetic aspects of the PV have changed decisively. Behind all these progresses, inventions and innovations can be seen as effective elements in the fields such as athlete selection, techniques, materials, technology depending on the development of sports sciences.

To jumping events, one of the high efficiency sports, training plan is indispensable for achieving targeted performance, as other Olympic events. Training scientists agree that if the annual plans are determined according to the targets such as the aim, the content, the equipment and the methods applied in the training, which is specific to the sports event, high efficiency levels can be reached by athletes. In other words, the concept of periodization and its effect on the development of records is one of the main subjects of training science as a key to achieving high level performance especially in target competitions.

The foundations of modern periodization were developed in the Soviet Union around the time of the Russian revolution, training periodization, established in general in the 1960s and initially based on the experience of high performance sport in the former Union of Soviet Socialist Republics (USSR), is definitely one of the most practically oriented sport events of training theory (Issurin, 2010; Naclerio et al., 2013). Although the continued evolution of sport and sport science has contributed to an enormous accumulation of knowledge, the traditional model of periodization as established about five decades ago, evidence and training technologies since that time have not changed much (Issurin, 2010). In the literature, there are many different definitions of periodization; Haff (2013) defined the periodization as fundamentally a planning paradigm in which training interventions are structured to maximize the performance or to adaptive responses in relation with the athletes' needs, moreover, according to Naclerio et al. (2013) periodization is the methodical planning and

structuring of training process that involve a logical and systematic sequencing of multiple training variables such as intensity, volume, frequency, recovery period and exercises in an integrative fashion and it is aimed to optimize specific performance outcomes at predetermined time points. If we approach to summarize all these mixed sentences; periodization is planning and organizing the trainings for a specific purpose (Açıkada, 2018).

Commonly used in many sports events are the division of the year into three main training phases: (1) preparation, (2) competition, and (3) transition (Bompa, 1994; Matveyev, 1981). Depending on the level and targets of the athlete, it is important to design the competitions determined in the activity program in order of priority. The first priority competitions are the ones where the highest peak form is expected (2-4 competitions), the second priority competitions are the ones that are expected to reach the high peak form and are in preparation for the highest peak form (6-8 competitions) (Açıkada & Bayraktar, 2018). For the competition period, which is a phase of the annual training planning, the time when the athlete starts the season, the total number of competitions, the frequency of the competition, the peak performance in the target competition, and the sustainable success are the questions that the coaches should answer before the season and the issues to be dealt with.

In accordance with all this information, the aim of this study was to determine the variables of elite athletes' competition seasons in vertical jumping events of athletics and to determine the relationships between these variables. Also, to constitute prediction models of season best (SB) and season performance average based on season first performance to offer a new insight for coaching education.

2. Method

The research group consisted of male and female elite athletes who ranked in the top 100 in HJ and PV events during the 2018 season.

2.1 Data Collection

The athletes' competition information in the season was reached from the 2018 world rankings that are published in the International Athletic Federation's (IAAF) official web page. Date of birth for each athlete, dates of the competitions he/she made during the season, and the ratings they had obtained were recorded from the database. The age of the athletes, the total number of days in the season (season days), the number of days between the competitions (days/comp.), the total number of competitions (total comp.), the number of competitions in which the season's best (SB) performance was achieved (SB comp.), the ratio of the SB to the total number of competitions (SB%), the percentages of the first (start%), end (end%) and average (mean%) scores were calculated.

2.2 Statistical Analysis

General characteristics of the participants were presented as means and standard deviations (±SD). Statistical comparison of the gender groups was carried out using Independent Samples t-Test. Pearson correlation coefficients (r) were used to express the relationships between parameters. Interpretation of correlation coefficients was as follows: $r \leq 0.49$ weak

relationship; 0.50 ≤ r ≤0.74 moderate relationship; and r ≥ 0.75 strong relationship (Portney & Watkins, 2015). Polynomial regression analysis was used to find coefficients of determination (r2) for the relationships. The quadratic equations were calculated to predictive SB performance and season average performances according the average of first two performances (AF2P) by gender and events. For the statistical procedure IBM-SPSS 20.0 software was applied and statistical significance was set at $p < 0.05$.

3. Results

The average and standard deviation values, the comparisons, in terms of gender with respect to the variables examined within the scope of the research are given in tables below.

Table 1. Descriptive statistics and comparing seasonal variables of high jumpers by gender

		Age	Season Days	Days/ Comp.	Total Comp.	SB Comp.	SB Comp%	First	AF2P	SB	Mean	End	Start%	End%	Mean%
M	Mean	24.2	112.4	13.2	8.8	4.7	53.6	2.18	2.19	2.26	2.19	2.19	96.5	96.9	97.0
(*n=100*)	*SD*	4.1	45.5	4.7	3.2	3.1	27.5	0.07	0.06	0.04	0.05	0.07	2.9	2.4	1.0
F	Mean	22.6	107.1	12.4	9.1	4.7	53.4	1.82	1.82	1.88	1.82	1.82	96.4	96.6	96.8
(*n=100*)	*SD*	*4.0*	40.9	5.0	3.1	2.3	24.0	0.06	0.06	0.05	0.05	0.06	2.1	2.4	1.0
	p	**.01***	.38	.21	.49	.96	.96	***<0.001****	***<0.001****	***<0.001****	***<0.001****	***<0.001****	.63	0.38	.24

Note. * p < 0.05, SD: Standard Deviation, SB: Season Best, M: Male, F: Female, AF2P: Average of First Two Performances.

Table 2. Descriptive statistics and comparing seasonal variables of pole vaulters by gender

		Age	Season Days	Days/ Comp.	Total Comp.	SB Comp.	SB Comp%	First	AF2P	SB	Mean	End	Start%	End%	Mean%
M	Mean	23.9	113.6	11.1	11.2	5.9	54.1	5.38	5.38	5.62	5.41	5.41	95.8	96.2	96.2
(*n=100*)	*SD*	4.2	34.0	4.4	4.3	3.8	27.8	0.23	0.19	0.13	0.14	0.20	3.2	2.9	1.0
F	Mean	23.7	105.3	11.1	10.4	6.4	60.3	4.21	4.23	4.47	4.28	4.28	94.3	96.0	95.8
(*n=100*)	*SD*	4.3	35.2	4.9	3.9	3.6	25.0	0.27	0.21	0.17	0.17	0.20	4.5	3.2	1.6
	p	*0.77*	*0.09*	*0.94*	*0.19*	*0.42*	*.10*	***<0.001****	***<0.001****	***<0.001****	***<0.001****	***<0.001****	***.01****	***.76***	***.03****

Note. * p < 0.05, SB: Season Best, M: Male, F: Female, AF2P: Average of First Two Performances.

In vertical jumping events, it was seen that athletes' average age was 23 years in HJ female and 24 years in HJ man and PV for both genders. When events were compared according to genders, except performance level differences, in HJ only ages were found to be different between genders. In PV, there were differences between genders for season first, end, and average percentages calculated according to SB ($p > 0.05$). The average SB performance for

HJ was calculated as 2.26 m for men and 1.88 m for female athletes. In PV, it was 5.62 m for men and 4.47 m for female athletes. High jumpers' season first, season end, and season average values were 96-97% of SB performances and it was 94-96% for PV (Tables 1-2).

Table 3. The relationship of season first performance of vertical jumps with SB, season end, and average performance

Season First Performance			**SB**	**Mean**	**End**
HJ	**Male**	r	**0.49***	**0.63***	**0.22***
		p	*<0.001*	*<0.001*	*0.03*
	Female	r	**0.76***	**0.79***	**0.60***
		p	*<0.001*	*<0.001*	*0.00*
PV	**Male**	r	**0.63***	**0.66***	0.18
		p	*<0.001*	*<0.001*	*0.07*
	Female	r	**0.67***	**0.76***	**0.46***
		p	*<0.001*	*<0.001*	*0.00*

Note. * $p < 0.05$, SB: Season Best.

When the relationships between season first and SB performances were analysed statistically significant, positive, and strong relationship ($r = 0.76$) was found for female HJ. This relationship was at the moderate level for both men ($r = 0.63$) and female ($r = 0.67$) PV athletes. In vertical jumping events, positive strong relationships were determined between the season average and the season first performances in female athletes. This relationship was at the moderate level for men in both events. When the relationships between season first and season end performance were examined, moderate and low-level relationships were calculated for the athletes except PV male athletes (Table 3).

Table 4. The relationship of AF2P means at the beginning of the season of vertical jumps with SB, season average, and end performance

AF2P at the beginning of the season			**SB**	**Mean**	**End**
HJ	**Male**	r	**0.64***	**0.79***	**0.39***
		p	*<0.001*	*<0.001*	<0.001
	Female	r	**0.79***	**0.88***	**0.66***
		p	*<0.001*	*<0.001*	*<0.001*
PV	**Male**	r	**0.75***	**0.79***	0.30
		p	*<0.001*	*<0.001*	*<0.001*
	Female	r	**0.71***	**0.84***	0.50*
		p	*<0.001*	*<0.001*	*0.00*

Note. * $p < 0.05$, SB: Season Best, AF2P: Average of First Two Performances.

When the relationships between AF2P means at the beginning of the season and SB performances were analysed, statistically significant, moderate relationships were found for HJ male (r = 0.64) and PV female (r = 0.71). On the other hand, statistically significant and strong relationships were observed for HJ female (r = 0.79) and PV male athletes (r = 0.75) (Table 4).

Table 5. The relationships of SB performance of athletes in vertical jumps with age, days between the competitions, total competition count

SB			**Age**	**Season Days**	**Days/Comp.**	**Total Comp.**
HJ	**Male**	r	**0.42***	0.16	**-0.22***	**0.41***
		p	*<0.001*	*0.11*	*0.03*	*<0.001*
	Female	r	**0.35***	0.08	**-0.29****	**0.47***
		p	*<0.001*	*0.41*	*<0.001*	*<0.001*
PV	**Male**	r	0.14	**0.41***	-0.10	**0.49***
		p	*0.16*	<0.001	*0.31*	<0.001
	Female	r	**0.27***	**0.36***	-0.04	**0.31***
		p	*0.01*	*<0.001*	*0.71*	*<0.001*

Note. * p < 0.05, HJ: High Jump, PV: Pole Vault.

Low, positive significant relationships were observed between SB and age of athletes for both genders in HJ and female PV athletes (Table 5). In another words, it can be said that athletes in these events have reached high performance levels in advanced ages. The low positive correlation between PV SB performance and the number of days of the season can be interpreted as athletes with higher performance levels have longer season days. There was a low level of positive relationship between the SB performances of all vertical jumping athletes and the total number of competitions. It can be said that elite athletes participated in more competitions during the season (Table 5).

When the relationship between season first performance and other season variables was examined, it was found that the relationship between the AF2P mean and these variables was higher than the season first performance. For this reason, the AP2P was used to predict SB performance and season performance average of the athletes. The equations that predict the SB and season average performances are given below.

I. A quadratic regression analysis was performed between the average of AF2P and SB performance variables which showed high positive correlation. According to this:

a) In female's HJ, it was seen that the AF2P could explain 70% of the SB performance. In other words, 70% of SB performance is related to the AF2P. SB Prediction equation related to AF2P:

$$SB = 10.211 + (AF2P \times -9.746) + [(AF2P)^2 \times 2.839]$$

b) In male's HJ, it was seen that AF2P could explain 57% of the SB performance. In other words, 57% of SB performance is related to AF2P. SB Prediction equation related to AF2P:

$$SB = 16.508 + (AF2P \times -13.533) + [(AF2P)^2 \times 3.207]$$

c) In female's PV, it was seen that AF2P could explain 57% of the SB performance. In other words, 57% of SB performance is related to AF2P. SB Prediction equation related to AF2P:

$$SB = 12.642 + (AF2P \times -4.435) + [(AF2P)^2 \times 0.59]$$

d) In male's PV, it was seen that AF2P could explain 64% of the SB performance. In other words, 64% of SB performance is related to AF2P. SB Prediction equation related to AF2P:

$$SB = 22.41 + (AF2P \times -6.763) + [(AF2P)^2 \times 0.676]$$

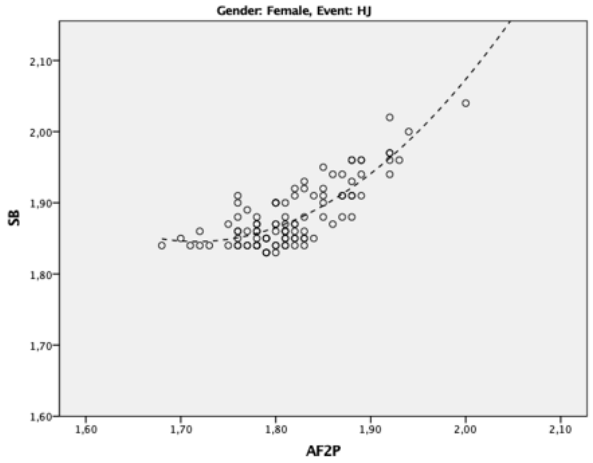

Figure 1. The relationship between SB performance and AF2P of female high jumpers ($r=0.79$, $p<0.001$; $r^2=0.70$)

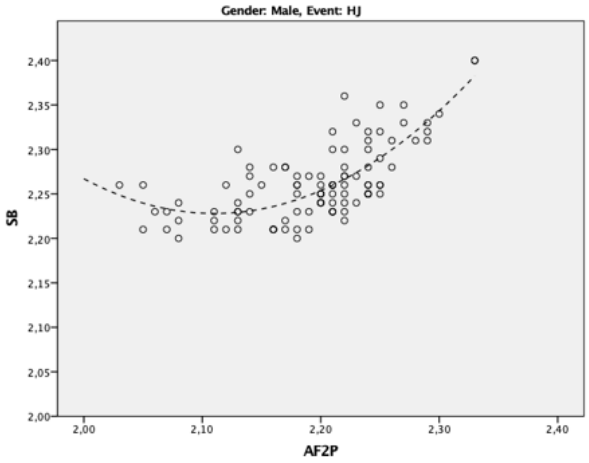

Figure 2. The relationship between SB performance and AF2P of male high jumpers ($r=0.64$, $p<0.001$; $r^2=0.57$)

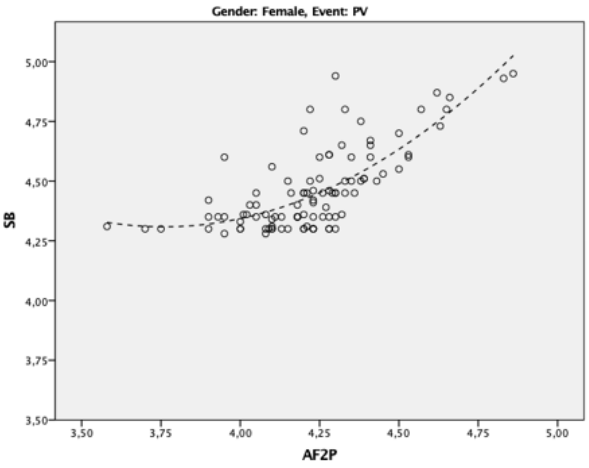

Figure 3. The relationship between SB performance and AF2P of female pole vaulters ($r=0.71$, $p<0.001$; $r^2=0.57$)

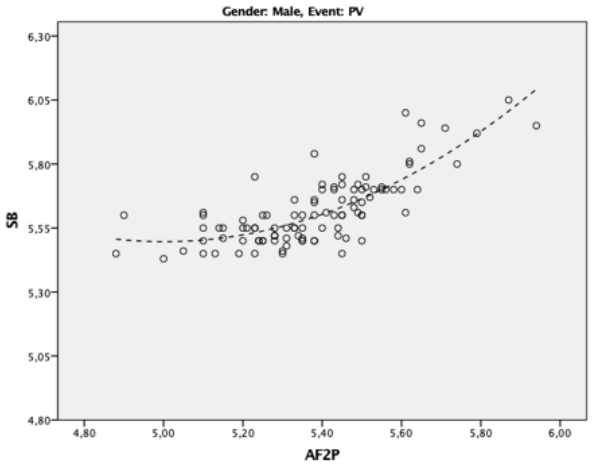

Figure 4. The relationship between SB performance and AF2P of male pole vaulters ($r=0.75$, $p<0.001$; $r^2=0.64$)

II. A quadratic regression analysis was performed between the AF2P and season performance average variables which showed high positive correlation. According to this:

e) In female's HJ, it was seen that the AF2P could explain 80% of the season average performance. In other words, 80% of season performance average is related to AF2P. SB Prediction equation related to AF2P:

$$\text{Season Performance Average} = 5.944 + (\text{AF2P} \times -5.254) + [(\text{AF2P})^2 \times 1.642]$$

f) In male's HJ, it was seen that AF2P could explain 68% of the season performance average. In other words, 68% of season performance average is related to AF2P. SB Prediction equation related to AF2P:

$$\text{Season Performance Average} = 11.213 + (\text{AF2P} \times -8.87) + [(\text{AF2P})^2 \times 2.168]$$

g) In female's PV, it was seen that AF2P could explain 73% of the season performance average. In other words, 73% of season performance average is related to AF2P. SB Prediction equation related to AF2P:

$$\text{Season Performance Average} = 8.521 + (\text{AF2P} \times -2.679) + [(\text{AF2P})^2 \times 0.395]$$

h) In male's PV, it was seen that AF2P could explain 64% of the season performance average. In other words, 64% of season performance average is related to AF2P. SB Prediction equation related to AF2P:

$$\text{Season Performance Average} = 11.381 + (\text{AF2P} \times -2.805) + [(\text{AF2P})^2 \times 0.315]$$

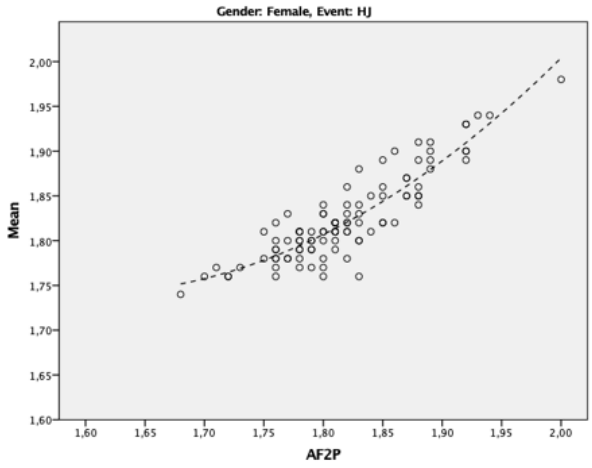

Figure 5. The relationship between season average performance and AF2P of female high jumpers ($r=0.88$, $p<0.001$; $r^2=0.80$)

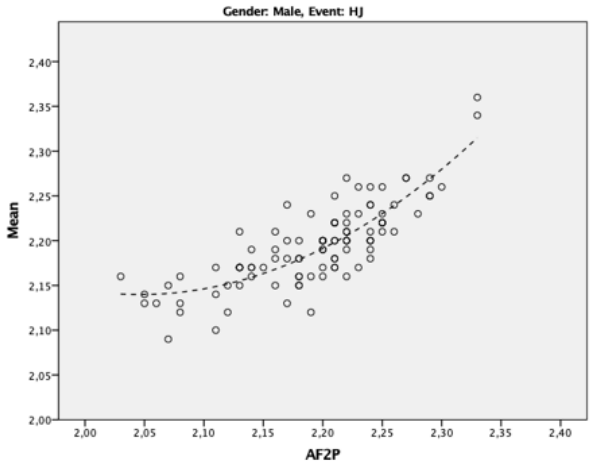

Figure 6. The relationship between season average performance and AF2P of male high jumpers ($r=0.79$, $p<0.001$; $r^2=0.68$)

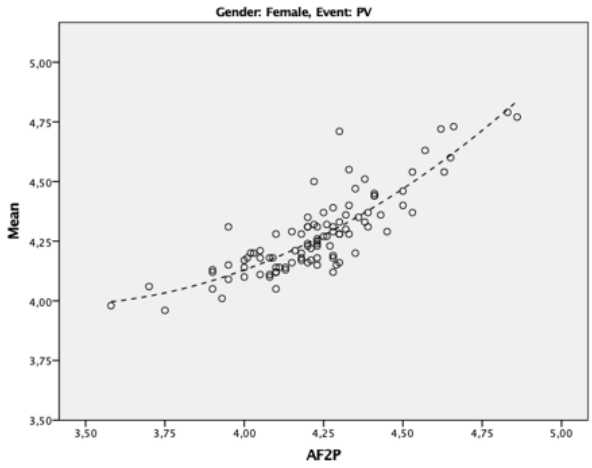

Figure 7. The relationship between season average performance and AF2P of female pole vaulters ($r=0.73$, $p<0.001$; $r^2=0.57$)

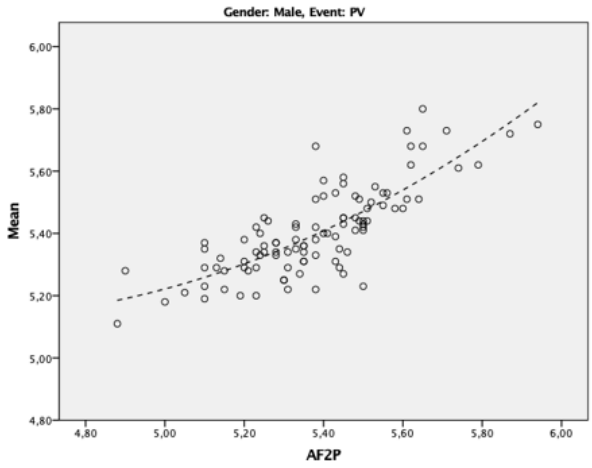

Figure 8. The relationship between season average performance and AF2P of male pole vaulters ($r=0.79$, $p<0.001$; $r^2=0.64$)

Table 6. Experimenting with prediction models for SB performance with female athletes in 2019 season

Event	Athlete	The AF2P (m)	SB Performance (m)	*Predicted SB Performance* (m)	*Difference Percentage for SB* (%)
HJ-M	Michael Mason	2.28	2.31	*2.32*	*0.4*
	Bohdan Bondarenko	2.25	2.31	*2.29*	*0.7*
	Django Lovett	2.28	2.30	*2.32*	*0.8*
	Mateusz Przybylko	2.26	2.30	*2.30*	*0.2*
	Jeron Robinson	2.28	2.30	*2.32*	*1.0*
HJ-F	Iryna Gerashchenko	1.96	2.00	*1.97*	*1.2*
	Nicola Mcdermott	1.95	1.99	*1.97*	*0.8*
	Aleksandra Yaryshkina	1.91	1.96	*1.94*	*0.7*
	Imke Onnen	1.93	1.94	*1.95*	*0.8*
	Yuliya Chumachenko	1.93	1.94	*1.96*	*0.6*
PV-M	Torben Blech	5.61	5.80	*5.74*	*1.0*
	Zachery Bradford	5.58	5.77	*5.72*	*0.9*
	Kc Lightfoot	5.62	5.76	*5.75*	*0.2*
	Claudio Michel Stecchi	5.69	5.75	*5.81*	*1.1*
	Bokai Huang	5.64	5.75	*5.77*	*0.3*
PV-F	Yarisley Silva	4.61	4.75	*4.69*	*1.4*
	Olivia Gruver	4.70	4.73	*4.73*	*0.1*
	Ling Li	4.67	4.72	*4.72*	*0.1*
	Annie R. Johnigan	4.53	4.65	*4.64*	*0.3*
	Angelina Krasnova	4.45	4.61	*4.59*	*0.3*

Note. HJ: High Jump, F: Female, PV: Pole Vault, M: Male.

Table 7. Experimenting prediction models for season performance average with female athletes in 2019 season

Event	Athlete	The AF2P (m)	Average Performance (m)	*Predicted Performance Average* (m)	*Difference Percentage for Average Performance* (%)
HJ-M	Michael Mason	2.28	2.26	*2.25*	*0.2*
	Bohdan Bondarenko	2.25	2.25	*2.23*	*0.8*
	Django Lovett	2.28	2.23	*2.25*	*1.1*
	Mateusz Przybylko	2.26	2.22	*2.24*	*0.9*
	Jeron Robinson	2.28	2.26	*2.26*	*0.0*
HJ-F	Iryna Gerashchenko	1.96	1.93	*1.93*	*0.6*
	Nicola Mcdermott	1.95	1.91	*1.92*	*0.2*
	Aleksandra Yaryshkina	1.91	1.89	*1.89*	*0.2*
	Imke Onnen	1.93	1.91	*1.91*	*1.0*
	Yuliya Chumachenko	1.93	1.89	*1.91*	*0.3*
PV-M	Torben Blech	5.61	5.54	*5.56*	*0.3*
	Zachery Bradford	5.58	5.58	*5.53*	*0.8*
	Kc Lightfoot	5.62	5.58	*5.56*	*0.3*
	Claudio Michel Stecchi	5.69	5.71	*5.62*	*1.6*
	Bokai Huang	5.64	5.57	*5.58*	*0.1*
PV-F	Yarisley Silva	4.61	4.63	*4.54*	*2.0*
	Olivia Gruver	4.70	4.55	*4.59*	*0.9*
	Ling Li	4.67	4.60	*4.57*	*0.6*
	Annie R.Johnigan	4.53	4.48	*4.48*	*0.0*
	Angelina Krasnova	4.45	4.46	*4.43*	*0.7*

Note. HJ: High Jump, F: Female, PV: Pole Vault, M: Male.

The prediction equations created in this study were applied to vertical jumping athletes competing in 2019 season and the results are given in Table 6 and Table 7. Values that the model was tested with real data of selected athletes in IAAF 2019 rank list are given in the Tables 6 and 7. The average of percentage differences according to actual performance values of SB and season performance average of selected athletes predicted according to first 2 competitions of season were found as 0.6% in both tables (Tables 6 and 7).

4. Discussion

Systematic and science-based trainings are important for both coaches and athletes in order to achieve the goals in elite sports. Moreover, coaches while preparing training plans, they demonstrate all of their knowledge, skills, experience, intuition, and creativity. In contrast, very few suggestions exist how coach education programs can develop a strong character in athletes (Kjær, 2019). To provide useful information, for coaches, about prediction models based on season first, season average, and SB performances; the aim of this study was to determine the variables of elite athletes' competition seasons in vertical jumping events of athletics and to determine the relationships between these variables. An important and a critical question that needs to be addressed is how coach educators support sports coaches to acquire new forms of (integrative) knowledge so that coaches can improve athletes' outcomes (Kjær, 2019). The most important finding of this study was even the season first, season average and season end percentages, calculated based on SB performance, may provide very useful information for coaches.

In most sports, number of competitions for world-class athletes has been increased. As the international sport federation has increased the number of competitions for elite and sub-elite athletes, national federations also have begun to organize many more events than previously. As a result, high-performance athletes have started to participate in many more competitive performances than in the past (Issurin, 2008). According to Acikada (2018); while some athletes need more competitions for preparation phase and to get into form, others may need a smaller number of competitions. It is necessary to know that each athlete can keep their form for 2 or 3 weeks depending on his/her training level (Açıkada, 2018). Competition schedules are set by coaches in accordance to athletes' need and both in periodization and preparing the competition schedule, the decisive factor is the biggest championship, sometimes called the main goal of the year. A decisive factor in achieving the efficiency goals of the year is the number of competitions that the athlete will participate in. On the other hand, the second important ones are the other official competitions that the coach chooses to participate in and the informal competitions that are planned to create an opportunity to evaluate the efficiency level of the athlete (Bompa, 2009). In the current study, maximum number of competitions was seen for PV both genders (10.8 for men and 10.00 for female athletes). Also, it was found that open field competitions accepted as the second competition season lasted approximately 3.5-4 months for all jumping events. Acikada (2018) states that when the single contest periodization is made, the length can be 5-5.5 months and when the double contest periodization is performed, the second competition period may last between 3-3.5 months. In accordance with this information, it can be said that the findings of the current study seem to support the literature for HJ (female), PV (female). Rather than these, competition period for other events seems to be a little bit longer than Acikada (2018) stated.

Gandelsman and Smirnov (cited in Bompa, 2009), proposes that an athlete must participate an average of 7 to 10 competitions before reaching peak performance. In this study, athletes reached their SB performance at fourth competition (both genders) for HJ, sixth competition for PV (both genders). These values found in the current study are lower than the ones reported in the literature.

One of the important outcomes of the current study is that the prediction equations created in this study were applied to real data of selected athletes from IAAF 2019 rank list (vertical jumping athletes competing in 2019 season). According to these prediction equations the average of percentage differences according to actual performance values of SB and season performance average of selected athletes predicted according to first 2 competitions of season were found as 0.6%.

When the prediction equations, applied to selected athletes in Table 6, are analysed in details: It is seen that SB performances are predicted with 1 cm difference for male high jump and 4 cm for male pole vault. On the other hand, for female high jumpers and pole vaulters the prediction is 2 cm different from the real performances. Moreover, if the prediction equations, applied to selected athletes in Table 7, are analysed in details; in the high jump (both male and female) season performance average was predicted with an average difference of 1 cm. In pole vault the equations predicted the season performance average with 4 cm.

As seen from the results of the current study, when the SB and season performance average prediction equations based on the average of the first competition at the beginning of the season are experimented to elite athletes' real performances in 2019 the results seem to be very close to each other. If coaches of selected athletes from Table 6 and Table 7 had applied these prediction equations in the beginning of the season, they would have had visions about the path to their goals.

With this study, by using prediction formulas for high jump and pole vault, coaches will be able to easily create predictions about the SB and season performance average at the beginning of the season. By doing so, if they calculate a result far away from their target, they may have a chance to ask "Is there something wrong?" and re-schedule their plans/programs.

To the best of our knowledge, this study is thought to be original as the prediction equations (season best and season performance average prediction equations based on the average of the first competition at the beginning of the season) created in this study are unique. As far as we know, there were no similar studies in the literature.

5. Conclusions

High jumpers' season first, season average and season end values were 97% of SB performances and it was about 96% for PV. These percentages with maximum of %4 difference states the fact that the success is not random. Regression analyses were performed according to the relationship between the AF2P, SB, and season performance average and the equations that predict the SB and season performance average were created based on these relationships. The predicted models created according to the season first performance may be considered as early evaluations for the coach and can be used for coaching education. Coaches can benefit the prediction models to predict the SB and season average performances and by doing so in case of calculating a prediction far away from the coach's aim it is possible that the coach can take the necessary measures at the beginning of the season. Moreover, models that create this kind of foresight may be used for other athletics events and/or metric-chronometric disciplines (swimming, triathlon, etc.).

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Conflict of Interest

No conflicts of interest between the authors and/or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, shareholding and similar situations in any firm.

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