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EXAMINATION OF THE EFFECTS OF DIVE ROLL MOVEMENT IN ARTISTIC GYMNASTICS, ON FORWARD SOMERSAULT TRAINING[4]

Abstract

The aim of this research is to examine the effects of dive roll movement (DRM) in artistic gymnastics, on forward somersault trainings (FST).

28 female athletes regularly continuing their training voluntarily participated in the study by the consent of their families. Experimental group (n = 14, age = 8.07 ± 0.27 years) and control group (n = 14, age = 8.79 ± 0.43 years) were established by simple random sampling method. Experimental group participated in DRM training for 4 weeks for 2 days a week for one hour. Then, the experimental and control groups participated in FST for six weeks together. At the end of the training period, both groups performed forward somersault twice. The expert trainers evaluated their performances by giving 10 points as a maximum value 3 points as a minimum value according to the accuracy of the movement by using The FST Level Scale (FSTLS), in which each athlete's FST were evaluated in 10 stages. The level of significance was 0,05.

The mean FSTLS scores of the experimental group (X1=21,21±4,15) were significantly higher than the control group (X2=15,79±2,75) (t = 4,08; p <0,05). When the evaluation criteria of the FS movement phases is considered, the experimental group have higher in the points obtained from the criteria of "C3.attaching torso to the legs", "C5.grasping knees by hands", "C7.separation of the torso from legs", "C8.controlled landing" and "C9.height of the motion" and it was found that there was a significant difference between them and the control group p <0.05). As a result, it was observed that the subjects in experimental group who performed DRM were evaluated to be more successful, during the performance phase of the FS drills, especially during the coordination phase in taking off after the contact with the ground was cut off. It might be suggested that the coaches should teach DRM before FSM drills.

Key words: artistic gymnastics, dive roll, forward somersault, instruction method

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INTRODUCTION

Gymnastics is a major branch of sport that involves a wide range of movements and basic movement skills (agility, balance, coordination, speed, etc.) that can be transferred to many other branches of sports. In sports education, especially in gymnastics, which involves acrobatic movements with difficult coordination, basic technical trainings are done over a period of time integrated with physical qualities in movement school where macro methods presenting logical structural diagram is presented during a long time (Potop, 2007, 2013). In gymnastics, complex movements are done with the combinations of a series of basic movements. Teaching these complex movements in pieces can enable the doing of the complex movement more successfully at the end of training period. For instance, cartwheel movement consists of several basic movements. For a successful cartwheel, basic gymnastics movements in it, such as handstand, forward body flip, twist jump and falling are taught separately then they are combined for a fluent application. While teaching these movements, the separate movements should be introduced and practiced in accordance with the age of the children, and after providing mental fitness, techno-motoric skill transfer should be provided for the conducting of the complex more difficult movement (Stidder and Hayes, 2011; Potop et al., 2013).

Somersault is a movement, in which the athletes the athlete make a 360-degree flip in the air then fall back on their feet. Since the athletes don't have any force to apply on their bodies in the air but the gravity, they can conduct the movement with limited control with the rotating force they can form. Despite this limitation, if the athletes train somersaults regularly and do other dynamic and explosive movements, they can improve their somersaults (Playter and Raibert, 1992; Blajer and Czaplicki, 2001; King and Yeadon, 2004).

In gymnastics, pre-learnt basic movements can ease the teaching of complex movements for beginners (Ikulayo, 1990; Asseman, 2004; Berk, 2004; Uzunov, 2008). In teaching of technical movements, helping with hands increases self-confidence among athletes and reduces the fear of injury (McAuley, 1985; Tsutsui and Imanaka, 2003; Wulf et al., 1998), and teaching the movements in separate parts with some supporting materials affects the process positively (Uzunov, 2008). On the other hand, Şentürk and Sezen (1999) reported in their studies conducted on university students that dive roll movement didn't have any significant effects on teaching forward somersault.

The purpose of the present research is studying the effects of pre-teaching of dive roll movement on the process of teaching forward somersaults among 8-9 year-old girls.

METHOD

In the present research, 28 female athletes training regularly participated voluntarily with parental consent. The participants were separated into two randomly as experiment (n=14, age=8.07±0.27 years, body weight=29.57±4.97 kg, height=1.32±0.07 m) and control groups (n=14, age=8.79±0.43 years, body weight=35.36±6.43 kg, height=1.41±0.09 m) (Table 1).

Table 1. Descriptive Statistics for Experiment and Control Groups

Variables	Groups	N	Min.	Max.	X	SD
Age (years)	**Experiment**	14	8	9	8,07	0,27
	Control	14	8	9	8,79	0,43
Body Weight (kg)	**Experiment**	14	20	38	29,57	4,97
	Control	14	22	42	35,36	6,43
Height (m)	**Experiment**	14	1,15	1,42	1,32	0,07
	Control	14	1,20	1,50	1,41	0,09

Neither group had had forward somersault or dive roll training before. Experiment group attended dive roll training for one hour, 2 days a week for 4 weeks (Figure 1).

Figure 1. Diagram for the dive roll movement worked with experiment group

After that, both experiment and control groups attended forward somersault training together for 6 weeks. At the end of the training period, both group members did the forward somersault movement (Figure 2) twice. These movements were video recorded. Somersault movement of each athlete was evaluated in accordance with Forward Somersault Training Level Scale (FSTLS), which assesses somersaults in 10 stages by 3 licensed trainers who scored athletes on 10 criteria from 1 as the lowest and 3 as the highest (Table 3) in accordance with the correctness of the movement (Şentürk and Sezen, 1999).

Table 2. Forward Somersault Training Level Scale

Criteria	Bad	OK	Good
C1. Both feet jump	1	2	3
C2. Raising hip	1	2	3
C3. Attaching torso to the legs	1	2	3
C4. Pulling head towards chest	1	2	3
C5. Grasping knees by hands	1	2	3
C6. Adjusting flip pace	1	2	3
C7. Separation of the torso from legs	1	2	3
C8. Controlled landing	1	2	3

C9. Height of the motion	1	2	3
C10. "Direction mistake"	1	2	3
Total			

The lowest score from forward somersault training level scale is 10 while the highest is 30. For the "direction mistake" criterion, scoring was done reversely, as "3 points" for no mistake" "1 or 2" points" when there is a complete or partial mistake for directing the movement. Athletes' higher scores were taken into analyses. Average forward somersault scores (X) and standard deviation values (SD) were calculated for experiment and control groups, after that independent samples T test was utilized at 0.05 significance level to compare to groups. Additionally, effects size of the differences between independent groups (Cohen's d) were calculated and the calculated d values were interpreted as; $d \leq 0.20$ small; $0.50 \leq d < 0.80$ medium and $d \geq 0.80$ large (Cohen, 1988).

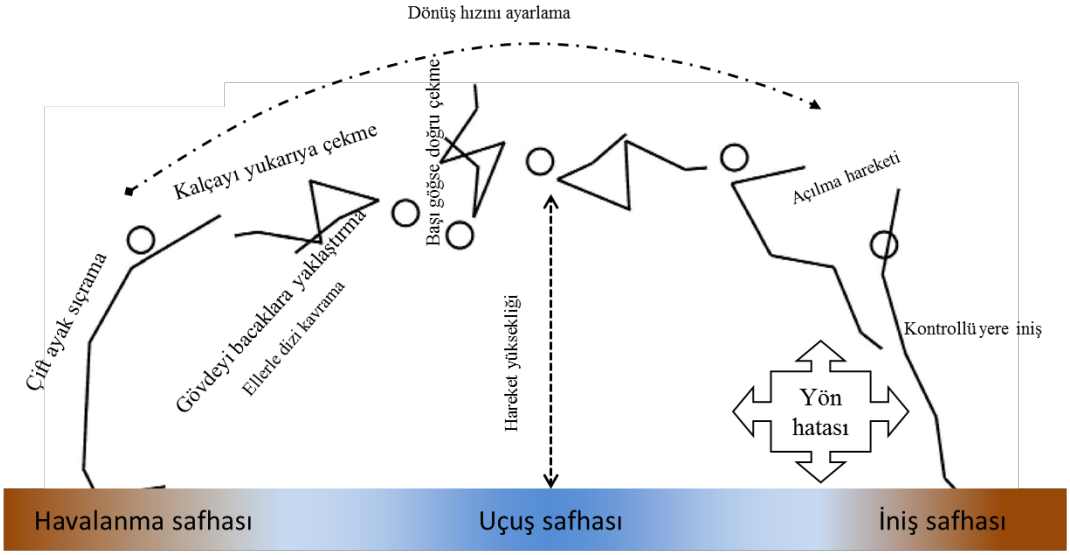

Figure 2. Forward somersault training level criteria

FINDINGS

Table 3 presents experiment and control groups' scores from each of 10 criteria and total Forward Somersault Training Level (FSTL) averages with standard deviation (X±SD), difference (t) analyses and significance (p) values.

Table 3. Comparison of experiment and control groups by forward somersault training level scores

Criteria	Groups	N	X	SD	t	p	Effect Size (Cohen's d)
C1. Both feet jump	Experiment	14	2.43	0.756	1.98	0.06	Medium (0.75)
	Control	14	1.86	0.770			
C2. Raising hip	Experiment	14	1.64	0.497	0.00	1.00	None
	Control	14	1.64	0.497			
C3. Attaching torso to the legs	Experiment	14	2.21	0.699	**2.77****	**0.01**	**Large (1.04)**
	Control	14	1.57	0.514			
C4. Pulling head towards chest	Experiment	14	2.43	0.646	1.88	0.07	Medium (0.71)
	Control	14	2.00	0.555			
C5. Grasping knees by hands	Experiment	14	2.71	0.469	**4.66****	**0.00**	**Large (1.75)**
	Control	14	1.79	0.579			
C6. Adjusting flip pace	Experiment	14	2.36	0.633	1.79	0.08	Medium (0.68)
	Control	14	2.00	0.392			
C7. Separation of the torso from legs	Experiment	14	1.71	0.726	**2.63****	**0.01**	**Large (0.99)**
	Control	14	1.14	0.363			
C8. Controlled landing	Experiment	14	1.86	0.663	**3.54****	**0.00**	**Large (1.35)**
	Control	14	1.14	0.363			
C9. Height of the motion	Experiment	14	2.43	0.852	**4.07****	**0.00**	**Large (1.53)**
	Control	14	1.36	0.497			
C10. "Direction mistake"	Experiment	14	1.57	0.514	1.54	0.14	Medium (0.57)
	Control	14	1.29	0.469			
Criteria Total	Experiment	14	21.21	4.154	**4.08****	**0.00**	**Large (1.54)**
	Control	14	15.79	2.751			

**P<0.01 significance level

According to the findings, FSTL score average of experiment group is (X_1=21.21±4.15) higher than control group (X_2=15.79±2.75) at a significant level (t=4.08; p<0.05). In terms of 10 criteria of forward somersault movement, there are significant differences between experiment and control groups (p<0.05) in favour of experiment group in "C3. Attaching torso to the legs", "C5. Grasping knees by hands", "C7. Separation of the torso from legs", "C8. Controlled landing" and "C9. Height of the motion" criteria. There are no significant differences between experiment and control groups in terms of "C1. Both feet jump", "C2. Raising hip", "C4. Pulling head towards chest", "C6. Adjusting flip pace" and "C10. "Direction mistake" criteria (p>0.05).

The size of the effects of the difference between experiment and control groups was large in FSTL total score and C3-C5-C7-C8 and C9 scores. The size of the effect was medium in C1-C4-C6 and C10 scores. There was no effect in C2 score.

DISCUSSION AND CONCLUSION

The findings of the present research showed that, 4-week dive roll training for one hour, 2 days a week among 8-9 year-old girls, who are beginners in gymnastics training, contributed to the training of forward somersault move, which is a complex movement.

The participants presented higher learning levels especially in attaching torso to the legs, grasping knees by hands, separation of the torso from legs, controlled landing and height of the motion phases. These phases are when the movement is at top and the body control is the most difficult, in other words the final phases of the movement. We can claim that preliminary dive roll training contributed to body control skills in flight phases when the body has no contact contact with the floor. Indeed, adequate height in flight phase provides a better control and a better landing.

Şentürk and Sezen (1999) conducted a 6-week forward somersault training with 14 experiment (22.79±2.42 year-old) and 14 control group (22.14±2.32 year-old); the total of 28 male university students. For their research, they conducted preliminary 4-week dive roll training with the experiment group. They reported that there were no significant differences between experiment (22.00±5.75) and control (20.29±6.27) groups in terms of their training level total scores ($t=0.67$; $p<0.05$). Accordingly, they reported that dive roll training didn't have a significant effect on the transfer of learning to the forward somersault training, but there was a significant difference in attaching torso to the legs criterion in favour of experiment group; additionally even not statistically significant experiment group had higher scores than control group in raising the hip, pulling head towards the hip, grasping knees by hands, separation of the torso from legs and direction mistake criteria. However, control group had higher scores in both feet jump, adjusting flip pace and height of the motion criteria, while both groups had equal scores in controlled landing criterion. The findings of the present research are generally not in agreement with this study. Yet, we can the reported significant difference in attaching the torso to the legs phase, which is during flight, indicates a positive learning transfer from dive roll to forward somersault by increasing body coordination during flight.

Consequently, in gymnastics, which has a wide range of movements, there are various methods to teach high difficulty movements to young children (Kaya et al., 2002; Aktaş, 2006; Heinen et al., 2010). The findings of the present research showed that preliminary dive roll training can be used in teaching of a complex movement, such as forward somersault, among children. Trainers can use this method effectively.

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GENİŞ ÖZET

Artistik Cimnastikte Yunus Takla Hareketinin, Öne Salto Öğretimine Etkisinin İncelenmesi

Bu çalışmanın amacı artistik cimnastikte öne salto öğretimi sürecinde, öncelikle yapılan yunus takla öğretimi çalışmalarının etkisinin incelenmesidir.

Çalışmaya, düzenli olarak antrenmanlara devam eden 28 kız sporcu gönüllü ve ailelerinden izinli olarak katılmıştır. Rastgele yöntemle deney (n=14, yaş=8,07±0,27 yıl) ve kontrol grubu (n=14, yaş=8,79±0,43 yıl) oluşturulmuştur. Her iki grup da daha önce hiç öne salto ve yunus takla eğitimi almamıştır. Deney gurubu, haftada 2 gün birer saat süreyle 4 hafta yunus takla öğretimine katılmışlardır. Daha sonra deney ve kontrol gurubu birlikte 6 hafta öne salto öğretimine katılmışlardır. Öğretim sürecinin sonunda her iki gurup öne salto hareketini 2 defa uygulamışlardır. Uygulamalar kamera ile görüntülenmiştir. Her sporcunun öne salto hareketinin 10 safhada değerlendirildiği Öne Salto Öğrenme Düzeyi Ölçeğine (ÖSÖDÖ) göre, uzman antrenörler 10 kriteri hareketin doğruluğuna göre en düşük 1 ve en yüksek 3 puan vererek değerlendirmiştir. Sporcunun en yüksek puan aldığı deneme değerlendirmeye alınmıştır. Denek ve kontrol grubunun öne salto uygulamasından aldıkları 10 kriter ve toplam puanlar arasında karşılaştırma analizleri yapılarak, 0,05 anlamlılık düzeyinde yorumlanmıştır.

Denek gurubunun ÖSÖDÖ puan ortalamaları (X_1=21,21±4,15) kontrol grubundan (X_2=15,79±2,75) anlamlı düzeyde yüksek bulunmuştur (t=4,08;p<0,05). Öne salto hareketi safhalarının 10 kriterde değerlendirilmesine baktığımızda, "K3.gövdenin bacaklara yaklaştırılması", "K5.ellerin dizi kavraması", "K7.açılma hareketi", "K8.kontrollü yere iniş" ve "K9.hareket yüksekliği" kriterlerinden elde edilen puanlarda denek daha yüksek ve kontrol grubu ile arasında anlamlı fark bulunmuştur (p<0,05). "K1.çift ayakla yapılan sıçrama", "K2. kalçanın yukarıya çekilmesi", , "K4. başın göğse doğru çekilmesi", "K6. dönüş hızının ayarlanması" ve "K10. yön hatası doğruluğu" kriterlerinden elde edilen puanlarda denek ve kontrol grubu arasında anlamlı fark yoktur (p>0,05).

Sonuç olarak, öne salto hareketinin uygulanış safhalarında özellikle yerle temas kesildikten sonra havada gerekli koordinatif safhaların gerçekleştirilmesi sürecinde yunus takla öğretimi uygulanan denek grubunun daha başarılı olduğu gözlenmiştir. Antrenörlere, artistik jimnastik sporcularına öne salto öğretiminden önce yunus takla hareketinin öğretilmesini önerebiliriz.

Anahtar kelimeler: artistik jimnastik, yunus takla, öne salto, öğretim