Sportis
Revista Técnico-Científica del Deporte Escolar, Educación Física y Psicomotricidad
Scientific Technical Journal of School Sport, Physical Education and Psychomotricity

Editor: University of A Coruña. A Coruña. Spain
ISSN-e 2386-8333
E-mail: sportis.journal@udc.es Web: https://revistas.udc.es

Original article. Examination of the effects of reactive agility and planned change of direction skills on self defense techniques in private security and protection program students. Vol. 8, n.º 3; p. 309-328, September 2022.
https://doi.org/10.17979/sportis.2022.8.3.9008

Examination of the effects of reactive agility and planned change of direction skills on Self Defense techniques in private security and protection program students

Examen de los Efectos de la Agilidad Reactiva y las Habilidades de Cambio de Dirección Planificado en las Técnicas De Defensa Personal en Estudiantes del Programa de Protección y Seguridad Privada

Mehmet Söyler[1]

Cankiri Karatekin University, Vocational School of Social Science, Çankırı, Turkey

Corresponding Author: mehmetsoyler@karatekin.edu.tr

Editorial shedule: *Artículo received 10/03/2022 Accepted: 04/05/2022 Published: 01/09/2022*
https://doi.org/10.17979/sportis.2022.8.3.9008

For cite this article you must use this reference:
Söyler, M. (2022). Examination of the effects of reactive agility and planned change of direction skills on self defense techniques in private security and protection program students. Sportis Sci J, 8 (3), 309-328 https://doi.org/10.17979/sportis.2022.8.3.9008

Authors' specific contribution: M.S.

Declaration of Conflicting Interests: The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding disclosure: The author(s) received no financial support for the research, authorship and/or publication of this article.

Acknowledgements: We thank volunteers for their support in our study

Sportis
Revista Técnico-Científica del Deporte Escolar, Educación Física y Psicomotricidad
Scientific Technical Journal of School Sport, Physical Education and Psychomotricity
Editor: University of A Coruña. A Coruña. Spain
ISSN-e 2386-8333
E-mail: sportis.journal@udc.es Web: https://revistas.udc.es
Creative Commons

Original article. Examination of the effects of reactive agility and planned change of direction skills on self defense techniques in private security and protection program students. Vol. 8, n.º 3; p. 309-328, September 2022.
https://doi.org/10.17979/sportis.2022.8.3.9008

Abstract

The purpose of this study is investigate the impact of reactive agility, reaction-based planned change of direction training on the practice of self defence methods among students enrolled in the Private Security and Protection program of Vocational Schools. Twenty male volunteer students, 21.20±1.28 years, height 177.37±6.18 cm, weight 75.56±5.50 kg, voluntarily participated in the study. While the volunteer research group received reactive agility, response speed training for 2 hours 4 days a week for 8 weeks, the control group continued to receive self defence skills instruction as usual. Measurements of body composition Body analyzer Inbody 270 (Japan), reactive test Fitspeed (Turkey) gadget for measuring agility performance, as well as other agility planned change of direction tests Fusion Smart (Australia) with an integrated system of photocell doors, T Test digital integrated system stopwatch (Belgium), Reaction time Speed test was measured using a Performanz Spark test equipment (Turkey). The SPSS 22 software was utilized to analyze the data. First, the data distribution was evaluated using the Shapiro-Wilk test, it was discovered that it did not have a normal distribution. Mann Whitney U Tests were used in this manner to find the difference between the pre-test and post-test results of the nonparametric Wilcoxon Signed Rank Test across groups in order to determine the difference between the pre-post-test data within the group. The level of significance in the study was determined at $p>0.05$. According to the statistical analysis, the 8-week planned change of direction, reactive agility training improved the response speed, agility performance of the work group students ($p>0.05$).

Key words

Defense, Training, Agility, Reaction

Resumen

El propósito de este estudio es investigar el impacto de la agilidad reactiva, el entrenamiento de cambio de dirección planificado basado en la reacción en la práctica de métodos de defensa personal entre los estudiantes matriculados en el programa de Protección y Seguridad Privada de las Escuelas Vocacionales. Veinte estudiantes voluntarios varones, 21,20 ± 1,28 años, altura 177,37 ± 6,18 cm, peso 75,56 ± 5,50 kg, participaron voluntariamente en el estudio. Mientras que el grupo de investigación voluntario recibió entrenamiento de agilidad reactiva y velocidad de respuesta durante 2 horas, 4 días a la semana durante 8 semanas, el grupo de control continuó recibiendo instrucción en habilidades de defensa personal como de costumbre. Mediciones de composición corporal Analizador corporal Inbody 270 (Japón), test reactivo Fitspeed (Turquía) Gadget para medir el rendimiento de agilidad, así como otras pruebas de cambio de dirección planificado de agilidad Fusion Smart (Australia) con un sistema integrado de puertas de fotocélula, T Test digital cronómetro de sistema integrado (Bélgica), tiempo de reacción La prueba de velocidad se midió utilizando un equipo de prueba Performanz Spark (Turquía). Se utilizó el software SPSS 22 para analizar los datos. Primero se evaluó la distribución de datos mediante la prueba de Shapiro-Wilk, se descubrió que no tenía una distribución normal. Las pruebas U de

Sportis
Revista Técnico-Científica del Deporte Escolar, Educación Física y Psicomotricidad
Scientific Technical Journal of School Sport, Physical Education and Psychomotricity
Editor: University of A Coruña. A Coruña. Spain
ISSN-e 2386-8333
E-mail: sportis.journal@udc.es Web: https://revistas.udc.es
Creative Commons

Original article. Examination of the effects of reactive agility and planned change of direction skills on self defense techniques in private security and protection program students. Vol. 8, n.º 3; p. 309-328, September 2022.
https://doi.org/10.17979/sportis.2022.8.3.9008

Mann Whitney se utilizaron de esta manera para encontrar la diferencia entre los resultados previos y posteriores a la prueba de la prueba no paramétrica de rangos con signos de Wilcoxon entre los grupos para determinar la diferencia entre los datos previos y posteriores a la prueba dentro del grupo. El nivel de significación en el estudio se determinó en p>0,05. De acuerdo con el análisis estadístico, el cambio de dirección planificado de 8 semanas, el entrenamiento de agilidad reactiva mejoró la velocidad de respuesta, el rendimiento de agilidad de los estudiantes del grupo de trabajo (p>0.05).

Palabras clave

Defensa, Entrenamiento, Agilidad, Reacción

Introduction

In every period in history, humanity has felt the desire for security. Private security services arose as a consequence of the increasing demand for individuals to offer their own protection, as a result of the increase in the areas of security services in Turkey, as in all countries, and the insufficiency of law enforcement units in their tasks through time (Göç et al., 2017a). The private security sector has made rapid progress in our country at the end of the nineties and has become a huge sector today (Göç et al., 2017b). Today, private security guards may be found in all governmental institutions and organizations, banks and corporations, large retailers, and a variety of industries (Söyler, 2015).

While private security officers in many institutions and organizations play an important role in assisting law enforcement in meeting security needs and maintaining public order and security. The Universities; Self Defence Techniques course for Private Security and Protection program students enrolled in related programs; Protecting oneself from attacks, using force against the aggressor, neutralizing, using equipment in such intervention applications, effective communication and interview procedure with the suspect, handcuffing, knowing the sensitive points that can render a person ineffective in order to use effective defence techniques and understanding the anatomy of the body throwing, successful hits, escape strategies and defence - intervention skills such as the capacity to withstand cutting instruments and weapons are also stressed (Söyler, 2015 & Nacak, 2015).

Sportis Revista Técnico-Científica del Deporte Escolar, Educación Física y Psicomotricidad
Scientific Technical Journal of School Sport, Physical Education and Psychomotricity
Editor: University of A Coruña. A Coruña. Spain
ISSN-e 2386-8333
E-mail: sportis.journal@udc.es Web: https://revistas.udc.es
Creative Commons

Original article. Examination of the effects of reactive agility and planned change of direction skills on self defense techniques in private security and protection program students. Vol. 8, n.º 3; p. 309-328, September 2022.
https://doi.org/10.17979/sportis.2022.8.3.9008

On the other hand, it includes the ability to resist, Self defence and physical intervention to the suspect in the professional process by observing proportional power and balance, the safe distance factor in the central area, a broad perspective that provides environmental control and the techniques of resisting the aggressor within the limited powers granted to them (Nacak, 2015). Besides, the techniques that the security guard will apply during the training process, the reaction time that expresses the distance to be intervened and the agility characteristics depending on the ability to change of direction are also effective (Moore & Raymond, 2001). Reactive Agility performance is an extremely important factor in combat sports today, and agility has been classified as the practice of speed movements for many years (Farrow, Young, & Bruce, 2005).

When considering the literature review, a general definition of agility has not been made, mostly the effective use of control ability is identified as the ability to change of direction in an effective and planned way (Barnes et al., 2007).

Today, Reactive agility tests based on performance measurement are one of the main methods of measuring and controlling the physical fitness level of individuals in vocational training based on sportive performance (Zemkova, 2016; Hall, 2015). Today around the world; many researchers, sports scientists, trainers, trainers apply different test modules to determine the reactive agility and planned change of direction performances of athletes and students. In this context, different test applications in different branches come to the fore. On the one hand, it provides a more reliable assessment of a different level of the student's ability development, on the other hand, it also obtains a positive relationship between the test data obtained and an application based on the professional development of the student (Palagine et al., 2015).

Performance in sports for private security officers, Private security students during their education and according to the characteristics of their professional activities is determined. It is thought to be related to the high-speed application of factors based on occupational conditional characteristics and athletic performance (Berges et al., 2018). Each of the tests applied for Private Security sports corresponds to applications that require technical technique and is based on the integration of speed, power and agility with high coordination in self defence sports. For this reason, students who receive self defence training should be ready for all kinds of dangers (Ghafouri et al., 2019)

Sportis
Revista Técnico-Científica del Deporte Escolar, Educación Física y Psicomotricidad
Scientific Technical Journal of School Sport, Physical Education and Psychomotricity
Editor: University of A Coruña. A Coruña. Spain
ISSN-e 2386-8333
E-mail: sportis.journal@udc.es Web: https://revistas.udc.es
Creative Commons
Original article. Examination of the effects of reactive agility and planned change of direction skills on self defense techniques in private security and protection program students. Vol. 8, n.º 3; p. 309-328, September 2022.
https://doi.org/10.17979/sportis.2022.8.3.9008

The aim of this study; Reactive agility and planned change of direction training Private Security the aim of this study is to examine the effects of the Self Defence Techniques course applied by male students studying in the program. When the literature is examined, there are many branches about reactive agility and planned change of direction, which define the superiority in skill (Fire Brigade and Police- Special Operations, etc.) Private Security program that applies the self defence techniques course, despite the fact that the study has been carried out. Very little research has been found on students.

With this research, it is aimed to develop training plans in and out of the classroom, to increase the effectiveness of intervention techniques and to eliminate an important deficiency in the literature, which has similar characteristics with martial arts. While strength, endurance, technical and tactical studies are at the forefront in the trainings performed by Private Security Officers; It is seen that studies on reactive agility and planned change of direction take little place in training programs and sometimes even not taken into account at all. However, the coexistence of different motoric features and different skills in individuals should be considered as a plus for each individual. In line with the results of this experimental study; It will be possible to obtain information about the effect of reactive agility and planned direction change training applied to Private Security and Protection Program students on motoric features and by evaluating the results obtained, accurate and efficient self defence. It is thought that it can contribute to the techniques course and exercise plans. Since there is limited information in the literature regarding this training given to Private Security and Protection Program students, the study in question; It is important in terms of being an original study that will contribute to the literature.

In addition, it is thought that these definitions are very important for the students who take self defence course in agility tests and studies to be able to predict the area, the point of encounter with the attacker, the distance between them and the movement area.

Sportis Revista Técnico-Científica del Deporte Escolar, Educación Física y Psicomotricidad
Scientific Technical Journal of School Sport, Physical Education and Psychomotricity
Editor: University of A Coruña. A Coruña. Spain
ISSN-e 2386-8333
E-mail: sportis.journal@udc.es Web: https://revistas.udc.es
Creative Commons

Original article. Examination of the effects of reactive agility and planned change of direction skills on self defense techniques in private security and protection program students. Vol. 8, n.º 3; p. 309-328, September 2022.
https://doi.org/10.17979/sportis.2022.8.3.9008

Material and Methods

Participants

20 volunteer male students studying at Çankırı Karatekin University Vocational School of Social Science Private Security and Protection Program participated in the research. The mean age (20.09±1.52 years), average height (176.9 ±4.35 cm), average body weight (76.3 ±9.83 kg), and Body Mass İndex (24.1±2.65 kg/m^2) of the research group (n=10) participating in the study were determined detected. It is seen that the average age of the volunteer students who participated in the study as the control group (n=10) was 21.5 ±.971 years, their average height was 177.7 ±7.8 cm, their average body weight was 74.7 ± 6.52 kg, and their body mass index (BMI) was 24.3 ±1.9 kg/m^2. Volunteer students were divided into two groups: 10 male students for the research group and 10 male students for the control group, and the experimental procedure relied on the cause-effect connection between variables and the pre-post test control group experimental design (Tamer, 2000). Before the studies, a health consent form was obtained from the volunteers, stating that there was no health obstacle in participating in the study. Just before study, all students were told about the study's topic and the examinations that will be realized.

The study was conducted in accordance with the guidelines of the revised Helsinki Declaration and the ethical approval with the protocol number of 2022/03 from the Faculty of Sports Science, Erzurum Ataturk Univesity.

Measurements

Volunteer students were divided into two groups of ten male participants and given performance assessments. The students' performance was measured at the Vocational School's well equipped indoor gym and the measurements and assessments were administered on the same day.

***Body compostition measurements*:** On an empty stomach, the students were just wearing shorts with no accessories, their shoes and socks were removed and the measurements were obtained using usual approaches, with bare feet on the gadget. Height was measured in cm, respectively and height was determined with a portable Holtain Stadiometer (Holtain Ltd.

Sportis
Revista Técnico-Científica del Deporte Escolar, Educación Física y Psicomotricidad
Scientific Technical Journal of School Sport, Physical Education and Psychomotricity
Editor: University of A Coruña. A Coruña. Spain
ISSN-e 2386-8333
E-mail: sportis.journal@udc.es Web: https://revistas.udc.es
Creative Commons

U.K.) measuring instrument, which has the ability to measure with ± 1 mm precision (Sassi et al., 2011). Inbody 270 (Seoul, South Korea) brand body analyzer was applied to determine body weight (kg) and fat percentage (Lukaski, 2003).

Reactive agility test: Fitspeed Fitmac (made in Turkey- A Fitmac) brand is a gadget that has the function of warning with visual light stimuli and is actively utilized by athletes in measuring agility performance. The Fitspeed A (Fitmac, Turkey) gadget was also used to test the reactive agility of the students. For the reactive agility test in the test protocol; Four reactive sensors are mounted on a professional punching bag to cover the point of view and hit from different angles. The viewing direction of the reactive sensors was determined in the direction of the down arrow so that the students could see the punches. This exam was taught to each student from several perspectives in order for pupils to not recall the position of the light stimulus in the reactive agility test. All data and the period of the test were recorded for statistical analysis (Hart et al., 2014).

Planned change of direction test: Fusion Sport Smart Speed (Australia) is a device with 0.01 sensitivity, digital integrated atmospheric system photocell gates, and (planned) change of direction protocol adaptive device, as well as more than twelve test protocols. Planned change of direction values of the students were also measured with the Fusion Sport Smart Speed (Australia) device.

By showing the content of the test in the form of a demo beforehand, students can start at the starting point at any time by being 1 meter behind the start photocell door. In the protocol of the test, the test was carried out with six integrated sensors (starting, ending, change of direction points known) placed in the hexagon and on the six marked points in the pre-drawn hexagon. During the testing, the students were given two repeated measures with 3-minute rest intervals, and the best result was recorded (Hart et al., 2014).

T agility test: Fusion Sport Smart Speed (Australia) is a device with 0.01 sensitivity, digital integrated atmospheric system photocell gates and (planned) change of direction protocol adaptive device, as well as more than twelve test protocols. The students' T-test (agility) results were also assessed using the Fusion Sport Smart Speed (Australia) gadget. By pointing out the content of the test in the form of a demo beforehand, students can start at the starting point at any time by being 1 meter behind the start photocell door. With 4 funnels and a T-

Sportis Revista Técnico-Científica del Deporte Escolar, Educación Física y Psicomotricidad
Scientific Technical Journal of School Sport, Physical Education and Psychomotricity
Editor: University of A Coruña. A Coruña. Spain
ISSN-e 2386-8333
E-mail: sportis.journal@udc.es Web: https://revistas.udc.es
Creative Commons
Original article. Examination of the effects of reactive agility and planned change of direction skills on self defense techniques in private security and protection program students. Vol. 8, n.º 3; p. 309-328, September 2022.
https://doi.org/10.17979/sportis.2022.8.3.9008

shaped arrangement on the track that was previously lined up on the field, the student passes through the photocell door with the feature of starting whenever he wants (funnel A), runs directly to the "B" funnel with a sprint, after touching with his right hand, the other target is " He touches the "C" funnel with side step with his left hand and touches the other running target "D" funnel with the right side step with his right hand. Afterwards, he comes to the "B" funnel with side step (side step) and finishes the test from the start gate in the first stage in the form of back step towards the "A" funnel at the finishing stage after touching it with the left hand. In this way, the smart speed photocell completes the test. During the exam, the students' maximum measures were obtained at complete rest intervals, and the best score was recorded (Kizilet, 2010; Pauole, 2000).

Reaction time speed: The Performanz company's Reaction Spark (TR) test device, which includes 8 light switches in the form of an automatic systemic device and a device that measures and improves visual reaction level at cognitive difficulty level and upper extremity motor reaction, was used. It begins and concludes with a total of 24 stimuli delivered by three randomly illuminated Lights from each reflector on the gadget (Kosinski, 2009; Paterno et al., 2004).

Training İntervention

In the research, the research group was given training for reaction speed, combat sports-specific speed and agility, which are not included in the Self Defence course curriculum, with increasing intensity for 8 weeks, 60-70-80 minutes (min) during free sports hours, 8 weeks, 4 days a week (Table 1). In the training content; Warm-up specific to reaction and agility training, quick strength drills, circuit training exercises, short-distance sprint drills with change of direction, reflexive sparring exercises, reflex hits in a gloved free bag were performed (Table 2). The control group on the other hand, continued the investigations that were part of the course training curriculum and did not conduct any additional studies during this procedure (Table 3). Self defence training proceeded during regular course hours in both groups and test measures were obtained for this study in the form of pre- and post-test applications.

Sportis
Revista Técnico-Científica del Deporte Escolar, Educación Física y Psicomotricidad
Scientific Technical Journal of School Sport, Physical Education and Psychomotricity
Editor: University of A Coruña. A Coruña. Spain
ISSN-e 2386-8333
E-mail: sportis.journal@udc.es Web: https://revistas.udc.es
Creative Commons

Original article. Examination of the effects of reactive agility and planned change of direction skills on self defense techniques in private security and protection program students. Vol. 8, n.º 3; p. 309-328, September 2022.
https://doi.org/10.17979/sportis.2022.8.3.9008

Table 1. Planned Change of Direction, Reaction and Reactive Agility Training Program

	Monday - Tuesday –Thursday - Friday	Duration
Week 1-2	Warm-up - Short Distance Sprints - Eskiv (right-left straight punch)	60
Week 3-4	Warm-up- Circuit Training- Reflexive Sparring- Shadow Boxing- Zig zag sprint	70
Week 5-6	Warm-up - Quick Strength Continuity - Reflex punches in the free bag - zig zag sprint	80
Week 7-8	Warm-up- Plyometric Force- Skipping Drils- Top-Middle-Bottom Punch Practice in Wall Bag	80

Explanation: Training loads and intensities were increased from week to week depending on the type of exercise and activity performed (Alan et al.,2016).

Table 2. Training Scope and Durations

1st -2 nd Week: Warm-up-15 minutes / Short Distance Sprints - 25 minutes / Eskiv-20 minutes
3rd- 4thWeek: Warm-up 15 minutes / Circuit training- 15 minutes/ Reflex Sparring- 15 minutes / Shadow boxing-15 minutes / zig zag sprint – 10 minutes
5th -6nd Week: Warm-up - 15 minutes / Quick Strength Rev. - 30 minutes / Reflex punch to hard bag-20 minutes / zig zag sprint - 15 minutes
7rd- 8thWeek: Warm-up – 15 minutes/ Plyometric Strength – 20 minutes / Skip drill- 20 minutes / wall bag punch -20 minutes

Explanation: Training loads and intensities were increased from week to week depending on the type of exercise and activity performed (Alan et al., 2016).

Table 3. Control Group Self Defense Techniques Course Contents

1st Week: Legitimate Defense - Use of Force and State of Obligation
2nd Week: Tactical Defense Distances (Safety Area) - Cuffing and Body Search
3rd Week: Person Transport Techniques - 360 Degree Person Control Techniques
4th Week: Coping Techniques
5st Week: Weapons and Equipment Security
6nd Week: Hard Control with Empty Hand- Responding to Firearm Attacks
7rd Week: Firearm Threat Situation Response
8th Week: Self Protection and Intervention Techniques

Explanation: Self Defense Techniques course contents included in the university curriculum were applied to the Control Group for 8 weeks.

Statistical Analysis

SPSS 22 program was applied in the analysis of the data. First and foremost, the distribution of the data was examined with the Shapiro-Wilk test, and it was determined that it did not show a normal distribution. In this direction, Wilcoxon Signed Rank Test, which is

Sportis Revista Técnico-Científica del Deporte Escolar, Educación Física y Psicomotricidad
Scientific Technical Journal of School Sport, Physical Education and Psychomotricity
Editor: University of A Coruña. A Coruña. Spain
ISSN-e 2386-8333
E-mail: sportis.journal@udc.es Web: https://revistas.udc.es
Creative Commons
Original article. Examination of the effects of reactive agility and planned change of direction skills on self defense techniques in private security and protection program students. Vol. 8, n.º 3; p. 309-328, September 2022.
https://doi.org/10.17979/sportis.2022.8.3.9008

one of the non-parametric tests to determine the difference between in-group pre-test-post-test results, was applied to Mann Whitney U Tests to determine the difference between pre-test and post-test results between groups.

Results

Table 4. The descriptive information about age, height, body weight and body mass index of the participants of the study is shown in

Demographical characteristics	Control Group			Research Group		
	n	x̄	sd	n	x̄	sd
Age (Years)	10	21.5	.971	10	20.9	1.52
Height (cm)	10	177.7	7.84	10	176.9	4.35
Body Weıght (kg)	10	74.7	6.52	10	76.3	9.83
Body Mass İndex (kg/m^2)	10	24.3	1.9	10	24.1	2.65

Body Height: BH, Body Weıght: BW, Body Mass İndex: BMI

Based on **Table 4**, the average age of the volunteer students participating in the research as the research group is 20.09 ± 1.52 years, their average BH is 176.9 ± 4.35 cm, their average BW is 76.3 ± 9.83 kg, and their BMI is 24.1 ± 2.65 kg/m^2.

It is seen that the average age of the volunteer students who participated in the study as the control group was 21.5 ± .971 years, their average BH was 177.7 ± 7.8 cm, their average BW was 74.7 ± 6.52 kg, and their BMI was 24.3 ± 1.9 kg/m^2.

Table 5. Pretest-posttest, arithmetic mean and standard deviation values of Reaction Agility, Planned Change of Direction, T Test, Reaction Time tests

Application	Test	Control Group		Research Group	
		n	x̄ ± sd	n	x̄ ± sd
Reactive Agility Test	Pre-Test	10	2.975	10	3.315
	Post-Test	10	2.858	10	2.746
Planned Change of Direction Test	Pre-Test	10	2.385	10	2.486
	Post-Test	10	2.362	10	2.132

Sportis
Revista Técnico-Científica del Deporte Escolar, Educación Física y Psicomotricidad
Scientific Technical Journal of School Sport, Physical Education and Psychomotricity
Editor: University of A Coruña. A Coruña. Spain
ISSN-e 2386-8333
E-mail: sportis.journal@udc.es Web: https://revistas.udc.es
Creative Commons
Original article. Examination of the effects of reactive agility and planned change of direction skills on self defense techniques in private security and protection program students. Vol. 8, n.º 3; p. 309-328, September 2022.
https://doi.org/10.17979/sportis.2022.8.3.9008

T Test	Pre-Test	10	12.05	10	11.76
	Post-Test	10	11.95	10	10.38
Reaction Time Test	Pre-Test	10	4.619	10	4.934
	Post-Test	10	4.498	10	4.241

According to **Table 5**, it was monitored that the pre-post test averages of the Reactive Agility Planned Change of Direction Test, T Test and Reaction Time Test of the control group were lower than the averages of the research group. When the pre-post test averages of the research group were compared with the control group, it was also seen that the averages of all tests performed had positive high values.

Table 6. Control group in-group comparison values

Control Group	Test	n	x̄ ± Sd	P
Reactive Agility Test	Pre-Test	10	2.975±.373	0.01*
	Post-Test	10	2.858±.509	
Planned Change of Direction Test	Pre-Test	10	2.385±.275	0.015
	Post-Test	10	2.362±.247	
T Test	Pre-Test	10	12.05±.776	0.161
	Post-Test	10	11.95±.777	
Reaction Time Test	Pre-Test	10	4.619±.572	0.02*
	Post-Test	10	4.498±.527	

p<0.05

Depending on **Table 6**, Reactive agility test of control group volunteer students (p=.01, p<0.05), Planned Change of Direction test (p=.015, p<0.05), Reaction Time test (p=.02, p<0.05) results were statistically significant in favor of the post-test, while the control group's T test (p=.02, p<0.05) p= 0.161) there was no statistically significant difference found between the preliminary and final evaluations (p>0.05).

Sportis
Revista Técnico-Científica del Deporte Escolar, Educación Física y Psicomotricidad
Scientific Technical Journal of School Sport, Physical Education and Psychomotricity
Editor: University of A Coruña. A Coruña. Spain
ISSN-e 2386-8333
E-mail: sportis.journal@udc.es Web: https://revistas.udc.es
Creative Commons

Original article. Examination of the effects of reactive agility and planned change of direction skills on self defense techniques in private security and protection program students. Vol. 8, n.º 3; p. 309-328, September 2022.
https://doi.org/10.17979/sportis.2022.8.3.9008

Table 7. Research group within-group comparison values

Research Group	Test	n	x̄ ± Sd	p
Reactive Agility Test	Pre-Test	10	3.315±.440	0.04*
	Post-Test	10	2.746±.296	
Planned Change of Direction Test	Pre-Test	10	2.486±.329	0.01*
	Post-Test	10	2.132±.153	
T Test	Pre-Test	10	11.76±.591	0.01*
	Post-Test	10	10.38±.274	
Reaction Time Test	Pre-Test	10	4.934±.461	0.01*
	Post-Test	10	4.241±.339	

p<0.05

According to **Table 7,** Reactive agility test of the volunteer students in the research group (p=. 04, p<0.05), Planned Change of direction test (p =. 01, p<0.05), Reaction Time test (p=. 0.1, p<0.05), T Test (p=. 0.01 p<0.05) There was a statistically significant difference revealed in favor of the test.

Table 8. Comparison of pre-test values between groups

Application	Group	Test	n	x̄ ± Sd	p
Reactive Agility Test	CG	Pre-Test	10	2.975±.373	0.079
	RG			3.315±.440	
Planned Change of Direction Test	CG	Pre-Test	10	2.385±.275	0.467
	RG			2.486±.329	
T Test	CG	Pre-Test	10	12.05±.776	0.361
	RG			11.76±.591	
Reaction Time Test	CG	Pre-Test	10	4.619±.572	0.193
	RG			4.934±.461	

p<0,05

CG: Control Group RG: Research Group

According to **Table 8**, when the pre-tests of the groups were compared, it was found that between the control and the research groups in reactive agility, planned change of direction and T-test variables; A significant difference was found in favor of the research group. Considering the reaction time test variable, a significant difference was found in favor of the control group (p<0.05).

Sportis
Revista Técnico-Científica del Deporte Escolar, Educación Física y Psicomotricidad
Scientific Technical Journal of School Sport, Physical Education and Psychomotricity
Editor: University of A Coruña. A Coruña. Spain
ISSN-e 2386-8333
E-mail: sportis.journal@udc.es Web: https://revistas.udc.es
Creative Commons

Original article. Examination of the effects of reactive agility and planned change of direction skills on self defense techniques in private security and protection program students. Vol. 8, n.º 3; p. 309-328, September 2022.
https://doi.org/10.17979/sportis.2022.8.3.9008

Table 9. Comparison of post-test values between groups

Application	Grup	Test	n	x̄ ± Sd	p
Reactive Agility Test	CG	Post-Test	10	2.858±.509	0.37
	RG			2.746±.296	
Planned Change of Direction Test	CG	Post-Test	10	2.362±.247	0.144
	RG			2.132±.153	
T Test	CG	Post-Test	10	11.95±.777	0.09*
	RG			10.38±.274	
Reaction Time Test	CG	Post-Test	10	4.498±.527	0.02*
	RG			4.241±.339	

p<0.05

According to **Table 9**, according to the post-test measurements applied to the volunteer students, there is a significant difference at p<0.05 level in favor of the research group between the T-Test and Reaction Time Test measurements. Although there was a positive increase in the Reactive Agility Test and the Planned Change of Direction test, no statistically significant difference was found (p>0.05).

Discussion

For 8 weeks, we evaluated the effect of increasing the intensity of response speed and speed-agility training specific to combat sports on the reactive agility and planned change of direction abilities of young Private Security and Protection program students. When the data for the work group (reactive speed-quickness + combat sports-specific training) and the control group (applications in the content of the self defence course) are compared, it is seen that the training program carried out increased, increased and accelerated the students' targeted performance values. With our study, it is seen that the most change is in the work group.

In the studies conducted in the vocational field, in addition to the physical fitness, it is seen that the level of physical fitness of the vocational officers during the study period has turned into a positive relationship as a result of the trainings (Lan et al., 2020).

Peterson et al. periodic training program findings for different occupational groups reported by, these training studies suggest that different training programs may be a better alternative to periodization programs for occupational groups in order to improve conditioning parameters (Peterson et al., 2008). The research's Reactive agility test and Planned Change of

Sportis
Revista Técnico-Científica del Deporte Escolar, Educación Física y Psicomotricidad
Scientific Technical Journal of School Sport, Physical Education and Psychomotricity
Editor: University of A Coruña. A Coruña. Spain
ISSN-e 2386-8333
E-mail: sportis.journal@udc.es Web: https://revistas.udc.es
Creative Commons

Direction post-test assessments indicated a favorable increase (p>0.05), despite the fact that there was no statistically significant difference between the groups in favor of the work group. This demonstrates that the trainings had a favorable influence on the research group's reactive agility times and planned change of direction. Parallel to this study, several investigations have shown that groups that exercise particular agility in reactive agility and planned change of direction tests are more agile, active, and quicker than those who do not train (Serpell et al., 2010; Gabbett and Benton, 2009 ; Farrow et al., 2005). Artioli et al. (2008) investigated the effect of six-week training on agility and change of direction performance in taekwondo players. 30 elite level 15 male taekwondo players with a mean age of 22±1.6 formed the experimental group and 15 male taekwondo players formed the control group. All individuals' agility (reactive) levels were tested before and after the six-week treatment.

According to the study's findings, the training group's agility performance improved considerably (p<0.05) (Artioli et al., 2008). In this regard, our research is comparable to the literature.

In the T-test agility test post-test measurements of the study, there was a statistically significant difference between the groups in favor of the work group (p<0.05). Hence, it shows that targeted training has a positive effect on the T test agility times of the work group. In the t-test performed, while the agility parameter was 11.76±.591 seconds before the trainings as seen in Table 7, this value was found to be 10.38±.274 seconds after the trainings as seen in Table 8. A statistically significant difference was found in the t-test values of the students in the work group before and after the trainings (p<.009). There was no statistically significant difference in the T-test agility pre-post-test values of the students in the control group.

When the comparison between the groups was made, there was a significant difference between the t-test values of the study and control groups for the work group (p<.009).

In parallel with this study, Miller (2006) examined the effect of training for 6 weeks on agility tests in the T test agility tests, and it was determined as 12.08 ± 1.0 sec before the training for the t-test and 12.1 ± 1.1 sec after the training. While the values of the control group before the training were 12.6 ± 1.1 seconds, this value was determined as 12.6 ± 1.1 seconds after the training. While there was a statistically significant difference in terms of the values before and after the training of the athletes for the training group, no significant difference was

Sportis
Revista Técnico-Científica del Deporte Escolar, Educación Física y Psicomotricidad
Scientific Technical Journal of School Sport, Physical Education and Psychomotricity
Editor: University of A Coruña. A Coruña. Spain
ISSN-e 2386-8333
E-mail: sportis.journal@udc.es Web: https://revistas.udc.es
Creative Commons

Original article. Examination of the effects of reactive agility and planned change of direction skills on self defense techniques in private security and protection program students. Vol. 8, n.º 3; p. 309-328, September 2022.
https://doi.org/10.17979/sportis.2022.8.3.9008

found in the control group (Miller, 2006). In a different study, Shimokochi, et al. (2013), 30 elite male Taekwondo athletes (age 22) reported that after 6 weeks of training, the athletes' performance on different Agility Tests increased significantly (Shimokochi et al., 2013). Along the same line, Axel, et al. (2018) stated that he discovered similar results in his study. In this study, it is conceivable to state that the training done boosted the agility of the work group pupils. In this regard, our research is comparable to the literature (Axel et al., 2018).

There was a statistically significant difference monitored between the groups in favor of the work group in the Reaction Time test post-test measurements of the study ($p<0.05$). Therefore, it shows that the trainings have a positive effect on the Reaction Time of the work group. In the Reaction Time test performed, the reaction values of the work group were 4.934±.461 seconds before the training as seen in Table 7, while this value was determined as 4.241±.339 seconds after the training as seen in Table 8. When the Reaction Time values of the students who did the targeted training were examined before and after the training, a statistically significant difference was found ($p<.0025$). When the pre-post test values of the control group for the Reaction Time were examined, no statistically significant difference was found. In the comparisons between the groups, there was a significant difference between the Reaction Time values of the study and control groups ($p<.0025$). In a study conducted concurrently with this one, it was shown that athletes engaged in martial arts and fire fighters had faster response times than inactive people (Donovan et al. 2006; Pawlak et al., 2015). Findings from the literature back up the study. Chung and Ng (2012) found that professional taekwondo players react faster to sport-specific stimuli than amateur taekwondo players in their research of professional and amateur taekwondo players. In their study, Vieten et al. (2007) discovered a substantial difference in response time between globally competitive taekwondo players and leisure and amateur athletes. Germanow et al. (2014) found variability in agility performance and reaction time performances with different physical performance tests on firefighting sports. In this study, it is reasonable to state that the training had a favorable influence on the response times of the work group pupils. In this regard, our research is comparable to the literature.

As a consequence of the research findings, reaction-direction change and agility training minimize the reaction-direction and agility durations of students enrolled in the Self

Sportis
Revista Técnico-Científica del Deporte Escolar, Educación Física y Psicomotricidad
Scientific Technical Journal of School Sport, Physical Education and Psychomotricity
Editor: University of A Coruña. A Coruña. Spain
ISSN-e 2386-8333
E-mail: sportis.journal@udc.es Web: https://revistas.udc.es
Creative Commons

Defence Techniques course, while increasing their intended direction change power. Candidates for Private Security Officer will receive training in the following areas: Use of force and necessity, handcuffing and body search, 360 Degree person control techniques, hard control with empty hands, response to non-firearm attacks, firearm threat response, self protection and ıntervention techniques, and tactical defence distances. Reaction time and agility are regarded to be very important. Significant increases in response speed, agility, and change of direction were noticed as a result of the reaction, planned change of direction, and agility training.

Additionally, self defence techniques, these characteristics are thought to be important motoric features at the point of defending and responding to attacks that the private security officer may encounter in a variety of areas (internal security, public order, etc.) whether prepared or unprepared. In this regard, it can be stated that depending on the Special Officer's reaction speed and agility, as well as his/her level of change of direction, he/she can switch to technical practice more quickly within the distances specified in the Self Defence Techniques course, which will have a positive effect on the use of police equipment and other techniques.

References

Alan N, Daniel C. Wilson Stephen W. Thompson Hembrought Strength and Conditioning for Professional Boxing: Recommendations for Physical Preparation Strength Cond J 2016, 82:38. https://doi.org/10.1519/SSC.0000000000000217

Artioli G G, Gualano B, Franchini E, Batista R N, Polacow V O, Lancha J R, A H. Physiological, Performance and Nutritional Profile of the Brazilian Olympic Wushu (Kung-Fu) Team. National Strength and Conditioning Association. Journal of Strength and Conditioning Research. 2008; Vol 0, Number 0: 1-6. https://doi.org/10.1519/JSC.0b013e318187687a

Axel, Tracy A.; Crussemeyer, Jill; Dean, Kevyn; and Young, Douglas E. (2018) "Field Test Performance of Junior Competitive Surf Athletes following a Core Strength Training Program," *International Journal of Exercise Science*: Vol. 11 : Iss. 6, Pages 696 - 707. Available at: https://digitalcommons.wku.edu/ijes/vol11/iss6/11

Sportis Revista Técnico-Científica del Deporte Escolar, Educación Física y Psicomotricidad
Scientific Technical Journal of School Sport, Physical Education and Psychomotricity
Editor: University of A Coruña. A Coruña. Spain
ISSN-e 2386-8333
E-mail: sportis.journal@udc.es Web: https://revistas.udc.es
Creative Commons

Barnes, J. L., Schilling, B. K., Falvo, M.J., Weiss, L.W. & Creasy, A. K. (2007). Relationship of jumping and agility performance in female volleyball athletes. Journal of Strength & Conditioning Research, 21(4), 1192-6. https://doi.org/10.1519/00124278-200711000-00036

Berges A, Fernandez-Del-Rio E, Ramos-Villagrasa PJ. The Prediction of Training Proficiency in Firefighters: A Study of Predictive Validity in Spain. Journal of work and organizational psychology, 2018;34(1): 10–15. https://doi.org/10.5093/jwop2018a2

Chung P. & Gabriel Ng, (2012), Taekwondo training improves the neuromotor excitability and reaction of large and small muscles, Physical Therapy in Sport, 13(3), Pages 163-169. https://doi.org/10.1016/j.ptsp.2011.07.003

Donovan, O. O., Cheung, J., Catley, M., McGregor, A. H., & Strutton, P. H. (2006). An investigation of leg and trunk strength and reaction times of hard-style martial arts practitioners. Journal of sports science & medicine, 5(CSSI), 5. [Pubmed; PMID: 24376366]

Farrow, D., Young, W. & Bruce, L. (2005). The development of a test of reactive agility for netball: A new methodology. Journal of Science and Medicine in Sport, 8(1), 52-60. https://doi.org/10.1016/S1440-2440(05)80024-6

Gabbett, T. & Benton, D. (2009). Reactive agility of rugby league players. Journal of Science and Medicine in Sport, 12(1), 212- 214. https://doi.org/10.1016/j.jsams.2007.08.011

Germanov G.N, Smorchkov VA, Mashoshina IV. Adequacy of means and methods of professional and applied physical training of cadets of institutes of the public fire service of Emercom of Russia to requirements of office activity. Uchenye zapiski universiteta imeni P.F. Lesgafta. 2014;2(108): 57–60. (In Russian) https://doi.org/10.5930/issn.1994-4683.2014.02.108

Ghafouri, F., & Honary, H., & GHADERI, J. (2019). Identification of Factors Influencing the Development of Iran Police Sports. Resource management in police, 6(4), 137-162. https://www.sid.ir/en/journal/ViewPaper.aspx?id=689912

Göç, E., Yıldırım, F. & Göç, M. (2017a). Legal Development of Special Security in Turkey

Sportis Revista Técnico-Científica del Deporte Escolar, Educación Física y Psicomotricidad
Scientific Technical Journal of School Sport, Physical Education and Psychomotricity
Editor: University of A Coruña. A Coruña. Spain
ISSN-e 2386-8333
E-mail: sportis.journal@udc.es Web: https://revistas.udc.es
Creative Commons

Göç, E., Söyler, M., Taylan, S. & Karaaslan, Ü. (2017b). Private Security and Turkey.

Hart, N. H., Spiteri, T., Lockie, R. G., Nimphius, S., & Newton, R. U. (2014). Detecting deficits in change of direction performance using the preplanned multidirectional Australian Football League agility test. The Journal of Strength & Conditioning Research, 28(12), 3552-3556. https://doi.org/10.1519/JSC.0000000000000587

Hall, J. E. (Ed.) (2015). Guyton and Hall Textbook of Medical Physiology (s.673-682). London, United Kingdom: Elsevier Health Sciences

Kızılet A., Atılan O,Erdemir I (2010) The effect of the different strength training on Quickness and jumping abilities of basketball Players between 12 and 14 age group. atabesbd2010;12(2):44/57.https://dergipark.org.tr/tr/pub/ataunibesyo/issue/28837/308544

Kosinkski J. "Literature Review On Reaction Time". Clemson University. August 2009. Http://Biae.Clemson.Edu/Bpc/Bp/Lab/110/Reaction.Htm (18.10.2009). https://doi.org/10.1016/S1464-2859(09)70159-2

Lan F-Y, Fernandez-Montero A, Yiannakou I, et al. A Mediterranean lifestyle is associated with lower hypertension prevalence and better aerobic capacity among New England firefighter recruits. J Occup Environ Med. 2020;62(7):466–71. https://doi.org/10.1097/JOM.0000000000001868

Lukaski H. Regional bioelectrical impedance analysis: applications in health and medicine. Acta diabetologica 2003;40(1):s196-s199. https://doi.org/10.1007/s00592-003-0064-4

Miller MG, Herniman JJ, Ricard MD, Cheatham CC, Michael TJ. The effects of a 6-week plyometric training program on agility. J Sports Sci Med. 2006 Sep 1;5(3):459-65. PMID: 24353464; PMCID: PMC3842147.

Moore II, Sgt Raymond E. (2001), Training Considerations for Close-Quarter Combat, Strength and Conditioning Journal, Volume 23, Number 5. https://doi.org/10.1519/00126548-200110000-00020

Sportis
Revista Técnico-Científica del Deporte Escolar, Educación Física y Psicomotricidad
Scientific Technical Journal of School Sport, Physical Education and Psychomotricity
Editor: University of A Coruña. A Coruña. Spain
ISSN-e 2386-8333
E-mail: sportis.journal@udc.es Web: https://revistas.udc.es
Creative Commons

Nacak, A. (2015). 21st century common security environment: planning proposals for law enforcement officers with military status. Journal of Security Sciences, 4(1), 1-20. https://doi.org/10.28956/gbd.239739

Palagina N, Dorogova YA, Polevshchikov M, Familnikova NV. Standardization of Testing the Level of Physical Fitness of Students of 18–20 years. Mediterranean Journal of Social Sciences. 2015;6(3): 887–896. https://doi.org/10.5901/mjss.2015.v6n3s7p265

Paterno, M.V., Myer, G.D., Ford, K.R.,Hewett, T.E. (2004) Neuromuscular training improves single-limb stability in young female athletes. J Orthop Sports Phys Ther, 34 (6), 305-316. https://doi.org/10.2519/jospt.2004.34.6.305

Pauole K., Madole K., Garhammer J., Lacourse M. and Rozenek R. (2000) Reliability and validity of the T-test as a measure of agility, leg power, and leg speed in college-aged men and women. J of Strength and Conditioning Research, 14 (4): 443-450. https://doi.org/10.1519/00124278-200011000-00012

Pawlak R, Clasey JL, Palmer T, Symons TB, Abel MG. The effect of a novel tactical training program on physical fitness and occupational performance in firefighters. J Strength Cond Res. 2015;29(3): 578–88. https://doi.org/10.1519/JSC.0000000000000663

Peterson, MD, Dodd, D, Alvar, B, Rhea, M, and Favre, M. Undulation training for development of hierarchical fitness and improved firefighting job performance. J Strength Cond Res 22: 1683–1695, 2008. https://doi.org/10.1519/JSC.0b013e31818215f4

Sassi, R., Dardouri, W., Gharbi, Z., Chaouachi, A., Mansour, H., Rabhi, A., and Mahfoudhi, M. (2011). Reliability and validity of a new repeated agility test as a measure of anaerobic and explosive power. Journal of Strength and Conditioning Research, 25(2), 472–480. https://doi.org/10.1519/JSC.0b013e3182018186

Serpell, B.G., Ford, M. & Young, W.B. (2010). The development of a new test of agility for rugby league. J Strength Cond Res, 24(12), 3270–3277. https://doi.org/10.1519/JSC.0b013e3181b60430

Sportis
Revista Técnico-Científica del Deporte Escolar, Educación Física y Psicomotricidad
Scientific Technical Journal of School Sport, Physical Education and Psychomotricity
Editor: University of A Coruña. A Coruña. Spain
ISSN-e 2386-8333
E-mail: sportis.journal@udc.es Web: https://revistas.udc.es
Creative Commons

Söyler M. Unpublished Lecture Notes. Yapraklı Vocational School, Çankırı: Çankırı Karatekin University; 2015.

Shimokochi, Y., Ide, D., Kokubu, M. ve Nakaoji, T. (2013). Relationships among performance of lateral cutting maneuver from lateral sliding and hip extension and 68 abduction motions, ground reaction force, and body center of mass height. J Strength Cond Res, 27, 1851-1860. https://doi.org/10.1519/JSC.0b013e3182764945

Tamer K. Measurement and Evaluation of Physical-Physiological Performance in Sports. 2000: Bağırgan Publishing House.

Vieten, M., Scholz, M., Kilani, H., & Kohloeffel, M. (2007, December). Reaction time in taekwondo. In ISBS-Conference Proceedings Archive.

Zemkova, E. (2016). Differential Contribution of Reaction Time and Movement Velocity to the Agility Performance Reflects Sport-Specific Demands. Human Movement, 17(2), 94-101. https://doi.org/10.1515/humo-2016-0013