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Comparison of visual reaction values of elite deaf wrestlers and elite normally hearing wrestlers

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Abstract

In this study. The research was conducted with the aim of examining the visual reaction values of deaf elite wrestlers (D) and normally hearing elite wrestlers (H). To work. 9 deaf wrestlers (height 179,55±3,74, body weight 78±11, 09) and 9 normally hearing wrestlers who participated in national and international competition were voluntarily joined the research. All of the athletes who are deaf subjects consist of at least 55 dB hearing loss in both ears. The visual hand reaction values of the wrestlers were measured using the electronic reaction time meter Newtest 1000. In the study. all participants' dominant hand were right hand. The data were analyzed using the SPSS (Version 22.0) program. Independent T test was performed to determine the difference between the two groups in which the obtained data showed normal distribution. The significance level was evaluated as $p < 0.05$. In the study findings. The average of right and left hand reaction timing between groups and between intergroup were similar. D group had significantly higher height and body weight averages than group N ($P < 0.05$). As a result, deaf athletes have similar reaction times to normal athletes so it is seen that loss of hearing does not make a difference at least in the result of this study.

Key words: Deaf athletes, Visual reaction, Wrestling.

INTRODUCTION

Physical activity is associated with good physiological and psychological well-being. (9). In sport, this is well known that, small times make teams or players winner. For being a winner reaction time (RT) is the most prominent component in recent sports events (4). The definition of reaction time is that the time elapsed between the beginning of a stimulus and the motor response There are plenty component that effect reaction time, including personal factors, environmental factors. The intrinsic factors contain fatigue, physical condition, motivation, limbs and others like age, gender, eating things, and neurological factors like recipient organs, sensory etc. The total reaction time needs this steps, human brain require approximately 60-70 msec. for realize the visual stimulus and then interpretation, planning how to response back. In the period of sports event, fast reply to given stimulus is so important (14).

The hearing system consists of several components that divide the broad spectrum of frequencies and densities of the environment (speech, music, signal and noise) into frequency components and temporal models with a physiological process. These acoustic signals are transmitted to the temporal lobes of the Central Nervous System via electrical stimuli to produce a neural message. The hearing process uses acoustic, mechanical and electrical principles and also analyzes the sound waves, removes noises and compares them to signals previously recorded in the memory of the subject. In this way, we know when someone is speaking, when we hear a musical note from a violin or a flute, or when a bird sings (10). Hearing loss: defined as the person who cannot have normal hearing ability, in who hears 25 dB or worse than two ears. Hearing impaired can be moderate, medium, advanced or severe. It can affect one or both hearing impaired hearing, but it can also cause difficulties in hearing speech and voices (6).

Deaf students are not much different from normally hearing children in terms of physical competence. In some studies, there was no significant difference in body composition, strength and flexibility, speed and cardiovascular endurance (7). Conversely, individuals who has hearing problems had better reaction times than normal individuals did in some studies. Other studies report normal people had better reaction times or equal reaction times. Therefore, studies with hearing impairments have gained importance (3). In this

study, we will compare the reactions times of both impaired elite wrestlers and normal elite wrestlers.

MATERİAL AND METHOD

Sample

In this study, 9 hearing wrestlers who participated in national and international competition were voluntarily joined the research. All participants are studying in Selçuk University, at sports science faculty. The participants are presently continuing their training. All of the athletes who are deaf subjects consist of at least 55 dB hearing loss in both ears. Participants of the study have no other health problems than hearing disability. Depending upon the content of the study, participants were demanded to fill forms related with their sport participation habitudes. The filling of forms was conducted with the help of a sign language expert.

Materials

The visual hand reaction values of the wrestlers were measured using the electronic reaction time meter Newtest 1000. In the study, all participants' dominant hand were right hand. This test was applied to measure the visual reaction time of deaf subjects. In related test was conducted in an environment where no noise components could disturb the attention of the participants for the test. Participants were asked to sit on a chair in front of a table where reaction time test equipment was put. During the test the sitting height of the individual was arranged according to his/her height where his/her hands were in an ergonomic position. The preferred finger of the subjects was put on the reaction time test equipment and they were asked to push the button when they see light. Before the test, 5 repetition exercise test was applied. Participants pushed the bottom 5 times for each hand then the other hand was measured. 5 repeated measurements of all participants were taken and the best and worst values were taken out and the arithmetic mean was calculated.

Table 1. The physical characteristics of participants

	Age (year)	Height(cm)	Body weight(kg)
Deaf	22.55+1.81	179.55±3.74	78±11.09
Normally Hearing	22.77+1.85	174±4.30	67.88±6.45

D: Deaf group, H: Normally hearing group

Statistical Analyze

The data were analyzed using the SPSS (Version 22.0) program. Independent T test was performed to determine the difference between the two groups in which the obtained data showed normal distribution. The significance level was evaluated as $p < 0.05$.

RESULTS

Table 2. Comparison of Two Groups. Intra-Group Right Hand and Left Hand Reaction Levels

Groups		Mean± SD	SE	P
Deaf	Right Hand RT	0.26±0.02	0.00	0.92
	Left Hand RT	0.26±0.03	0.01	
Normally hearing	Right Hand RT	0.25±0.01	0.00	0.78
	Left Hand RT	0.25±0.01	0.00	

D: Deaf group, H: Normally hearing group

Table 3. Comparison of Measured Parameters Between Two Groups

Variables	Group	Mean± SD	SE	P
Right Hand RT (second)	D	0,26±0,02	0,00	0,31
	H	0,25±0,01	0,00	
Left Hand RT(second)	D	0,26±0,03	0,01	0,45
	H	0,25±0,01	0,00	
Age (year)	D	22,55±1,81	0,60	0,80
	H	22,77±1,85	0,61	
Height(cm)	D	179,55±3,74	1,24	0,01*
	H	174,00±4,30	1,43	
Body weight(kg)	D	78,00±11,09	3,69	0,03*
	H	67,88±6,45	2,15	

D: Deaf group, H: Normally hearing group *p<0.05

No significant association was found between intra-group right hand and left hand reaction levels in the stud (p> 0.05). There was no relation between two groups' right hands and left hands reaction times (p> 0.05).

DISCUSSION

In In this study, we examined the visual reaction values of deaf elite wrestlers (E) and normally hearing elite wrestlers. Result of the study, it was found that the hearing loss did not affect reaction times in positive or negative way. Elite deaf wrestlers' right hands and left hands reaction times were 0,26±0,02 and 0,26±0,03 respectively. Normally hearing elite wrestlers right hands and left hands reaction times were 0,25±0,01 and 0,25±0,01 respectively. In addition, there was no intra-group differences for visual reaction times. Similar to our work Seitz and Braker (12) undertaken 10 deaf and 10 normally hearing individual to visual reaction. They found no differences between both groups parameters.

Sladen et al. (13) measured 10 deaf (29.7 year) and 10 normally hearing (29.9 year) individuals. In their study, it was found that normally hearing individuals had significantly better visual reaction times than other group. Again, Codina et al (2) conducted a study on 5-10 year-old (15 deaf 49 normally hearing) children and test stated that deaf children had significantly longer reaction times compared to normally hearing. Ciğerci et al (1) measured visual hand reaction times of 12 normally hearing sedentary (13,08 yeear) 11 deaf sedentary (12,18 year). It was shown that the having no hearing loss sedentary people were significantly faster than deaf sedentary people. Yıldırım et al. (11) compaired visual reaction times of 59 normally hearing sedentary and 64 deaf sedentary so it was found that deaf group was significantly slower. Loss of one of the sensory systems may be due to the fact that other existing sensory systems are negative. This can be why impaired slower than others.

Some other studies support deaf people about visual reaction times. Codina et al (2) studied with 6 normally hearing and 5 deaf individual for comparing their visual reaction times. In their study deaf individuals significantly did reaction test than normally hearing individuals. Soto-rey et al (14) measured 44 deaf (22.6 year) and 79 normally hearing people (25.6 year) for visual reaction times and they reported that deaf people were significantly faster than normally hearing people. Lore and song's (8) participants were composed of 20 deaf (16.7 year) and 19 normally hearing (15.2) people and deaf group did significantly better reaction times. Lastly, Finney et al (5) studied with 6 normally hearing and 6 deaf individuals. It was stated that deaf people significantly faster than normally hearing group. it can be said that those with hearing impairment reading the lips of the other person and reading the sign language during

the conversation can strengthen the visual mechanisms so they can show faster reaction times.

As stated in most of the above mentioned literature knowledge, deafness is an effect for reaction times but not only factor. There are a variety of factors that affect the duration of the reaction (warming, fatigue, motivation, age, sex, sports, team sports, individual sports, type of axons or number of synapses). The reasons for differences in work done may be due to these differences.

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