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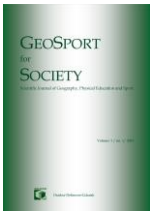

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Sports habits of hearing impaired people in the Northern Great Plain region of Hungary

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Abstract: Although hearing impaired people represent a significant group of handicapped people, only a few studies examine their physical activities. This study was performed in the Spring of 2019 in Debrecen, Hungary by recruiting 86 hearing impaired people. Here the frequency and type of their physical activity as well as their motivation was examined. Average age of the subjects was 42.0±16.9 years, 41.9% of them performs regular physical activity. Out of them 54.1% excercises twice a week, the rest even more often. Soccer, jogging, and cycling were the most preferred sports. Percentage of hearing impaired people performing regular physical activity was about the same as it was for people with normal hearing. Reason for motivation – it makes them happy and they feel better due to the physical activity – or staying at home – their health condition limits them and they have little free time – was also similar in both groups. However, 80% of the people with impaired hearing preferred to do physicial activity together other hearing impaired.

Keywords: hearing impaired people, sport, sports habits, physical activity, gender-related differences

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Introduction

By definition a handicapped person is someone who permanently suffers from a disease resulting in damage in sensory, communicational, physical, mental or psychosocial function – or many of those at the same time – that limits or inhibits equal participation in society due to environmental or sociological obstacles (XXVI. law, 1998). Therefore, disability should not be considered as a disease but rather a special status where individuals may have different needs in their everyday lives.

Nowadays hearing impairment is the third common chronic disease resulting in serious public health problem (Vidranski and Farkaš, 2015). Increasing number of hearing impaired people is not the only problem, but all the harmful consequences that accompany this condition. Many factors influence the physical activity of handicapped people, such as the surrounding environment (both natural and constructed), emotional and psychological obstacles, limitations in equipment's, difficulties in understanding the law and obtaining proper information, lack of professional knowledge, improper approach of professionals and their surrounding community, lack of financial support, etc. Several studies have proven the importance of regular physical activity and active free time in prevention and health maintenance. Health consciousness and physical activity is even more important for handicapped people. Population-based surveys showed decreased physical activity among hearing impaired people compared to people with normal hearing. Prior studies examined different functions of deaf children related to their physical activity including motor functions (Pennella, 1979; Lieberman et al., 2004; Zwierzchowska et al., 2004; Hartman et al., 2011) coordination, sense of rhythm (Fotiadou et al., 2006) and endurance (Hattin et al., 1986); Hartman et al. (2007) proving the benefit of physical activity on these functions. Publications showed that deaf children carried sedentary lifestyle and percentage of obesity was higher among deaf children (Stewart and Ellis, 2005) compared to the control group (Dair et al., 2006; McGuire et al., 2007; Emond et al., 2015). Several studies proved that general health status of hearing impaired people was worse than that of healthy population. One of the reason is that physical inactivity increases the risk of chronic diseases which were not diagnosed and treated properly (Heath and Fentem, 1997; Van der Ploeg et al., 2004; Jaarsma et al., 2014; Emond et al., 2015). Degree of physical activity depends on the attitude of family members (Ellis, 2001; Ellis and Dummer, 2002; Martin, 2006; Ellis et al., 2014; Crowe et al., 2015) and providing proper help for communication. Based on prior studies quality of communication with the parents was better at young people having hearing aids compared to those without the device. Also, they had more health related information providing benefits in health care options (Woodcock and Pole, 2007; Fernandes et al., 2015; Smith and Samar, 2016; Kushalnagar et al., 2018; Fuentes-

López and Fuente, 2020). Studies examined the possible motivating factors that may encourage deaf athletes to achieve better performance.

53 deaf athletes from Europe reported that competing with normal hearing athletes improved their performances. Performing physical activity together with normal hearing athletes facilitated social integration of deaf athletes (Atherton et al., 2010; Kurková et al., 2011). Correlation between healthy lifestyle and physical-mental well-being is a well-known phenomenon proven by many studies. Therefore, the importance of active lifestyle for handicapped people is evident and does not need any further proof. Despite of this fact the motivation and degree of physical activity among handicapped people is much lower compared to healthy individuals due to complex reasons. Most important reason for that is limited communication among hearing impaired and deaf people. In case of hearing impairment limited communication can inhibit both psychological improvement and development of social and motor skills. Since effectiveness of problem solvation – both in everyday life and emergency situations as well - highly depends on motor skills, normal development of motor skills is indispensable to conduct problem-free lifestyle (Vidranski and Farkaš, 2015). Hearing impairment in childhood also inhibits acquirement of theoretical skills in the long run and potentially can result in physical damage. As Ellis (2014) and coworkers published results from prior studies, hearing impaired children many times suffer from vestibular disorders affecting their balance. This can cause accidents resulting in physical injury, even though several studies reported evidence about the benefit of treating vestibular lesions. Patients suffering from hearing problems (hearing impairment or deafness) more often reported health problems and decreased physical activity (Lobenius-Palmér et al., 2018). Also, rate of depression was higher compared to people with normal hearing (Woodcock and Pole, 2007). In correlation to that, Li and coworkers proved in 2019 that deaf teenagers participated in less physical and more sedentary activity compared to teenagers with normal hearing. Deaf teenagers, compared to the control (normal hearing) group, had a tendency to carry sedentary activities rather than light, medium or strong physical exercise as only a small percentage of the subjects (4% of deaf and 24% of normal hearing teenagers) fulfilled the World Health Organization's recommendations for physical activity. However, it is also true that physical activity of hearing impaired people was the highest among all the examined handicapped groups. Still, it would be important to facilitate social integration and increase the amount of physical activity in this population.

Methodology

Based on the 2011 census in Hungary, there are 63 014 hearing impaired and 8571 deaf people in Hungary, while in Hajdu-Bihar county these numbers were 3249 and 462, respectively (KSH, 2014). Although this is a significant number, only few

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studies examine their physical activities. Our study was performed in the spring of 2019 in Debrecen, Hungary by recruiting 86 people. By using a questionnaire, the frequency and type of physical activity of hearing impaired people as well as their motivation was assessed. Most of the hearing impaired people filled out the questionnaire in person with the help of a sign language interpreter, while others could participate using an on-line form.

Data were evaluated using the EvaSys program (VSL Inc. Hungary, http://www.vsl.hu). Before asking the subjects to answer the questions a trial version was completed to assess whether the questions were unambiguous and whether the possible answers would cover all the fields we wished to examine. Based on the feedback the questionnaire was finalized. Answering the questions was voluntary and anonymous.

The values are given as average ±SD. Differences were considered significant where $p<0.05$. 59.5% of the responders were men, while 40% of them were women, respectively. Average age was 42.0±16.9 years. We also measured the BMI since we considered it as an important parameter related to sports habits. Related values were the following: body weight: 76.9±16.0 kg, height: 171.4±8.9 cm, BMI: 26.2±5.4 kg/cm2. Close to 90% of the responders live in Debrecen or in another town, a small percentage live in villages or small towns. As far as their family status, 56% of them were married, 28.6% were single, 11.9% were divorced and 3.6% were widow(er), respectively. Willingness to answer the questions was the highest among the elderly and young people, respectively. Answering rate of people above 60 and between 51-60, 26-30 and 18-20 was the highest, while representation of people between 31-35 was the lowest (Figure 1).

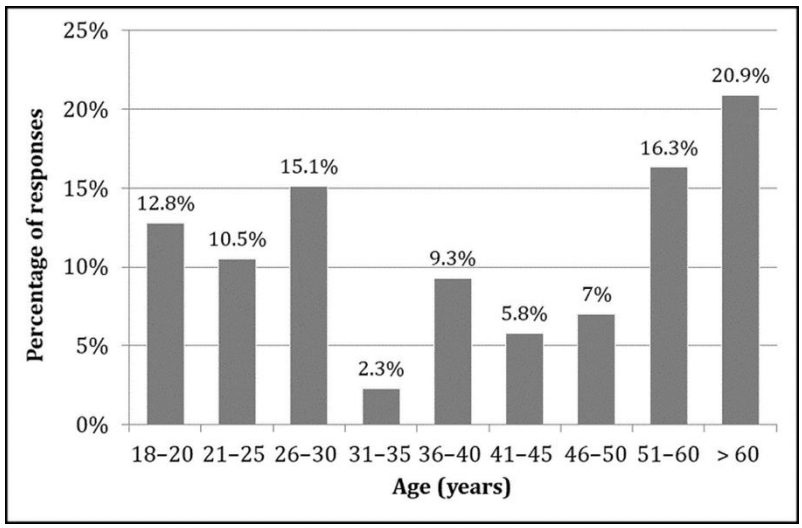

Figure 1. Distribution of participants based on their age

Even though most of the participants belonged to the elderly - who had difficulties in continuing their studies since proper conditions were not provided at that time - their education level was relatively high (86.1% of them continued their studies after finishing primary school). 47.7% of them graduated in vocational school or technical college, while 31.4% obtained their degree in high school or technical school. After finishing high school only 7% of them continued their studies. 22.1% of them still keeps studying, most of them in IT field (6 person), 2 of them is preparing for graduation in high school for adults, while 3 of them is studying sport-related major on a BSC level (2 people as organizer of physical activities, 1 as a sport-geography teacher). Besides that, they studied graphic, naturopath, natural healing therapist, IT specialist, electrician, painter and social worker major, respectively. 51.8% of them is currently working, while 48.2% are unemployed. Relatively high percent of unemployment rate could be due to the fact that 22.1% of them are still studying. Most of the responders (25 people) do physical labor (blue color workers, cleaning service, flyer distributors, baker, driver, shop assistant, carpenter, packer, sewer, store man). High number of people doing physical labor was due to the fact that many did not continue their studies after obtaining a technical degree. 13 people performed intellectual work (data processing, sign language teacher, translator, accountant, office worker, secretary). 5 of them had two jobs at the same time, one of them did intellectual work at both places (personal assistant, data entry), 4 of them had both physical and intellectual jobs (cleaning lady – record manager, shop assistant – data processor, bakery assistant – data entry, warranty controller –data processor).

Close to three quarters of the participants (72.9%) suffered from congenital, while the rest (27.1%) from the acquired form of hearing impairment. Congenital hearing impairment is mostly due to genetic factors (inheritance), Rh-incompatibility between the mother and the fetus, and infections during prenatal life, respectively (Keresztessy et al., 2005) 85.5% of the responders were born with hearing impairment or lost their hearing before starting to talk, while 14.5% of them lost their hearing after starting to talk (at the age of 6, 7, 8, 12, and 26, respectively). We also examined how hearing impaired people communicate with people with normal hearing (Figure 2).

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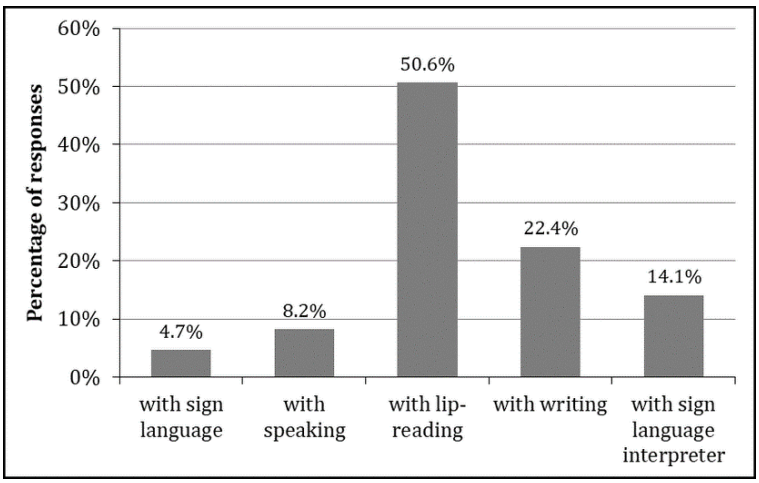

Figure 2. Communication forms of hearing impaired people to people with normal hearing

More than 50% of the responders preferred lip-reading, which could be due to the high number of congenital hearing impairment, which time period has a significant impact on speech development. People born with hearing impairment are forced to learn lip-reading from their early childhood which is a great help in their communication. 22.4% of them prefers to use written form of communication in case there is no other way to understand other people. 14.1% of them asked for help from sign language interpreters, because most of them do not have personal interpreters, so they have to manage everyday life problems with the help of their relatives or friends. Sign language interpreters are usually available for arranging official duties or handling important situations. Only 8.2% of them prefers to talk, because only a small number of hearing impaired people (suffered from the acquired form of hearing impairment) participated in this study and only 14.5% of them lost their hearing after learning to talk. Only 4.7% of them used sign language when they communicated with people with normal hearing since only few healthy people – mostly interpreters, healthy relatives, and friends – can use this form of communication.

Results

Subjects of this study had an average free time of 5.3 hours during the weekdays, while it was a little bit more than 6.8 hours on the weekends, respectively. 44.1% of the respondents reported 6 or more hours free time during weekdays and 50.0% reported 8 or more hours during weekends, which corresponds to the percentage of employed versus unemployed participants. Despiteof having significant amount of free time, only 41.9% of the participants performs regular physical activity. 54.1% of them exercises twice a week, 24.3% 3-4 times/week, while 21.6% does physical activity 5 times a week (or even more often). The fact that fourth of the

responders carries out physical activity at least 5 times a week made it plausible that those were the subjects who participated in competitions (79.5%) and could be members of sport teams (65.8%).

Physical activity is an integral part to more than half of the subjects' lives. 63.2% of them has done physical activity for more than 10 years, 5.3% of them has been exercising for 1, 3, 5, 6, 7, and 9 years, while 2.6% of them for 4 and 10 years, respectively. The fact that BMI was 24.8±4.4 kg/cm2 for those who performed regular physical activity, while it was 27.3±5.8 kg/cm2 for those who did not, resulting in a significant difference ($p<0.04$). 56% of men reported regular physical activity, while this parameter was significantly lower (only 17,6%) for women ($p<0.001$). This gender-related difference was similar between married (n=47) versus single (n=24) responders ($p<0.001$). 29.8% of married, while 75% of single participants performed regular physical activity. Exercise habits were influenced by education level and place of living as well. Only 34% of subjects without high school degree (n=53) perform regular physical activity, while the same parameter was 54.5% for those who had high school degree (n=33) (difference was significant between the two groups, $p<0.01$). Surprisingly, only 23.8% performs regular physical activity among the residents of county seats (Debrecen, n=41), the same parameter was 59.1% in smaller towns (difference was significant between the two groups, $p<0.001$). This could be explained by the fact that more people (50%) performs regular physical activity in small towns' clubs versus in county centers (7.1%). Similar to the entire population (Balatoni et al., 2016), the rate of physical activity is age-dependent among hearing impaired people (Figure 3). 90% of teenagers below 20 years of age perform regular physical activity, the same parameter was 70% for people between 21-30 years, while it was only 10-30% at people over 40.

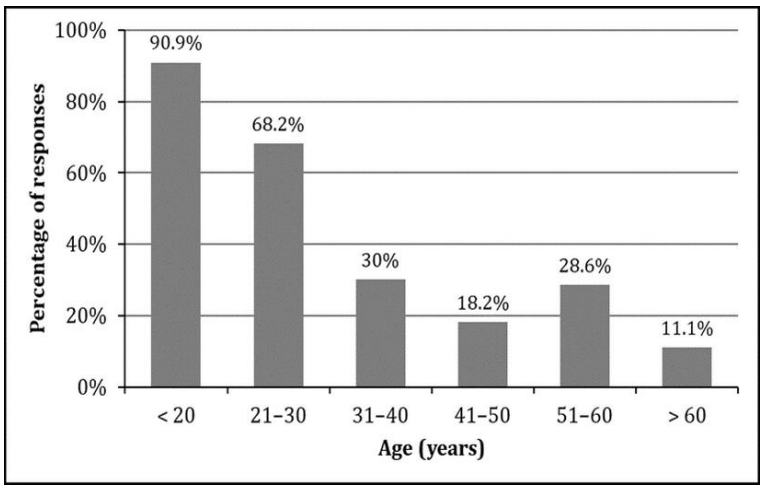

Figure 3. Age-related distribution of subjects performing regular physical activity

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Based on our data the attitude toward regular physical activity was not influenced by the origin (congenital or acquired) of hearing impairment. 45.2% of people suffering from congenital hearing impairment and 34.8% of those with acquired hearing impairment reported regular physical activity (at least twice a week; $p>0.2$). 81.1% of the subjects found it important to exercise together with hearing impaired people, while only 18.9% percent of them gave negative reply. This high percentage could be explained by the significant number of congenital hearing impaired people since they were surrounded by hearing impaired people in special institutions from their early childhood. They preferred to exercise with hearing impaired people because of the common way of communication, since it is easier for them to share their experiences, relax and support each other by using the same sign language. However, it was the reason why some of them did not want to exercise together with other hearing impaired people since they needed their hand and vision to use sign language and that could inhibit physical activity. Many of them were open-minded to exercise with people with normal hearing since in case of certain sports hearing is not so important. Also, for some of them activity itself was more important than the type of communication.

„In Hungary, even the sport professionals are not aware of the fact that handicapped people can request availability for regular physical activity and adjusting the supply in free-time activities to the special demands could be a beneficial investment" (Gombas, 2016).

Subjects are satisfied above the average with the number and level of sport facilities and types of sports could be performed. They also feel the need for a baseball court, swimming pool, athletic field, gym, and sport facility specially made for hearing impaired people operated by their organization. In these places most of the subjects' exercise with sport partners, friends or alone.

Most of them preferred to do a team sport or type of activity that can be performed together with someone else. Most popular activities were soccer, jogging/athletics, cycling, volleyball, swimming, basketball, gymnastics, and exercise in a gym (Figure 4).

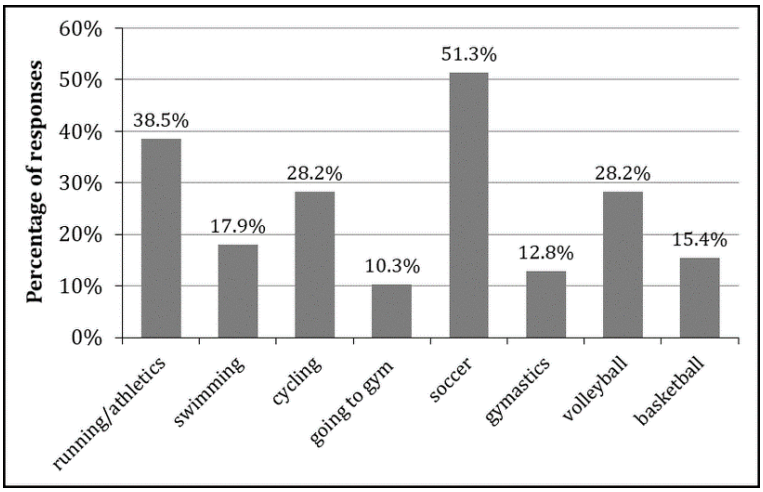

Figure 4. Mostly preferred sports by athletes participating in this study

They practice these activities in sport clubs, sport facilities (29.1%), and outdoor (20.9%) about the same percent, while the percentage was smaller (12.8%) for those who exercised at home. Only few percent (1.2%) of them exercised at work due to limited opportunities. Most of the responders' life's (70.3%) were affected by sports, only 29.7% reported no effect. Answers clearly showed that physical activity has a positive impact on their physical and mental well-being. They felt healthier, more released and self-conscious; physical activity helped to relax, think positive, cope with stress, lose weight, maintain their shapes, and to motivate them (Figure 5).

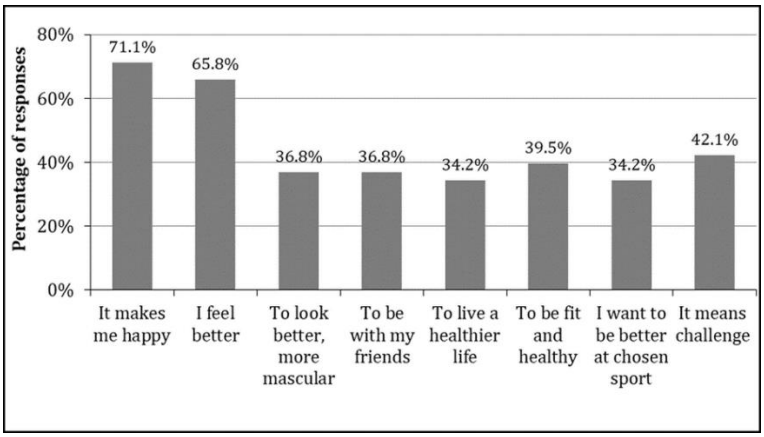

Figure 5. Motivation factors of subjects

More than half of the responders (58.1%) does not exercise. We also assessed the possible reasons behind this phenomenon (Figure 6). Many of them (44%) couldn't exercise because of their health status. This could be due to the high number of elderly participants. Close to one third of them (32%) reported lack of free time

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while 14% family circumstances as a reason for not doing physical activity. Twelve percent of them did not feel motivated, felt tired to exercise or did not exercise due to the lack of company. Only 8% reported financial difficulties and the same amount of people said that they do enough exercise at work which correlates to the high number people doing physical labor.

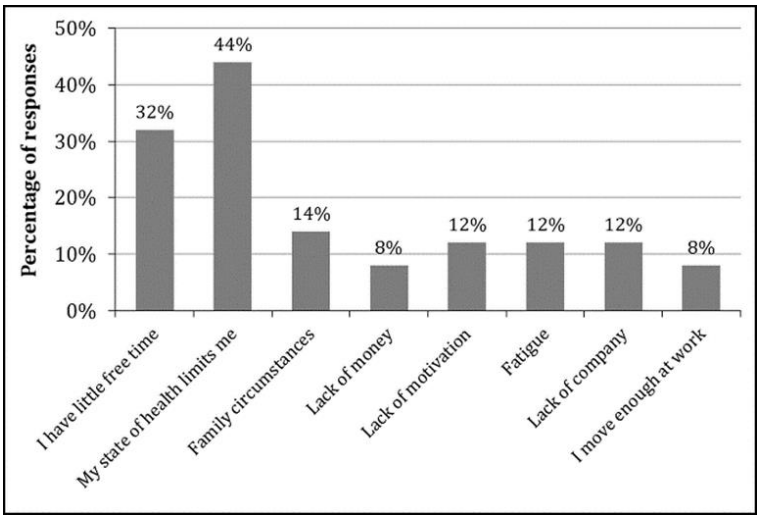

Figure 6. Reasons behind physical inactivity among responders

Conclusions

Our results are important as only a few surveys studied the exercise habits of hearing impaired people in Hungary. Everyone needs to do physical activity to maintain healthy lifestyle, well-being, and self-consciousness. The same is true for hearing impaired people, where the following statements represented the major motivating factors: „I want to feel good", „Health", „I want to develop more muscles", „I want to look better". Due to their limited communication hearing impaired people formed a closed community, however, they stayed open-minded to get in contact with people with normal hearing. The fact that 81.1% of them found it important to exercise together with another hearing impaired persons confirmed their strong identity. Even more responders were open to exercise together with people with normal hearing since physical activity was their highest priority. Love of physical exercise provides a good opportunity for social integration, understanding the culture of hearing impaired people which requires open-mindedness from both sides. All studies agreed that it is very important to support the participation of hearing impaired people in physical activities. Also, providing proper infrastructural conditions and building up communities with healthy people has a great benefit for hearing impaired people. Studies had proven that parents' attitude toward physical activity had a huge impact on healthy children's attitude toward physical activity

(Welk et al., 2003). Subsequently, Ellis and coworkers found positive correlation between the parents' and the children's endurance and their participation in physical activity.

Physical education (PhysEd) classes in school should encourage children (both hearing impaired children and children with normal hearing) to do physical activity rather than deterring them. Based on Stewart and Ellis's publication in 1999, an appropriate PhysEd class should emphasize the importance of life-long physical activity, also resulting in proper physical condition. Since many times school classes were the only options for children to perform physical activity without facing any access issues, the importance of these classes was significant. Without these classes children had a tendency to carry a completely inactive, sedentary lifestyle. Therefore, schools - together with corresponding political organizations - should encourage the participation of more and more students in daily exercise classes. Altogether, improving physical condition by involving so many participants should result in the life-long love of physical activity and healthy lifestyle (Stewart and Ellis, 1999). PhysEd classes could be beneficial by building up communities, since social support is very important for physical and mental well-being. Handicapped teenagers being less active in physical, social and cultural activities as well as in education and employment when compared to healthy teenagers has a negative impact on their health, well-being and career options (Carroll et al., 2018). Therefore, communication is indispensable for health improvement, active lifestyle, health care and building up communities. Any type of hearing impairment could be a serious obstacle to achieve these goals. Therefore, professionals should consider special communication needs of hearing impaired or deaf people so they could enjoy a better quality of life (Woodcock and Pole, 2007).

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Ethical clearance

The work was approved by the Hungarian Medical Research Council (24634-4/2018/EKU).

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