ORIGINAL ARTICLE

Evaluation of self-defence for people with visual impairments – methodology aspects

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A Study Design
B Data Collection
C Statistical Analysis
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Jitka Čihounková[ADE], Alena Skotáková[BC], Jindřiška Kohoutková[BC], Martin Bugala[B]

Faculty of Sport Studies, Masaryk University, Brno, Czech Republic

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Abstract

Background & Study Aim: Self-defence for persons with some disability is a neglected area by most experts on self-defence. The aim of this study is to create the basic methodology of self-defence course for people with visual impairments

Material & Methods: Ten persons (5 sightless and 5 short sighted, 5 men and 5 women; aged between 16 and 57) have attended 24 hour course of self-defence. We use a set of questions to determine the degree of self-confidence in self-defence situations such as prevention, verbal conflict and physical assault before and after the course. Second evaluation method is an expert analysis of scenario training.

Results: After the self-defence course self-confidence during prevention and communication and inner security during conflict situations increased, which was shown in scenario trainings as well.

Conclusions: A self-defence course for people with visual disabilities should be focused on the early recognition of danger, verbal defence training and the use of physical contact. Post conflict stays as a challenge in this area.

Key words: model mugging • scenario training • security concerns • self-confidence • verbal defence

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Author's address: Jitka Čihounková, Faculty of Sport Studies, Masaryk University, Kamenice 5, Brno 625 00, Czech Republic; e-mail: cihounkova@fsps.muni.cz

Introduction

Talking about self-defence in general conflict situation should be judge correctly and before the act of defence. This can be crucial for choosing the right defence strategy which should lead to secure solution of conflict situation. Conflict can be verbal as well as it can result in the use of force and physical contact. Therefore self-defence is often associated with some kind of combat operations. An eclectic approach is mostly applied while developing self-defence systems. It means that they are derived from different kind of martial arts, combat sports and other disciplines. At the same time, they must be flexible to meet all individual requirements according to their physical and psychological characteristics. In fact, the manner of its application is much more important than a technique itself [1, 2].

Observe-Orient-Decide-Act loop by Boyd [3], widely used in the context of defensive tactic [4-6] is a base of our approach as well. The phases Observe and Orient are the most decisive for visually impaired people. A self-defence training develops mental endurance, it shapes self-esteem, self-confidence and generally leads to changes in life attitudes [7]. Mental toughness [8-9] and body posture [10] can be also enhanced by practicing combat sports and martial arts.

It is generally known [11, 12] that people with disabilities are more vulnerable to violence than other non-disabled people [13]. Disabled people live with always present fear from an attack including even their houses which can lead to isolation and fear to go out without assistance [11]. This fear can be reduced by attending the self-defence course. [14] According to figures published by the RNIB charity [15] people with sight loss are more likely to be experienced with discrimination and a hate crime. Pava [16] warn of an increase in crime committed on disabled people, too.

There are about 11 millions of short sighted and about 1 million of sightless people in Europe, about 60 000 to 100 000 people with visual impairment in the Czech Republic at the guess from which one tenth is sightless [17].

There is no single form of self-defence for sighted people nor for their blind counterparts. In many countries there are some attempts to offer self-defence courses for the visually impaired. In counselling centres special courses of martial arts or sports are offered in an adapted form. However, this kind of training does not represent a comprehensive preparation for self-defence situations [18]. There are many attempts to create a special self-defence training program in the USA, for example *Mega No Makki*, program rooted in traditional martial arts. It takes in account a difficulty with escaping and briefly covers the laws allowing people to protect themselves[19]. The1 Touch self-defence program was created by Stephen Nicholls in the Great Britain. He started to modify the martial arts techniques while working with blind and visually impaired students. [20].

Another umbrella organization in the USA is quite well known „NOT-ME!" with primary objective in promotion, advancing and unifying self-defence education and training for all at-risk populations [6]. Then Pava [21] focused on visually impaired women.

After scanning the current state of security concerns of visually impaired people in the Czech Republic [22], which had shown a need of alert and self-confidence in every phase of self-defence (pre-conflict, conflict and post-conflict), a preliminary methodology for a self-defence course was created, assessed and evaluated by the team of specialists from the Department of Gymnastics and Combatives at Masaryk University.

The aim of this study is to create the basic methodology of self-defence course for people with visual impairments.

Material and methods

The research sample consists of 5 high school students (3 girls and one boy aged 16, one men aged 24), 3 university students (one men aged 31, one 23years old woman and one female Ph.D. student aged 29) and 2 men aged 51 and 57 with finished learning of trade.

These 10 persons (5 sightless and 5 short sighted, 5 men and 5 women) aged between 16 and 57 have attended 24 hour course of self-defence divided into 12 lessons taught once a week. Aims of the course were to increase self-confidence during prevention and communication and inner security during conflict. According to the determined aims we built up the content of the course.

Self-defence – *noun* fighting techniques used for defending oneself against physical attack, especially unarmed combat techniques such as those used in many of the martial arts [50].

Scenario training – method used in the self-defence teaching both for training and evaluation purposes consisted in pre-prepared course of a situation similar to theatre script with fixed roles and activity of the actors where the roles of the actors (assailants) and defender (tested person) are already given.

A Likert scale – is a psychometric scale commonly involved in research that employs questionnaires. It is the most widely used approach to scaling responses in survey research, such that the term (or more accurately the **Likert-type scale**) is often used interchangeably with *rating scale*, even though the two are not synonymous [51].

Tai-sabaki – body movement [52].

Ashi-sabaki – footwork. The most common form of footwork seen in the various *budō* is *suri-ashi* in which the practitioner slides smoothly across the floor. Other conventional forms of footwork include *ayumi-ashi, okuri-ashi, hiraki-ashi, and tsugi-ashi* [52].

For each participant with visual impairment there was one assistant who was skilled in self-defence and trained in working with people with visual impairments.

Eight lessons were focused on conflict prevention, improving stability, reaction and spatial orientation, acquiring new self-defence skills and usage of various communication strategies. The ninth and tenth lesson were intended for revision of all self-defence strategies and skills with two assistants for each participant – one of the assistants playing a role of attacker, the second one being an insinuator. Last two lessons of the course were organized as a scenario training: each participant had to go through the given route during which some self-defence situation with various testing aims occurred. Unluckily two participants refused to take part in scenario trainings and one more (participant number 4) got ill for the twelfth lesson. That is the reason why the first and second scenario trainings were organized for 8 persons and the third and fourth scenario trainings for 7 persons only.

We use a set of questions to determine the degree of self-confidence in self-defence situations such as prevention, verbal conflict and physical assault before and after the course. The set of questions using exploratory methods (based on the experience of visually impaired people with risky or violent behaviour towards this specific group and their security concerns) leading to a structured interview was conducted to assess experience and self-confidence of people with visual impairments.

The interview was divided into 3 sections of questions, each concerning the different group of issues. *First section:* the degree of self-confidence in self-defence situations (such as prevention, verbal conflict and physical assault); *the second section:* the level of fear from selected situation (which were selected based on literature [11] interview with Jitka Graclíková and Alexandr Zvonek from The Teiresiás Centre, specialists who work with people with visual impairment, and a survey among people with visual impairment); *the third section*: asks participants about their strategies in the field of self-defence (Table 1).

We used 6-point ranking scale to determine the level of agreement with every question. (1 – I totally disagree, 6 – I totally agree). The scale we used was based on the Likert scale which is 5-pointed. In order to avoid a mean we added a point.

Similarly to Vít [23] we use expert analysis of scenario trainings assessed ex post from video record as the second evaluation method [24, 25]. Four experts on self-defence assessed video recording of 4 scenario trainings for each participant of the course except two participants for first scenario set and three from second scenario set, who had apologized themselves from this part of the course. The criteria for experts were following: (1) at least 4 years experience in self-defence training (till the present without intermission); (2) university education in the field of self-defence or experience as a long-term martial art trainer; the minimum age of 18 (legal age limit in the Czech Republic) – Table 2.

Scenario training 1 was focused on pre-conflict phase. Each participant faced a man who was trying to stop the participant and employ his attention. A verbal conflict escalated step by step. If the reaction of the participant was adequate (do not stop, deescalate a conflict, keep distance and others) or they managed to escape, the aggressor gave up the conflict and left the participant. There were other persons around ready for help if the participant asked for it and alarmed them.

Scenario training 2 exposed participants to a row of three people that they should pass.

Scenario training 3 was a simulation of theft attempt in the place of elevator. The main goal was to test participant whether he alarmed other people in front of elevator and solve post-conflict part of the conflict.

Scenario training 4 followed scenario training 3 and was most complex. It monitored guard, communication, distance, escape and a physical defence as well. After passing two men in front of the door, an attacker is coming and after some communication the attacker is trying to catch participant´s wrist and pull him away.

Assessment of the scenario trainings were realized by two steps. First each expert assessed the video records, then assessments of experts were put together. All experts must have the same assessment for it to be valid. If there had been some discrepancies among the experts´ assessments, they would have been discussed with all

Table 1. The set of three sections of questions for pre- and post test.

The first section: the degree of self-confidence in self-defence situations	
1.1	When I walk alone at night I am more alert and I am watching my surroundings
1.2	I purposely avoid places, where there could be higher risk of attack
1.3	I can behave in order not to provoke a conflict
1.4	When somebody starts to attack me (shouting at me, threaten) I know how to react every time
1.5	I can avoid physical conflict by verbal communication
1.6	It is easy for me respond to verbal conflict
1.7	I feel confident solving verbal conflict
1.8	If I were physically attacked I would know what to do
1.9	It is easy for me to respond to physical conflict.
1.10	I feel confident solving physical conflict
1.11	In general, I can avoid conflict as well as solve it
The second section: the level of fear from selected situation	
2.1	In public transport I feel like someone is trying to get my handbag
2.2	I am a witness of a situation in which a group of children is rude to their surroundings
2.3	In public transportation somebody starts to touch me
2.4	Some stranger asks me for money
2.5	A drunken man wants to enter a conflict situation and tells me that I spilled beer on him
2.6	In a party somebody hits me to provoke conflict
2.7	Somebody grabs my handbag, backpack and starts to pull it from me
2.8	Somebody grabs my arm, covers my mouth or aggressively pulls me away
2.9	In the street somebody grabs me from the back and pulls my hair or color
2.10	At night in the street somebody gives me an inappropriate proposal
The third section: strategies in the field of self-defence	
3.1	I avoid situations I am most afraid of
3.2	I try to face my fear and not to limit myself in life
3.3	I think that knowledge of communication strategies can help successfully solve conflict situation

the experts in an evaluation session. However, all experts presented identical assessments.

Statistical analysis

To results of test and retest before and after the course non-parametric t-test was applied using Statistica software. By this we found the level of significance of differences between the participants' confidence during pre-conflict, solving verbal and physical conflicts and their strategies. For finding the effect size of the difference before and after the course we used Cohen's d calculator through MS Excel software.

Results

We found big effect size in the difference of the score of the questions 1.5, 1.7, 1.8, 1.11 and 2.2. There was a medium-effect size in the difference of the score of the questions 1.3, 1.4, 1.6, 1.10 and 3.2. Although the sample is too small for statistical conclusion, the significance of difference between the test and retest was supported by p value in questions 1.5, 1.8, 1.10, 2.2 and 3.2 (Table 4).

At the beginning of the course participants felt quite confident in the field of crime prevention, less when it comes to verbal conflict and most unsure they were about their reaction to physical assault. Changes in the score of every question from the first part of the interview were noticed as corresponding to the aims of the course. It means that self-confidence during prevention and communication and inner security during conflict situations increased.

The differences in score of just two questions has low effect size, 5 differences from 11 are

Table 2. The characteristics of the expert team (n = 4) assessing scenario trainings

Sex	Age	Qualification
Female	31	karate: 18 years of practice, 2nd class trainer, 2nd dan; university teacher 7 years (karate, self-defence for specific groups, criminology, theory and methodology of combatives)
Male	25	2013 bachelor´s degree of Special education for security bodies [26] 2015 master degree of Applied Sport Education for security bodies [27]; 5 years practicing martial arts and self-defence
Male	25	2013 bachelor´s degree of Special education for security bodies [26] 2015 master degree of Applied Sport Education for security bodies [27]; 8 years practicing martial arts and self-defence
Male	24	2013 bachelor´s degree of Special education for security bodies [26] 2015 master degree of Applied Sport Education for security bodies [27]; 7 years practicing martial arts and self-defence

Table 3. Describes participants´ actions during scenario training which were assessed according to the aims of the course.

Participant´s action	Description
Guard	Participant adopts suitable position and posture for defence (disguise guard, defensive/offensive guard…) Assessment: yes / no
Communication	Participant communicates with aggressor (uses appeal, trap…) Assessment: yes / no
Alarm other people	Participant communicates with people around (shouts for help) Assessment: yes / no
Distance	Participant works with distance correctly (elongate, shorten, keep) Assessment: yes / no
Try to escape	The way of defence leads to distraction from aggressor and escape to shelter Assessment: yes / no
Post-conflict	Participant tries to check surroundings after the contact with aggressor Assessment: yes / no / "-" in blind, when it cannot be assessed
Use of physical defence	Participant chose suitable physical defence with successful result Assessment: 1 – the threat was assessed well, suitable technique was chosen according to the situation, defence was successful, attacker was beaten 2 – solution of the situation using physical defence was suitable and successful with some drawback (such as hesitation, low speed, little force) 3 – physical defence was insufficient or it was not use despite the situation had required it
A need of advice insinuator	Participant solves self-defence situation correctly with no need of advice Assessment: 1 – no need of advice insinuator 2 – 1 advice for 1 situation, after advice participant reacted correctly, it was no need to repeat an advice 3 – more than 1 advice for 1 situation. Advice insinuator had to repeat his advice

middle-sized and differences in score of four questions reach a high effect size. The highest effect size was found in assessing self-ability to react to a physical assault (a shift from the mean 2.0 before the course to the mean of 4.0 after the course with the effect size Cohen d = –1.48). Similarly the difference in score of the last question from the first part which sums up general self-assessment in the field of self-defence reached high effect size (a shift from the mean 3.6 before the course to the mean of 4.57 after the course with the effect size Cohen d = –0.84).

In the second section we found a big effect size in differences between the score of the test and retest in the question number 2.2 (from mean 3.6 to 1.75; d = 1.29). Participants of the course feel significantly more relaxed during witnessing a verbal aggression.

The third section focused on strategy showed a congruence with the aims of the course by big effect size of score shift in question 3.2 (from 4.8 to 5.4; d = –0.76). Participants are more willing to overcome their fear and do not allow the fear to limit their lives (Table 4).

Table 4. Test and retest results.

Question	Test		Retest		Cohen d	*p* value
	Mean	SD	Mean	SD		
The first section						
1.1	4.600	1.897	5.285	0.755	−0.45	0.603
1.2	4.800	1.475	5.285	1.253	−0.34	0.689
1.3	4.700	1.251	5.285	0.755	−0.54	0.448
1.4	3.600	1.173	4.428	0.975	−0.74	0.188
1.5	3.300	1.251	4.857	0.899	**−1.37**	**0.025**
1.6	3.500	1.649	4.428	0.975	−0.66	0.356
1.7	3.400	1.505	4.571	1.133	−0.84	0.078
1.8	2.000	1.414	4.000	1.154	**−1.48**	**0.015**
1.9	1.800	1.475	2.714	1.603	−0.57	0.122
1.10	2.100	1.370	3.142	1.573	**−0.68**	**0.049**
1.11	3.600	1.349	4.571	0.786	−0.84	0.111
The second section						
2.1	2.200	1.135	2.428	1.902	−0.14	0.818
2.2	3.600	1.897	1.571	0.975	**1.29**	**0.032**
2.3	4.200	2.097	3.857	2.267	0.15	0.356
2.4	2.900	1.100	3.142	2.193	−0.13	0.853
2.5	4.100	1.911	3.428	1.718	0.35	0.111
2.6	3.300	1.766	3.571	1.511	−0.16	0.689
2.7	4.200	1.932	3.857	2.115	0.16	0.569
2.8	4.700	1.946	4.285	2.058	0.20	0.356
2.9	4.600	1.955	4.571	2.149	0.01	1.000
2.10	3.700	2.213	3.142	2.115	0.25	0.234
The third section						
3.1	5.111	1.269	5.428	1.133	−0.25	1.000
3.2	4.800	0.788	5.428	0.786	**−0.76**	**0.030**
3.3	5.777	0.440	5.714	0.755	0.10	1.000

Scenario trainings

The first scenario training was focused on pre-conflict phase (Table 5). Only one participant was not able to react, because of obvious mental overstress. Some kind of guard was used by 6 from 8 participants, which is a very satisfying score. Every participant except one used appropriate communication to deescalate a conflict and cut themselves from an attacker. One participant only alarmed other people during communication with the attacker. Keeping distance was present at two participants and one half of participants tried to escape, which was the end of the scenario training 1. The most common advice of advice insinuator was to escape. Post-conflict was not assessed in blind, two participants from 4 left succeeded in post-conflict phase according to assessment. More than half of participants dealt well conflict situation with no big need of advice.

The second scenario training exposed participants to a raw of three men (Table 6). Some kind of guard was used by half of participants. Two participants only did not keep a distance well and two participants did not try to escape. Post-conflict was not assessed in blind, three participants from 4 left succeeded in post-conflict phase according to assessment. Most of participants dealt well conflict situation with no big need of advice

During the third scenario training two participants only employed a proper guard (Table 7). Every participant except one used appropriate communication to deescalate a conflict and cut themselves from an attacker. One participant only did not alarm other people during communication with the attacker. Every participant except one behaved well in the post-conflict phase. Appropriate and effective physical defence was applied by one participant only. Four participants use physical defence with not very serious fails and two of participants failed in the physical defence completely. More than half of participants dealt well conflict situation with no big need of advice.

During the fourth scenario training four participants employed a proper guard (Table 8). Every participant except one used appropriate communication to deescalate a conflict and cut themselves from an attacker. Three participants only alarmed other people during the scenario training. Two participants only were able to apply tactical usage of distance in conflict situation. Appropriate and effective physical defence was applied by one participant only. Two participants used physical defence with not very serious fails and half of participants failed in the physical defence completely. The need of advice was present in most conflict situation.

Table 5. Scenario training 1 assessment.

Scenario training 1	Code of participants and results of observation							
	1	2	3	4	5	6	7	8
Guard	YES	YES	NO	YES	YES	YES	YES	NO
Communication	YES	YES	NO	YES	YES	YES	YES	YES
Alarm other people	NO	NO	NO	YES	NO	NO	NO	NO
Distance	NO	NO	NO	NO	YES	YES	NO	NO
Try to escape	NO	YES	NO	YES	YES	NO	NO	YES
Post-conflict	–	YES	YES	–	–	–	NO	NO
A need of advice insinuator [code of insinuator's intervention assessment]	2	3	3	1	2	3	2	1

Table 6. Scenario training 2 assessment

Scenario training 2	Code of participants and results of observation							
	1	2	3	4	5	6	7	8
Guard	NO	YES	YES	NO	YES	YES	NO	NO
Distance	YES	YES	YES	YES	NO	YES	YES	NO
Try to escape	YES	YES	NO	NO	YES	YES	YES	YES
Post-conflict	–	YES	YES	–	–	–	YES	NO
A need of advice insinuator [code of insinuator's intervention assessment]	1	1	3	2	1	1	1	1

Discussion

Although there were no differences found in approaches to blind and visually impaired in organizations providing self-defence education we must bear in mind that it is quite complicated to evaluate visually impaired and every tool should be used carefully [28].

In the first part of course evaluation we found an important change when participants assessed their ability of non-conflict self-production, which corresponds with the aims of the course. The aim of enhancing communication skills, using communication strategies and enhancing self-confidence while facing verbal conflict was successfully fulfilled. The inner self-confidence during verbal self-defence is one of the basic preconditions for defence to be successful [1, 29-32] and it prevents shunning society because of the fear of conflict [33]. This result is also supported by the fact that the participants feel significantly less fear of witnessing verbal conflict situation, which was simulated in the second scenario training as well.

Many aspects (for example high visibility, inability to identify their assailants or to use visual cues) can influence a feeling of visually impaired people to be more at risk to experience physical assault. Pava [16] also points out the task of self-confidence in the risk situations. Especially verbal self-defence strategies can prevent physical attack and help persons with visual impairment to feel more confident at risk situations.

Our results show, that the course of self-defence enhanced inner security and self-confidence during solving physical assault. Although there was quite big difference in the scores before and after the course and it achieved big effect size, a mean score after the course is slightly over the average, which reflects one of the aims of the course in a positive way. Participants of the course acquired experiences and basic self-defence techniques and they do not feel almost helpless in the field of physical conflict (the mean before course 2 from maximum of 6), on the other hand they are aware of their limits and risks of physical assault (the mean after the course 4 from maximum of 6). That means that in accord with Vít, Reguli and Čihounková [2] they have a real awareness that despite hard training the result of a self-defence situation with physical assault is always uncertain. The result mentioned above is very important because one of the main drawbacks of self-defence course is excessive self-confidence of the graduates who often lose the realistic point of view and feel invincible as Vít and Reguli [34] point out. Similarly every difference in the score of questions concerning physical assault, reaction on it and inner security during dealing with it enhances with effect size, but it stays under the average at the same time, which confirms the need of reviewing a real threat of self-defence situation mentioned above.

For evaluation of the course there is a substantial shift in overcoming uncertainty and fear, which

Table 7. Scenario training 3 assessment.

Scenario training 3	Code of participants and results of observation						
	1	2	3	5	6	7	8
Guard	NO	NO	YES	NO	YES	NO	NO
Communication	YES	YES	NO	YES	YES	YES	YES
Alarm other people	YES	YES	NO	YES	YES	YES	YES
Try to escape	YES	YES	NO	NO	YES	YES	YES
Post conflict	YES	YES	YES	YES	YES	YES	NO
Use of physical defence [code of physical defence assessment]	2	3	3	2	2	2	1
A need of advice insinuator [code of insinuator's intervention assessment]	1	1	3	1	1	3	1

Table 8. Scenario training 4 assessment.

Scenario training 4	Code of participants and results of observation						
	1	2	3	5	6	7	8
Guard	NO	YES	YES	NO	YES	YES	NO
Communication	YES	YES	NO	YES	YES	YES	YES
Alarm other people	NO	YES	NO	YES	YES	NO	NO
Distance	NO	YES	NO	YES	NO	NO	NO
Try to escape	NO	YES	YES	YES	YES	YES	YES
Use of physical defence [code of physical defence assessment]	3	3	3	2	2	3	1
A need of advice insinuator [code of insinuator's intervention assessment]	2	1	3	2	2	2	1

significantly influences the quality of life [35]. Although people with disabilities have certain limitation they are able to develop other capabilities and to draw on available resources to protect themselves [36].

When it comes to adopted motor skills, communication skills and strategies, which the participants should adopt from the self-defence course, participants succeeded in using guard and communication. These two actions were present in most of the lessons. Less satisfied we are with alarming other people, which is fighting with participants' shyness [37]. The scenario trainings showed the lack of time spent with this topic during the course.

In methodology of self-defence training for people with visual impairments [38] also the empirically verified methodology of teaching safe-fall technique for the visually impaired people should be applied [39]. One of the most innovative concepts of modern therapies and preventive rehabilitation programs is based on the elements of martial arts (safe-fall, collision avoidance by *tai-sabaki*, *ashi-sabaki*, fun forms of martial arts etc.). These programs could be apply not only to the blind or visually impaired but also to the people with other disabilities (amputations of the extremities, or with intellectual disabilities [40-45]), or for reducing aggressiveness [46-48] etc.

Conclusions

A self-defence course for people with visual impairments should be focused on coping with pre-conflict situation through knowledge of threats and risks they face. Information about threats and risks can be gained from visually impaired people only and each course should be suit to fit the given group of participants. In a conflict situation it is necessary to keep the clash on the verbal level and prevent the transition from verbal to physical conflict. When it comes to matter of assistants' motivation for taking part in the self-defence course we can draw on Gombás [49] experience.

Determined aims of the course were fulfilled. The participants of the course enhanced their faith in own ability to react, face and solve conflict situation. At the same time they kept a real picture of defence possibilities with visual impairment. They accepted a necessity of dealing with troubles in pre-conflict phase and avoiding the physical defence. The crucial challenge of self-defence for visually impaired people remains the post conflict phase – escape to secure, which is considerably difficult because of impossibility to run away or surrounding's control.

The course of self-defence was suitably focused on the beginning of the conflict (pre-conflict) as potential victim's production, regulation of mental state, communication strategies. This approach seems to be a suitable way for meeting the

participants' expectations as well as for enhancing self-confidence and competences for solving conflict situations.

Because of small sample we cannot generalize our results. On the other hand individual approach is required for every kind of impairment and for this group we can conclude that created methodology fits well. It would be worthy to apply our methodology to other groups of visually impaired people in the future to confirm present results.

Highlights

The most important change after the self-defence course was in self-confidence during solving verbal conflict situation.

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