Fear of Falls in Wheelchair Users

Jakub Tomeček, Alena Skotáková

Faculty of Sports Studies, Masaryk University Brno

Abstract

The article deals with the issue of fear of falls in wheelchair users and the change in fall concerns after completing a self-defense course. The aim of this study was to assess the impact of a self-defense course for wheelchair users on their fear of falls. To collect data we used a questionnaire and participant observation in the lessons of self-defense for wheelchair users. The participants filled in the questionnaires at the beginning and at the end of the course.

The results show that the course of self-defense has an effect on wheelchair users' fear of falls. This effect differs depending on the type of disability of the participant and on the level of self-confidence. We can claim that the participants with a low level of fear at the beginning of the course this attitude has shifted slightly and they became more aware of potential threats. On the contrary, the participants whose level of fear was high, those fears were reduced and their attitude towards a potential fall is slightly more relaxed.

Key words: *wheelchair, falls, self-defense*

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INTRODUCTION

The instincts to preserve one's life, interests and values are deeply ingrained in every individual (Pavelka & Stich, 2015). It is therefore natural that these instincts take over in life-threatening, stressful, self-defense situations. A self-defense conflict, even though it may only take a few seconds in most cases, has a certain cycle and can be divided into seven stages: education, initiation, escalation, confrontation, stabilization, normalization, evaluation (Wagner, 2006).

In this paper we deal with self-defense in people with disabilities where it is necessary to primarily focus on the pre-conflict stage. It is the phase of education, getting information about where the participant can gain an advantage over the assailant thanks to the knowledge of tactics and strategy. The stage of initiation is typically triggered by the assailant, however it is important to make sure the defender does not become an initiator e.g. by making an inappropriate comment or movement or by bumping into the assailant. The last of the pre-conflict stages is escalation. This stage directly precedes the confrontation itself and can occur repeatedly during a conflict. To prepare for it the participants learn assertiveness and ways to control the assailant effectively.

The theory of self-defense takes into account the fact that some people are disadvantaged in self-defense situations – particularly women, children, the elderly and people with disabilities (Reguli, 2005). It is therefore necessary to adjust self-defense courses to individual needs

of these individuals by selecting appropriate strategies and methods of teaching. Studies show (Čihounková, Skotáková & Kohoutková, 2016) that people with physical disabilities are victims of assaults more often than people without disabilities. This fact can lead to greater fear of an assault and lower self-confidence in people with disabilities.

It has been found that in certain countries (Kane, 2008) people with disabilities are three times more likely to be a victim of a crime and that crime is also these people's main concern. They fear an assault and they do not feel safe in the streets, nor in their own homes. This fear is most widely spread among people with limited mobility or visual impairment. One of the consequences of this fear is obviously a higher risk of social isolation as these people fear going out unaccompanied. The higher risk of victimization in these people has been pointed out also by Čírtková (2014). Due to these facts it is necessary to also aim to improve the mental condition of the participants. Self-defense exercise per se is highly emotionally and mentally demanding, which makes it an ideal tool for building one's confidence and improving their mental wellbeing since the growing level of skills correlates with the level of confidence as demonstrated e.g. by Wong (1991).

Previous research in the area of self-defense (Čihounková et al., 2016, Skotáková, Čihounková, & Sklenaříková, 2017) implies that wheelchair users greatly fear falling off the wheelchair. Other studies (Kirby, Ackroyd-Stolarz, Brown, Kirkland & Macleod, 1994; Gavin-Dreschnack, Nelson, Harrow & Ahmed, 2005; Gaal & Rebholtz, 1997; Berg, Hines & Allen, 2002; Chen, Wang, Hunang, Chang, Mao & Wang, 2011) confirm that falls are a frequent phenomenon encountered by wheelchair users, where 40–60% of them will have experienced a fall. Furthermore, the authors of the above studies state that although the injuries resulting from the falls are not lethal in most cases, 60–80% of total injuries of wheelchair users are caused by a fall.

Therefore, our course of self-defense for wheelchair users focuses namely on the issue of falls both in terms of methodology (an integral part of the course was teaching the techniques of falls applied in model situations) and also in terms of research whose results are presented in this paper. We bear in mind that every physical activity as such is beneficial to wheelchair users (cf. Shephard, 1991).

The aim of this study is to assess the impact of a self-defense course for wheelchair users on their fear of falls.

Design of the research

This study's design is quasi-experimental (Privitera & Ahlgrim-Delzell, 2018), it was supplemented with case studies due to the small number of respondents. These studies incorporate quantitative data and contribute to explanation of the results of our intervention. Case studies combine data obtained from personal questionnaires, observation and non-structural dialogues. Personal questionnaire included questions concerning the fear of the potential fall during daily activities. Respondents were answering it two times, at the beginning and at the end of intervention. The dialogues concerned the topics of respondents' private lives and experience with self-defence and falls. They were done in the course of respective educational units. Respondents were observed by Jakub Tomeček and Alena Skotáková, what was observed was primarily the behaviour in crisis situations, reactions to unexpected impulses and personal traits of respondents.

The research sample

The research sample consisted of wheelchair users. The experimental group was composed of the participants of the self-defense course, which in this case represented an intervention programme. The experimental group composed of 6 women and 1 man aged 23 to 60 with a varying degree of education (vocational or secondary with school-leaving exams), see table 1.

Tab. 1: Basic Characteristics of the Experimental Group.

participant	age	gender	occupation	education	degree of disability/ specification	wheelchair experience
1	23	female	student	secondary with school-leaving exams	mobility of lower limbs	16 years
2	27	female	interpreter	secondary vocational	paraplegia	22 years
3	48	female	self-employed	secondary vocational	paresis of lower limbs	4,5 years
4	60	female	–	secondary with school-leaving exams	3rd degree quadri-plegia	5 years
5	27	female	–	secondary with school-leaving exams	mental problem	5 let
6	35	male	IT-specialist	secondary with school-leaving exams	paraplegia	15 years

Intervention programme "Self-defence course for wheelchair users"

The experimental group had in total 10 practical double session. The course took place at the Faculty of Sports Studies Masaryk University in Brno. The course gradually dealt with all the phases of conflict (with an emphasis on pre-conflict) and the participants learned how to behave in these situations.

The course also included teaching of strategic solution of self-defense situations and verbal self-defense, the development of technical skills needed for self-defense per se (e.g. blocks, punches, etc.), training of fall techniques including combat in a disadvantaged position on the ground and the final stabilisation of a conflict situation (getting assistance, moving away to safe distance, etc.). The final part of a teaching session was always devoted to conditioning compensation exercise and relaxation to cool down. At the end of each session there was a direct feedback slot from the participants with the aim to gradually improve the dynamics of the course. Some of the comments given above are included in the case study. At the end of the course, all the techniques and skills were applied in model situations.

Research methodology

To gain data we used a questionnaire "The Spinal Cord Injury – Falls Concern Scale" (SCI–FCS) by Boswell-Ruyse (2010). The SCI-FCS includes a test of internal reliability and validity with an excellent score. Yardly (2005) states that this questionnaire is partly based on FES-I questionnaire. The Czech version of the questionnaire was done by a back-translation according to Boswell-Ruyse (2010). The questionnaire includes 16 closed questions, the respondent marks the most suitable answer with a cross. The questions deal with everyday activities.

The following four options of answers are provided: not at all concerned; somewhat concerned; fairly concerned; very concerned. Each of the options has an assigned value 1–4, thanks to which the result of each questionnaire can be interpreted as a score (s). If the respondent does not perform the activity they are asked to answer as IF they had to do it. Having answered all the questions the points are added up and classified into one of the categories: 16–19 points low level of fear; 20–27 slight fear; 28–64 high level of fear see table 2. Subsequently the data are sorted into a table of frequencies and processed into a graph. Further data were obtained by observations at the sessions of the intervention course.

Tab. 2: The Questionnaire.

	Not at all concerned 1	Somewhat concerned 2	Fairly concerned 3	Very concerned 4
1. Getting dressed or undressed	1	2	3	4
2. Moving around the bed (including sitting up)	1	2	3	4
3. Inserting enema or toileting	1	2	3	4
4. Washing or showering self	1	2	3	4
5. Transferring on/off a commode or toilet	1	2	3	4
6. Transferring in/out of bed	1	2	3	4
7. Transferring in/out of a car	1	2	3	4
8. Reaching for high objects (e.g. pressing button on a lift, reaching to a high shelf)	1	2	3	4
9. Picking objects up from the floor (e.g. clothes, pet bowl, pen)	1	2	3	4
10. Cooking or food preparation (e.g. making a sandwich, stirring food on the stove)	1	2	3	4
11. Pushing wheelchair on flat ground	1	2	3	4
12. Pushing wheelchair on an uneven surface (e.g. rocky ground, irregular pavement)	1	2	3	4
13. Pushing wheelchair up/down gutters or curbs	1	2	3	4
14. Pushing wheelchair up/down a slope	1	2	3	4
15. Shopping	1	2	3	4
16. Lifting heavy objects across body (e.g. shopping bags, wheelchair into the car)	1	2	3	4

The course of measurements

The questionnaire was distributed twice among the respondents (at the beginning and at the end of the intervention programme). Each member of the experimental group is described individually as a case study.

RESULTS AND DISCUSSION

We present the results of a survey concerning fear of falls and additional case studies.

The average score (s) of the experimental group was identical at the beginning and at the end of the intervention programme, i.e. s = 28, while the individual results of participants differed. Considering that value 1 in the questionnaire signifies no fear and value 4 great fear of a participant, we can assume that the lower average score indicates a higher level of self-confidence in people who (despite their disability) decided to attend a relatively challenging self-defense course. For the individual values achieved by the participants, see Table 3.

Table 3: The Score Achieved by Individual Participants of the Experimental Group at the Beginning and at the end of the Course.

	Experimental group	
participant	**Beginning of course**	**End of course**
1	32	29
2	23	28
3	26	27
4	40	31
5	20	20
6	27	33
average	**28**	**28**

The answers of individual participants are given in graph 1 in percentages, which makes apparent the positive, neutral or negative change between the first and second investigation. Displays the frequencies of positive and negative changes in answers in the experimental group. Neutral answers constitute the empty field between the positive and negative value. Specifically, e.g. in question 16 one of the participants noticed a positive change, one a negative change and 4 gave the same answer meaning there was no change.

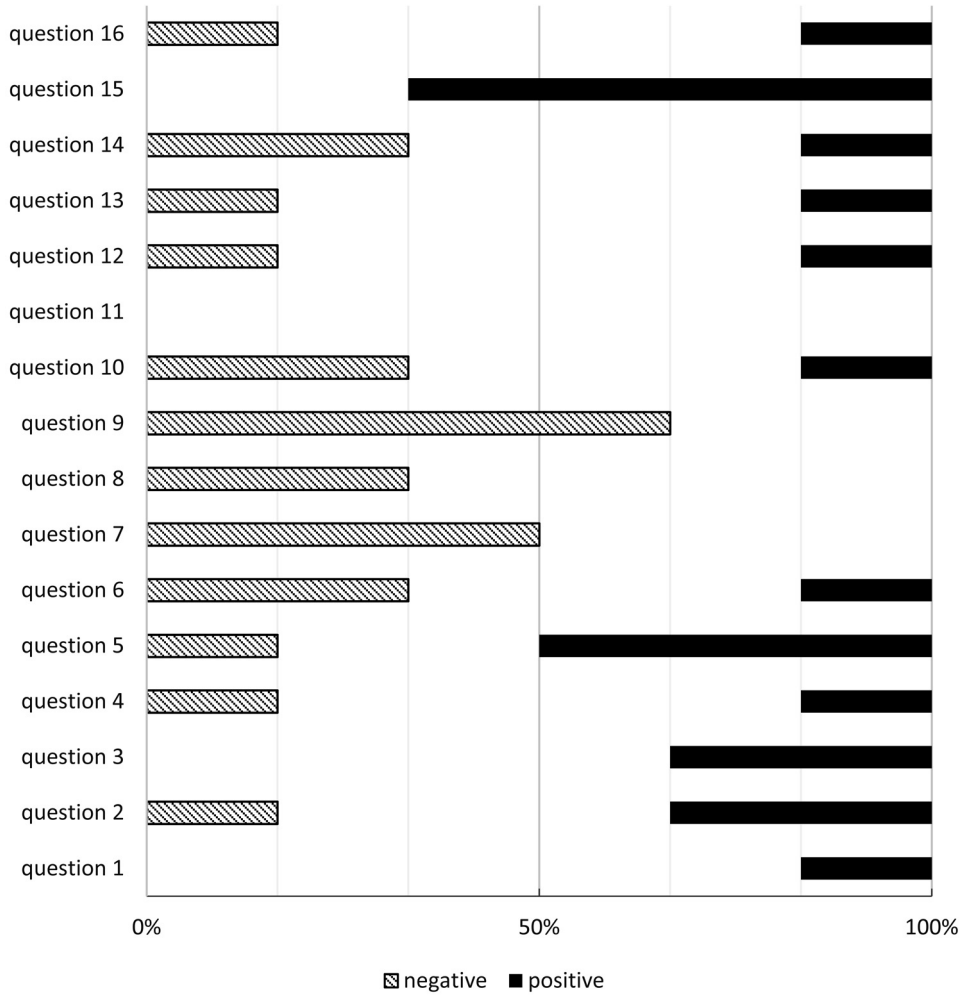

Fig. 1: Displays the frequencies of positive and negative answers in the experimental group. Neutral answers constitute the empty field between the positive and negative value.

Case studies

In the case study analysis below we discuss the results from the questionnaire in greater detail and we also include our observations during the self-defense course.

Participant 1:

Woman aged 23, completed secondary education with school-leaving exams, paraplegic, wheelchair experience of 20 years. She has a congenital disorder and has been using a wheelchair since early childhood. She is quite confident on the wheelchair while performing everyday activities but is also aware of potential risks. Thanks to the techniques taught in the course this participant's self-confidence has increased and so has her confidence in performing everyday tasks. Her starting score was 32, while at the end her score was 29, i.e. she has moved from great fear category into slight fear. Participant 1 is still aware of potential risks but she proclaimed several times in the feedback after the session that thanks to higher self-confidence her quality of life has improved as confirmed by her questionnaire score. Changes were noted specifically in questions concerning getting dressed and undressed, moving on the bed, using the toilet, as well as lifting objects from

the ground and preparing food. In these cases there was a lower fear of fall while being engaged in the above activities. These changes can be attributed to an improvement in motor skills and coordination of movements on the wheelchair, which were trained e.g. during self-defense against multiple assailants. During this activity it is essential to observe the surroundings and move the wheelchair quickly and precisely. On the other hand, there was a slight increase in the fear of getting over grooves and curbs and while going uphill and downhill. These activities involve tilting the wheelchair and the participant is more aware of potential risks of this as a result of being trained the assisted fall.

Participant 2:
Woman aged 27, interpreter, completed secondary vocational education, paraplegic, wheelchair experience of 22 years. The participant is a positive young woman, her disability is congenital and she has been using a wheelchair since early childhood. The functional mobility of her lower limbs has been partly preserved, thanks to which she is able to move around across short distances, e.g. to load the wheelchair into a car and then get into the car. The participant has an assistance dog which affects her perception of potential risks. The participant chose her assistance dog as a form of passive or active self-defense aid. As a result of the course the participant has become aware of the potential risks and injuries associated with a wheelchair fall. The effect the intervention course had on this participant was the opposite to Participant 1. At the beginning of the programme her score was 23 and at the end it was 28, which means that in both cases she fell into the category of slight fear. This might be interpreted in such a way that at the end of the course the participant is now aware of potential risks and due to that she improved in the area of fall prevention, or injuries associated with a fall. There were noted specific changes concerning moving around, such as in going to the toilet, getting onto a bed or into a car. These activities require certain exertion. We can assume that thanks to taking the course under supervision of a trainer she could test her actual physical limits and she has therefore changed her perception of these activities and the fear of performing them. In the course the participants trained several times the transfer from the ground onto the wheelchair as well as manipulation with the wheelchair. Also in this instance the training led to higher self-confidence in performing the task. On the contrary, there was an increased level of fear of riding on uneven terrain. Similarly to other participants, participant 2 also practised a fall off the wheelchair with the trainer's assistance so she has experienced feelings associated with such a fall and is aware of the risks of riding on uneven terrain.

Participant 3:
Woman aged 48, self-employed, completed secondary education with school-leaving exams, paresis of lower limbs, wheelchair experience of 4.5 years. Participant 3 is an active woman with many hobbies. Although she is not able to move her legs, she is capable of rotation of the trunk on the wheelchair and the general mobility of her upper body is very good. She decided to enrol on the course to gain new experience. This participant was not fully aware of potential threats and the training sessions were mainly fun for her. Having completed the whole intervention and model situations her perception of the risks has changed and now she also knows how to respond to them. The score achieved at the beginning of the course was 26 and 27 at the end, which means slight fear. The difference between the two scores is not great, however, there are significant changes in the individual answers to the questionnaire.

The fear of fall while performing everyday activities has been reduced, while alertness when performing other everyday activities has grown. Specifically there have been changes in washing and taking a shower, lifting objects off the floor and cooking and preparing food where the fear has grown slightly. These activities require relatively strenuous moves which increase the risk of falls. The changes are minor, which means that the opportunity to practise the fall off the wheelchair

has changed the participant's view of the risk and she is now aware of potential threats. On the contrary, the fear of going to the toilet has been reduced, perhaps as a result of enhanced physical condition thanks to the training of challenging self-defense techniques.

Participant 4:
Woman aged 60 years, unemployed, completed secondary education with school-leaving exams, quadriplegia of the 3rd degree, wheelchair experience of 5 years. This participant is an elderly lady who is fully aware of her limits but attempts to lead a fulfilled life nevertheless. As the only one in the group she is using an electric wheelchair but is also able to operate a non-electric one if necessary and uses the services of an assistant. In case of a fall off the wheelchair she is completely reliant on the help of others due to the extent of her disability. The participant has got personal experience of an assault and it was also her main motive for enrolling on the self-defense course. Her initial score was 40, i.e. relatively high, which indicates that the participant rather fears a fall while performing all everyday activities. In the course of the intervention programme, however, the participant was engaged and enthusiastic, which led to an increase in her self-confidence. By the end of the course her score was reduced to 31, classified as the great fear group. Participant 4 is still aware of her limits and potential threats but in her own words in the feedback has improved the quality of her life thanks to aligning her fears with reality rather than exaggeration. There were changes in almost two thirds of the questionnaire, to be more precise in 10 out of 16. The changes were mostly positive, i.e. the fears were reduced. The participant had a chance to try out where her limits are. According to her description there was a shift in her perception of performance of individual activities and her attitude. The participant stated in the interview that thanks to completing individual parts of the course, such as assisted fall off the wheelchair, verbal and nonverbal communication but also self-defense techniques as such, she built her muscles and improved her motor skills on the wheelchair, which led to an increased self-confidence in her everyday life.

Participant 5:
Woman aged 27, unemployed, completed secondary education with school-leaving exams, mental incapacity to walk, wheelchair experience of 5 years. The participant is an energetic woman with an unusual disability – she claims that when she is alone and in familiar environment, she is capable of walking but whenever there is another person watching her (acting as a stressor) she has to rely on the wheelchair. Her mobility on the wheelchair is relatively good, and also in case of a fall she is able to get up using her lower limbs. Her final score reflects that as it was 20 both at the beginning and the end of the programme. The results of this participant are specific with regard to the type of her disability, her results fall into the category of slight fear and as the only one of the group her results are close to the low fear category. Individual answers varied in the course of the programme. Comparing the results before and after the intervention, there was an increase in the fear of riding on uneven terrain, which could be associated with the participant's mental problem. Falling off a wheelchair was also in this case trained with the assistance of professional trainers. There was a decline in the fear while doing shopping, which can be attributed to the fact that the participant's self-confidence is higher and she does not have to fear everyday activities away from home anymore thanks to her improved mobility. The participant has changed her perception of potential threats – at the end of the course she is aware of the fact that a fall off the wheelchair might occur. Although her functional mobility is adequate and her problem is only mental, there are risks of injuries of the same extent as in the case of persons suffering from functional impairment of the skeletal-muscular system.

Participant 6:
Male, aged 35 years, IT specialist, secondary with school-leaving exams, paraplegia, wheelchair experience of 15 years. His ability to defend himself against potential threats is significantly reduced due to the inability to reference the muscles below the waist. The participant seemed composed and confident both at the beginning and at the end of the course. He exercised with enthusiasm and interest. His initial score was 27 and final 33. These values point to a shift from the great to slight fear group at the end of the intervention programme. The score suggests that considering the relatively long experience of wheelchair use, the participant manages everyday activities without major problems and fears. The course, however, raised his awareness of potential risks and threats.

The higher final score indicates that the participant started to recognise potential risks associated with falls. The fear was higher specifically regarding various transfers or overcoming obstacles which were trained in the course with the assistance of a trainer. Thanks to the experience the participant's view may have changed. On the other hand, the participant's fears were reduced while moving on a bed and while doing shopping, which can be attributed to improved coordination and mobility on the wheelchair as a result of self-defense practice.

CONCLUSION

Although some authors (Best, Heller & Bigge, 2005; Vítková, 2006) claim that the living conditions of people with disabilities are improving worldwide, our course of self-defense for wheelchair users was unique for our respondents who had not encountered a similar learning opportunity before. Although the self-defense course for wheelchair users was taken by only 6 participants, we obtained quality data which gave us an insight into the issue of falls in wheelchair users while performing everyday activities. Our primary interest was whether completing the course has an effect on the fear of falls and what kind of effect it is. Based on the results it can be said that the effect is apparent on two levels depending on the level of self-confidence of the participants and their wheelchair experience.

In case of self-confidence, there was an increase and thus a decrease in the final score, which corresponds with a decrease in real fears of falling off a wheelchair. In the case of wheelchair experience occurring mainly in those who had been using the wheelchair for relatively long period of time or had retained functional mobility of lower limbs, there was a shift in thinking. Having completed the course, the participants are more aware of their own limits and of potential risks. The issue of mental state and injury prevention in wheelchair users is extensive and further research is needed to address these areas. There are two dimensions of the course, one of them the self-defence training and the other training as such as the participants improve their physical condition, motor skills on the wheelchair as well as coordination. It is therefore not only the training of techniques suitable for self-defence but also a type of exercise that can improve quality of life.

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