

In search of new methods. Qigong in stuttering therapy

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Abstract

Introduction: Even though stuttering is probably as old a phenomenon as the human speech itself, the stuttering therapy is still a challenge for the therapist and requires constant searching for new methods. Qigong may prove to be one of them.

Aim of the research: The research paper presents the results of an experimental investigation evaluating the usefulness of qigong practice in stuttering therapy.

Material and methods: Two groups of stuttering adults underwent 6-month therapy. In group I – the experimental one ($n = 11$) – the therapy consisted of speech fluency training, psychotherapy and qigong practice. In group II – the control one ($n = 12$) – it included speech fluency training and psychotherapy. In both groups 2-hour sessions of speech fluency training and psychotherapy were conducted twice a week. Two-hour qigong sessions took place once a week.

Results: After 6 months the therapy results were compared with regard to the basic stuttering parameters, such as the degree of speech disfluency, the level of logophobia and speech disfluency symptoms. Improvement was observed in both groups, the beneficial effects, however, being more prominent in the qigong-practising group.

Conclusions: Qigong exercises used in the therapy of stuttering people along with speech fluency training and psychotherapy give beneficial effects.

Introduction

The Oscar-winning film “The King’s Speech”, featuring two main protagonists – the stuttering monarch and his unconventional speech therapist – shows that stuttering therapy gives good results provided it is conducted by competent and, primarily, ingenious therapists. It does. Working with a stuttering person is a continuous challenge; it is a constant search for new, optimum therapeutic methods. Qigong may prove to be such a method.

Even though stuttering has been researched for over two hundred years, it has not been established whether it is: a disease or a symptom of a disease [1, 2], a speech neurosis or a symptom of a neurosis [3], a syndrome [4], an incorrect verbal behaviour [5].

No generally accepted definition of stuttering has been developed, either. Mitrinowicz-Modrzejewska, Van Riper, Kałużński, Julmy, Kaczmarek, Becker, Andrews, Pruszewicz, Woźniak and others essentially agree that stuttering is a disorder of speech fluency, pace and rhythm, caused by an excessive tension of respiratory, articulatory and phonation muscles [6].

Stuttering however has a far broader sense than the mere disturbance of the suprasegmental level of an utterance. It also consists in a combination of emotional, sociological, educational and other phenom-

ena accompanying those disturbances – as specified by Adamczyk [7], Johnson and Darley [8], Chęćek [9], and Tarkowski [2]. Stuttering is a troublesome disorder, disrupting one’s inner peace, shattering plans and life aspirations, affecting relations with people from one’s surroundings, limiting (or even preventing) interpersonal contacts.

As in the case of the definition of the term, the expert knowledge sources present numerous explanatory concepts of what causes stuttering. In general, the ideas can be grouped in six theories:

- developmental/linguistic theories – stuttering emerges during the speech formation period as a result of specific factors that have an impact on the child at that stage,
- organic theories – stuttering is the effect of constitutional or neurological differences in the central nervous system,
- neurotic theories – stuttering is a neurosis,
- psychological theories – stuttering is an acquired reaction,
- physiological theories – stuttering is a somatopsychic disorder,
- biocybernetic theories – stuttering occurs because the “electron emitting” part of the speech centre is damaged [9].

Stuttering can be discussed on four levels: linguistic, biological, psychological and social [2]. In the linguistic context stuttering is a speech fluency disorder. To stutter means to speak disfluently. The basic symptoms of speech disfluency include: the repetition of sounds, syllables or their combinations, the prolongation of sounds, the blockage of speech, the insertion of unnecessary sounds (embolophrasia), undue pausing, revisions [10].

The frequency of speech disfluencies is regarded as the basic indicator of the stuttering severity/intensity.

The most common disfluency type is the *repetition* of certain language elements. The repeated elements include sounds, syllables, words, phrases or their parts. This disfluency is classified both as a physiological and pathological one [11].

The *prolongation of sounds* is regarded as a basic symptom of pathological disfluency. It may also act as a gap filler in speech [12]. *Speech blockage* means the inability to pronounce words [13] or sounds in a given word. The blockages occur mostly in voiceless plosives and their voiced counterparts. The occurrence of a blockage always causes a tense pause. *Embolophrasia* means the interpolation of meaningless sounds into speech or the production of prolonged sounds starting an utterance or occurring at the joints of speech segments [14, 15]. *Revisions* are pauses in the flow of speech caused by correcting linguistic mistakes. They are symptoms of syntactic or articulatory disfluencies [14, 15].

The symptoms presented above may appear separately or together. When two or more symptoms occur together this is called “the clustering of disfluencies” [17].

In the biological context stuttering is the effect of excessive tension of the speech apparatus muscles. It takes the form of: multiple repetitions of movement in clonic stuttering, excessively prolonged movements in tonic stuttering, VX Z C a combined form in clonic-tonic stuttering (a mixed type).

The excessive tension of the speech apparatus muscles can be located in the respiratory system

and then respiratory stuttering is diagnosed – in the phonatory system muscles, which results in phonation stuttering, or in the articulatory apparatus, which gives articulatory stuttering. The mixed form, respiratory-phonation-articulatory in different combinations, is most common.

In the psychological context the research tends to focus on the stutterer rather than on stuttering itself. The question arose about the stutterer’s distinctive features other than speech disfluency. There have been attempts to reconstruct the personality model of a stutterer that included the following characteristics: fear of speaking, reticence, shyness, depression-proneness, low self-esteem, feeling guilty, susceptibility to frustration, difficulty with stress management. However, what is encountered most frequently is a stereotypical rather than an actual image of a stutterer, as among people who stutter there are courageous, daring, talkative, extroverted, easygoing individuals with high self-esteem and serious achievements [18]. Nevertheless, stutterers undoubtedly suffer from logophobia, since the unpleasant experiences connected with communicating with others – most frequently the negative reaction of people to speech disfluency – generates or strengthens the communication apprehension.

McCroskey defines communication apprehension (CA) as an individual’s level of fear or anxiety associated with either real or anticipated communication with another person or persons [19].

In a social context stuttering is the disturbance of interpersonal communication, which occurs mostly in conversation. It is a function of speech disfluency and a reaction to it. This disfluency can be normal or pathological, whereas the reactions can be individual or social, positive or negative [20].

In order for the issue of stuttering to be understood, it should be analysed by means of a systemic-structural approach, its particular elements should be recognized and described and, primarily, the relations between them should be explained (Figure 1).

The practice of qigong is one of the core methods used in traditional Chinese medicine (beside herbal treatment, massage, acupuncture and diet-

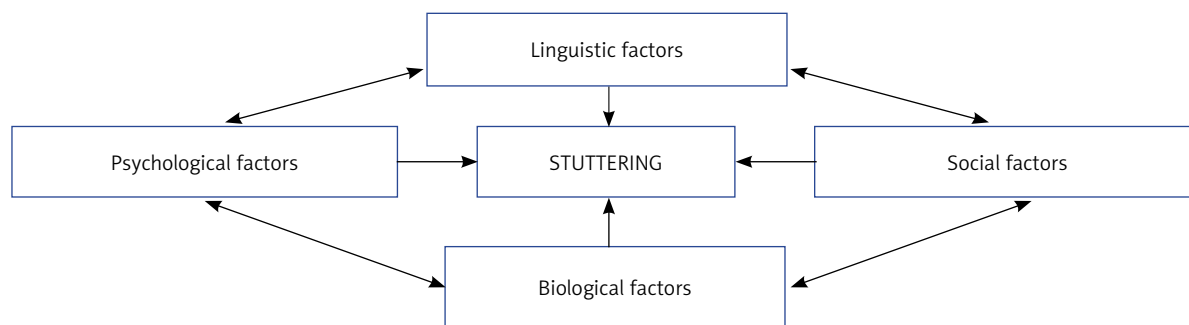


Figure 1. Stuttering in the systemic-structural approach from: Góral-Pótróla J, Tarkowski Z. *Skala Samooceny i Oceny Jąkania* (The scale of self-evaluation and stuttering evaluation) [in Polish] 2012, p. 66

ics), whose theoretical foundations were described in *The Yellow Emperor's Classic of Internal Medicine*. It was used over 3000 years ago and in those times it was an integral part of medicine.

The qigong exercises were classified into three main groups with regard to the assumed objective. The first group includes exercises in which movements resemble those of animals (bears, birds, monkeys, etc.) and has a prophylactic nature. The objective is to prevent diseases and to prolong one's life. The second type comprises mainly respiratory exercises used in chronic complaints. The third group consists of multiple forms of movement with a stimulating and circulation-regulating effect on different parts of body, which are designed to eliminate pain and enhance the functioning of bodily organs.

The exercises are usually performed in three bodily positions: standing, sitting or lying. During the exercises performed in a standing position slow and gentle arm movements are practised (the motions are different and depend on the practice), the leg position is stable and the spinal column is upright. Particular movement sequences are designed to strengthen different bodily organs (liver, heart, digestive system, lungs, kidneys). It is crucial that every time the intakes and outtakes of breath combined with movement elements are as long and quiet as possible and those who practise stay focussed on the relevant organ. The practices performed in the sitting or lying positions require staying motionless and consist in breathing control and concentration (the focus is on the observation and regulation of one's breathing). The practice is conducted under an instructor's supervision.

The qigong-practising person tries to achieve coordination between three elements: muscular tension, breathing and concentration. What is essential is smooth, long and uniform inhaling and exhaling while staying focussed on properly selected, biologically active points. During the training, the breath becomes deeper (due to greater involvement of the diaphragm), which is accompanied by relaxation and gradual improvement of concentration. As a result, qigong exercises reduce excessive muscular tension, improve breathing, provide relaxation and enhance task motivation together with self-discipline. Regular practice gives the opportunity to develop deep muscle relaxation while remaining fully conscious and focussed.

The beneficial, long-term effect of the practice, consisting in the reduction of the stress and anxiety level, the normalization of blood pressure and the reduction of pain and muscular tension, have been clinically proven [21, 22].

Since qigong instructs how to release the excessive muscular and neural tension in a natural way, it has been assumed that it can be helpful in the treatment of stuttering. Directly reducing the impact of biologi-

cal and psychological factors it is consequently possible – according to the systemic-structural approach to stuttering in which the disorder is treated not as a simple compilation of components but as their functional structure – to limit the effect of linguistic and social factors as well.

Aim of the research

The aim of the study was to evaluate the usefulness of applying qigong training in stuttering therapy.

Material and methods

Twenty-three adult stutterers aged 21 to 34 (7 women and 16 men) participated in the experimental research. These were people with advanced stuttering: the speech disfluency severity was greater than 15.0%, and the logophobia level exceeded five points on a ten-point scale.

The subjects were divided randomly into group I as the experimental one ($n = 11$) and group II as the control one ($n = 12$), and underwent 6 months of therapy. In group I the therapy included speech fluency training, psychotherapy and qigong practice. In group II – the control one – the therapeutic activities were limited to standard methods applied in this sort of treatment, i.e. speech fluency training and psychotherapy. In both groups, fluency training and psychotherapy sessions were conducted twice a week (2-hour meetings). Qigong exercises were held once a week (a 2-hour session).

The evaluation of the purposefulness of applying qigong exercises was conducted by comparing the magnitude and nature of the change in the groups (pre-therapy and post-therapy condition) with regard to the basic stuttering parameters, i.e. speech disfluency intensity, types and frequency of speech disfluency symptoms and the level of logophobia.

The corpus of verbal utterances was collected on the basis of conversations conducted with the stutterers. Each subject participated in two conversations: the first one was conducted before the therapy, and the second one after the therapy had been completed. The obtained subjects' utterances were recorded on CD by means of digital technology. The linguistic analysis covered the text of the first three hundred syllables of each conversation, a total of 13 800 syllables.

The speech disfluency severity (SDS) of the subjects was established using the formula: $SDS = (x/y) \times 100\%$, where x = the number of syllables with disfluencies, $y = 300$ syllables.

The level of logophobia was determined using *The Questionnaire of Speech Disfluency and Logophobia* [15].

Statistical analysis

In order to examine the statistical *significance of the differences in results between group 1 and group 2 the*

Table 1. The speech disfluency severity before and after the therapy. Group I ($n = 11$)

Subject's identification number	Number of syllables with disfluencies		Ratio of the difference in the number of syllables with disfluencies before and after the experiment to 300 (syllables)	Structure indicator (t)	Significance of t to t_{α} (p)
	Before the experiment	After the experiment			
1	49	30	-0.0633	-2.3333	< 0.02
2	45	22	-0.0767	-2.8944	< 0.01
3	48	19	-0.0967	-2.4987	< 0.02
4	51	30	-0.07	-2.4735	< 0.02
5	47	25	-0.0734	-2.7699	< 0.01
6	54	25	-0.10	-3.5336	< 0.001
7	56	21	-0.1167	-8.2776	< 0.001
8	47	30	-0.0567	-2.004	< 0.05
9	55	30	-0.0834	-2.23	< 0.05
10	55	36	-0.0634	-2.1134	< 0.05
11	56	20	-0.0867	-6.1316	< 0.01

structure indicator was applied, determined by the formula [23]:

$$t = \frac{\frac{m_1}{n_1} - \frac{m_2}{n_2}}{\sqrt{\frac{p \times q}{n}}}$$

where m_1 and m_2 – the distinguished group size, n_1 and n_2 – the appropriate group size with regard

to m_1 and m_2 , and $p = \frac{m_1}{n_1} + \frac{m_2}{n_2}$ whereas $q = 1 - p$,

while $n = \frac{n_1 + n_2}{2}$.

The structure indicator was interpreted as follows: if $t > t_{\alpha}$ read from the tables, then the H_0 hypothesis at the α confidence level was rejected, otherwise, i.e. if $t < t_{\alpha}$ then H_0 was accepted.

Results

Speech disfluency severity

The results of group I (the experimental one) with regard to the speech disfluency severity are presented in Table 1.

All the subjects from the experimental group manifested a decreased speech disfluency severity. This condition was not accidental – the null hypothesis with regard to the difference between the number of syllables with disfluencies before and after the

Table 2. The subjects ranked hierarchically due to the improvement in the severity of speech disfluencies. Group I ($n = 11$)

Position in hierarchy	Subject	Structure indicator	Significance of t to t_{α} (p)
1	7	-8.2776	< 0.001
2	11	-6.1316	< 0.01
3	6	-3.5336	< 0.001
4	2	-2.8944	< 0.01
5	5	-2.7699	< 0.01
6	3	-2.4987	< 0.02
7	4	-2.4735	< 0.02
8	1	-2.3333	< 0.02
9	9	-2.23	< 0.05
10	10	-2.1134	< 0.05
11	8	-2.004	< 0.05

experiment was rejected in favour of the results after the experiment.

Taking into account the value of the structure indicator, the subjects in the experimental group were ranked hierarchically due to the resulting improvement in the severity of speech disfluencies (Table 2).

Table 3. The speech disfluency severity before and after the therapy. Group II ($n = 12$)

Subject's identification number	The number of syllables with disfluencies		Ratio of difference in the number of syllables with disfluencies before and after the experiment to 300 (syllables)	Structure indicator (t)	Significance of t to t_{α} (p)
	Before the experiment	After the experiment			
1	56	33	-0.0767	-2.5567	< 0.02
2	51	28	-0.0767	-2.7103	< 0.01
3	51	30	-0.07	-2.4735	< 0.02
4	47	21	-0.0867	-4.335	< 0.001
5	45	19	-0.0867	-3.2717	< 0.01
6	54	32	-0.0734	-2.4467	< 0.02
7	47	38	-0.03	-1.0	< 0.40
8	54	31	-0.0767	-1.5653	< 0.20
9	50	19	-0.1034	-3.9167	< 0.001
10	53	30	-0.0767	-2.4031	< 0.01
11	48	34	-0.0467	-1.6502	< 0.1
12	55	27	-0.0934	-3.3004	< 0.001

Table 4. The subjects ranked hierarchically due to the resulting improvement in the severity of speech disfluencies. Group II ($n = 12$)

Position in hierarchy	Structure indicator	Structure indicator	Significance of t to t_{α} (p)
1	4	-4.335	< 0.001
2	9	-3.9167	< 0.001
3	12	-3.3004	< 0.001
4	5	-3.2717	< 0.01
5	2	-2.7103	< 0.01
6	1	-2.5567	< 0.02
7	3	-2.4735	< 0.02
8	6	-2.4467	< 0.02
9	10	-2.4031	< 0.01
10	11	-1.6502	< 0.1
11	8	-1.5653	< 0.20
12	7	-1.0	< 0.40

The above presented ranking of the experimental group members is evidence that the resulting improvement in the specified area varies from 1‰ to 5% of the committed mistakes (syllables with disfluencies). The significance of the results of group II (the control one) with regard to the speech fluency severity is presented in Table 3.

The results presented in Table 3 show that speech disfluency severity decreased in the control group as it did in the experimental group. The null hypothesis was rejected in favour of the results after the experiment. On the basis of the value of the structure indicator, the control group members were ranked hierarchically due to the resulting improvement in the severity of speech disfluencies (Table 4).

The above presented ranking of the control group members is evidence that the resulting improvement in the specified area varies – from 1‰ of mistakes (syllables with disfluencies) to 10%, 20%, or even 40%.

Comparing the results of the experimental and control groups, it should be noted that a larger positive change in the severity of speech disfluencies was observed in group I (the experimental one).

The level of logophobia

The level of logophobia recorded in subjects from group I (experimental) is presented in Table 5. The results show that logophobia decreased in ten subjects and in one case no change was recorded. In 11 subjects from Group II the fear of speech decreased, while in one case no change was recorded (Table 6).

The statistical significance between group I and group II was examined on the basis of the results presented in Table 7, using the empirical results from Tables 5 and 6.

The value of the structure indicator t was -0.9326 (with the probability $p < 0.40$); hence the null hypothesis was rejected in favour of group I (experimental).

Table 5. The level of logophobia in the subjects before and after the therapy. Group I ($n = 11$)

Subject's identification number	Level of logophobia (in points)	
	Before	After
1	8	5
2	8	4
3	6	2
4	5	4
5	8	6
6	8	4
7	7	3
8	5	4
9	9	5
10	6	6
11	6	2

Table 6. The level of logophobia in subjects before and after the therapy. Group II ($n = 12$)

Subject's identification number	Level of logophobia (in points)	
	Before	After
1	6	4
2	8	6
3	8	7
4	6	5
5	3	3
6	8	6
7	9	8
8	9	6
9	5	2
10	5	4
11	6	5
12	7	4

It can be assumed that this result is the effect of the qigong practice.

The frequency of speech disfluency symptoms

In the utterances of stutterers from group I, both during the initial talk and in the final conversation, six types of speech disfluency symptoms were recorded. Before the therapy 592 symptoms in total were noted, and in the final test their number decreased to 287 (Table 8). On the basis of the calculated values of the structure indicator, it was established that in comparison with the initial test the final test revealed that: *prolongation of sounds* decreased by 40%, *blockage of sounds* decreased by 95%, *embolophrasia* decreased by 99%, *revisions* decreased by 70%, *repetitions of sounds* decreased by 99%, *pauses* decreased by 99%.

In the utterances of the stutterers from group II, both during the initial and the final conversations, six types of speech disfluency symptoms were recorded. Before the therapy 637 speech disfluency symptoms in total were recorded, while in the final examination their number fell to 346 (Table 9). On the basis of the calculated values of the structure indicator it was established that, in comparison with the initial test: *the revisions* increased by 10%, *the prolongation of sounds* decreased by 95%, *the sound blockage* decreased by 99%, *embolophrasia* decreased by 95%, *pauses* decreased by 99%, *sound repetition* decreased by 99%.

The significance of the experimental and control groups' results for the frequency of speech disfluency symptoms is presented in Table 10. On the basis of the results in Table 10 the null hypothesis was rejected in favour of the experimental group. Qigong practice al-

Table 7. The logophobia results. Groups I and II

Group I		Group II	
Points after the experiment	45	Points after the experiment	60
The total number of points: before and after the experiment	121	The total number of points: before and after the experiment	140

lows the following symptoms to decrease: *blockage of sounds* with the probability $p < 0.10$, i.e. with 90% certainty, *pauses*, with the probability $p < 0.60$, i.e. with 40% certainty, *repetition of sound*, with the probability $p < 0.10$, i.e. with 90% certainty.

Discussion

Therapy is based on the ability to solve patients' problems by changing their condition, i.e. by achieving an improvement in their functioning, whereas the problem is the function of obstacle and objective. For stutterers, stuttering itself is not a problem. It becomes one only when it poses an obstacle in achieving individual or social goals.

Therapy for stuttering persons, understood as a skill to solve their problems, comprises speech fluency training and psychotherapy. An integration of these therapeutic methods has been postulated for a long time. Seeman already believed [23] that the therapy for stuttering persons is aimed at changing their personality and improving speech fluency, which requires the application of a complex method

Table 8. The frequency of speech disfluency symptoms in subjects before and after the therapy. Group I

Subject's identification number	Type and number of speech disfluency symptoms											
	Prolongation of sounds		Blockages of sounds		Embolophrasia		Pauses		Revisions		Repetitions (of sounds, ...)	
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After
1	11	12	18	6	2	3	10	4	3	4	7	3
2	5	7	15	6	5	4	9	5	4	0	11	0
3	7	5	15	3	6	3	11	7	2	2	9	2
4	16	7	9	2	10	6	7	1	1	0	12	4
5	7	11	14	3	5	3	11	3	2	1	18	6
6	1	6	21	6	2	3	18	6	3	0	16	5
7	6	7	23	4	1	3	12	6	0	1	14	4
8	7	9	12	4	2	3	10	6	3	4	14	5
9	3	6	19	11	5	0	13	4	0	1	21	5
10	5	3	17	17	2	3	5	6	4	4	23	3
11	8	10	11	3	5	0	7	4	4	2	13	2
Total	76	84	174	62	45	31	113	52	26	19	158	39
Mean value	6.9090	7.5454	15.8181	5.9090	4.0909	2.8181	10.2727	4.7272	2.3636	1.7272	14.3636	3.5454
Standard deviation	3.8008	2.5712	4.0858	4.2309	2.5028	1.5850	3.33278	1.6564	1.4316	1.5427	4.6372	1.6713
Minimum	1	3	9	2	1	0	5	1	0	0	7	0
Maximum	16	12	23	17	10	6	18	7	4	4	23	6
Median	7	7	15	4	5	3	10	5	3	1	14	4

comprising psychotherapy, speech therapy and pharmacological treatment. Adamczyk, Kratochvil, Tarkowski, Chęćek, Zaleski, and Bochniarz [2, 24, 25] also share the view.

Both elements of the stuttering treatment are absolutely essential, the problem being their optimum combination and a selection of techniques and methods, since stuttering therapy requires work on many levels, taking into account the social, psychological, biological and linguistic factors.

Due to the possibility of gaining control over muscular tension and achieving the state of deep relaxation during qigong exercises, it was decided to include this type of practice in therapy. Even though the expert knowledge literature does not contain information on the use of qigong in stuttering therapy, the long-term effect of the exercises, such as the reduction in the level of stress, anxiety and muscular tension, has been clinically confirmed [22, 26].

The improvement of the essential stuttering parameters was reported both in the experimental and in the control groups. The results show, however, that the stutterers who practised qigong achieved a better effect. The difference between the experimental group and the control one proved to be statistically significant. It refers to the decrease in both speech disfluency severity and the level of logophobia. In addition, a quantitative and qualitative change in speech disfluency symptoms, especially the reduction in the most severe symptoms of stuttering, i.e. blockages and tense pauses, is of significance here. It can therefore be assumed that this condition is due to the inclusion of qigong exercises in the therapy. The researchers observed similar effects, such as a reduced anxiety or lower stress levels, in students practising qigong, or in patients with fibromyalgia. Due to a small number of subjects, it is advisable to repeat the test on a larger population.

Table 9. The frequency of speech disfluency symptoms in particular subjects before and after the therapy. Group II

Subject's identification number	Type and number of speech disfluency symptoms											
	Prolongation of sounds		Blockages of sounds		Embolophrasia		Pauses		Revisions		Repetitions (of sounds, ...)	
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After
1	2	6	20	10	3	3	17	5	3	1	14	6
2	10	7	17	9	3	2	11	5	2	2	10	4
3	3	5	19	11	5	5	14	7	0	1	12	4
4	6	5	12	5	6	1	9	5	1	1	15	5
5	14	4	7	4	3	0	6	3	0	2	17	5
6	7	8	18	7	4	4	10	8	1	1	16	4
7	16	9	8	7	5	6	10	7	2	3	8	4
8	6	5	14	10	6	4	12	5	1	2	16	6
9	12	4	9	2	7	4	8	4	3	2	18	5
10	13	6	8	3	9	5	8	6	3	1	13	7
11	9	11	9	6	4	3	9	5	4	4	14	5
12	6	2	21	9	2	1	12	7	0	1	15	10
Total	104	72	162	83	57	38	126	67	20	21	168	65
Mean value	8.6666	6	13.5	6.9166	4.75	3.1666	10.5	5.5833	1.6666	1.75	14	5.4166
Stand. deviation	4.2295	2.3452	5.0579	2.8418	1.9202	1.7716	2.8431	1.3819	1.3123	0.9242	2.7688	1.6562
Minimum	2	2	7	2	2	0	6	3	0	1	8	4
Maximum	16	11	21	11	9	6	17	8	4	4	18	10
Median	8	5.5	13	7	4.5	3.5	10	5	1.5	1.5	14.5	5

Table 10. Frequency of speech disfluency symptoms. Groups I and II

Group	Symptoms	Prolongation of sounds	Blockage of sounds	Embolophrasia	Pauses	Revisions	Repetition of sounds
I	After the experiment	84	62	31	52	19	39
	Total: before and after the experiment	160	236	76	165	45	197
II	After the therapy	72	83	38	67	21	65
	Total: before and after the therapy	176	245	95	193	41	233
Difference between groups I and II	<i>t</i> value	2.1150	-1.9586	0.1047	-0.64	1.7289	-1.9286
	<i>t</i> _α significance (<i>p</i>)	< 0.05	< 0.10	< 0.90	< 0.60	< 0.10	< 0.10

Conclusions

Qigong exercises used in the therapy of stuttering people along with speech fluency training and psychotherapy give beneficial effects. With regard to the three researched areas – the severity of speech disfluencies, the logophobia level, and the frequency of symptoms – a larger positive change was observed in the group of stutterers practising qigong. It is a pilot study, which needs to be repeated on a larger population.

References

- Mitrinowicz A. Jąkanie. Przyczyny i leczenie. PZWL, Warszawa 1952.
- Tarkowski Z. Psychosomatyka jąkania. Wyd. Fundacji „Orator”, Lublin 2009.
- Orthmann W, Scholz H, Stottern. Berlin 1983.
- Bohme C. Das Stotter Syndrom. Hipokrates Verlag, Stuttgart 1977.
- Ingham RL, Andrews G. Behavior therapy and stuttering: a review. *J Speech Hearing Disorders* 1983; 4: 420–463.
- Tarkowski Z. Jąkanie. Wydawnictwo Naukowe PWN, Warszawa 2001.
- Adamczyk B. Jąkanie jako góra lodowa. *Logopedia* 1998; 23: 9–22.
- Johnson W, Darley F. Diagnostic methods in speech pathology. Haper and Row Publishers, New York 1963.
- Chęć M. Jąkanie. Diagnostyka – terapia – program. Oficyna Wydawnicza „Impuls”, Kraków 2007.
- Häge A. Cognitive abilities and interactional variables in young stutterers. *Stutterings. Proceedings of the First World Congress on Fluency Disorders*, Munich, Germany 1995; 162–165.
- Kruger U. Wyznaczniki składniowej segmentacji tekstu miejskiego języka mówionego mieszkańców miast Górnego Śląska i Zagłębia. Wydawnictwo Uniwersytetu Śląskiego, Katowice 1983.
- Maclay H, Osgood CE. Hesitation phenomena in spontaneous English speech. *World* 1959; 15: 19–34.
- Zebrowski PM, Conture EG. Judgments of disfluency by mothers of stuttering and normally fluent children. *J Speech Hear Res* 1989; 32: 625–634.
- Böhme C. Das Stotter-Syndrom. Verlag Hans Huber, Stuttgart 1977.
- Tarkowski Z. Kwestionariusz nie płynności mówienia i logofobii. Wydawnictwo Polskiej Fundacji Zaburzeń Mowy, Lublin 1992.
- Tarkowski Z. Jąkanie wczesnodziecięce. WSiP, Warszawa 1992.
- Hubbard C, Yairi E. Clustering of disfluencies in the speech of stuttering and nonstuttering preschool children. *J Speech Hear Res* 1988; 31: 228–233.
- Góral-Półrola J, Tarkowski Z. Skala samooceny i oceny jąkania. Wyd. WSETiNS i Wyd. Fundacji Orator, Kielce-Lublin 2012.
- McCroskey JC, Richmond V P. Willingness to communication. Sage Publications, London 1987; 129–155.
- Tarkowski Z. Nowe ujęcie mowy bezładnej. W: Człowiek wobec ograniczeń. Tarkowski Z, Jastrzębowska G (red.). Wyd. Fundacji Orator, Lubin 2002; 187–197.
- Sousa CM, Goncalves M, Machado J, et al. Effects of qigong on performance-related anxiety and physiological stress functions in transverse flute music schoolchildren: a feasibility study. *J Chin Intergat Med* 2012; 10: 858–865.
- Liu W, Zahner L, Cornell M, et al. Benefit of Qigong exercise in patients with fibromyalgia: a pilot study. *Int J Neurosci* 2012; 122: 657–664.
- Seemann M. Nowe poglądy w patogenezie jąkania. *Otolaryngol Pol* 1952; 4: 72–81.
- Adamczyk B, Kuniszuk-Jóźkowiak W, Sadowska E. Wpływ zespołowego mówienia na mowę jąkających się. *Logopedia* 1975; 12: 47–54.
- Chęć M. Kwestionariusz Cooperów do Oceny Jąkania. Zarys terapii. Wydawnictwo Polskiej Fundacji Zaburzeń Mowy, Lublin 1993.
- Green J. Metody i zadania statystyki matematycznej. PWN, Warszawa 1972; 77.

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