Effectiveness of Zhineng Qigong on Emotional and Behavioural Difficulties in the School Environment: Results of a Two-way Mixed Design Study

Učinkovitost Zhineng Qigonga pri zmanjševanju čustvenih in vedenjskih težav v šolskem okolju: rezultati raziskave z dvosmernim mešanim načrtom

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Abstract

After the Pilot Study, made in the school year 2017/2018, entitled "Evaluation of the effectiveness of Zhineng Qigong on emotional and behavioural difficulties in the school environment" cast promising results, we decided to upgrade the research methodology including a comparison group. In school year 2018/2019 we narrowed down our study group and focused on continuing our research with three graders. Students, their parents and their teachers all filled in the Strengths and Difficulties Questionnaire (SDQ) before and after the three months Zhineng Qigong intervention. Results show small to moderate decrease in emotional symptoms, conduct problems, hyperactivity, and peer problems and an increase in prosocial behaviour; although not all changes were noticeable to all the informants. We found no such changes in the comparison group before and after three months. However, using 2x2 ANOVA, no significant changes were noticed when controlling both variables, time and presence of intervention. Our research results indicate that Zhineng Qigong can represent a tool for improvement of psychophysical well-being, conduct, and social relationships among students and teachers of primary school, but further research must be done to substantiate such claims.

Keywords: Zhineng Qigong, primary school students, learning environment, health, well-being, emotional and behavioural difficulties.

Povzetek

Po uspešno opravljeni pilotni študiji v šolskem letu 2017/2018 (Preverjanje učinkovitosti Zhineng Qigonga pri zmanjševanju čustvenih in vedenjskih težav v šolskem okolju), smo se odločili nadgraditi raziskovalne metode in v raziskavi vključiti primerjalno skupino. V šolskem letu 2018/2019 smo se osredotočili na ožjo starostno skupino in raziskavo nadaljevali s tretješolci. Učenci, njihovi starši in razredničarke so izpolnili vprašalnike SDQ (Strengths and Difficulties Questionnaire) pred in po tromesečnem izvajanju vadbe Zhineng Qigong v razredu. Rezultati kažejo majhen do zmeren padec emocionalnih simptomov, vedenjskih težav, hiperaktivnosti in težav med vrstniki ter izboljšanje prosocialnega vedenja; čeravno vse spremembe niso bile opažene pri vseh informatorjih. Pri primerjalni skupini ni bilo opaziti izboljšanja. Kljub temu nismo našli nobenih statistično značilnih razlik med skupinama, ko smo kontrolirali oboje, čas in prisotnost intervencije z 2x2 ANOVO. Raziskava je potrdila, da lahko Zhineng Qigong predstavlja uspešno orodje za izboljšanje psihofizičnega počutja, vedenja in socialnih interakcij med učenci in učitelji v osnovni šoli, vendar je za dokazovanje njegovih učinkov potrebnih še več podobnih raziskav.

Ključne besede: Zhineng Qigong, osnovnošolski učenci, učno okolje, zdravje, dobro počutje, čustvene in vedenjske težave.

1. Introduction

1.1. *What Qigong is*

The practise of Qigong is known to humanity for at least 2200 years as discovered by the findings in Ma Wang Dui excavation site in China, where scrolls depicting exercises to preserve and strengthen life were found. Although there are certain essential and common elements to all forms of Qigong, such as graceful movement, correct postural alignment, mental concentration on the current moment, relaxation and breathing, Zhineng Qigong (智能气功) emphasises that the practitioner must use its initiative and intention to transform all its instincts into conscious activities. Its developer, doctor Pang He Ming, defined this system as: *"...a training that requires the participant to consciously use the mind intent to focus inward to transform, improve, and enhance life functions. Mental, posture and breathing adjustments are the extensions of the inward training. It is a training which enables the participants to transform natural instinctive activities into conscious activities." (Pang & Chan, 2015, p. 6).* Various forms of Qi Gong are proven to be beneficial in improving balance, strength and flexibility (Taylor-Piliae et al., 2006), reducing cancer and cancer treatment-related problems (Overcash, Will, & Lipetz, 2013), enhancing well being and mental health (e.g. Griffith et al., Johansson, Hassmén, & Jouper, 2011, 2008, Manzaneque, et al., 2009, Stenlund et al., 2009). We chose this system of Qigong since it does not contain any religious nor superstitious connotations, and the practices are easily adaptable for any person, despite their age or state of health. It was also designed to be safely practised by large groups, so we consider it a suitable system for the school context. A more detailed description of Qigong can be found in the paper of Lugano and colleagues (2018).

1.2. Description of the Zhineng Qigong intervention in third grade of primary school

The program was scheduled and divided into four different parts based on Dr. Pang Ming's four verses that describe the ideal desirable state in which humans could live.

Four verses of Dr. Pang Ming

健康长诗　　Living in health with a long life

和谐自控　　Being harmonious with self-control

自由自觉　　Free with true- self-awareness

美满平等　　Enjoying perfect beauty and equality

Our focus was to hand over the essence of these four verses, explaining it to students accordingly to their level of understanding and inviting them to reflect and discuss if they agreed and considered this as desirable attributes in one's own life. Most importantly, we tried to convey a practical usage by illustrating Zhineng Qigong techniques with actual examples for daily life so they could better relate to them.

The methods we used in correlation to these four verses were Zu Chang Fa (Method for organising the field), Peng Qi Guan Ding Fa (Method for lifting and pouring Qi), Dun Qian

Fa (Method for squatting in front of a wall), Cheng Qi (Extend qi), La Qi (Pull Qi). General descriptions of these methods are presented elsewhere (Lugano et al., 2018).

Next, to the previously mentioned methods, only two new techniques were introduced during this school year:

Sleeping Gong is a relaxation method of lying down with the back on the floor, hands overlapping above the head and sole of feet in contact with each other. By itself, this posture helps to open and relax the main joints of shoulders and hips, and then is combined with visualisation to relax consciously part by part the whole body.

Focusing without blinking method: We first practised looking into a fixed object for about sixty seconds and then contested with each other trying to not blink for as long as possible. The goal of the exercise is not about winning but maintaining concentration and relaxation despite the awkwardness.

Apart from the Qigong practices in each class, we would include games to set up a playful ambient, and the games were always aimed to build up cooperativeness and trust in the group.

1.3.Aim of the paper

Aim of our research was to examine the effectiveness of the Zhineng Qigong program in a local school. We studied the effects of our workshops on student's strengths and difficulties by using two-way mixed research design. We included the comparison group, consisting of the same-age students from the same school that did not attend the workshops. We propose that emotional symptoms, hyperactivity, conduct and peer problems will decrease after the enrolment in the Zhineng Qigong program and that the prosocial behaviour would increase after the enrolment in the group of students who attended the workshops. We assume that based on the results of our pilot study that found small to moderate improvement in all the mentioned areas. We estimate there will be no difference in the comparison group in their strengths and difficulties due to not be exposed to intervention activities.

2. Method

2.1. Participants

We focused on the third graders of the Slovenian primary school *Osnovna šola Preserje pri Radomljah*. The intervention group was composed of 18 students aged nine years old, who had already participated in Zhineng Qigong in the previous year. They were already familiar with the methods and the team. The comparison group was composed of 16 students of the same age range from other classes at the same school, with whom we never had direct contact. The students, teachers and parents of the students that participated in the study served as informants of different aspects of student's behaviour by completing the SDQ questionnaires.

2.2. Instruments

We used the Slovene version of the Strengths and Difficulties Questionnaire (SDQ, Goodman, 1998) in our study. The questionnaire includes 25 items that comprise five scales,

each containing five items, that can be rated on a three-point scale from 0 to 2; where 0 means *not true*, 1 represents *somewhat true* and 2 means *certainly true;* scores ranging from 0 to 10. We used the version for parents and teachers, that is intended for four to 17-year-old children and another for students, aged 11-17 years old. The students in our sample were younger than that, but since teachers reported that they are used to filling in the questionnaires and that they will get help from their teachers, we decided to use it nonetheless. We did not consider the cut-off scores and only used the data from the questionnaire to compare their strengths and difficulties before and after the programme and between the intervention and comparison group.

The SDQ measures emotional symptoms (e.g. worrying, being unhappy, and having headaches), conduct problems (e.g. losing temper, fighting, and lying), hyperactivity (e.g. being restless, fidgeting, and easily distracted), peer problems (e.g. being picked on, not having friends), and prosocial behaviour (e.g. being nice, helpful and kind to others, and volunteering). First four scales, i.e. emotional symptoms, conduct problems, hyperactivity, and peer problems can be summed in a total difficulties score (ranging from 0 to 40) and the last one, i.e. prosocial behaviour represents the strengths.

2.3. Research design

We used a two-way mixed study design. We included two groups of students in our research. First group, the intervention group, consisted of students who were previously involved in Zhineng Qigong workshops and continued with workshops in the current school year. The second group consisted of students of the same school year who were not involved in Zhineng Qigong activities and represented the comparison group.

The study design was proposed to and agreed by the Ana Nuša Kern, the principle of the Primary school *Preserje pri Radomljah*, where we carried out the programme between February and May 2019. Information consents for participating students in the Zhineng Qigong programme and students in the comparison group were obtained from both groups of parents. Students, teachers, and parents of students of both groups filled in the baseline questionnaires before and the follow-up versions after the Zhineng Qigong intervention.

We calculated Cohen's *d* for each dimension of the SDQ questionnaire before and after the workshops. We also used a two-way mixed method ANOVA. Prior to ANOVA analysis, Kolmogorov-Smirnov test, Shapiro-Wilk test, and Q-Q Plots (for studentized residuals) were used to test for normality of the data as usually there is one of the assumptions of ANOVA (Field, 2009) that the dependent variable should be approximately normally distributed for each combination of the groups of the two factors. The testing of normality of the data showed quite significant deviations from normality; however, we continued with ANOVA analysis since Blanca, Alarcón, Arnau, Bono, and Bendayan (2017) via their Monte Carlo simulation demonstrated that *F*-test is robust to non-normality. All analyses were made via IBM SPSS Statistics for Windows, Version 21.0.

3. Results

We evaluated the Zhineng Qigong programme using the Strengths and Difficulties Questionnaires (SDQ) to measure emotional symptoms, conduct problems, hyperactivity, peer problems, and prosocial behaviour before and after the implementation of the program in both intervention and comparison group. Students, their parents and their class teachers filled in the

SDQ questionnaire before the Zhineng Qigong programme and after the programme. We present the descriptive statistics and the effect sizes in Table 1. Our results show moderate effect sizes in conduct and peer problems and total difficulties, based on students' reports. In other categories, based on the reports of at least one informant, we found small effect sizes. On the other hand, we found no significant changes in the categories of SDQ after the three months in the comparison group. Based on these results, we can assume that there were some positive changes in the behaviour of the students in the intervention group and not in the comparison group, which was not involved in the programme.

As stated in the previous section, the data were also analysed via 2x2 mixed ANOVA. However, it is essential to emphasise that no statistical correction was made for multiple comparison problem (e.g. Bonferroni correction). Because of the extensiveness of all the ANOVA results, only significant results will be presented.

Parents reported a statistically significant drop ($p = .03$) in total difficulties in both groups between initial and final testing, $F(1, 32) = 5.06$, $r = .37$. There was a significant interaction effect ($p = .03$) between the group and the time reported by students themselves in total difficulties, $F(1,64) = 5.09$. There was also a significant main effect ($p = .04$) of the time as reported by teachers in emotional symptoms, $F(1,31) = 4.75$, $r = .36$. Another significant main effect ($p = .01$) of the time was found as reported by teachers in prosocial behaviour, $F(1,31) = 8.54$, $r = .46$. There was no main effect in any of the measured variables at any of the three groups (i.e., parents, teachers, and students) of the group (i.e., comparison or intervention group), which indicates that intervention had no statistically significant effect on emotional or behavioural difficulties of students, based on these analyses.

Table 1
Descriptive statistics and effect sizes of SDQ measures before and after the workshops in both intervention and comparison group

	Intervention group (workshops) *N*=18							The comparison group (without workshops) *N*=16						
	Before the programme			*After the programme*				*Before the programme*			*After the programme*			
		M	*SD*		*M*	*SD*	Cohen's *d*		*M*	*SD*		*M*	*SD*	Cohen's *d*
Total difficulties[a]	Parents	8.89	4.51	Parents	6.78	4.82	0.452[c]	Parents	7.81	4.31	Parents	7.56	4.46	0.057
	Teachers	8.72	6.88	Teachers	6.53	5.46	0.353[c]	Teachers	6.19	4.17	Teachers	5.81	3.43	0.100
	Students	11.78	4.19	Students	9.11	5.12	**0.571[b]**	Students	10.00	4.44	Students	10.81	5.41	-0.164
Emotional symptoms	Parents	2.50	2.41	Parents	1.56	1.92	0.431[c]	Parents	2.31	2.09	Parents	2.19	1.64	0.064
	Teachers	2.72	2.65	Teachers	1.65	1.77	0.475[c]	Teachers	1.50	1.97	Teachers	1.13	1.71	0.201
	Students	2.50	1.86	Students	1.78	1.80	0.393[c]	Students	3.06	1.81	Students	3.13	2.22	-0.035
Conduct problems	Parents	1.72	1.60	Parents	1.65	1.62	0.043	Parents	1.31	0.79	Parents	1.38	1.50	-0.058
	Teachers	1.17	1.98	Teachers	1.00	1.62	0.094	Teachers	0.94	1.06	Teachers	0.81	1.05	0.123
	Students	2.28	1.60	Students	1.50	1.42	**0.516[b]**	Students	1.94	1.24	Students	2.00	1.51	-0.043
Hyperactivity	Parents	3.22	2.24	Parents	2.50	1.98	0.341[c]	Parents	3.00	1.83	Parents	2.81	1.97	0.100
	Teachers	3.44	2.79	Teachers	2.82	3.23	0.205[c]	Teachers	2.50	1.97	Teachers	2.50	1.97	0.000
	Students	4.11	1.94	Students	3.72	2.11	0.192	Students	2.75	1.81	Students	3.50	1.55	-0.445
Peer problems	Parents	1.44	1.10	Parents	1.17	1.20	0.235[c]	Parents	1.19	1.38	Parents	1.19	1.80	0.000
	Teachers	1.39	1.58	Teachers	1.06	1.25	0.232[c]	Teachers	1.25	1.53	Teachers	1.38	1.59	-0.083
	Students	2.89	1.02	Students	2.11	1.68	**0.561[b]**	Students	2.25	1.29	Students	2.19	1.52	0.043
Prosocial behaviour	Parents	8.39	1.20	Parents	8.22	1.31	0.135	Parents	8.13	1.31	Parents	8.31	1.62	-0.122
	Teachers	7.28	2.61	Teachers	8.06	1.82	-0.347[c]	Teachers	8.25	1.69	Teachers	8.69	1.58	-0.269
	Students	7.17	2.41	Students	7.83	1.95	-0.301[c]	Students	7.38	2.31	Students	7.75	1.81	-0.178

Notes. *M* – mean; *SD* – standard deviation; [a]Sum of scales Emotional symptoms, Conduct problems, Hyperactivity and Peer problems; [b]moderate effect size; [c]small effect size; according to Cohen's criteria (1988).

4. Discussion

The purpose of our study was to evaluate the possible benefits on emotional, behavioural, and interpersonal aspects that primary school students could get from participating in a Zhineng Qigong programme.

We want to draw attention to the fact that when we carried out the Pilot Study (Lugano et al., 2018) in the previous year the scores of Total Difficulties index in the intervention group at baseline were relatively high. The principal of the school chose this specific group among the whole school population for us to carry the study, due to the high level of problems that they denounced before the intervention. In other words, we initiated the study with the most "problematic" group of the school, and even after the successful intervention that reflected in improvements in the SDQ scores, still at the beginning of this second intervention the Total Difficulties scores were somewhat higher than those in the comparison group. Following this group's progress for two consecutive years now, we estimate that if we continue with our programme, we could expect even better results. When comparing the results of the Total Difficulties from both groups after the intervention, the intervention group's scores outdo the comparison group's scores except from the teacher's perspective, and even there the difference is insignificant.

Comparison of the results before and after the intervention, calculated by Cohen's d, shows that the group who attended the Zhineng Qigong programme present a decrease in emotional symptoms conduct problems, hyperactivity, and peer-related problems while an increase of prosocial behaviour. Changes represent a small to moderate overall improvement, while in the control group, the variability of those same measurements is at best insignificant, and in some cases, even tend to aggravate slightly. In other words, if this tendency would continue invariably, we could expect the previously regarded as "problematic" group to become a "model" group.

Another noticeable change from our previous research to this year's research is that while in last years' second grade the students did not perceive much change by themselves and instead other informants, namely parents and teacher, noticed and denounced the positive results of the intervention. At that time, we adjudicated this to the relative immature capability of self-observation of the 8-year old students. Interestingly, only one year later, are the students the ones who denounce most considerable improvement, which suggests a deepening in self-awareness and self-judgement along with strengthening mechanisms of self-regulation of conduct and behaviour. On the other hand, the development of different mental processes could also result in students having higher expectations regarding the effects of the intervention. This year they were more aware that their group is involved in the study as an intervention group and that there are other students involved in the study but do not get any attention in the form of Zhineng Qigong workshops. These circumstances could have also influenced their perception of different aspects that were measured with SDQ.

4.1.Limitations of the study and suggestions for further research

There were two challenges that we faced during our programme. First one was the time given for implementation of Zhineng Qigong practice. Three months of practice, which means 14 sessions – one 45 min session per week, is a relatively short period and small amplitude to mark more significant changes in scales that were researched.

Another challenge was correctly filled questionnaires. Some of them were useless because they were not filled by the same parent, what means that a point of view and opinion on the child's improvement or regression was different accordingly who filled a questionnaire before or after a project. Some of the parents filled questionnaires before the start of the research, but not when the research was finished. In that way we had to exclude those cases, which represent a significant loss since we were dealing with a small sample. The small sample size is also a significant limitation of our study.

In the future, we suggest including a more considerable number of students in the study. It would also be beneficial to include a comparison group that would be in contact with the Zhineng Qigong practitioners, but the work would not include Zhineng Qigong elements. This improvement could, in some way eliminate the placebo effect in the intervention group in which students can be aware of the possible improvements due to workshops. We could improve the validity of our finding also by adding the additional measurements after a significant period after the end of the workshops.

5. Conclusion

The comparison of SDQ results before and after the programme in the intervention and comparison group partially confirm our hypothesis of Zhineng Qigong being an effective way to enhance and benefit the learning environment in school by impacting the emotional, behavioural and interpersonal states of primary school students. However, based on the results of 2x2 ANOVA, we found no main effects in any of the measured variables at any of the three groups (i.e., parents, teachers, and students) of the group (i.e., comparison or intervention group). Further research on this matter would be beneficial in understanding the Zhineng Qigong effects on students in the school environment.

6. Literature

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