ORIGINAL RESEARCH

Psychological Effects of Yi Ren Medical Qigong and Progressive Resistance Training in Adults With Type 2 Diabetes Mellitus: A Randomized Controlled Pilot Study

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ABSTRACT

Background • Previous studies suggest that qigong therapy has physiological benefits for adults with type 2 diabetes; however, information about the psychological benefits of qigong therapy in this population is limited.

Objective • The objective of this research project was to identify psychological responses to qigong vs control interventions in adults with type 2 diabetes.

Design • The research team designed a randomized, controlled, three-arm clinical trial comparing 12 weeks of Yi Ren Medical Qigong (YRMQ), progressive resistance training (PRT), and standard care.

Setting • The study was performed at Bastyr University Research Institute, Kenmore, Washington.

Participants • Participants were 13 men and 19 women (N = 32) with diagnosed type 2 diabetes, a mean age of 56.3 ± 8.1 (standard deviation) years, glycated hemoglobin > 7.5%, and fasting blood glucose > 7 mmol/dL (126 mg/dL).

Intervention • For 12 weeks, participants in the YRMQ and PRT group attended a 1-hour weekly group session that a certified instructor led and were instructed to practice at least twice a week for 30 minutes.

Primary Outcome Measures • The research team used the Perceived Stress Scale and the Beck Depression Inventory scores to analyze the data.

Results • YRMQ decreased perceived-stress scores by 29.3% ($P < .05$) and depression scores by 14.3% (not significant [NS]). The active control group, PRT, also decreased stress scores by 18.6% (NS) and decreased depression scores by 50% ($P < .03$). Stress and depression measures remained unchanged in the standard care group.

Conclusion • YRMQ and PRT may be beneficial in reducing perceived stress and improving depression in patients with type 2 diabetes, although verification of the clinical significance of these findings requires a longer study with a larger sample size. (*Altern Ther Health Med.* 2012;18(1)30-34.)

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Psychological distress, specifically mental stress and depression, is related to impaired glucose management and may also play a causal role in the development of type 2 diabetes; however, its role is not completely understood.[1-4] For instance, when exposed to high psychosocial stress in their work environment, women had a greater risk of developing type 2 diabetes.[3] Conversely, the need for daily self-monitoring of diet and blood glucose levels may contribute to the higher levels of psychological distress observed in this population.[4]

Unfortunately, undiagnosed depression occurs in about 45% of patients with type 2 diabetes.[5] Little is known about the association of depression with chronic illnesses, including type 2 diabetes, although the relationship between depression and glycated hemoglobin (HbA1c) levels appears to be more significant in women with type 2 diabetes than in men.[6] Early detection of depression is beneficial for optimal treatment because depressive symptoms may be a predictor of poor self-care in diabetes.[7]

To help manage mental stress, the American Diabetes Association recommends that patients learn to relax through breathing exercises, progressive relaxation therapy, exercise, and positive thinking.[8] Aerobic exercise and resistance training have demonstrated that they reduce stress in the general population[9] and lower blood glucose levels in type 2 diabetic patients.[10,11] Recent clinical research shows the benefits of mind-body therapies, such as qigong therapy,[12,13] tai chi,[14] yoga,[15] progressive relaxation technique,[16] and mindfulness-based stress reduction[2] as adjunctive treatments to provide relief from diabetes-related symptoms. In the current study, the research team used a Yi Ren Medical Qigong (YRMQ) protocol specifically designed to treat patients with type 2 diabetes.

YRMQ is a novel system based on *qi* or "vital energy" with origins in the Complete Reality School located in northern China. For more than 3000 years of recorded history, the Chinese have used thousands of different qigong forms.[17] Qigong is part of traditional Chinese medicine (TCM), which works with *qi* as a key feature of human psychology, physiology, and biology for healing and improving health conditions. Gong simply means the results or outcomes of training and practice. *Yi* stands for the way of change and the laws of different energy interactions in the natural world, and *ren* means *human*. The Chinese designed most forms of qigong not for the purpose of treating or curing disease but rather of maintaining health or cultivating spiritual well-being. The various styles of qigong differ in form, type of body movement, methods of breathing, use of self-massage, and practice of meditation. Individuals may practice it alone or in a group setting.

One unique aspect of YRMQ includes an effective *qi* activation and initiation where practitioners perform all exercises with a heightened sense of feeling, focus, and awareness. This heightened sensation of *qi* promotes self-awareness of internal energy conditions and helps to nourish, heal, and harmonize internal organ systems. Additionally, our research team designed its YRMQ training program specifically to treat type 2 diabetes. The design involves a liver-excess-energy-releasing exercise; a pancreas-empowering exercise; and a liver and pancreas–harmonizing exercise.

Though demonstrating favorable results, recent systematic reviews of studies evaluating the psychological and biological effects of different forms of qigong therapy suggest that a majority of the studies had methodological flaws[13,18]; thus, their results may be unreliable. Concerns about previous studies include poor monitoring of compliance, high loss to follow-up, lack of randomization, and other issues regarding the qigong intervention. This article presents the results for psychological outcomes that the research team evaluated before and after a controlled 12-week intervention of qigong in adults with type 2 diabetes, using validated measures of stress and depression. We have previously reported[19] the effects of YRMQ on fasting blood glucose and insulin on these study participants.

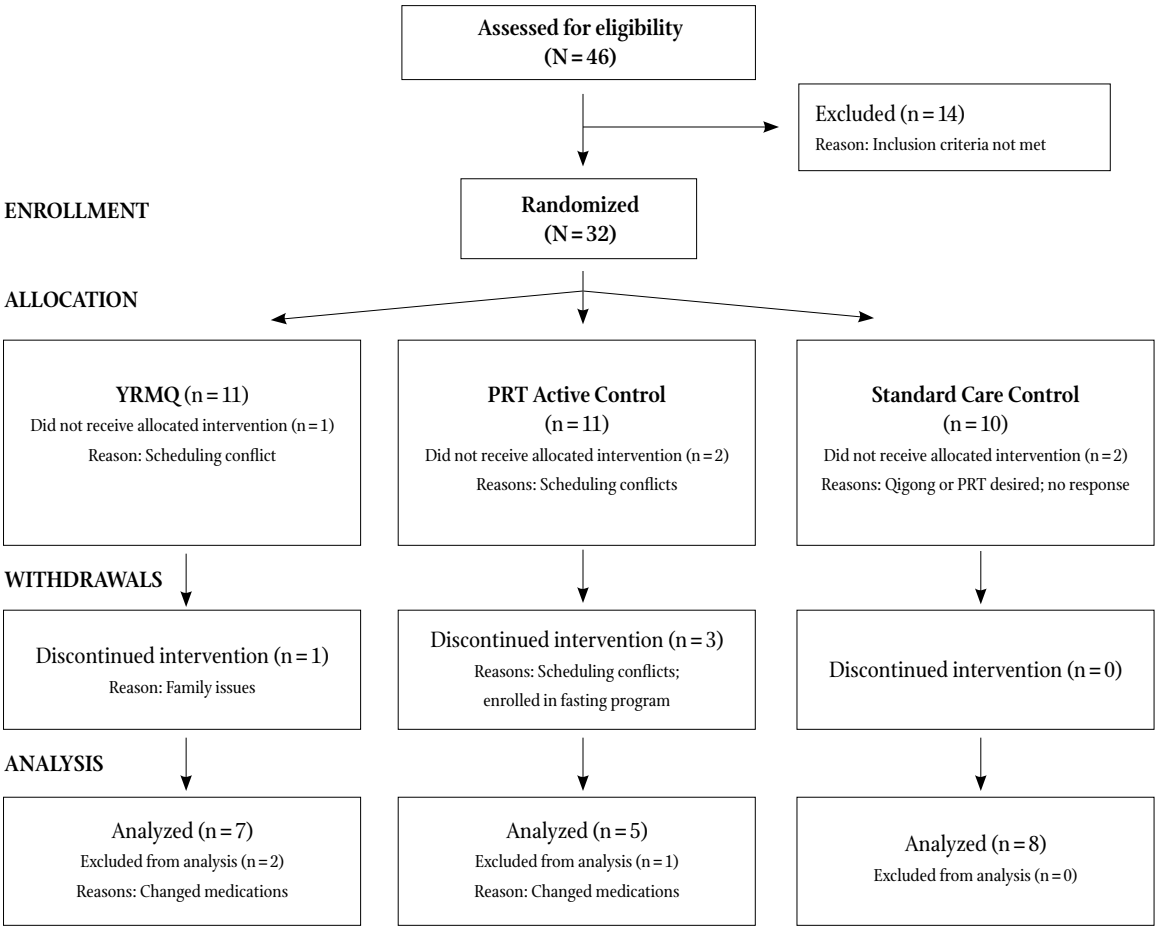
RESEARCH DESIGN AND METHODS

The research team collected and analyzed all data at Bastyr University's Research Institute in Kenmore, Washington. Medical physicians diagnosed participants (N = 32) with type 2 diabetes, and the participants met the inclusion criteria consisting of an HbA1c level greater than 7.5% and a fasting blood glucose greater than 7 mmol/dL (126 mg/dL). The research team randomly assigned age- and sex-matched participants (N = 32, 13 men and 19 women) to one of three groups for a 12-week intervention period. The first cohort (n = 14) started in August 2007, and the second cohort (n = 18) began in February 2008. The team asked all participants to maintain their conventional diabetes care—including medications, diet, and exercise—during the study. None of the participants were taking insulin; however, all were taking oral diabetes medication. Group 1 (n = 11) received the YRMQ intervention; group 2 (n = 11) received the progressive resistance training (PRT) intervention as an active comparator; and group 3 (n = 10) served as the standard care control group. The intervention consisted of weekly YRMQ or PRT sessions in groups (60 min/wk) that certified instructors led. In addition, the research team asked participants in both active treatment groups to practice at home twice a week for 30 minutes per session.

The objective of this research project was to determine the psychological effects of YRMQ and PRT therapy in patients with type 2 diabetes. Before and after the intervention, the team assessed participants' perceived stress using the Perceived Stress Scale (PSS) and determined depression using the Beck Depression Inventory (BDI). Researchers have validated both evaluation tools[20,21] and frequently use them in research. PSS is a 10-item self-report questionnaire that measures an individual's evaluation of the stressfulness of life situations. A lower PSS score indicates less stress. BDI is a 21-question, multiple-choice, self-report inventory for measuring severity of depression. A lower BDI score indicates less depression. The research team also assessed fasting blood glucose and insulin and HbA1c throughout the intervention. Bastyr University's Institutional Review Board approved the research protocols, and the research team obtained informed consent from all 32 participants.

The research team has expressed all data as mean ± standard deviation and has used two-tailed, paired *t*-tests to compare mean values before and after treatment within groups. The team used an analysis of variance with a quadratic polynomial approach to determine the significance of trends and performed Spearman's rank test and regression analyses to detect any correlations between variables. The team considered $P < .05$ (two-tailed) to be statistically significant and performed all statistical analyses using the Statistical Package for Social Science, version 16 (SPSS, Chicago, Illinois).

Figure 1. Participant Flow Chart



Abbreviations: PRT, progressive resistance training; YRMQ, Yi Ren Medical Qigong.

RESULTS

Of the 251 phone-screened participants, the research team evaluated 46 participants at Bastyr University (Figure 1). Among them, 32 met the inclusion criteria, and the team randomized them into one of three groups: YRMQ, PRT, or standard care control. Thirteen men and 19 women had a mean age of 56.3 ± 8.1 years and mean body mass index of 31.8 ± 6.0 kg/m^2. The Table presents information regarding the baseline values of the study's participants. Baseline measurements for PSS and BDI were not statistically significant between the groups ($P > .67$ and $P > .69$, respectively). A total of nine participants dropped out of the study (two from the control group, five from the PRT group, and two from the YRMQ group), and the research team excluded three from analysis (one from the PRT group and two from the YRMQ group) as a result of changes in their medications. The research team reported no adverse events in the intervention groups.

YRMQ significantly decreased perceived stress scores by 29.3% ($P < .05$) (Figure 2) and decreased depression scores by 14.3% (not significant [NS]) (Figure 3). PRT decreased perceived stress scores (–18.6%; NS) and significantly decreased depression scores by 50% ($P < .03$). The usual care control group did not have

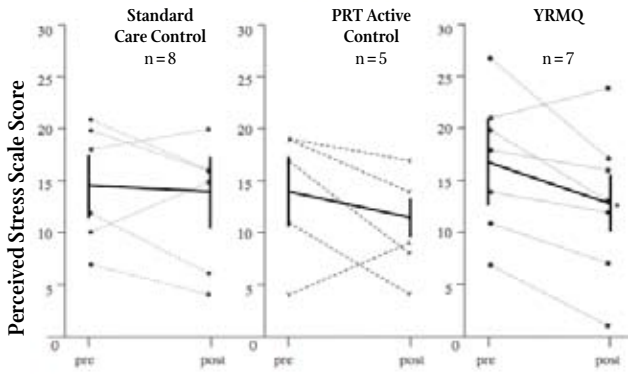
Table. Demographics and Baseline Values

	Standard Care Control	PRT Active Control	YRMQ	*P*-value
Age (y)	59.4 ± 6.8	58.4 ± 7.4	57.0 ± 6.3	.84
BMI (kg/m^2)	31.2 ± 4.0	31.1 ± 4.0	32.0 ± 6.5	.94
HbA1c (%)	7.9 ± 0.8	8.6 ± 1.2	8.8 ± 1.1	.66
PSS Score	14.4 ± 5.5	14.0 ± 6.5	16.9 ± 6.7	.67
BDI Score	5.0 ± 3.1	5.2 ± 2.6	7.4 ± 8.8	.69

Abbreviations: BDI, Beck Depression Inventory; BMI, body mass index; HbA1c, glycated hemoglobin; PRT, progressive resistance training; PSS, perceived stress score; YRMQ, Yi Ren Medical Qigong.

[a] Data are mean ± standard deviation.
[b] No statistically significant differences between groups at baseline.

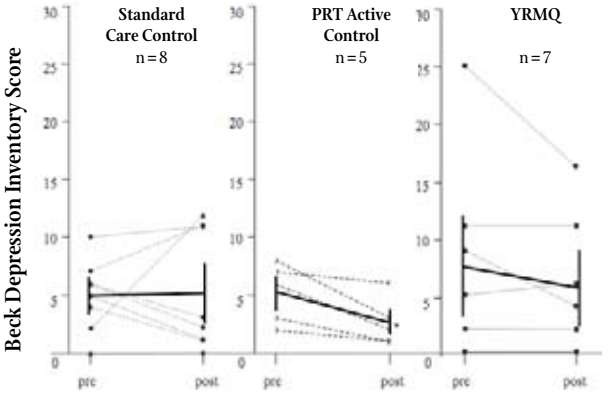
Figure 2. Perceived Stress Scale Scores Before and After Intervention for Each Participant



Dark solid lines indicate the mean ± standard deviation; *t*-test preintervention (pre) and postintervention (post), $P = .05$.

Abbreviations: PRT, progressive resistance training; YRMQ, Yi Ren Medical Qigong.

Figure 3. Beck Depression Inventory Scores Before and After Intervention for Each Participant



Dark solid lines indicate the mean ± standard deviation; *t*-test preintervention (pre) and postintervention (post), $P = .03$.

Abbreviations: PRT, progressive resistance training; YRMQ, Yi Ren Medical Qigong.

any statistically significant changes in their level-of-stress (–2.8%; NS) or depression scores (+2.0%; NS). Correlations performed using Spearman's rank test revealed a positive correlation between PSS and BDI scores ($r^2 = 0.49$; $P < .03$; $n = 20$). Additionally, we observed a strong positive correlation between the change in PSS and BDI scores from baseline (week 0) to final (week 12) only in the YRMQ group ($r^2 = 0.88$; $P < .01$; $n = 7$).

As the research team has previously reported,[19] YRMQ training resulted in significant reductions in fasting glucose levels in patients with type 2 diabetes and demonstrated trends toward improvement in insulin resistance and HbA1c.

DISCUSSION

Mental stress and depression may exacerbate physiological symptoms associated with type 2 diabetes and contribute to poor adherence to diet and exercise. After 12 weeks of YRMQ, a significant reduction in participants' perceived stress was observed in this study. This finding is consistent with previous qigong studies that have observed positive effects on stress[22,23]; however, to our knowledge, other researchers have conducted only one study with patients with type 2 diabetes.[12] Previous reports involving nondiabetic populations identified decreases in stress following qigong practice in hospital staff[22] and in computer workers.[23] Controlled and relaxed breathing and slow movement that involves large muscle groups may be in part responsible for the favorable effects of qigong on stress reduction.

YRMQ also decreased depression scores in this study, which is consistent with an earlier finding illustrating psychological improvements in anxiety and mood with qigong relaxation therapy in adults with type 2 diabetes.[12] Earlier research looking at the effects in an elderly population also showed relief from depression following regular qigong exercise.[24] Another report indicated that qigong had an effect on attenuating anxiety and depression in patients undergoing chemotherapy.[25] Additionally, the prevalence of psychological stress in type 2 diabetic patients may be associated with an increase in depressive symptoms.[1] Though differing in magnitude, the current study showed a decrease in perceived stress and depression in both intervention groups, suggesting that a relationship exists between stress and depression. Only the YRMQ group, however, exhibited a strong positive correlation between the psychological effects observed. In the standard care control group, the changes in stress and depression were negligible.

Participants in the PRT group also experienced positive effects on depression and perceived-stress scores. To our knowledge, this study is the first to report the significant effect of PRT on depression in this population. The research team speculates that resistance training reduces stress in type 2 diabetic patients, which contributes to the improved glucose management. Previous studies indicate better glucose management following resistance training[10,11]; however, we observed no improvement in blood glucose concentration during the 12 weeks of PRT in the current study.[19] When compared with the standard care control group, PRT showed some benefits in maintaining glucose levels. Furthermore, one of the studies that looked at the effects of PRT explained that adverse events were more common in the exercise groups, and the generalizability of their results to patients who have difficulty adhering to exercise programs is uncertain.[10] This result suggests that more intense exercise programs may not be suitable for all type 2 diabetic patients, especially the elderly.

While the research team was able to address some of the limitations of previous research on qigong and diabetes by performing a randomized controlled trial, several limitations to the current study exist. First, since it was a pilot study, the number of subjects was very small, thus precluding the team's ability to draw strong conclusions about the effects. Second, the length of the intervention was only 12 weeks, and many participants took 3 to 4 weeks to develop a regular practice of qigong or PRT and to start observing effects. Based on our study's outcomes, we suggest that type 2

diabetic patients should practice qigong daily to have a better effect on alleviating diabetes-related symptoms. Thus, a longer intervention may be necessary to observe larger clinical and statistical effects. In spite of these limitations, however, we were able to observe statistically significant changes in stress and depression scores in the study's participants, providing important data for future large-scale clinical trials.

CONCLUSIONS

In conclusion, YRMQ and PRT may be beneficial in reducing perceived stress and improving depression in patients with type 2 diabetes. Thus, YRMQ and PRT may be effective adjunctive therapies in the treatment of type 2 diabetes, although verification of the clinical significance of these findings requires a longer study with a larger sample size.

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