

Effect of Reiki and Qi-gong therapy on improving negative emotional states of anxiety, depression, and stress among Type-2 Diabetic patients

Nagwa Ahmed Souilm

Assistant Professor, Psychiatric Mental Health Nursing, Faculty of nursing, Beni-Suef University, Egypt

Abstract

Diabetes is a worldwide chronic disease with high prevalence especially in developing countries. In addition to its physical complications, diabetic patients are at high risk of suffering a wide spectrum of psychological disorders as negative emotions. **Aim:** To evaluate and compare the effectiveness of Reiki and Qi-gong therapy techniques in improving diabetic patients' negative emotional states. This quasi-experimental research design was carried out at the National Institute of Diabetes and Endocrinology's Hospital in Cairo, Egypt. It included 200 Type 2 diabetes patients randomized into two equal groups, one for Qigong and one for Reiki techniques. A self-administered questionnaire with a standardized tool (Depression Anxiety Stress Scales [DASS]) was used in data collection. The intervention programs were administered in the form of instructional guidelines through eight sessions for each group. The results showed that the two study groups had similar socio-demographic characteristics. After implementation of the intervention, most patients in the two groups were having no anxiety, no depression, and no stress. Statistically significant improvements in all three parameters in both groups ($p < 0.001$). The multivariate analysis identified the study intervention as the main statistically significant independent negative predictor of the patients' scores of anxiety, depression, and stress. Reiki technique was also a statistically significant independent negative predictor of these scores. Both Reiki and Qi-gong therapy techniques were effective in improving diabetic patients' negative emotional states of anxiety, depression, and stress, with slight superiority of the Reiki technique. The inclusion of these techniques in the management plans of Type-2 diabetic patients is recommended.

Keywords: Reiki, Qi-gong, Negative Emotional States & Type-2 Diabetes.

Introduction

Diabetes is a worldwide chronic disease due to a disorder in the metabolism of blood glucose. It has high prevalence rates especially in developing countries and is associated with 1.5 million deaths per year. It showed increasing trends over the last few decades (WHO, 2020). Egypt has high prevalence rates of diabetes reaching 20.9% among 20-79 years old, and it ranks tenth highest country in the global ranking of age-adjusted DM prevalence (Sayed et al., 2022).

Type-1 diabetes mellitus (T1DM) is attributed autoimmune destruction of the β -cells of the pancreas which are responsible for insulin secretion. Meanwhile, in Type-2 diabetes mellitus (T2DM), which is the more prevalent, patients, suffer from insulin resistance. These two types are widely different in their etiology, epidemiology, complications, and prognosis although some cases may pose some ambiguity in diagnosis (Laspe et al., 2022).

Diabetic patients may on the long-term suffer low quality of life due to its physical and psychological complications attributed to macro- and micro-vascular changes leading to renal, retinal, peripheral vascular, cardiovascular, and neurological diseases (Ali et al., 2022). Moreover, their risk of death diabetic patients is 1.5 times higher than the general

population. Yet, the advances in the treatment modalities of diabetes with the new technologies led to improvements in the life expectancy and prevention of complications among these patients (Kulzer, 2022).

In addition to the physical complications associated with Type-2 DM, these patients are at high risk of suffering a wide spectrum of psychological disorders. Thus, diabetic patients are more likely to have negative emotions such as anxiety, depression, and stress (Khashayar et al., 2022). Research has demonstrated high prevalence rates of these psychological problems among diabetic patients (Al-Mohaimed, 2017; Alajmani et al., 2019 & Alzahrani et al., 2019). The association between these negative emotion symptoms and diabetes and its trajectory seem to be complicated and bidirectional (Cárdenas, et al., 2022). For instance, stress and anxiety can increase the risk of developing Type-2 DM through its deregulatory effect on the hypothalamic-pituitary-adrenal axis, thus initiating resistance to insulin (Merswolken et al., 2012). Moreover, depression among was shown to increase the risk of diabetic retinopathy among diabetic patients (Sun et al., 2022).

The management of Type-2 DM has greatly evolved during the last few decades, with technological advances reflected on its treatment modalities

including self-monitoring, precise insulin titration, and insulin pump, and smart insulin pens (Simmons & Riddley, 2022). Added to these are the advances in pharmacotherapy (Kobayati et al, 2022), telehealth (Kasturiratne et al., 2021), and mobile applications (Lee et al., 2022).

Complementary and alternative medicine have also added to the effectiveness of treatments of Type-2 DM, and research demonstrated better patient outcomes in multi-approaches compared to mono-approaches in its management (Alanazi et al, 2022). Reflexology, which is based on application of pressure on hands and feet is one of these approaches (Whatley et al, 2022). Reiki is a biofield therapy technique based on energy healing, developed by the Japanese Mikao Usui of Kyoto in the 19's. In this technique, energy is guided by therapist's hands placed near patient's body to activate the ability of the body to heal and restore its balance (Zadro & Stapleton, 2022). It demonstrated successes in management of fatigue in breast cancer patients on chemotherapy (Karaman & Tan, 2021), sleep disorders (Costa et al., 2022), hypertension and alcohol consumption (Pérez Briones et al., 2022), children on palliative care (Thrane et al., 2022), and cerebral palsy (Love et al., 2022).

Meanwhile, Qigong technique is a type of mind-body meditative exercise developed in traditional Chinese medicine more than 5000 years ago. It involves coordination of breathing and physical movement with mental energy to promote cognitive performance (Chan et al., 2019 & Zheng et al., 2020). It showed effectiveness in the management of patients with knee osteoarthritis (Chao et al., 2021), atrial fibrillation (Oesterle et al., 2022), pulmonary rehabilitation for COPD (Gauthier et al., 2022), and hypertension (Kohl-Heckl et al., 2022).

Significance of the study

Diabetes mellitus represents a major public health problem in Egypt, with increasing trends. Although recognizing and addressing its related psychological symptoms is of great importance in its management, this still remains suboptimal. Inexpensive complementary medicine approaches like Reiki and Qi-gong therapies could be of help.

Aim of the study

To evaluate and compare the Effect of Reiki and Qi-gong therapy on improving negative emotional states of anxiety, depression, and stress among Type-2 Diabetic patients.

Research hypotheses.

H₍₁₎: Type-2 Diabetic patients receiving either Reiki or Qi-gong therapy intervention will have significantly lower scores of anxiety, depression, and stress.

H₍₂₎: Type-2 Diabetic patients receiving either Reiki therapy intervention will have significantly lower scores of anxiety, depression, and stress in comparison with those receiving Qi-gong therapy intervention.

Participants and Methods

Research design:

The study was carried out using a quas-experimental research design.

Setting:

The study was conducted at the National Institute of Diabetes and Endocrinology's Hospital. The institute is one of the oldest public hospitals and educational institutes established in 1975. Its governmental hospital with 140-bed capacity provides specialized diabetes care services to Cairo as well as whole country patients.

Participants:

The study sampling population consisted of all patients suffering from Type 2 diabetes attending the setting during the time of the study. Patients were recruited in the study sample with the inclusion criteria of having Type 2 diabetes diagnosed based to ADA criteria, with unchanged antidiabetic therapy, and having a diagnosed negative emotional state (depression, anxiety, stress). Patients with diagnosed severe psychiatric or neurological disability or addiction, unable to perform the intervention techniques, or enrolled in other clinical trials were excluded. The sample size required was computed to demonstrate a difference in patients' scores of anxiety, depression, or stress with a moderate effect size (0.42) between the two intervention groups. Using the G*power software program the required sample size for a 95% level of confidence and 80% power was ninety participants per group. This was increased to one hundred to compensate for an expected 10% attrition.

A total of 260 patients were screened for eligibility, of whom two hundred were eligible (Figure 1). These were randomized into two equal groups, one for Qigong and one for Reiki techniques, using simple randomization technique. All patients in both groups continued throughout the study phases, complied with the study interventions, and were included in the statistical analyses.

Data collection tools:

The researcher used a self-administered questionnaire with a standardized tool (Depression Anxiety Stress Scales [DASS]) for assessment of depression, anxiety, and stress, along with a section for patients' demographic and health characteristics such as age, gender, marital status, duration of diabetes, treatment modalities, body mass index, and glycemic control.

The DASS tool is a self-report scale used to assess three negative emotional states, namely anxiety, depression, and stress. The scale was developed for both research work and clinical application (Lovibond & Lovibond, 1995). It has forty-two statements equally divided into three dimensions (anxiety, depression, and stress) with fourteen statements each. The Arabic version of the scale was used in this study (Moussa et al., 2001).

Scoring:

The response to each statement is on a 4-point scale ranging from “Do not apply to me at all” to “Applies to me very much, or most of the time.” These are scored from zero to three, respectively. The total score for each of the three dimensions is computed by simple summation of the scores of its fourteen statements. A higher score of the anxiety dimension denotes that the respondent is apprehensive, shaky, may experience sweating of palms, breathing difficulties, and tachycardia, with possible loss of control. A high total depression score indicates that the respondent is slow, gloomy, pessimistic about future, unable to enjoy or to be involved, and lacks initiative. Lastly, a respondent with higher score in the stress dimension is likely to be tense, irritable, easily upset, jumpy, and not tolerating delays or interruptions. Although the scale is meant to be quantitative, its instructions manual set levels for categorization of the severity of symptoms of depression, anxiety, and stress respectively as follows: None (<10, <8, <15); Mild (10-13, 8-9, 15-18); Moderate (14-20, 10-14, 19-25); Severe (21+, 15+, 26+).

Validity and reliability of the tool

The reliability and validity of the scale was documented in previous studies (Crawford & Henry, 2003; Page et al., 2007). Moreover, a standardized Arabic form the scale was used in the study (Moussa et al., 2001). Thus, it needed no more validation. Additionally, its internal consistency was assessed in the current study, and it demonstrated high levels of reliability with Cronbach’s alpha coefficient as high as 0.994. Meanwhile, the prepared self-administered questionnaire was presented to five experts in psychiatric nursing to review the demographic and health characteristics section, and to arbitrate the relevance of the scale for the study aim.

Pilot study:

A pilot study was carried out on ten patients representing 10% of the required sample size to examine the clarity of the data collection form as well as the feasibility of the research process. Slight modifications were needed based on the pilot results, and the tool was finalized. The pilot patients were not included in the main study to avoid information bias.

Administrative and ethical considerations. All methods were carried out in accordance with relevant guidelines and regulations. The study approval was obtained from The Ethical Committee at the Faculty of Medicine, Beni-Suef University, Egypt; approval number (0006240). An informed written consent was obtained from each patient at recruitment. The clinical trial was registered in the “Clinical Trials.gov Protocol Registration and Results System (<https://clinicaltrials.gov/ct2/show/NCT05704465?cond=reiki+and+qigong&draw=2&rank=1>) registration number is (NCT05704465) and the full date of first registration is 9/1/ 2023.

The study procedures complied with all pertinent research ethics. The researcher clearly explained the aim of the study and its procedures to each potential participant, informed eligible ones of their rights to refuse or withdraw at any time, and invited them to participate. They were reassured that any obtained information would be confidential and only used for research purposes.

Fieldwork

This involved assessment, planning, implementation, and evaluation phases.

Assessment phase: In this phase, the researcher recruited two hundred participants fulfilling the eligibility criteria. They were given the data collection form along with instructions regarding its filling and were asked to complete it. Each participant took 20-30 min to fill the form. The filled forms were collected and revised for completeness. The information obtained at this phase was considered as the pre-intervention data. Then, each patient was randomly assigned to either the Reiki or the Qi-gong therapy group using a simple randomization technique.

Planning phase:

This phase involved preparation of the intervention programs to be implemented in each of the two groups. This was based on a review of pertinent literature taking account of participants’ identified needs. The intervention program for each type of the two therapies involved three theoretical sessions for knowledge background about diabetes and negative emotional state, four practical sessions, and one final session for recapitulation and evaluation. The training programs were validated by three experts in psychiatric nursing. They approved its feasibility and relevance.

Implementation phase:

The intervention programs were administered in the form of instructional guidelines through eight sessions for each of the two groups. The program lasted 4 weeks and comprised eight sessions. Each session duration was 50-90 min. The sessions were administered in small groups of 4-5 patients.

Reiki therapy technique: In the first session, the researcher explained the aim and objectives of the intervention program to participants and briefed them with the sessions' schedule and the procedures to be followed throughout the intervention. The second session focused on knowledge about negative emotional state (anxiety, depression, stress), covering its meaning, signs and symptoms, and levels of severity. The third session discussed the basics of Reiki technique and its concept, mode of action, and process. The fourth through seventh sessions were practical sessions. During the practical session, a Reiki practitioner moves his/her hands close to the patient's body in a set of positions. Each hand position focuses on a different part of the body including the head, shoulders, stomach, and feet. The hands are held in position for 3 to 10 minutes, depending on patient's needs. Each session lasted between 60 and 90 minutes. By the end of the session, the patient and therapist reflect on their experience and the emotions with the technique. The eighth session was a recapitulation of the program and ended with evaluation or post-testing.

Qi-gong therapy technique: The first and second sessions were like those in the Reiki technique group. The third session addressed the concept and basics of Qi-gong therapy. The fourth to seventh sessions involved patients' carrying out simple movements and breathing techniques. In these sessions, the patient does not need to undress since "Qi" is thought to pass through air and clothing. Qigong exercises are mostly performed in standing position, making it easier to all ages and levels of fitness. The practitioner is at about a one-foot distance from the patient's body, to guide and manipulate movements. Breathing patterns are like yoga, with Qigong movements in a mindful link to inspiration and expiration, with incorporation of deep diaphragmatic breathing. The patient may have different feelings like heat or coolness, tingling, vibration, or twitches. The eighth session was similarly for program recapitulation and post-testing.

The interventions were delivered in each study group in small subgroups of 4-5 patients. The sessions were administered twice per week from 10:00 am to 1:00 pm. The participants in each group were instructed to use self-treatment and repetitive learning using a cassette tape and recorder. They were asked to listen to the instructions and apply them at least once per day.

Evaluation phase:

In this phase, the researcher administered patients a post-intervention test to assess the effectiveness of the implemented interventions using the same data

collection form used in pretest. The fieldwork lasted for 8 months, from January to September 2022.

Statistical analysis:

Data were presented using frequencies and percentages for categorical ones and means and standard deviations and medians for numeric ones. Cronbach alpha coefficient was computed to assess DASS scale reliability. Comparison of numeric data was performed using Student t-test or the non-parametric Mann-Whitney test as suitable. For categorical data, Chi-squared or Fisher exact test with or without Freeman-Halton extension for tables larger than two-by-two. Spearman rank correlation analysis was used to examine the correlations among DASS dimensions and with patients' age and duration of diabetes. Multivariate regression analysis was performed to identify the independent predictors of DASS score. The level of statistical significance was considered at $p < 0.05$. All data management was performed on IBM SPSS Statistics for Windows, version 20 (IBM Corp., Armonk, NY, USA).

Results

Table (1): socio-demographic characteristics of patients in the two studied groups (n = 200)

	GROUP				X ² test	P-value
	Qigong (n=100)		Reiki (n=100)			
	No.	%	No.	%		
Age:						
<20	10	10.0	11	11.0		
20-	41	41.0	42	42.0	6.29	0.10
40-	37	37.0	24	24.0		
60+	12	12.0	23	23.0		
Gender:						
Male	50	50.0	42	42.0		
Female	50	50.0	58	58.0	1.29	0.26
Marital status:						
Unmarried	54	54.0	46	46.0		
Married	46	46.0	54	54.0	1.28	0.26
Residence:						
Urban	57	57.0	64	64.0		
Rural	43	43.0	36	36.0	1.03	0.31

Table (2): Health characteristics of patients in the two studied groups (n = 200)

	GROUP				X ² test	P-value
	Qigong (n=100)		Reiki (n=100)			
	No.	%	No.	%		
Duration of diabetes:						
<5 years	45	45.0	58	58.0		
5+ years	55	55.0	42	42.0	3.38	0.07
Glycemic control:						
Poor	54	54.0	47	47.0		
Good	46	46.0	53	53.0	0.98	0.32
Treatment:						
Oral	37	37.0	47	47.0		
Oral + insulin	41	41.0	30	30.0	2.92	0.23
Insulin	22	22.0	23	23.0		
BMI:						
<25	46	46.0	56	56.0		
25+	54	54.0	44	44.0	2.00	0.15
Previous use of relief techniques:						
No	83	83.0	77	77.0		
Yes	17	17.0	23	23.0	1.13	0.29
Types: @						
Yoga	4	23.5	4	17.4	Fisher	0.70
Meditation	3	17.6	3	13.0	Fisher	1.00
Recreation therapies	5	29.4	7	30.4	0.00	0.94
Music therapies	5	29.7	12	52.2	2.07	0.15

(*) Statistically significant at $p < 0.05$

(@) Not mutually exclusive

Table (3): Pre-intervention levels of anxiety, depression, and stress among patients in the two studied groups (n = 200)

	GROUP				Test [@]	P-value
	Qigong (n=100)		Reiki (n=100)			
	No.	%	No.	%		
Anxiety:						
Mild	2	2.0	1	1.0		
Moderate	3	3.0	1	1.0	Fisher	0.430
Severe	95	95.0	98	98.0		
Score (max=42):						
Mean+SD	29.7±7.1		28.0±5.9		t=1.89	0.060
Median	31.00		29.00			
Depression:						
None	3	3.0	0	0.0		
Mild	1	1.0	2	2.0		
Moderate	6	6.0	10	10.0	Fisher	0.223
Severe	90	90.0	88	88.0		
Score (max=42):						
Mean+SD	29.7±7.1		28.9±5.7		t=1.93	0.055
Median	32.00		30.00			
Stress:						
None	4	4.0	2	2.0		
Mild	5	5.0	3	3.0		
Moderate	16	16.0	30	30.0	Fisher	0.098
Severe	75	75.0	65	65.0		
Score (max=42):						
Mean+SD	28.8±6.9		27.3±5.6		t=1.78	0.761
Median	30.00		28.00			

(@) Freeman-Halton extension of Fisher exact test

Table (4): Post-intervention levels of anxiety, depression, and stress among patients in the two studied groups (n = 200)

	GROUP				Test [@]	P-value
	Qigong (n=100)		Reiki (n=100)			
	No.	%	No.	%		
Anxiety:						
None	80	80.0	87	87.0		
Mild	4	4.0	1	1.0		
Moderate	4	4.0	0	0.0	Fisher	0.121
Severe	12	12.0	12	12.0		
Score (max=42):						
Mean+SD	5.7±8.3		4.4±7.0			
Median	3.00		2.00		U=1.54	0.21
Depression:						
None	83	83.0	87	87.0		
Mild	4	4.0	1	1.0		
Moderate	5	5.0	0	0.0	Fisher	0.043*
Severe	8	8.0	12	12.0		
Score (max=42):						
Mean+SD	6.0±7.9		4.7±7.6			
Median	4.00		3.00		U=4.41	0.04*
Stress:						
None	88	88.0	88	88.0		
Mild	4	4.0	7	7.0		
Moderate	4	4.0	3	3.0	Fisher	0.681
Severe	4	4.0	2	2.0		
Score (max=42):						
Mean+SD	5.3±7.7		3.9±6.6			
Median	2.50		2.00		U=2.59	0.11

(@) Freeman-Halton extension of Fisher exact test

(*) Statistically significant at p<0.05

Table (5): Pre-post-intervention changes in the scores of anxiety, depression, and stress among patients within the Qigong and Reiki groups (n = 200)

	Pre (n=100)		Post (n=100)		Mann Whitney test	P-value
	Mean±SD	Median	Mean±SD	Median		
Qigong:						
Anxiety	29.7±7.1	31.00	5.7±8.3	3.00	127.70	<0.001*
Depression	29.7±7.1	32.00	6.0±7.9	4.00	128.72	<0.001*
Stress	28.8±6.9	30.00	5.3±7.7	2.50	129.58	<0.001*
Reiki:						
Anxiety	28.0±5.9	29.00	4.4±7.0	2.00	134.90	<0.001*
Depression	27.9±5.7	30.00	4.7±7.6	3.00	130.03	<0.001*
Stress	27.3±5.6	28.00	3.9±6.6	2.00	137.91	<0.001*

(*) Statistically significant at p<0.05

Table (6): Correlation between patients' anxiety, depression, and stress scores and their characteristics

	Spearman's rank correlation coefficient		
	Anxiety	Depression	Stress
Scores of:			
Anxiety	1.000		
Depression	.966**	1.000	
Stress	.959**	.960**	1.000
Age	.306**	.284**	.272**
Duration of DM	.192**	.174*	.168*

(*) Statistically significant at p<0.05

(**) Statistically significant at p<0.01

Table (7): Best fitting multiple linear regression model for the anxiety, depression, and stress scores

	Unstandardized Coefficients		Standardized Coefficients	t-test	p-value	95% Confidence Interval for B	
	B	Std. Error				Lower	Upper
Anxiety score							
Constant	49.25	2.67		18.439	<0.001	44.00	54.51
Intervention	-23.80	0.71	-0.86	33.574	<0.001	-25.19	-22.40
Group (Reiki)	-1.39	0.71	-0.05	1.947	0.052	-2.79	0.01
DM Control	2.11	1.11	0.08	1.901	0.058	-0.07	4.30
BMI >25	2.96	1.11	0.11	2.658	0.008	0.77	5.15
r-square=0.74 Model ANOVA: F=284.76, p<0.001							
Variables entered and excluded: age, gender, marital status, residence, duration of DM, previous use of relief technique							
Depression score							
Constant	54.67	1.55		35.201	<0.001	51.61	57.72
Intervention	-23.41	0.71	-0.85	32.912	<0.001	-24.80	-22.01
Group (Reiki)	-1.43	0.71	-0.05	2.005	0.046	-2.83	-0.03
Previous use of relief technique	-1.76	0.89	-0.05	1.971	0.049	-3.51	0.00
r-square=0.73 Model ANOVA: F=363.92, p<0.001							
Variables entered and excluded: age, gender, marital status, residence, duration/control of DM, BMI							
Stress score							
Constant	48.93	2.53		19.340	<0.001	43.95	53.90
Intervention	-23.46	0.67	-0.87	34.952	<0.001	-24.78	-22.14
Group (Reiki)	-1.38	0.67	-0.05	2.042	0.042	-2.70	-0.05
DM Control	1.84	1.05	0.07	1.745	0.082	-0.23	3.91
BMI >25	2.51	1.06	0.09	2.378	0.018	0.44	4.59
r-square=0.76 Model ANOVA: F=308.08, p<0.001							
Variables entered and excluded: age, gender, marital status, residence, duration of DM, previous use of relief technique							

As **Table (1)**: Presents, the patients in the two studied groups, Qigong and Reiki, had similar socio-demographic characteristics with no statistically significant differences. Their age was mostly between 20 and <60 years old, with slightly more females in the Reiki (58%) compared with the Qigong (50%) group. They also had a slightly higher percentage of married, 54% vs 46%. More than a half of the patients in both group has urban residence.

As regards health characteristics, **Table (2)**: Shows that more patients in the Reiki group had their diabetes for <5 years (58%), had good glycemic control (53%), and were on oral treatment (47%). Meanwhile, more patients in the Qigong group had their BMI 25 or higher (54%). However, none of these differences was statistically significant. Only a few of the patients in both groups reported previous use of relief techniques, mostly recreation and music therapies.

At the pre-intervention phase, almost all patients in the Qigong (95%) and Reiki (98%) groups were having severe anxiety as described in **Table (3)**: Additionally, most of them were having severe depression, 90% and 88% respectively. Meanwhile, their stress was mostly moderate to severe. No statistically significant differences could be revealed between the two groups. Their median scores were high reaching around thirty points from a maximum score of 42 points.

After implementation of the intervention **Table (4)**: most of the patients in the Qigong and Reiki groups were having no anxiety, no depression, and no stress. Their median scores also fell down to range between 2.00 and 4.00 points from a maximum score of 42 points. The table demonstrates that the patients in the Reiki group had significantly less depression ($p=0.043$) with lower median score (3.00) compared with the score of the Qigong group (4.00), $p=0.04$.

Comparing the pre-post-intervention scores within groups, **Table (5)**: Points to statistically significant improvements in all three parameters in both groups ($p<0.001$). The stress scores demonstrated the strongest improvements with the median scores 2.50 and 2.00 in the Qigong and Reiki groups, respectively.

Table (6): Indicates that the patients' scores of anxiety, depression, and stress had statistically significant strong positive correlations, the highest being between anxiety and depression ($r=0.966$). Additionally, all three scores had statistically significant weak positive correlations with patients' age and duration of diabetes. The highest correlation was between the anxiety score and patient's age ($r=0.306$).

The multivariate analysis **Table (7)**: Identified the study intervention as the main statistically significant

independent negative predictor of the patients' scores of anxiety, depression, and stress. Additionally, the Reiki technique was a statistically significant independent negative predictor of the patients' scores of anxiety, depression, and stress, but with less effect compared with the study intervention as indicated by their standardized beta coefficients. Meanwhile, patients' glycemic control and overweight were positive predictors of the scores of anxiety and stress. The table also indicates that patients' previous use of relief technique was a statistically significant independent negative predictor of the patients' scores of depression.

Discussion

This study aim was to evaluate and compare the effectiveness of Reiki and Qi-gong therapy techniques in improving diabetic patients' negative emotional states. The study results demonstrate improvements in patients' scores of anxiety, depression, and stress in both interventions, which leads to acceptance of the first set research hypothesis. The results also point to slightly more improvements in the Reiki groups in comparison with the Qi-gong groups, and thus the second research hypothesis can also be accepted.

As the study findings indicate, the diabetic patients had comparable socio-demographic characteristics. Moreover, their health characteristics were similar with no significant differences. The close similarity between the two groups indicate that the process of randomization was successful. This is a cornerstone criterion of successful randomized clinical trial. In this respect, **Berger et al., (2021)** highlighted that randomized clinical trials are at the top of research designs' level of evidence, and the process of randomization applied is its main foundation as it prevents any selection bias and ensures close similarity of the groups under study regarding all known and potential or unknown confounders.

According to the current study results, severe anxiety was highly prevalent among the diabetic patients in the two study groups at the pre-intervention phase, with almost all of them suffering from severe levels of anxiety. The finding was expected and may be attributed to the constant apprehension among these patients due to diet and treatment regimens. They could also have panic of the occurrence of episodes of hyper- or hypo-glycemia, with possible loss of control. In line with this, a study in China demonstrated high levels of anxiety among Type-2 diabetic patients and this was more associated with the lack of proper glycemic control and fluctuations in their blood sugar (**Yang et al., 2022**). Similar findings were also reported in studies in Peru

(Arteaga-Zarate et al., 2022)³⁷, and in Canada (McInerney et al., 2022).

The current study has also revealed that before the intervention phase, a great majority of the patients in both studied groups were suffering from severe depression. This might be explained by their concerns about the restrictions imposed on them in diet and activities, as well as their constant thoughts about the potential diabetes complications affecting their lives. Thus, they have feelings of pessimism, low spirit, helplessness, and hopelessness, with low satisfaction with life. In agreement with this, a follow-up study of Type-2 diabetic patients, a significant positive correlation was identified between diabetes and depression (Meloni et al., 2022). Moreover, a recent study in the United States identified a gene (CRHR2) linking depression to Type-2 (Amin et al., 2022).

Slightly fewer diabetic patients in the present study groups were having severe stress before the intervention, but still these constituted around more two third of the patients. Such high levels of stress could be due to the lifestyle changes inflicted by the disease on them. This could make them constantly over-aroused, easily startled, unable to relax, touchy, and nervy, jumpy, and agitated. These findings are congruence with those reported in a study in Indonesia, where about two-thirds of Type-2 diabetic patients were suffering from stress, and this was influenced by factors related to the need to comply with the treatment regimen, and glycemic control (Bhaskara et al., 2022).

Concerning patients' characteristics influencing their anxiety, depression, and stress symptoms, the present study revealed the presence of significant weak positive correlations of their score with patients' age and duration of diabetes. The findings are quite plausible given the negative effects of aging and its associated physical and psychological problems on the emotional state of these patients. Moreover, a life-long chronic disease as diabetes would certainly have a negative impact on patients' emotional state, and this might increase with the duration of illness and possibly associated complications. Similarly, a study of distress among Type-2 diabetic patients in Ethiopia found significantly higher levels of anxiety and depression with increasing age (Shimels et al., 2022). The implementation of the present study intervention led to significant improvements in diabetic patients' symptoms of anxiety, depression, and stress. This was observed among the patients in both Reiki and Qi-gong groups. Thus, either of the two therapy techniques can help in the alleviation of these patients' negative emotional state. This has been demonstrated in the bivariate analyses, which demonstrated statistically significant post-

intervention decreases in all scores of negative emotional state in both groups. Moreover, the independent effect of each of these two interventions on patients' symptoms of anxiety, depression, and stress was further confirmed in multivariate analysis where the main negative independent significant predictor of the scores of these three symptoms was the intervention.

In agreement with these foregoing current study findings, a meta-analysis examining the effectiveness of mind-based and body-based interventions on Type-2 diabetes control demonstrated a significant improvement in patients' stress in Qi-gong technique interventions (Sanogo et al., 2022). Moreover, another systematic review of randomized clinical trials provided evidence of the beneficial effects of Reiki therapy on patients' mental symptoms of anxiety, depression, and stress. The study recommended that this technique may be used as a complementary treatment for these symptoms. For better outcomes, the study recommends 60 min of Reiki once a week for 6 to 10 weeks; 30 min of Reiki once a week for a minimum of 4 weeks for anxiety, and 30 to 45 min of Reiki once a week for 6 weeks for stress (Zadro & Stapleton, 2022).

Furthermore, the current study results point to slight superiority of the Reiki technique as compared with the Qi-gong technique. Thus, in the bivariate analyses, all post-intervention scores of anxiety, depression, and stress were lower in the Reiki group, although only the difference in the depression scores reached statistical significance. Meanwhile, the multivariate analysis identified the Reiki technique as an additional independent negative predictor of each of the anxiety, depression, and stress scores. This might be explained by the anti-depressive and anxiolytic effects of salutary touch as reported in a German study addressing the mechanisms of action of touch therapy including its oxytocinergic effect (Müller-Oerlinghausen et al., 2022).

Lastly, the present study analyses demonstrated that the patients who had a previous experience with other relief techniques had more improvement in their depression scores. This might be related to their belief in the usefulness of such techniques. Meanwhile, those patients with glycemic control had less improvements in their scores of anxiety and stress, which could be explained by that might experience lower levels of these negative emotions before the intervention with a feeling of satisfaction with the control of their diabetes. Also, the overweight and obese patients had less improvements in their anxiety and stress scores, which could be due to the negative effect of obesity on their psych as well as on the control of their diabetes. In congruence with this, a study in Greece reported higher prevalence of stress

symptoms among Type-2 diabetic patients with high Body Mass Index levels (Klinis et al., 2022).

Conclusion

Both Reiki and Qi-gong therapy techniques are effective in improving diabetic patients' negative emotional states of anxiety, depression, and stress, with slight superiority of the Reiki technique.

Recommendations

The study recommends inclusion of these techniques in the management plans of Type-2 diabetic patients. Nurses need to be trained in administering them. Further studies are proposed to assess their effects on glycemic control.

References

- **Alajmani D.S.A., Alkaabi A.M., & Alhosani M.W. (2019):** Prevalence of undiagnosed depression in patients with type 2 diabetes. *Front Endocrinol (Lausanne)*. Published online 2019.
- **Alanazi M., Unnisa A., Patel R.D., Alanazi J., Khalid M., Ahmad S., Jandrajupalli S.B., Hussain T., Abobaker S.H., & Chandolu S. (2022):** Comparative analysis between mono approach and multi approaches in managing T2DM: a survey-based study. *Eur Rev Med Pharmacol Sci.*; 26(17):6290-6299. doi: 10.26355/eurrev_202209_29653. PMID: 36111930.
- **Ali M.K., Pearson-Stuttard J., Selvin E., Gregg E.W. (2022):** Interpreting global trends in type 2 diabetes complications and mortality. *Diabetologia.*; 65(1):3-13. doi: 10.1007/s00125-021-05585-2. Epub 2021 Nov 27. PMID: 34837505; PMCID: PMC8660730.
- **Al-Mohaimed A.A. (2017):** Prevalence and factors associated with anxiety and depression among type 2 diabetes in Qassim: a descriptive cross-sectional study. *J Taibah Univ Med Sci*. Published online.
- **Alzahrani A., Alghamdi A., Alqarni T., Alshareef R., & Alzahrani A. (2019):** Prevalence and predictors of depression, anxiety, and stress symptoms among patients with type II diabetes attending primary healthcare centers in the western region of Saudi Arabia: a cross-sectional study. *Int J Mental Health Syst.*; 13:48-54.
- **Amin M., Ott J., Gordon D., Wu R., Postolache T.T., Vergare M., & Gragnoli C. (2022):** Comorbidity of Novel CRHR2 Gene Variants in Type 2 Diabetes and Depression. *Int J Mol Sci.*; 23(17):9819. doi: 10.3390/ijms23179819. PMID: 36077219; PMCID: PMC9456299.
- **Arteaga-Zarate G., Demarini-Olivares G., Torres-Slimming P.A., & Bernabe-Ortiz A. (2022):** Type 2 diabetes mellitus and anxiety symptoms: a cross-sectional study in Peru. *Wellcome Open Res.*; 6:331. doi: 10.12688/wellcomeopenres.17328.2. PMID: 35600247; PMCID: PMC9111365.
- **Berger V., Bour L., & Carter K. (2021):** A roadmap to using randomization in clinical trials. *BMC Med Res Methodol* 21, 168 (2021). <https://doi.org/10.1186/s12874-021-01303-z>
- **Bhaskara G., Budhiarta A.A.G., Gotera W., Saraswati M.R., Dwipayana I.M.P., Semadi I.M.S., Nugraha I.B.A., Wardani I.A.K., & Suastika K. (2022):** Factors Associated with Diabetes-Related Distress in Type 2 Diabetes Mellitus Patients. *Diabetes Metab Syndr Obes.*; 15:2077-2085. doi: 10.2147/DMSO.S363431. PMID: 35873530; PMCID: PMC9296679.
- **Cárdenas L., Cabezas M.D.C., Muñoz A., Proaño J.L., Miño C., & Aguirre N. (2022):** Prevalence and risk factors of depression, anxiety, and stress in an Ecuadorian outpatient population with type II diabetes mellitus: A cross-sectional study (STROBE). *Medicine (Baltimore)*; 101(39):e30697. doi: 10.1097/MD.00000000000030697. PMID: 36181107; PMCID: PMC9524958.
- **Chan J.S.Y., Deng K., Wu J., & Yan J.H. (2019):** Effects of meditation and mind-body exercises on older adults' cognitive performance: a meta-analysis. *Gerontologist*; 59: e782-e790. doi: 10.1093/geront/gnz022
- **Chao J., Jing Z., Xuehua B., Peilei Y., Qi & Cartilage G. (2021):** Effect of Systematic Exercise Rehabilitation on Patients With Knee Osteoarthritis: A Randomized Controlled Trial;13(1_suppl):1734S-1740S. doi: 10.1177/1947603520903443. Epub 2020 Feb 10. PMID: 32037857 Free PMC article
- **Costa J.R.D., Marcon S.S., Nitschke R.G., Santo F.H.D.E., Piexak D.R., Oliveira S.G., Goes H.L.F., & Soto P.J.L. (2022):** Reiki for promotion of health and sleep quality in hospital nursing professionals. *Rev Bras Enferm.*;75(5):e20210535. doi: 10.1590/0034-7167-2021-0535. eCollection 2022. PMID: 35976274 Free article. English, Portuguese.
- **Gauthier R., Vassail J., Croutaz J.P., & Raspaud C. (2022):** Active mind-body movement therapies and pulmonary rehabilitation for people with COPD *Rev Mal Respir.* Mar; 39(3):258-269. doi: 10.1016/j.rmr.2021.12.001. Epub 2022 Feb 7. PMID: 35144842 Reviews. French.
- **Karaman S., & Tan M. (2021):** Effect of Reiki Therapy on Quality of Life and Fatigue Levels of Breast Cancer Patients Receiving Chemotherapy. *Cancer Nurs.*; 44(6):E652-E658. doi: 10.1097/NCC.0000000000000970. PMID: 34387236
- **Kasturiratne A., Khawaja K.I., Ahmad S., Siddiqui S., Shahzad K., & Athauda L.K., (2021):** The iHealth-T2D study, prevention of type 2 diabetes amongst South Asians with central obesity and prediabetes: study protocol for a

- randomised controlled trial. *Trials*;22(1):928. doi: 10.1186/s13063-021-05803-7. PMID: 34922608; PMCID: PMC8684177.
- **Khashayar P., Shirzad N., Zarbini A., Esteghamati A., Hemmatabadi M., & Sharafi E. (2022):** Diabetes-related distress and its association with the complications of diabetes in Iran. *J Diabetes Metab Disord*. 27:1-7. doi: 10.1007/s40200-022-01103-2. Epub ahead of print. PMID: 35915591; PMCID: PMC9328774.
 - **Klinis S., Symvoulakis E.K., Stefanidou M., Bertsias A., Christodoulou N., & Tsiouri I. (2022):** Self-efficacy, stress levels and daily style of living among older patients with type 2 diabetes in a rural primary care setting: a cross-sectional study. *Med Pharm Rep.*; 95(3):267-274. doi: 10.15386/mpr-2152. Epub 2022 Jul 26. PMID: 36060500; PMCID: PMC9387573.
 - **Kobayati A., Haidar A., & Tsoukas M.A. (2022) :** Glucagon-like peptide-1 receptor agonists as adjunctive treatment for type 1 diabetes: Renewed opportunities through tailored approaches? *Diabetes Obes Metab.*; 24(5):769-787. doi: 10.1111/dom.14637. Epub ahead of print. PMID: 34989070.
 - **Kohl-Heckl W.K., Schröter M., & Cramer H. (2022):** Complementary medicine use in US adults with hypertension: A nationally representative survey. *Complement Ther Med*. May; 65:102812. doi: 10.1016/j.ctim.2022.102812. Epub 2022 Jan 29. PMID: 35101554 free article.
 - **Kulzer B. (2022):** Physical and psychological long-term consequences of diabetes mellitus. *Bundesgesundheitsblatt Gesundheitsforschung Gesundheitsschutz.*; 65(4):503-510. German. doi: 10.1007/s00103-022-03517-y. Epub 2022 Mar 16. PMID: 35294561; PMCID: PMC8979877.
 - **Laspe I., Meier J.J., & Nauck M.A. (2022):** Comparison of Insulin-Treated Patients with Ambiguous Diabetes Type with Definite Type 1 and Type 2 Diabetes Mellitus Subjects: A Clinical Perspective. *Diabetes Metab J*. 2022 Mar 22. doi: 10.4093/dmj.2021.0322. Epub ahead of print. PMID: 35313393.
 - **Love L., Anderson A.M., von Sadovszky V., Kusiak J., Ford J., & Noritz G. (2022):** A study of Reiki therapy on unpleasant symptoms in children with cerebral palsy. *Complement Ther Clin Pract.*; 46:101529. doi: 10.1016/j.ctcp.2021.101529. Epub 2022 Jan 19. PMID: 35074604
 - **McInerney A.M., Lindekilde N., Nouwen A., Schmitz N., & Deschênes S.S. (2022):** Diabetes Distress, Depressive Symptoms, and Anxiety Symptoms in People With Type 2 Diabetes: A Network Analysis Approach to Understanding Comorbidity. *Diabetes Care*; 45(8):1715-1723. doi: 10.2337/dc21-2297. PMID: 35704532.
 - **Meloni M.E., Cherchi S., & Tonolo G. (2022):** Psychodiagnostic Investigation between Diabetes and Depression: There Is a Correlation. *Psychiatr Danub.*;34(Suppl 8):262-264. PMID: 36170740.
 - **Merswolken M., Deter H.C., Siebenhuener S., Orth-Gomer K., & Weber C.S. (2012):** Anxiety as predictor of the cortisol awakening response in patients with coronary heart disease. *Int J Behav Med*.
 - **Müller-Oerlinghausen B., Eggart M., Norholt H., Gerlach M., Kiebgis G.M., Arnold M.M., & Moberg K.U. (2022):** Berührungsmmedizin – ein komplementärer therapeutischer Ansatz unter besonderer Berücksichtigung der Depressionsbehandlung [Touch Medicine - a complementary therapeutic approach exemplified by the treatment of depression]. *Dtsch Med Wochenschr.*; 147(4):e32-e40. German. doi: 10.1055/a-1687-2445. Epub 2021 Dec 17. PMID: 34921360; PMCID: PMC8841210.
 - **Oesterle A., Giancaterino S., Van Noord M.G., Pellegrini C.N., Fan D., Srivatsa U.N., & Amsterdam E.A. (2022):** Effects of Supervised Exercise Training on Atrial Fibrillation: A Meta-Analysis of Randomized Controlled Trials. *J Cardiopulm Rehabil Prev.*;42(4):258-265. doi: 10.1097/HCR.0000000000000665. Epub 2022 Feb 28. PMID: 35235540
 - **Pérez Briones N.G., Ruiz Paloalto M.L., Casique Casique L., Ramírez-Girón N., Azucena Rodríguez Puente L., Ruiz Lara A., & Landeros-Olvera E. (2022):** Effect of Reiki Therapy on Blood Pressure and Alcohol Consumption in Young Adults: A Clinical Trial. *Altern Ther Health Med*. 2022 Aug 5:AT7277. Online ahead of print. PMID: 35951066
 - **Sanogo F., Xu K., Cortessis V.K., Weigensberg M.J., & Watanabe R.M. (2022):** Mind- and Body-Based Interventions Improve Glycemic Control in Patients with Type 2 Diabetes: A Systematic Review and Meta-Analysis. *J Integr Complement Med*. 2022 Sep 7. doi: 10.1089/jicm.2022.0586. Epub ahead of print. PMID: 36070591.
 - **Sayed Ahmed H.A., Fouad A.M., Elotla S.F., Joudeh A.I., Mostafa M., Shah A., Shah J., & Mohamed S.F. (2022):** Prevalence and Associated Factors of Diabetes Distress, Depression and Anxiety Among Primary Care Patients With Type 2 Diabetes During the COVID-19 Pandemic in Egypt: A Cross-Sectional Study. *Front Psychiatry*; 13:937973. doi: 10.3389/fpsy.2022. 937973. PMID: 35722556; PMCID: PMC9203894.
 - **Shimels T., Kassu R.A., Bogale G., Muleta M.B., Akalu G.T., Getachew A., Shewamene Z., Getnet M., & Abraha M. (2022):** Health-Related Quality of Life of Patients with Type 2 Diabetes Mellitus and Hypertension in Addis Ababa, Ethiopia. *Ethiop J Health Sci.*; 32(2):381-392. doi: 10.4314/ejhs.v32i2.19. PMID: 35693563; PMCID: PMC9175229.

- **Simmons K., & Riddley S. (2022):** Diabetes and Technology. *Prim Care*; 49(2):327-337. doi: 10.1016/j.pop.2021.11.005. Epub 2022 Apr 22. PMID: 35595486.
- **Sun X.J., Zhang G.H., Guo C.M., Zhou Z.Y., Niu Y.L., Wang L., & Dou G.R. (2022):** Associations between psycho-behavioral risk factors and diabetic retinopathy: NHANES (2005-2018). *Front Public Health*; 10:966714. doi: 10.3389/fpubh.2022.966714. PMID: 36187629; PMCID: PMC9521717.
- **Thrane S.E., Williams E., Grosseohme D.H., & Friebert S. (2022):** Reiki Therapy for Very Young Hospitalized Children Receiving Palliative Care. *J Pediatr Hematol Oncol Nurs.*; 39(1):15-29. doi: 10.1177/27527530.211059435. PMID: 35722865
- **Whatley J., Perkins J., & Samuel C. (2022):** 'Reflexology: Exploring the mechanism of action'. *Complement Ther Clin Pract.*; 48:101606. doi: 10.1016/j.ctcp.2022.101606. Epub 2022 May 18. PMID: 35613519.
- **World Health Organization [WHO], (2020):** Diabetes. Published 2020. Available at: https://www.who.int/health-topics/diabetes#tab=tab_1 [access date Oct 5, 2022].
- **Yang W., Liu M., Tian Y., Zhang Q., Zhang J., Chen Q., Suo L., & Chen Y. (2022):** The increased prevalence of depression and anxiety in T2DM patients associated with blood glucose fluctuation and sleep quality. *BMC Endocr Disord.*; 22(1):232. doi: 10.1186/s12902-022-01147-8. PMID: 36114534; PMCID: PMC9482159.
- **Zadro S. & Stapleton P. (2022):** Does Reiki Benefit Mental Health Symptoms Above Placebo? *Front Psychol*; 13: 897312. doi: 10.3389/fpsyg.2022.897312. PMID: 35911042; PMCID: PMC9326483.
- **Zheng G., Zheng Y., Xiong Z., & Ye B. (2020):** Effect of Baduanjin exercise on cognitive function in patients with post-stroke cognitive impairment: a randomized controlled trial. *Clin. Rehabil.* 34, 1028–1039. doi: 10.1177/0269215520930256

This is an open access article under
[Creative Commons by Attribution Non-Commercial \(CC BY-NC 3.0\)](https://creativecommons.org/licenses/by-nc/3.0/)
(<https://creativecommons.org/licenses/by-nc/3.0/>)