



Effect of Jacobson's Progressive muscle relaxation on Diabetes Mellitus II: RCT

Nisha Shinde and Subhash Khatri

College of Physiotherapy, Pravara Institute of Medical Sciences, Loni.

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ABSTRACT

The objective of this randomized controlled study was to determine the effects of Jacobson's progressive muscle relaxation on blood glucose, QOL, Stress, and HbA1c (A1C) and cholesterol in patients with Diabetes mellitus II (TDM2). Patients with diabetes mellitus II were randomized to either groups. Session of JPMR and sessions of routine management. All sessions were individual. Total of 20 participants were entered, and 19 completed the 3-month protocol. A blood glucose, A1C, Cholesterol were assessed, and WHOQOL and HADS for depression and anxiety were administered pre-randomization and after completion of intervention for both groups. Statistical analysis was done for comparison of both groups. After applying "t" test pre relaxation and post relaxation data shows highly significance difference between mean and standard deviation values of all parameters in group A i.e. ($p < 0.01$) This pilot study supports the use of Jacobson's progressive muscle relaxation in patients with Diabetes mellitus II (TDM2) Further research is necessary to determine the long-term effects of JPMR Jacobson's Progressive muscle relaxation can be included in routine management in Diabetes mellitus II.

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Introduction

The number of cases of diabetes is on a rise in India, owing to many of the risk factors including change in lifestyle and standard of living. The data given by the WHO is much less than the actual gravity of the condition. WHO says that India ranks highest with 32 million diabetic patients and this number will increase to 79.4 million by the year 2030. It has affected around 10-16% of the urban population and 5-8% of the rural population.[1] The population of India has now crossed 1000 million, and this should give us the magnitude of the problem, with average estimate of patients is about 40 million. This means that India has the highest number of diabetics than any other country in the world. Impaired Glucose Tolerance (IGT) is a mounting problem in the world. The prevalence of IGT is thought to be around 8.7 per cent in urban areas and 7.9 per cent in rural areas, although this estimate may be too high. [2,3]

The pathogenesis of diabetes begins at a much earlier age in India that also means that chronic long term effects like Retinopathy, Cardiomyopathy, Vasculopathy, neuropathy and Nephropathy. Suffering from any of the complications of diabetes can be a very difficult to go through. Even though if individual is tough, it can be pretty devastating for that individual, and both family and friends. It is even worse for Individuals if they develop diabetes who already suffers from other existing conditions. [4,5]

This is why one must treat this condition (diabetes) at the right time. It is a very sad fact is that there are people in the world who do not even know they have diabetes, even though they have [5]. It is a proven fact that people who suffers from diabetes also have a very high risk of developing other health conditions. Proper control over blood glucose levels is associated with a reduced risk for developing diabetes complications. [6,7] There are many ways in which diabetes can be prevented. From the time of recognition of diabetes mellitus

to now, different management methods have been recommended. The major medical care is insulin or other anti hyperglycemic drugs along with diet and exercise.[6] Despite this regular management, many complementary interventions had been used. Solutions or remedies by which one can remove the problems in life. Some of the remedies are nature, proper exercise, proper breathing, proper relaxation, proper diet, proper thinking, yoga, pranayama, meditation and recreation that could imply massage therapy and progressive muscle relaxation; are the special physiotherapy techniques.[7,8]

In all the remedies one of the technique that are highly important to learn and implement into daily life is relaxation. Relaxation can be highly beneficial if practiced routinely in one's everyday life. The relaxation is widely used by people to reduce anxiety and cope with stress-related problems. [9] In the clinical setting, relaxation procedures are active, educational forms of therapy that can decrease the occurrence of tension and anxiety disorders. Clinical Relaxation can ease or eliminate problems for those already afflicted as well. In clinical intervention, the client and therapist work collaboratively to understand the source of the problem and its impact in that person's life. Relaxation therapy is initiated and taught in the clinician's office but is practiced primarily in the client's own environment. [10,11] There are countless methods used to achieve relaxation, but the procedures that are most commonly practiced in the clinical setting are Jacobson's (1938) Progressive Muscle Relaxation. [9] New research is showing the simple act of becoming relaxed can have surprising health benefits, In addition to the obvious psychological effects of relieving stress and mental tension, the new findings indicate, deep relaxation, if practiced regularly, can strengthen the immune system and produce a host of other medically valuable physiological changes. Moreover, the research shows, relaxation may help to prevent the disease by making people less

susceptible to viruses, and by lowering blood sugar, blood pressure and cholesterol levels. [12,13]

In the last few decades, a substantial amount of data has been collected on many factors relating to relaxation [14] such as specific effects of different methods of relaxation individual differences in response to treatment variables that increase adherence to treatment and relaxation therapy.[15 16] That effects on specific health problems. That is necessary for today's life. Because we live in a day and age that offers countless opportunities for advancement and growth in every facet of life. The 21st century has embarked on new, innovative technologies that have spawned tremendous increases in the quality of life for each and every one of us.[17,18,19] Jacobson progressive muscle relaxation involves contracting the specific muscles, holding that in position, then relaxing the muscles. This technique often involves progressing through the muscle groups of the body one at a time, beginning with the feet, spending approximately one minute on each area .Progressive relaxation may be practiced while lying down or sitting. [20,22] This approach has been suggested for psychosomatic disorders, for pain relief, to ease physical tension, to relieve and overcome psychosomatic disorders.[21]

Based on the above, pilot study was carried out so as to identify the effect of progressive muscular relaxation technique at stress, Quality of life and blood glucose, Cholesterol and HbA1c level in subjects between 40 and 60 years old who suffer from type 2 diabetes mellitus. Results of the study indicate beneficial effects of progressive muscle relaxation therapy on T2DM patients.

Materials and methods

Source of data

Department of Physiotherapy, & Dept. of Medicine, Pravara Rural Hospital, Loni, Tal- Rahata, Dist- Ahmednagar, Maharashtra State, India- 413 736.

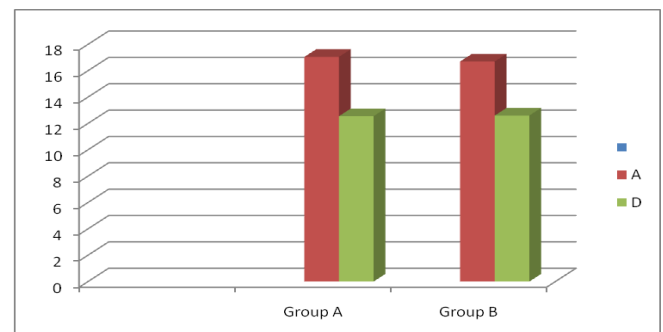
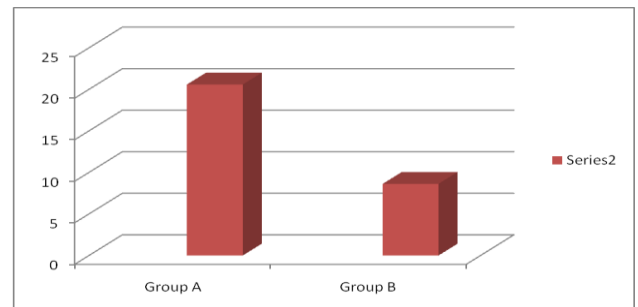
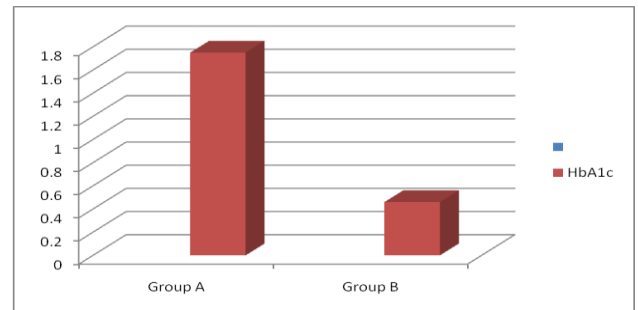
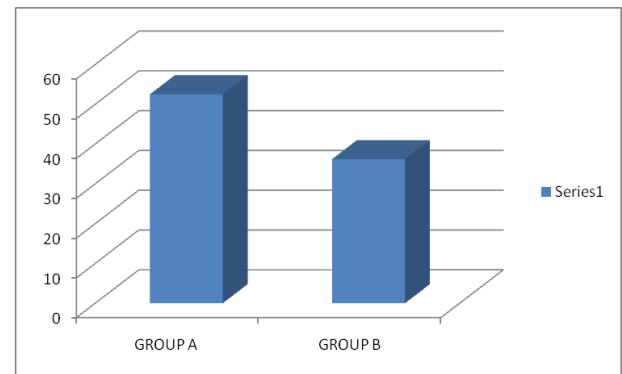
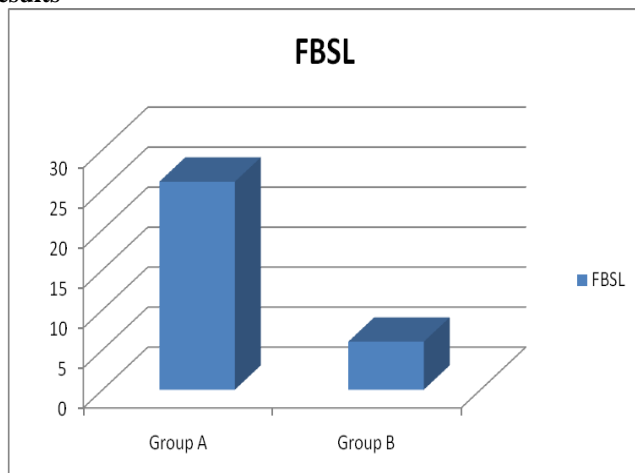
Study Design: Randomized Controlled Trial (RCT).

Sample size: Twenty participants .

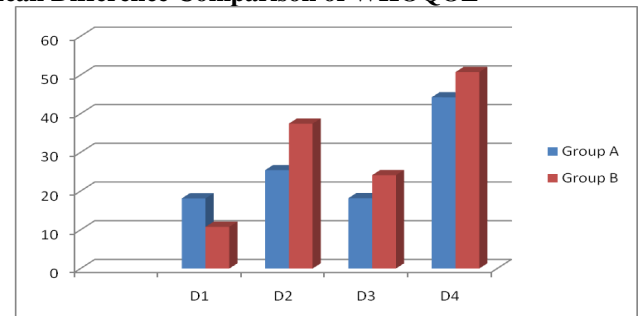
Sampling Method : The Male and Female participants with age group 40 to 60 years, from the Department of Medicine, Pravara Rural Hospital Loni. And those referred to physiotherapy O.P.D. College of physiotherapy, PIMS. Who were clinically diagnosed as Diabetes Mellitus II (TDM2) were recruited by block random sampling and were randomly allocated into two groups. Group A: Was given Routine medical treatment and Jacobson's Progressive muscle relaxation. (Relaxation tech. given three months)

Group B: Was given routine medical treatment

Results



Mean Difference Comparison of WHOQOL



Results Statistical analysis was done by using Statistical Package of Social Sciences (SPSS) 13.0 using various statistical measures such a mean, standard deviation (SD) and tests of significance such as unpaired 't' test. The results were concluded to be statistically significant with $p < 0.05$ and highly significant with $p < 0.01$. Paired 't' test was used to compare differences between the post session of two groups.

Table 1. Mean Difference Comparison of Fasting BSL

FBSL	Group A (Mean difference)	Group B (Mean difference)	t-value	p-value
	26±9.2	6±3.2	9.22	P<0.0001 highly significant

Table 2. Mean Difference Comparison of BSL(Pp)

PP	Group A (Mean difference)	Group B (Mean difference)	t-value	p-value
	52.50	36.20	3.17	0.0865 Significant

Table 3. Mean Difference Comparison Of HADS

Hads	Group A (Mean difference)	Group B (Mean difference)	t-value	p-value
A	16.70	12.60	5.941	P< 0.0001 Highly significant
D	17.05	12.55	5.836	P< 0.0001 Highly significant

Table 4. Mean Difference Comparison of WHOQOL

WHOQOL	Group A (Mean difference)	Group B (Mean difference)	t-value	p-value
D1	18.11	10.77	8.24	0.0254 significant
D2	25.41	37.43	3.43	0.0014 significant
D3	18.18	24.12	14.60	p<0.0001 highly Significant
D4	44.24	50.75	2.396	0.021 Significant

Table 5. Mean Difference Comparison of HbA1c%

HbA1c %	Group A (Mean difference)	Group B (Mean difference)	t-value	p-value
	1.75± 0.34	0.46±0.58	8.50	P< 0.0001 highly significant

Table 6. Mean Difference Comparison of Cholesterol

Cholesterol	Group A (Mean difference)	Group B (Mean difference)	t-value	p-value
	20.58	8.62	8.62	P< 0.0001 highly significant

Table 1. Shows comparison of fasting blood glucose, it shows significant reduction in group A that is 26±9.2 and Group B is 6±3.2 and (t=9.22) p = < 0.001 Shows Highly significance to reduction of fasting blood glucose (FBSL) Table 2 Shows comparison of postprandial blood glucose, it shows significant reduction in group A that is (52.50) and Group B is (36.20) and (t= 3.17) p = < 0.0865 Shows significant reduction of postprandial blood glucose (PPBSL) Table 3: shows statistically significant reduction in HbA1c % in group A was (1.75± 0.34) and in Group B was (0.46±0.58) (t= 5.77, p= 0.0001) Table 4: Shows statistically significant reduction in total cholesterol in group A was (20.58) than in Group B was (8.62) (t= 8.62, p= 0.0001) Table 5: Shows comparison of post HADS scores it shows significant reduction in Anxiety group A that is Anxiety score was (16.70) and depression score was (17.05) and (t= 5.941) Group B Anxiety score was (12.60) depression score was (12.55) and (t= 5.836) p = < 0.0001) If we see the post intervention comparison for both the groups. Group A shows significant reduction of depression and anxiety scores. Table 6 : The WHOQOL score showed statistically significant difference

in pre and post measurement in in all four domains. There was statistically significant difference in the D1 (t = 8.24, P < 0.05) and D2 (t = 3.43, P < 0.05) D3 (t = 14.60, , P < 0.001) and D4 (t = 2.396 , P < 0.001)

Discussion

Our present pilot study with a Randomized controlled group design clearly demonstrates that after two habituation session, JPMR reduces state anxiety and psychological stress and improve subjective well-being in patients with Diabetes Mellitus II . Our findings replicate in a previous findings (Vancampfort et al. 2011) in a Five other small RCTs showed trends toward positive improvements in A1C and blood glucose and cholesterol.. A South African study that compared an intervention of education plus aerobic exercise to one of education plus relaxation therapy in Black African women showed small but similar improvements in A1C in both groups, Our findings do provide further rigorous scientific evidence for the utility of JPMR within the multidisciplinary care in patients with diabetes II. The ability to deal with state anxiety, psychological stress and negative effect during JPMR may of

relevance for several other mental health benefits. (Mueser et al. 2007) This study demonstrates that relaxation techniques may offer such an easy to learn healthy alternative for subjective stress and state anxiety (19,20) Richard Surwit, a psychologist at Duke University Medical Center, found that relaxation improved the body's ability to regulate glucose in patients with the most common type of diabetes, which has its onset in adulthood. It is the body's inability to control glucose, or blood sugar, that ultimately leads to damage done by the disease(18,19)

The phenotype of TDM2 includes reductions in both insulin secretion and action. Insulin resistance, more so than impaired insulin secretion, is directly affected by numerous lifestyle factors. In the absence of pharmacological treatments that directly improve insulin sensitivity. As well as the fact that pharmacological treatments are not currently employed to prevent the progression to TDM2 in at risk individuals, lifestyle modifications are important components in the treatment of TDM2. (23)

Scientific research have been done on this that is contractile activity directly increased muscle glucose transport. Clinical significance of the acute stimulation of muscle glucose transport is that contractile activity produces a short term increase in insulin sensitivity. Mechanisms of the post-exercise increase in insulin sensitivity. Clinical significance of the post-exercise increase in insulin sensitivity. Regular exercise training increases insulin sensitivity. (24) As we are giving the alternate contraction and relaxation of all the muscle groups in body step by step. There we are giving contractions for all muscle groups. And trying to increase insulin sensitivity.

Conclusion

Jacobson's progressive muscle relaxation plays a major role in the prevention and control of insulin resistance in type 2 diabetes, and diabetes-related health complication. Relaxation training improve insulin action, and can assist with the management of Blood Glucose levels, lipids, CV risk, mortality, anxiety and QOL. It is therefore imperative that health care providers find a ways to improve their effectiveness in treating diabetes Present study has shown JPMR training significant reduction in Blood sugar level, HbA1C%, Cholesterol level and improve quality of life and decrease in stress and anxiety level. Technique is simple and easy to learn. This can be well adopted by people who face stressful work conditions. This technique can be combined with medications and other therapeutic interventions for treating other clinical conditions also. Jacobson's progressive muscle relaxation may be used as an adjunct to conventional physiotherapy in diabetes mellitus . we conclude that the diabetic population's lifestyle can be favorably modified by applying a simple and economic intervention of prevention at the primary healthcare level. This would bring about a reasonable reduction in mortality, complications and costs resulting from this illness, which we expect would encourage the application of this pilot program in other health care centre's across the country

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