



## Research Article

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### EFFECTIVENESS OF LAUGHTER THERAPY VERSUS HUMOUR THERAPY ON BLOOD GLUCOSE LEVEL AMONG INDIVIDUALS DIAGNOSED WITH TYPE 2 DIABETES MELLITUS

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#### ABSTRACT

Diabetes mellitus is a common non-communicable health problem, globally and in India. Due to increasing urbanization, dietary changes, reduced physical activity and other unhealthy lifestyle and behavioral patterns, the prevalence is increasing. The aim of the study is to find out the effectiveness of laughter therapy versus humour therapy on blood glucose levels among individuals diagnosed with type 2 diabetes in Bengaluru. A true experimental design was used and by simple random sampling allocating 50 in control group, 50 in experimental group I (laughter therapy) and 50 in experimental group II (humour therapy). The pretest and post test level of fasting blood sugar (FBS), post prandial blood sugar (PPBS) was assessed by glucometer. The posttest mean score of fasting blood sugar in group I was  $132.4 \pm 2.1$ , group II was  $122.1 \pm 2.1$  and control group was  $194.1 \pm 2.4$  mg/dl. The posttest means score of post prandial blood sugar in group I was  $220.5 \pm 4.1$ , group II was  $185.1 \pm 4.6$  and control group was  $295.5 \pm 5.1$  mg/dl. The study has proved that laughter and humour therapy are an effective complementary and preventive therapy in reducing blood glucose levels. Therefore, it contributes to long-term regulation of type 2 diabetes. The humour therapy was better than laughter therapy as it stimulates the whole-body system.

**Keywords:** type 2 diabetes, laughter therapy, humor therapy

#### INTRODUCTION

Diabetes mellitus was first described in India in the ancient texts of Charaka and Sushruta (1500 BCE).<sup>1</sup> Since 1990s, diabetes has gradually evolved into a major public health problem. It is strongly related to the lifestyle changes brought by economic transition, industrialization, and globalization. The epidemic of diabetes places a huge burden on individuals and families, representing a drain on health resources and reduces the productivity, growth, and thus by development of the nation.<sup>2</sup> Using humor therapy to decrease stress, diminish pain, improve quality of life and even an improvement in immune functioning has recently become a popular topic in professional literature.

Laughter in response to a either spontaneous or a humorous stimulus is a natural occurrence and does not require large amounts of time or money in order to implement.<sup>3</sup>

Laughter therapy is regarded as a long-standing noninvasive complementary and alternative therapy since 1970. Studies have found a variety of positive effects of laughter therapy on anxiety, depression, tension and general health and it has been found useful for insomnia, pain relief, improving pulmonary function, and increasing immunity. Currently, there are several laughter therapies clubs around the world in which people gather to practice laughter and laughing on purpose; this fake laughter gradually becomes effective in releasing "anti-stress and joyful hormones"<sup>4</sup>.

Laughter therapy stimulates the whole-body system. Negative emotions like anxiety, agitation, unexplained irritability, fear, inattention, extreme lethargy, confusion and sorrow are factors that elevate the blood glucose level<sup>5</sup>. Conversely, positive emotions such as laughing, happiness, joyful etc., have been

reported to modify the levels of neuroendocrine factors involved in negative emotions and to modulate immune function<sup>6</sup>.

Living with Diabetes is stressful. Therapeutic practice of laughter therapy offers a unique form of exercise that impact positively on body, mind and emotions. Laughter therapy influences the body's biochemistry, helping to ensure that the chemical messages are working for the person, not against them. Research suggests that laughing keep diabetes under control. It is similar to exercise which improves the overall performance of the heart's muscular function and decreases the heart disease and lower blood sugar. It also stimulates positive emotions and a more positive outlook. Studies have proved that hearty laughter regulates the blood sugar as it massages the endocrine glands responsible for glucose production<sup>7</sup>. Laughter and humour therapy has proved to be an effective complementary and preventive therapy which contributes to the long-term regulation of type 2 diabetes. Hence the researcher has planned as a comparative study with a control group.

#### Statement of the Problems

A true experimental study to evaluate the effectiveness of laughter therapy versus humour therapy on blood glucose level among individuals with type 2 diabetes in primary health centers, North Bengaluru.

#### Objective

To assess the effectiveness of laughter therapy and humor therapy on blood glucose level among individuals diagnosed with type 2 diabetes.

**MATERIALS AND METHODS**

A true experimental design was used to conduct the study among individuals with type 2 diabetes in selected Primary Health Centers (PHCs), North Bengaluru. A total of 150 individuals with type 2 diabetes were allotted, 50 each in experimental group I, group II and in control group by simple random sampling technique. The researcher had selected 8 PHCs and randomized using lottery methods, 2 PHCs in control group, 3 PHC each in experimental group I and II. The Individuals diagnosed as type 2 Diabetes, who were on oral hypoglycemic agents, who were between the age group of 40 to 60 years and also able to read or write Kannada or English were included in the study. Individual diagnosed as diabetes with complications like chronic obstructive pulmonary diseases, cardiovascular disease retinopathy and who were critically ill were excluded from the study.

After obtaining formal permission from the Director of Medical Education, Karnataka, the individuals were informed about the purpose of the study and informed consent was obtained. After collecting the demographic data, the pretest level fasting Blood sugar (FBS) and post prandial blood sugar (PPBS) were assessed using the standardized glucometer among individual with type 2 diabetes in control group and experimental group I and II. After the pretest, the experimental group I received Laughter therapy which is demonstrated by the researcher and group II received the Humor therapy which was given by local language comedy videos shown through television as eight sessions for four weeks for 30 to 40 minutes with the hospital routine. Laughter therapy included warm up exercise, spontaneous laugh and stimulated laugh. The control group followed the hospital routine. Every week, the post test level of FBS and PPBS were assessed by the same tool in all the groups.

**Ethical consideration**

The study was conducted after obtaining the written approval from the Institutional Human Ethics Committee of Saveetha medical college and hospital (007/11/2013IEC/SU; dated 15 November 2013)

**RESULTS**

One way analysis of variance with Dunnett’s test was done to assess and compare the level of blood glucose within experimental and control group revealed that the level of blood glucose (FBS and PPBS) was same in the experimental group I and II and in control group at the baseline.

The Table 1 shows that there was a significant ( $P < 0.001$ ) difference between the pretest ( $174.2 \pm 1.4$ ) and post test ( $132.4 \pm 2.1$ ) level of FBS in experimental group I observed after administration of laughter therapy. Also there was a significant ( $P < 0.001$ ) difference between the pretest ( $176.1 \pm 1.3$ ) and post test ( $122.2 \pm 2.1$ ) level of FBS in experimental group II observed after administration of Humor therapy. There is no significant difference between pre test ( $176.7 \pm 1.7$ ) and post test ( $194.0 \pm 2.4$ ) level of FBS in the control group.

The Figure 1 shows that there was a significant ( $P < 0.001$ ) difference between the pretest ( $278.8 \pm 3.8$ ) and post test ( $220.5 \pm 4.1$ ) level of PPBS in experimental group I observed after administration of Laughter therapy. Also there was a significant ( $P < 0.001$ ) difference between the pretest ( $280.4 \pm 3.9$ ) and post test ( $185.1 \pm 4.6$ ) level of PPBS in experimental group II observed after administration of Humor therapy. There is no significant difference between pre test ( $283.2 \pm 4.0$ ) and post test ( $295.5 \pm 5.1$ ) level of PPBS in the control group.

The pre test, post test-1, post test 2, pre-post-3 and post test 4 of control, experimental group 1 and experimental group 2 were analyzed by one way ANOVA and Dunnett’s test. In the control FBS, Post test 2, post test 3 and post test 4 showed significant increased when compared to the pretest. In the experimental group I and experimental group II, all post tests were significantly decreased compared to the respective pre tests. One way ANOVA with Student Newman-Keuls multiple comparisons were done to assess pre test and post test of respective control, experimental group I and group II. The pre test FBS was not statistically significant. The post test 1, post test 2, post test 3 and post test 4 of laughter therapy and humour therapy showed statistically improved compared to the control group. The laughter therapy improvement was better than humour therapy in FBS level (Table 1 and Figure 1). Post test showed same significant level for PPBS.

**Table 1: The mean and SE of pre test and post tests on FBS of Control Group, Laughter therapy and Humour therapy**

S. No.	Group	FBS Mean $\pm$ SE (n = 50 each) mg/dl		One way RM ANOVA with Dunnett’s test
1	Control	Pre	$176.7 \pm 1.7$	29.540 $P < 0.001$
		Post 1	$180.5 \pm 1.7$	
		Post 2	$187.1 \pm 2.3$	
		Post 3	$190.1 \pm 2.2$	
		Post 4	$194.0 \pm 2.4$	
2	Laughter Therapy	Pre	$174.2 \pm 1.4$	149.420 $P < 0.001$
		Post 1	$158.2 \pm 1.5$	
		Post 2	$148.2 \pm 1.8$	
		Post 3	$141.5 \pm 2.0$	
		Post 4	$132.4 \pm 2.1$	
3	Humour Therapy	Pre	$176.1 \pm 1.3$	233.491 $P < 0.001$
		Post 1	$154.6 \pm 1.1$	
		Post 2	$140.7 \pm 2.1$	
		Post 3	$131.7 \pm 2.4$	
		Post 4	$122.1 \pm 2.1$	

Table 2: The mean and SE of pre test and post tests on PPBS of Control Group, Laughter therapy and Humour therapy

S. No.	Group	PPBS Mean $\pm$ SE (n= 50 each) mg/dl		One way RM ANOVA with Dunnett's test
1	Control	Pre	283.2 $\pm$ 4.0	4.472 P 0.002
		Post 1	285.5 $\pm$ 3.8	
		Post 2	289.4 $\pm$ 3.7	
		Post 3	293.9 $\pm$ 4.6	
		Post 4	295.5 $\pm$ 5.1	
2	Laughter Therapy	Pre	278.8 $\pm$ 3.8	65.648 P < 0.001
		Post 1	254.7 $\pm$ 3.7	
		Post 2	244.6 $\pm$ 4.0	
		Post 3	235.3 $\pm$ 4.4	
		Post 4	220.5 $\pm$ 4.1	
3	Humour Therapy	Pre	280.4 $\pm$ 3.9	140.753 P < 0.001
		Post 1	242.6 $\pm$ 4.3	
		Post 2	209.7 $\pm$ 5.2	
		Post 3	195.7 $\pm$ 5.0	
		Post 4	185.1 $\pm$ 4.6	

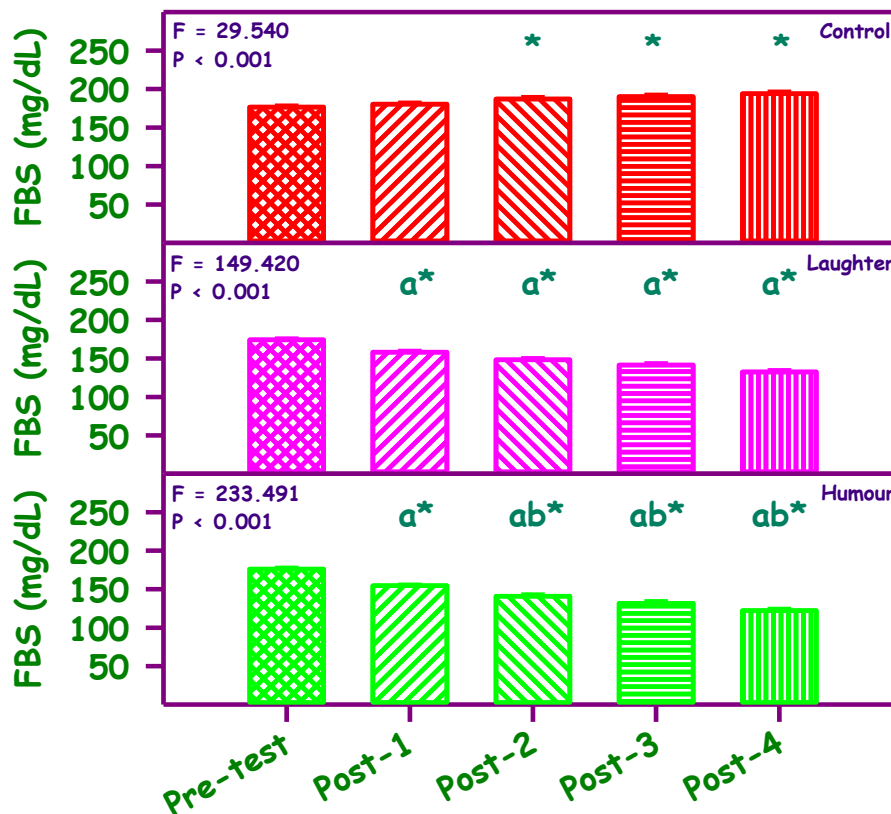


Figure 1: Effect of laughter therapy and humour therapy on fasting blood sugar (FBS)

Values are mean  $\pm$  SE (n = 50 each). The 'F' and 'P' values are by one way RM ANOVA with Dunnett's test.

\*Significantly different from the respective pre-test. The respective pre-test and post-tests of control, laughter therapy and humour therapy are compared by one way ANOVA with Student Newman Keuls multiple comparison test,

For the pre-test the 'F' and 'P' values are 0.709 and 0.494 respectively. For the post-test 1 the 'F' and 'P' values are 87.526 and < 0.001 respectively.

For the post-test 2 the 'F' and 'P' values are 134.952 and < 0.001 respectively. For the post-test 3 the 'F' and 'P' values are 197.140 and < 0.001 respectively. For the post-test 4 the 'F' and 'P' values are 294.652 and < 0.001 respectively.

a-Significantly different from control. b-Significantly different from laughter therapy.

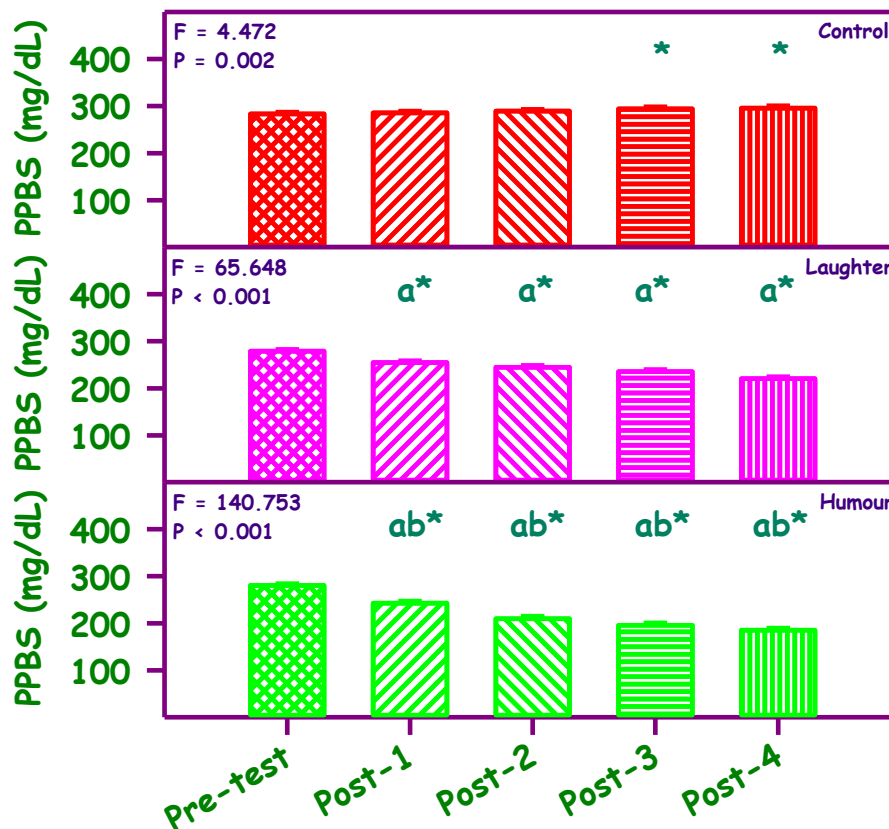


Figure 2: Effect of laughter therapy and humour therapy on post prandial blood sugar (PPBS)

Values are mean  $\pm$  SE (n = 50 each). The 'F' and 'P' values are by one way RM ANOVA with Dunnett's test.

\*Significantly different from the respective pre-test. The respective pre-test and post-tests of control, laughter therapy and humour therapy are compared by one way ANOVA with Student Newman Keuls multiple comparison test,

For the pre-test the 'F' and 'P' values are 0.318 and 0.728 respectively. For the post-test 1 the 'F' and 'P' values are 30.893 and < 0.001 respectively.

For the post-test 2 the 'F' and 'P' values are 82.394 and < 0.001 respectively. For the post-test 3 the 'F' and 'P' values are 109.633 and < 0.001 respectively. For the post-test 4 the 'F' and 'P' values are 145.151 and < 0.001 respectively.

a-Significantly different from control. b-Significantly different from laughter therapy.

## DISCUSSION

The present study has been conducted to evaluate the effectiveness of laughter therapy versus humor therapy on level of blood glucose among individual with type 2 diabetes. The study results highlighted that both laughter therapy and humor helped to reduce the level of FBS and PPBS among individual with type 2 diabetes than control group. It gives evidence that laughter therapy and humour therapy are simple, cost effective and easy technique to reduce the blood glucose level. The humour therapy was better than the laughter therapy.

Keiko hayashi. *Et al*<sup>8</sup>, (2003) supported by a study conducted in Japan among 19 type 2 diabetes mellitus to find the effectiveness of laughter therapy for 2 days. The result revealed that there was a significant reduction of PPBS. It may be due to the favorable effect of laughter therapy which may include the acceleration of glucose utilization by the muscle motion during the laughter. The positive emotions such as laughter acted on the neuroendocrine system and suppressed the elevation of blood glucose level.

## CONCLUSION

Diabetes mellitus is a major non communicable disease problem among Indian populations. Various measures like diet, exercise, medication and self-monitoring of glucose and other supportive therapy would control the high blood glucose among diabetics. Laughter therapy and humor therapy proved to be effective measure to reduce the blood glucose level (FBS and PPBS) among individual with type 2 diabetes. As it is a noninvasive technique, easy to learn and practice in clinical settings and it can be used as a complimentary intervention with diet control and alternate to the medical treatment.

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