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Comparative study on the nutritional status of diabetic patient and non- diabetic people, age group of (40-55 years)

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Abstract
According to the International Diabetes Federation (IDF), in 2030 the global prevalence of diabetes was approximately 439 million people and 7.7% of the word population. Hence, the present study aimed to investigate the effect of garlic on lipid parameters and serum glucose levels in diabetic patients in order to achieve a comprehensive result through a systematic review and meta-analysis. According to the analysis results of global data, the prevalence of diabetes melllitus in adults was about 153 million in 1980 and 347 million in 2008. It is estimated to increase to 439 million in 2030, with a 69% increase in developing countries and 20% in developed countries. Among those cases, type 2 diabetes mellitus (T2DM) typically occurred in overweight young adults as well as aged populations, with the underlying mechanism a relative deficiency of insulin due to abnormal insulin sensitivity and insulin resistance involving various transport pathways and key molecules. As a common chronic disease, T2DM easily induces age-matched disabilities and multiple organ dysfunctions or failure. Meanwhile, the problem of T2DM-induced depression is also proposed and focused on in recent years. It was reported that one in four patients suffered clinically significant depression, and that the depression could even adversely affect the course and increase the risk of T2DM-related complications. In most standard guidelines for T2DM medical care, comprehensive treatment including diet Control, exercise, drug intake, insulin injection, and sometimes bariatric surgery were recommended, with confirmed efficacy. However, taking hypoglycemic drugs would be still a major and popular choice due to its flexibility and low cost for a long time, especially in developing countries where more and more newly diagnosed T2DM may emerge. The Aims and objectives of this study is To study Height, Weight, B.M.I, Blood pressure of diabetic patient and normal people following anthropometric technique and To analysis the dietary consumption of diabetic patient and normal people.

Keywords: diabetes, health status, MUAC, BMI

Introduction
Populations with diabetes mellitus (DM) who have visited a doctor are increasing dramatically. Diabetes affects over 140 million human populations in the west and estimates of the prevalence will reach 300 million by 2025. Atherosclerosis is one of the late consequences of diabetes that affects many organs and is the cause of morbidity and mortality. Elevated serum lipids are risk factors that cause atherosclerosis and progress diabetes particularly cardiovascular problems. Hyperlipidemia causes atherosclerotic plaques and blocks artery in a chronic process. One percent Low Density Lipoprotein (LDL) reduction is associated with 2% decrease in the consequences of coronary artery disease. In addition, cholesterol-lowering drugs can reduce 25% LDL level in men with coronary artery disease and reduce subsequent mortality due to coronary heart disease. High blood sugar causes non-enzymatic binding of glucose to proteins inside and outside the cell. Those who have DM will face long-term problems such as renal failure, eye damage, cardiovascular system failure and the central nervous system failure.
Among the currently therapeutic options, such as hypoglycemic drugs and insulin therapy, which have limitations, there has been much attention to use of traditional plants medicine that modulate hyperglycemia, dyslipidemia and prevent diabetes-induced complication. Also, plant-based medicine provides beneficial effects, alongside with only minimal or no complications in clinical experiments, and compared to other medicine are relatively cost effective. In this regard. Garlic beneficial effects such as antimicrobial and lowering blood fats have been proven in various studies that is among the herbs with a high consumption from the earliest times. In another study, garlic is seen as an effective plant for blood glucose control through herbal therapy. Researchers believe that the therapeutic effect of garlic and its components on modulating lipid synthesis and excretion of sterols is probably due to the Diallyl disulfide (DADS) decomposition of Allicin. Garlic decreases the absorption of cholesterol and inhibits the activity of enzymes involved in cholesterol synthesis. Garlic is a member of the Liliaceae family. Garlic contains various compounds, including organic sulfur compounds, amino acids, vitamins and minerals. Probably, some components of garlic such as Allicin, aigio, *S*-allyl cysteine, and DADS have the therapeutic effects on serum levels of glucose, lipid profile and insulin.
According to the International Diabetes Federation (IDF), in 2030 the global prevalence of diabetes was approximately 439 million people and 7.7% of the word population. Hence, the present study aimed to investigate the effect of garlic on lipid parameters and serum glucose levels in diabetic patients in order to achieve a comprehensive result through a systematic review and meta-analysis.
According to the analysis results of global data, the prevalence of diabetes melllitus in adults was about 153

million in 1980 and 347 million in 2008. It is estimated to increase to 439 million in 2030, with a 69% increase in developing countries and 20% in developed countries. Among those cases, type 2 diabetes mellitus (T2DM) typically occurred in overweight young adults as well as aged populations, with the underlying mechanism a relative deficiency of insulin due to abnormal insulin sensitivity and insulin resistance involving various transport pathways and key molecules. As a common chronic disease, T2DM easily induces age-matched disabilities and multiple organ dysfunctions or failure. Meanwhile, the problem of T2DM-induced depression is also proposed and focused on in recent years. It was reported that one in four patients suffered clinically significant depression, and that the depression could even adversely affect the course and increase the risk of T2DM-related complications. In most standard guidelines for T2DM medical care, comprehensive treatment including diet control, exercise, drug intake, insulin injection, and sometimes bariatric surgery were recommended, with confirmed efficacy. However, taking hypoglycemic drugs would be still a major and popular choice due to its flexibility and low cost for a long time, especially in developing countries where more and more newly diagnosed T2DM may emerge.

Garlic is one of the oldest cultivated plants all over the world, and is regarded as food as well as traditionally a medicine. Garlic extract is a compound of various biological activities, and proved to be beneficial for human bodies due to its antimicrobial, antioxidant, anticarcinogenic, antimutagenic, antiasthmatic, immunomodulatory, and prebiotic effects. Previous studies have already demonstrated that it can reduce the level of blood pressure and cardiovascular events in severe hypertensive patients. Also, it might play positive roles in the primary prevention of colorectal cancer and cardiovascular mortality, although the effects were not completely confirmed.

Currently, garlic extract is becoming one of the most extensively studied drugs, and the positive effects of garlic supplements on blood glucose control and liquid regulation were further reported, which attracted more and more attention from researchers. A series of randomized controlled trials (RCTs) of high quality were designed to investigate its efficacy in the management of T2DM during last the decades. As a promising traditional food and medicine, together with its potential advantages of multiple targets, wide distribution, low cost, and rare complications, garlic would have a very important and significant influence on current clinical management of T2DM if its efficacy were confirmed. However, due to the limited sample size and verified outcomes, there is not yet a comprehensive and quantitative analysis with high reliability. Therefore, a meta-analysis through identifying all available RCTs was conducted to evaluate systematically the efficacy and safety of garlic supplements in the management of T2DM on blood glucose, as well as blood liquids including total cholesterol, triglyceride, high density lipoprotein (HDL), and low density lipoprotein (LDL) regulation.

Aims and objectives

- To study Height, Weight, B.M.I, Blood pressure of diabetic patient and normal people following anthropometric technique.
- To analysis the dietary consumption of diabetic patient and normal people.

Materials and Methods

To find out the health status following parameters and adopted.

- Height (cm)
- Weight (kg)
- Body mass index (kg/m2)

Anthropometric Measurement

To do this project work I have measured the height, weight, waist circumference, mid upper arm circumference of 20-30 years of break industrial worker between male and female. I used some anthropometric indicate for coquet the information of this project.

- **Measurement of height**

Height is measured with a vertical measuring rod. The subject should stand create looking straight on a level surface with heels together and toes apart, without shoes. The moving had pieces of the anthropometry should be lowered to rest flat on the top of the reading should be taken. Height should be taking read to the nearest ¼" or 0.5cm. An average of three measurement is taken as the measurement.

- **Measurement of body weight**

Subject stands on the platform of the human weighting machine exerting equal pressure on both feet the reading in taken from the scale with an accuracy of 0.5 kg.

Weight is measured with the individual under Basel conditions with minimum clothing and without shoes. The zero error of the weighing scale should be checked before taking the corrected as and when required.

Calculation of index

Body mass index is measured by the following formula.

BMI (Body Mass Index)

$BMI = Weight\ (kg)/Height\ (m)^2$

- **Blood pressure and Pulse Rate**

The blood pressure measurements were made of after the complication of the anthropometric measurements. Left arm blood pressure was taken with a Sphygmomanometer and Stethoscope after the participate has been seated in a released position for 5 minutes. Prior to taking measurements, subjects were instructed to lie on the bed and then the left arm was placed at the inside of the body. Two former measurements were recorded and average for analysis. A 5 minute relaxation period between the two measurements was maintained for all subjects, systolic Blood Pressure (SBP) and Diastolic Blood Pressure (DBP) were recorded to the nearest mm of Hg as the appearance (Phase-I) and disappearance (Phase-II) of Karat off sounds respectively.

- **Questionnaire methods for measuring food intake**

Health status measurement of nutritional status of brick industrial worker questionnaire method a diet survey may also includes data collection to dietary habits and practices. The data that is collected to have translated into.

Mean intake (grams of food interms of cereals, pulses, vegetables, fruits, milk, meat, fish and eggs).The mean intake of nutrients per individual consumption unit this diet survey provides information a dietary intake patterns, specific foods consumed and estimated intakes. Thecaloriefic and nutritive values of different food stuffs consumed by the workers were estimated using the tables of

nutritive value of Indian food and compared with the quantity of the Recommended Dietary Allowance (RDA) for the Indians by ICMR 2010. The survey was carried out during a period of 7 days.

Analysis of Data

The data of each anthropometric parameter and food intake of workers were used for calculating the mean and standard deviation. The standard errors of means are also calculated. These mean values were compared with the standard data published by ICMR and NCHS.

Statistical Analysis

The calculated data was analyzed by the mean value, standard Deviation, standard Error and T-Test with the help of computer package.

Mean

It is arithmetic average of the observed scores. The sample means is represented by the symbol X, where X represents each individual scores of samples, OX is the sum of all scores and n is the sample size or the total frequency of cases in the samples.

$$\bar{x}=\frac{\sum x}{n}$$

Standard Deviation (SD)

Standard Deviation (SD) is positive square root of the mean of squared deviation of all the scores from the mean. It is an absolute measure of deviation and is expressed in the same unit as the original scores. Standard of a sample is donated by-

$$SD=\sqrt{\frac{\sum(x-\bar{x})2}{n-1}}$$

Standard Error (SE)

Standard Error (SE) of a statistic is a measure of the deviation of the statistic from the corresponding parameter and consequently serves as an index of the sampling error of that statistic. It is standard deviation of the sampling distribution of the relevant statistic.

$$SE=\frac{SD}{\sqrt{n}}$$

T-test

To test the significance of the different between the means of two smalls samples that different ($x,-x^2$) is converted to student q s T score which is than interpreted with the reference to the appropriated distribution.

The t-values is computed as follows

$$t=\frac{\overline{x1}-\overline{X2}}{\sqrt{\frac{s1^2+s2^2}{n}}} \text{ or } t=\frac{\bar{D}}{SE}$$

Result & discussion

Representation of Data

After collection of data by using proper methodology, the results of assessment are arranged in tabular form-

Firstly I observed the height, weight, BMI, BP, and Nutritional status of Non-Diabetic patient (40-55 years of age). Then I observed the height, weight, BMI, BP, Nutritional status and recent and previous blood report of Diabetic patient (40-55 years of age).

Table 1: general profile of non-diabetic people, age group of (40-55 years)

Case Study	Name	Age	Sex	Economic Status	Work Activity
1	Kajol Rana	55	F	Medium	Sedentary
2	Lakhi Rani Rana	45	F	Medium	Sedentary
3	Tulsi Rana	40	F	Medium	Sedentary
4	Sonatan Rana	45	M	Medium	Sedentary
5	Sujata Pramanik	41	F	Medium	Sedentary
6	Karna Maity	50	F	Low	Sedentary
7	Reboti Maity	40	F	Low	Sedentary
8	Nanda Das	42	M	Low	Heavy
9	Nomita Das	41	F	Low	Sedentary
10	Nishikanta Das	52	M	Low	Heavy
11	Sankar Ruhidas	54	M	Low	Heavy
12	Tapas Ruhidas	45	M	Low	Heavy
13	Chobi Ruhidas	48	F	Low	Sedentary
14	Minakshi Das	47	F	Medium	Sedentary
15	Laxmi Das	40	F	Medium	Moderate

Table 2: anthropometric data of non-diabetic people in the age group of (40-55 years)

Case study	Name	Age	Sex	Hieght	Weight	BMI
1	Kajol Rana	55	F	146	53	24.88
2	Lakhi Rani Rana	45	F	138.4	30	15.70
3	Tulsi Rana	40	F	142.5	40	19.70
4	Sonatan Rana	45	M	145.2	60	28.57
5	Sujata Pramanik	41	F	145.3	52	24.64
6	Karna Maity	50	F	154	45	18.98
7	Reboti Maity	40	F	142	46	22.88
8	Nanda Das	42	M	158	68	27.30
9	Nomita Das	41	F	148.5	56	25.45
10	Nishikanta Das	52	M	159.5	56	22.04
11	Sankar Ruhidas	54	M	159.3	68	26.87
12	Tapas Ruhidas	45	M	160	85	33.20
13	Chobi Ruhidas	48	F	148	61	27.85
14	Minakshi Das	47	F	166	65	23.63
15	Laxmi Das	40	F	155.3	52	21.57
MEAN				151.2	55.8	24.21733
SD				8.200261	13.21363	4.357018
SE				2.118931	3.414375	1.125844

Table 3: General profile of diabetic patient, age group of (40-55 years)

Case study	Name	Age	Sex	Economic status	Work activity
1	Sefali Pradhan	55	F	High	Sedentary
2	Rashbehari Dhara	54	M	Medium	Moderate
3	Hazera Bibi	45	F	Medium	Sedentary
4	Arati Rani Ari	47	F	High	Sedentary
5	Nayanjali Dhara	49	F	Medium	Sedentary
6	Nihar Ranjan Sen	42	M	High	Moderate
7	Swapan Kumar Maity	48	M	High	Moderate
8	Madhumita Maity	42	F	High	Sedentary
9	Dulal Ch. Maity	55	M	Medium	Moderate
10	Amiya Kr. Das	47	M	Medium	Moderate
11	Kalpana Pal	41	F	High	Sedentary
12	Sattayaranjan Bera	55	M	Medium	Moderate
13	Lakhan Ch. Das	53	M	High	Moderate
14	Bilasi Tudu	55	F	High	Sedentary

15	Ananta Kr. Bhowmik	52	M	High	Moderate

Graphical Representation of Anthropometric Measurement

Table 4: Comparison of BMI (kg/m^2) between diabetic patient and normal people

Anthropometric parameters	Diabetic patient (Mean± SEM)	Normal people (Mean± SEM)
BMI (kg/m^2)	25.81±0.89	24.21±1.12

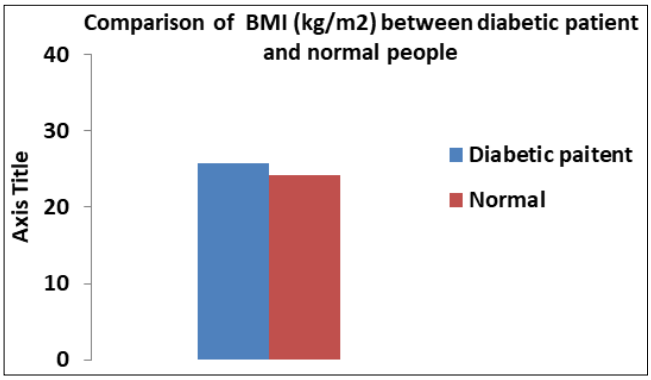


Fig 1: For levels of significance, two-tail critical t scores (DF=28) are quoted below- $t_{.05\,(28)}$ =2.048, $t_{.02\,(28)}$ =2.467, $t_{.01\,(28)}$ =2.763, $t_{.001\,(28)}$ =3.674

The computed t of 1.23 is higher than even the critical t for the 0.05 level of significance. The probability p of correctness of the H_0 is not being correct exceeds 0.05 and is considered to low. So the H_0 can be rejected. It is inferred that the mean BMI score have differ significantly (p< 0.05).

Table 5: Comparison of Systolic Blood Pressure (mm/hg) between diabetic patient and normal people

Anthropometric parameters	Diabetic patient (Mean± SEM)	Normal people (Mean± SEM)
Systolic Blood Pressure (mm/hg)	136.8±5.53	133.84±5.58

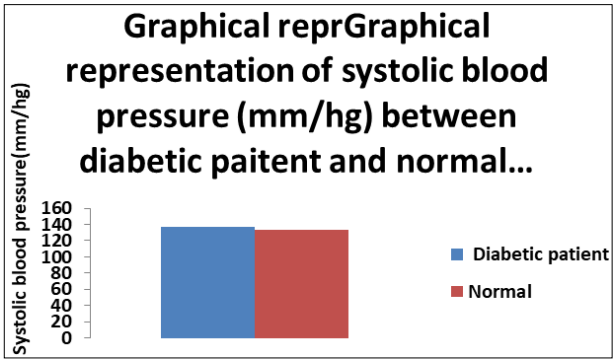
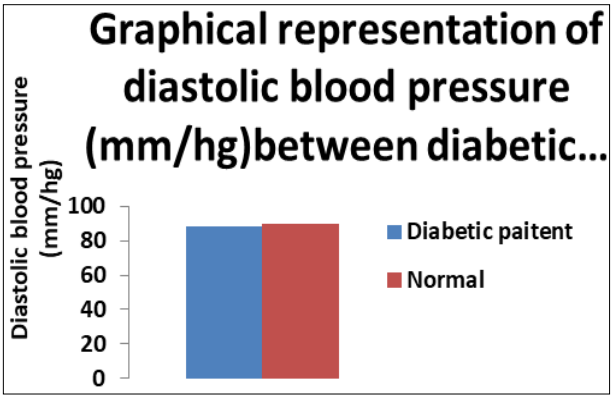


Fig 2: For levels of significance, two-tail critical t scores (DF=28) are quoted below-$t_{.05\,(28)}$ =2.048, $t_{.02\,(28)}$ =2.467, $t_{.01\,(28)}$ =2.763, $t_{.001\,(28)}$ =3.674

The computed t of 0.37 is higher than even the critical t for the 0.05 level of significance. The probability p of correctness of the H_0 is not being correct exceeds 0.05 and is considered to low. So the H_0 can be rejected. It is inferred that the mean systolic score have differ significantly (p< 0.05).

Table 6: Comparison of Diastolic Blood Pressure (mm/hg) between diabetic patient and normal people

Anthropometric parameters	Diabetic patient (Mean± SEM)	Normal people (Mean± SEM)
Diastolic Blood Pressure (mm/hg)	88.4±4.05	90.07±4.68



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The computed t of 0.27 is higher than even the critical t for the 0.05 level of significance. The probability p of correctness of the H_0 is not being correct exceeds 0.05 and is considered to low. So the H_0 can be rejected. It is inferred that the mean diastolic score have differ significantly (p< 0.05).

Table 7: Comparison of haemoglobin level (gm/dl) between diabetic patient and normal people

Anthropometric parameters	Diabetic paitent (Mean± SEM)	Normal people (Mean± SEM)
haemoglobin level (gm/dl)	12.99±0.28	14.59±0.36

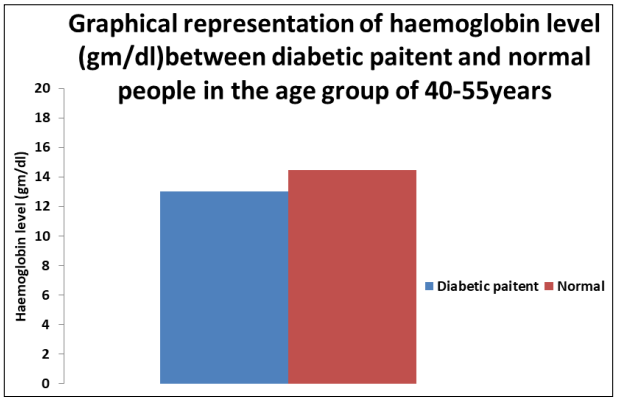

Fig 4: For levels of significance, two-tail critical t scores (DF=28) are quoted below-$t_{.05\,(28)}$ =2.048, $t_{.02\,(28)}$ =2.467, $t_{.01\,(28)}$ =2.763, $t_{.001\,(28)}$ =3.674

The computed t of 3.63 is higher than even the critical t for the 0.01 level of significance. The probability p of correctness of the H_0 is not being correct exceeds 0.01 and is considered to low. So the H_0 can be rejected. It is inferred that the mean haemoglobin score have differ significantly (p< 0.01).

Table 7: Comparison of Energy (kcal) between diabetic patient and normal people

Anthropometric parameters	Diabetic patient (Mean± SEM)	Normal people (Mean± SEM)
Energy(kcal)	1823.42±124.02	2216±137.4

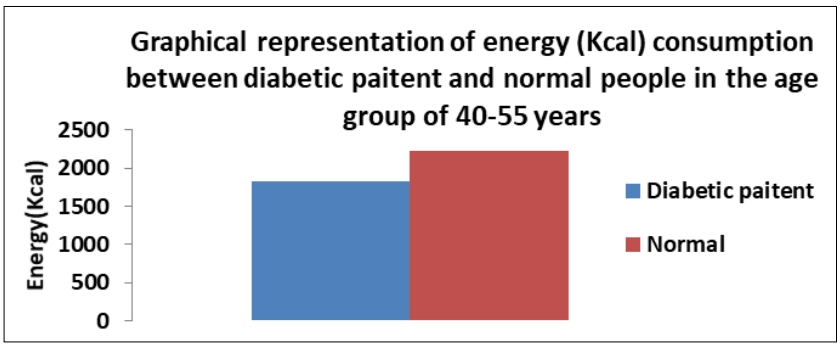

Fig 5: For levels of significance, two-tail critical t scores (DF=28) are quoted below-$t_{.05\ (28)}$ =2.048, $t_{.02\ (28)}$ =2.467, $t_{.01\ (28)}$ =2.763, $t_{.001\ (28)}$ =3.674

The computed t of 2.12 is higher than even the critical t for the 0.05 level of significance. The probability p of correctness of the H_0 is not being correct exceeds 0.05 and is considered to low. So the H_0 can be rejected. It is inferred that the mean energy score have differ significantly (p< 0.05).

Table 8: Comparison of Carbohydrate (gm) between diabetic patient and normal people

Anthropometric parameters	Diabetic paitent (Mean± SEM)	Normal people (Mean± SEM)
Carbohydrate (gm)	264.89±2.62	332.4±20.57

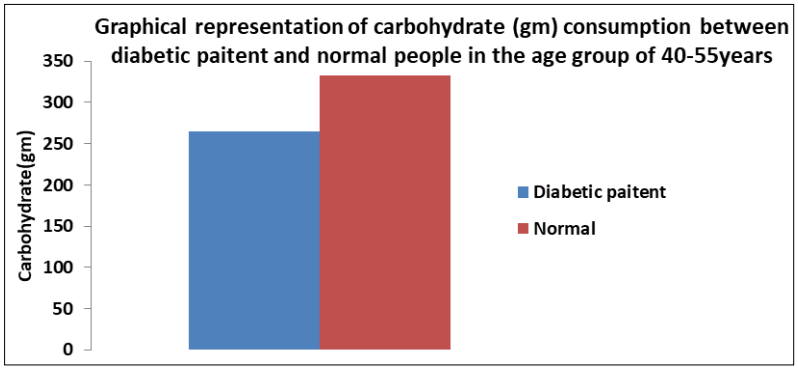

Fig 6: For levels of significance, two-tail critical t scores (DF=28) are quoted below-$t_{.05\ (28)}$ =2.048, $t_{.02\ (28)}$ =2.467, $t_{.01\ (28)}$ =2.763, $t_{.001\ (28)}$ =3.674

The computed t of 3.26 is higher than even the critical t for the 0.01 level of significance. The probability p of correctness of the H_0 is not being correct exceeds 0.01 and is considered to low. So the H_0 can be rejected. It is inferred that the mean carbohydrate score have differ significantly (p< 0.01).

Table 9: Comparison of protein (gm) between diabetic patient and normal people

Anthropometric parameters	Diabetic paitent (Mean± SEM)	Normal people (Mean± SEM)
Protein (gm)	82.12± 2.91	64.85±4.01

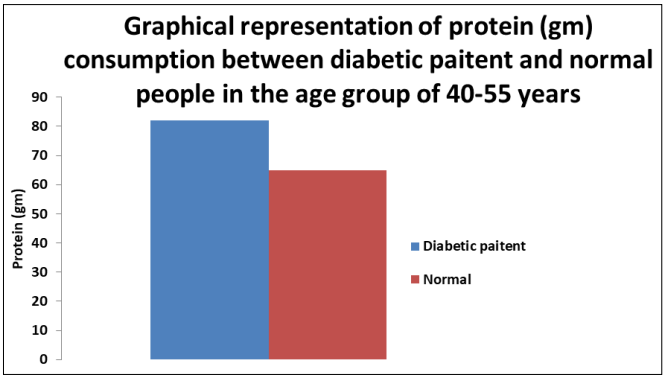

Fig 7: For levels of significance, two-tail critical t scores (DF=28) are quoted below-$t_{.05\ (28)}$ =2.048, $t_{.02\ (28)}$ =2.467, $t_{.01\ (28)}$ =2.763, $t_{.001\ (28)}$ =3.674

The computed t of 0.55 is higher than even the critical t for the 0.05 level of significance. The probability p of correctness of the H_0 is not being correct exceeds 0.05 and is considered to low. So the H_0 can be rejected. It is inferred that the mean protein score have differ significantly ($p< 0.05$).

Table 10: Comparison of fat (gm) between diabetic patient and normal people

Anthropometric parameters	Diabetic patient (Mean± SEM)	Normal people (Mean± SEM)
Fat (gm)	44.99±1.64	66.71±0.4.12

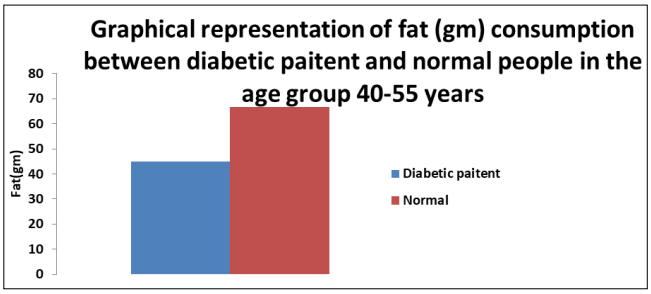

Fig 8: For levels of significance, two-tail critical t scores (DF=28) are quoted below-$t_{.05\ (28)}$ =2.048, $t_{.02\ (28)}$ =2.467, $t_{.01\ (28)}$ =2.763, $t_{.001\ (28)}$ =3.674

The computed t of 4.89 is higher than even the critical t for the 0.001 level of significance. The probability p of correctness of the H_0 is not being correct exceeds 0.001 and is considered to low. So the H_0 can be rejected. It is inferred that the mean fat score have differ significantly ($p< 0.001$).

Table 11: Comparison of blood glucose level (gm/dl) in fasting condition between recent value and before value in diabetic patient

Anthropometric parameters	Recent value (Mean± SEM)	Before value (Mean± SEM)
Blood glucose level(gm/dl)	125.93±10.97	132.46±10.13

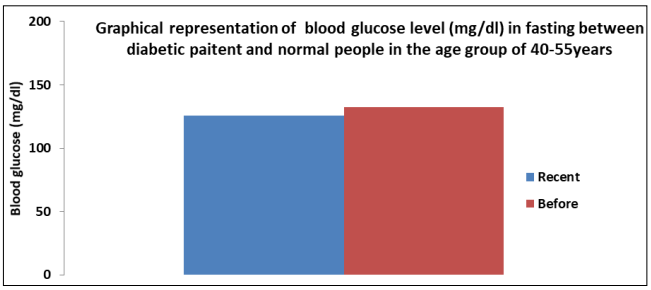

Fig 9: For levels of significance, two-tail critical t scores (DF=28) are quoted below-$t_{.05\ (28)}$ =2.048, $t_{.02\ (28)}$ =2.467, $t_{.01\ (28)}$ =2.763, $t_{.001\ (28)}$ =3.674

The computed t of 2.29 is higher than even the critical t for the 0.05 level of significance. The probability p of correctness of the H_0 is not being correct exceeds 0.05 and is considered to low. So the H_0 can be rejected. It is inferred that the mean blood glucose score have differ significantly ($p< 0.05$).

Conclusion

A recent increase in the popularity of alternative medicine and natural products has renewed interest in garlic and their derivatives as potential natural remedies. This review may be useful to increase our knowledge of garlic therapeutic effects and improve our future experimental and clinical research plans. Although it is shown that garlic may have a significant clinical potential either in their own right or as adjuvant therapy in different disorders, however, due to some issues, such as methodological inadequacies, small sample sizes, lack of information regarding dose rationale, variation between efficacy and effectiveness trials, the absence of a placebo comparator, or lack of control groups more standard experiments and researches are needed to confirm the beneficial effect of garlic in various diseases. Future trials on the effect of garlic should include information on the dosage of active ingredients of standardized garlic preparations for better comparison of trials. It would also be interesting to explore the effect of different forms of garlic extract on standard drug therapy, especially when used as adjuvant therapy.

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