

Psychological Well-Being and Quality Of Life among Patients with Type 2 Diabetes Mellitus

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Abstract: Diabetes represents one of the most significant disease burdens facing Indian population as the incidence and prevalence of diabetes has gone up multifold in the past few decades. International Diabetes Federation (IDF) predicts that by 2030, India could account for 101.2 million of the world's 552 million patients with diabetes, which indicates that the disease is going to take an endemic status soon. This study is to assess relationship between psychological well-being and quality of life among patients with diabetes mellitus. A sample of 400 Patients with diabetes mellitus with type 2 which consist of 200 male and 200 female who are attending the clinics and health care centers in Palakkad Dist. were taken randomly as the subjects of the present investigation by administrated psychological wellbeing scale and the quality of life scale were analyzed using t-test and Pearson's correlation. Result revealed that there is significance difference in psychological well-being among male and female patients with Type 2 of diabetes mellitus but there is no significance difference in quality of life among male and female patients with diabetes mellitus. On the other hand, there is significance relationship between psychological well-being and quality of life among patients with Type 2 of diabetes mellitus.

Key words: Diabetes Mellitus, Psychological well-being, Quality of life.

INTRODUCTION

Health psychology is an emerging field of Psychology. Health Psychology is an exciting and relatively new field devoted to understanding psychological influences on how people stay healthy, why they become ill, and how they respond when they do get ill (Taylor S., 2012). Diabetes is the most common chronic illness and has invaded in almost every Indian family. Diabetes is a metabolic disorder of multiple a etiology characterized by chronic hyperglycemia with disturbances of carbohydrate, fat and protein metabolism resulting from defects in insulin secretion, insulin action, or both (WHO, 2006). Being life-style illness, diabetes affects every area of a diabetes patient's life. Various aspects of patient's psyche also affect the disease and its management. Distress related to diabetes, knowledge and efficacy of diabetes, and personality make tremendous difference in

quality of life (QOL) of the patients. Diabetes is less focused on medicine and more on management. This management is done by the patients which most of the times makes the patient stressful and unproductive for daily activity. If the patients are not well informed about the disease and its management they might get severe complications, which may lead to death. Patients need self-control and patience to apply the modifications which is directly affected by the personality of the patient.

Effects of diabetes on physical functioning

Diabetes can affect physical health in various ways. The most notorious is the development of long-term complications and their consequences. When patients suffer visual impairment, heart problems, end stage renal disease, impotence or peripheral neuropathy resulting in chronic pain, or even worse an

amputation, there is likely to be a significant drop in perceived quality of life. The patient will be less able to participate in pleasurable activities and his ability to function independently may be impaired as well. Gregg et al. (2000) evidenced that diabetes is a major burden of physical disability in adults and that these disabilities may substantially impair their quality of life. They found that coronary heart disease was the major contributor for disability, with stroke especially effecting men.

Diabetes influences social relationships

The mere presence of diabetes can affect the quantity and quality of a patient's relationships. As patients begin to institute changes in daily habits in order to manage diabetes most effectively, loved ones may begin to rebel. Alternatively, friends or family members may begin to push for self-care changes even when the patient is unwilling to make them, very possible in a young growing diabetic patient. In either case, it is easy to begin feeling alone with diabetes, feeling different and unsupported, and believing that no one can understand what living with diabetes is really like. Jacobson et al. (2004) followed a group of young adults with Type 1 diabetes. These were compared to an age- matched group. The diabetes group reported fewer friendships overall and they experienced less trust and sense of intimate friendship in love relationships.

Psychological wellbeing

Psychological well-being is a very subjective term but form all the research that has been carried out, the term is used throughout the health industry as kind of a 'catch-all phrase' meaning contentment, satisfaction with all elements of life, self-actualization (a feeling of having achieved something with one's life), peace and happiness.

Psychological well-being in people with diabetes

Psychological well-being is related to the individual's representation of the condition, and also is related to physical symptoms and social experiences .Physical symptoms in

diabetes care usually include temporary hypoglycemic or hyperglycemic and long-term complications . A diabetic's well-being is often linked to the individual's insight regarding his or her capability of coping with the everyday demands of the diabetes condition and its treatment difficulties. Fulfilling social obligations, sustaining social relationships, maintaining better metabolic control, and preventing or delaying the onset of diabetes complications are the other preoccupations.

Quality of life

Quality of life is also increasingly recognized as an important health outcome in its own right, representing the ultimate goal of all health interventions. More than 50 years ago, the World Health Organization stated that health was defined not only by the absence of disease and infirmity, but also by the presence of physical, mental, and social well-being. Though health care providers sometimes focus on medical outcomes alone when assessing the efficacy of their interventions, any person with diabetes will tell you that these outcomes are truly meaningful only to the extent that they affect physical, emotional, and social well-being--that is, quality of life.

Diabetes and quality of life

The demands of diabetes care can have a potent impact on mood, both short-term and long-term. Many patients may become chronically frustrated, discouraged, and/or enraged with a disease that often does not seem to respond to their best efforts. They may also feel hopeless or despondent about the possibility of avoiding long-term complications. It can be a difficult, emotional struggle to find a way to include diabetes in one's life and to confront the sense of mortality that diabetes may represent. This may be especially problematic at those specific time points in the natural history of the illness when diabetes suddenly seems quite "real"—such as at diagnosis, if and when insulin is first started, and when long-term complications begin to occur.

In addition, chronically elevated blood glucose levels may lead to persistent fatigue, which

can exacerbate depressed mood. Similarly, frequent hypoglycemic episodes can be exhausting, debilitating, discouraging, and potentially quite frightening.

Facing a disease that is often difficult and confusing to manage, patients may feel a pervading sense of helplessness that detracts significantly from the overall sense of well-being. To assess this dimension, evaluation might focus on patients' perceived emotional distress due to diabetes-related symptoms, self-care, relevant problematic situations, and broader diabetes issues.

REVIEW OF RELATED LITERATURE

Aqueleem et. al. (2016) had studied the hope and psychological well-being among diabetes patients. The result revealed significance difference between male and female diabetes patients on hope and psychological well-being and relationship between hope and psychological well-being was found significantly positive.

Brey, P. (2015) had studied the design for the value of human well-being. The discussion had indicated that design for well-being was possible, but must deal with complex issues that have not yet been adequately resolved, which include the scope problem, the epistemological problem, the aggregation problem and the specification problem.

Yadav and Singh (2015) have conducted the role of self-efficacy in mental health among people with Type 2 diabetes. The results of the study make it obvious that self-efficacy was an important predictor of mental health. if diabetic people have higher, level of self-efficacy they were had lower rate of mental health problems. They were able to interpret threatening situation as manageable significant challenges and feel less stressed in adverse circumstances of life.

Boghle& Prakash observed that person high on psychological well- being not only carries high level of life satisfaction, self-esteem, positive feelings and attitudes but also manages tension, negative thoughts, ideas and feelings more efficiently.

Armendáriz I and Labrador M. (2015) revealed that People with diabetes experience high levels of stress and the psychosocial

impact of diabetes also affects family members

Co MA et. al. (2015) indicated that Poorer glycemic control was only associated with diabetes-related distress (measured by DHP-PD and PAID) but not major depressive disorder (measured by K10). It may be more appropriate to screen for diabetes-related distress rather than major depressive disorder for patients with T2DM.

R.J.Anderson, Freedland, Clouse, & Lustman, revealed that patients with diabetes face major changes in lifestyle and the possibility of developing debilitating and life-threatening complications. Patients with poorer glycaemic control, have a higher prevalence of concomitant psychiatric illnesses, such as depression and eating disorders. A meta-analysis showed the odds of depression in diabetic groups were twice that of the non-diabetic comparison groups (OR¹/₄2.0, 95% CI 1.8 – 2.2).

Velasco MJ et al (2015), shows that it is necessary to consider the HRQOL assessment should be considered in adolescence, with special attention to the psychological aspects in the proposed treatment and design of educational interventions.

Eiser et al., reveals that well-being in diabetic patients is associated with the perception of their ability to cope with the demands of diabetes and its treatment, to sustain social relationships, and to prevent the onset of complications in order to yield greater life satisfaction.

Gómez-Rico et. al. (2014) said that due to the bio psychosocial impact of DM1 usually assumed in the life of the child and family, and how it may compromise the quality of life and emotional wellbeing of both, different studies have agreed on the importance of identifying the set of psychological factors involved in healthy adjustment to illness in the child and adolescent with DM1.

Egede LE et. al (2014) conducted a study on relationship of serious psychological stress to quality of life in diabetic patients; serious psychological stress was assessed in 1,659 patients with diabetes who participated in the 2007 medical care expenditure survey (MEPS).

Yavari Abbas et. al. (2011) has studied the effect of exercise on psychological well-being in T2DM. The findings demonstrate a significant decrease in the mean GHQ-12

scores. Factor analysis by Graetz's three-factor model suggests that factor I (anxiety and depression) associates with more improvement than the other factors. The Concluded the exercise improves psychological distress in T2DM and results in improved well-being.

Naess, Midtjhell, Moum, Sorensen, and Tambs showed that the psychological wellbeing of diabetic patients was found to be significantly poorer than that of those without diabetes.

Anjana et al. (2011) says that different studies various types of detailed investigation and analysis has been conducted to estimate the spread of DM among the urban population in India. However, the availability of information on DM among the rural population is very scare in fact. The census of India (2013) reported that close to 742 million people that is 70% of population in India in rural areas. Therefore, it becomes essential to estimate the spread of diabetes among rural Indian population in order to design ways to light the battle against DM.

Quality of life

Tara Singh (2015) has studied co-morbid depression and health-related quality of life in diabetes. The findings hold particular clinical importance because effective treatment was available for both diabetes and depression. Health care professionals must be concerned with the mental health of diabetes patients and the potential negative effects of co-morbid depression on medical outcomes and diabetes self-care. Treatment for depression in patients with diabetes can result in improved medical outcomes, as well as improved HRQ and psychological well-being.

Gac Sanit (2015) done a study on Emotional stress and quality of life in people with diabetes and their Families in this The DAWN2 study is an observational, cross-sectional study. In the present study, we used the Spanish sample of patients (N=502) and their relatives (N=123). 13.9% of patients were at risk of possible depression while 50.0% of people with diabetes and 45.5% of family members reported a high level of diabetes-related emotional stress. People with diabetes experience high levels of stress and the psychosocial impact of diabetes affects family members.

Dismuke CE et. al. (2014) revealed that Among U. S. adults, SPD is associated with significantly diminished QOL beyond the

effects of depression. Targeted interventions to mitigate the adverse effects of SPD are needed, independent of programs to address depression.

Manjunath K et. al. (2014) Shows that Diabetes does impair the QoL of patients but not to a great extent. There is a need to specifically target and improve the QoL of women, widowed and separated, and non-obese diabetics who are at risk of a poor QoL. QoL assessment should be routinely practiced in diabetic clinics.

Al Hayek AA et. al. (2014) shows that gender, economic status, and complication of DM were independent risk factors for majority of the subscales of Health related quality of life.

Sarvottam (2014) reported the overweight is a problem of all countries. Improved living standards contribute to overweight. Persistent deposited of fat tissue can cause variation in the metabolic process. After few years this overweight people end up with heart problems and it effect on the quality of life .

Kalka D (2013) shows that Individuals with diabetes have lower global perceived quality of life and satisfaction with health and physical domain. In this group, the intensity of depressive symptoms is higher. Both groups use a task-oriented style with the same frequency in times of stress. Persons with diabetes use an emotion-oriented style more often than healthy persons, whereas the latter use an avoidance-oriented style

Van Son J et. al (2013) stated in a study on Psychology in Somatic Diseases, Department of Medical and Clinical Psychology, Tilburg University, Tilburg, The Netherlands revealed that usual care, resulted in a reduction of emotional distress and an increase in health-related quality of life in diabetic patients who had lower levels of emotional well-being.

Yfantouda and Evangelis, (2012) have conducted the role of psychosocial factors in wellbeing and self-care in young adults with Type 1 Diabetes. The relationship between internal and external locus of control beliefs, diabetes knowledge and wellbeing indicates the importance of addressing empowerment and self-efficacy in psycho education interventions for this client group.

Javanbakht M et. al. (2012) indicates that patients with diabetes in Iran suffer from relatively poor HRQoL. Therefore, much more attention should be paid to main determinants of HRQoL to identify and implement

appropriate policies for achieving better management of diabetes and ultimately improving the quality of life of diabetic patients in this region.

Giupta and misra (2007) reveals that the diabetes varied from 1-4% among urban and 1-2% among rural population. However since 1990's puts the variation to 5-15% among urban and 4-6% among semi-urban population. 2.5% in rural populations 5.4% in an exceedingly northern state 12.3-15.5% in urban center, south India, 12.3-16.8% in Jaipur, Central India.

Mohan et al. (2007) highlighted the epidemiology of diabetes in numerous regions of India, in keeping with UN agencies criteria was 5.6% of urban and 2.7% for the rural areas. In south regions of India, the spread has been reported to vary between 0.7% in Pondicherry to 19.5% in urban areas. Whereas the spread was between 1.3% in Tiruvantapuram to 13.2% in Gothavary in rural areas.

METHODOLOGY AND DATA ANALYSIS

The aim of the study is to find out a relationship between psychological well-being and quality of life among patients with diabetes mellitus. Patients with diabetes mellitus with type 2 who are attending the clinics and health care centers in Palakkad Dist. were constituted the population of the study for the present investigation. A representative sample of total 400 Patients with diabetes mellitus with type 2 which consist of 200 male and 200 female who had attended the clinics and health care centers in Palakkad Dist. by using random sampling method. Descriptive survey method was employed to carry out present study. The variables are **Independent variables**: Diabetes mellitus condition (Type 2), gender (male and female) and **Dependent variable**: psychological well-being and quality of life.

Objectives of the study

The following objectives were formulated for the proposed study:

1. To study the difference in psychological well-being among male and female patients with Type 2 of diabetes mellitus;

2. To study the difference in quality of life among male and female patients with diabetes mellitus;
3. To study the relationship between psychological well-being and quality of life among patients with Type 2 of diabetes mellitus.

Hypotheses of the study

1. H_0 : There is no significant difference in psychological well-being among male and female patients with Type 2 of diabetes mellitus
2. H_0 : There is no significant difference in quality of life among male and female patients with diabetes mellitus
3. H_0 : There is no significant relationship between psychological well-being and quality of life among patients with Type 2 of diabetes mellitus

The following tools were employed for the purpose of collecting data from the selected subjects:

Psychological wellbeing scale (Ryff, 1998)

The psychological well-being in diabetic patients was evaluated by psychological well-being scale (Ryff, C.D., & Singer, B., 1998, The contours of positive human health, psychological inquiry) in this 18 questions were present indicating six dimensions (Autonomy, Environmental mastery, Personal growth, Positive relations with others, Purpose in life & Self-acceptance). Respondent's rate statements on a scale of 1 to 7, with one indicating strong disagreement and seven indicate strong agreement.

Quality of life scale (Stamm, B.H., 2010)

The quality of life scale was taken from the concise manual for the quality of life, 2nd edition and the questionnaire was constructed and standardized by Stamm, B.H. (2010) and published by the QOL.org. It contains 30 statements indicating three dimensions (Compassion satisfaction, Burn out, Secondary traumatic stress), Scale constitute of five point rating, the values and description for each point is 1 = Never 2 = Rarely 3 = Sometimes 4 = Often 5 = Very Often. Based on responses marked by client there level of stress, psychological wellbeing and quality of life evaluated

Procedure for data collection

Data was collected by tools i.e., psychological wellbeing and quality of life scale along with personal information sheet was used to collect

data. The researcher approached them with written request and permission was granted to meet the patients (already diagnosed & who are on treatment) attending various diabetic clinics and health centers located in Palakkad Dist. The questionnaires were collected from the participants for further analyses.

Mean scores, Standard Deviations and Percentages were computed. To find out the significance of difference between means of different groups under study t test were applied. To find the significance relationship between the variables, Pearson correlation was used.

DESCRIPTIVE ANALYSIS

Demographic Analysis of Patients with Type 2 of Diabetes Mellitus

Table1. Frequency and percentage of patients with Type 2 of diabetes mellitus with regard to gender

Gender			
	Frequency	Percent	Cumulative Percent
Male	200	50.0	50.0
Female	200	50.0	100.0
Total	400	100.0	

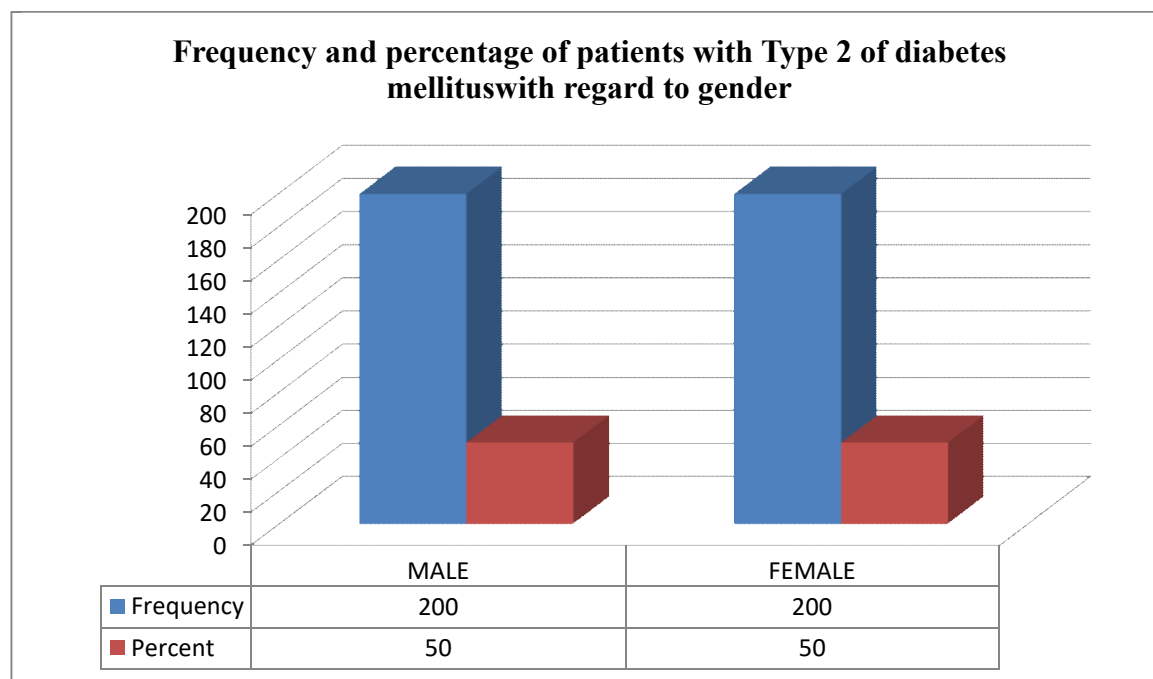


Figure1. Frequency and percentage of patients with Type 2 of diabetes mellitus with regard to gender

There were both equal patients with Type 2 of diabetes mellitus.

Table2. Frequency and percentage of patients with Type 2 of diabetes mellitus with regard to age group

Age Group

	Frequency	Percent	Cumulative Percent
35-40	300	75.0	75.0
40-45	24	6.0	81.0
45-50	76	19.0	100.0
Total	400	100.0	

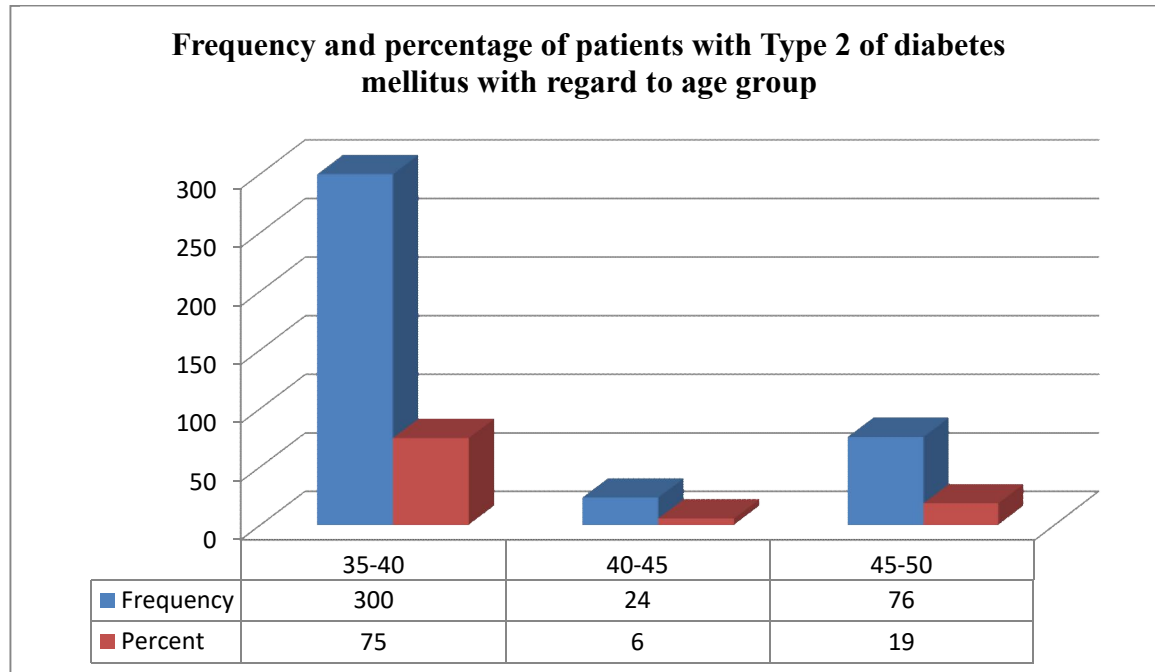


Figure2. Frequency and percentage of patients with Type 2 of diabetes mellitus with regard to age group

There were 75% patients with Type 2 of diabetes mellitus with age group of 35-40 years and follow by 19% of 45-50 years age group.

Table3. Frequency and percentage of patients with Type 2 of diabetes mellitus with regard to working status

Working Status			
	Frequency	Percent	Cumulative Percent
Non-working	96	24.0	24.0
Working	304	76.0	100.0
Total	400	100.0	

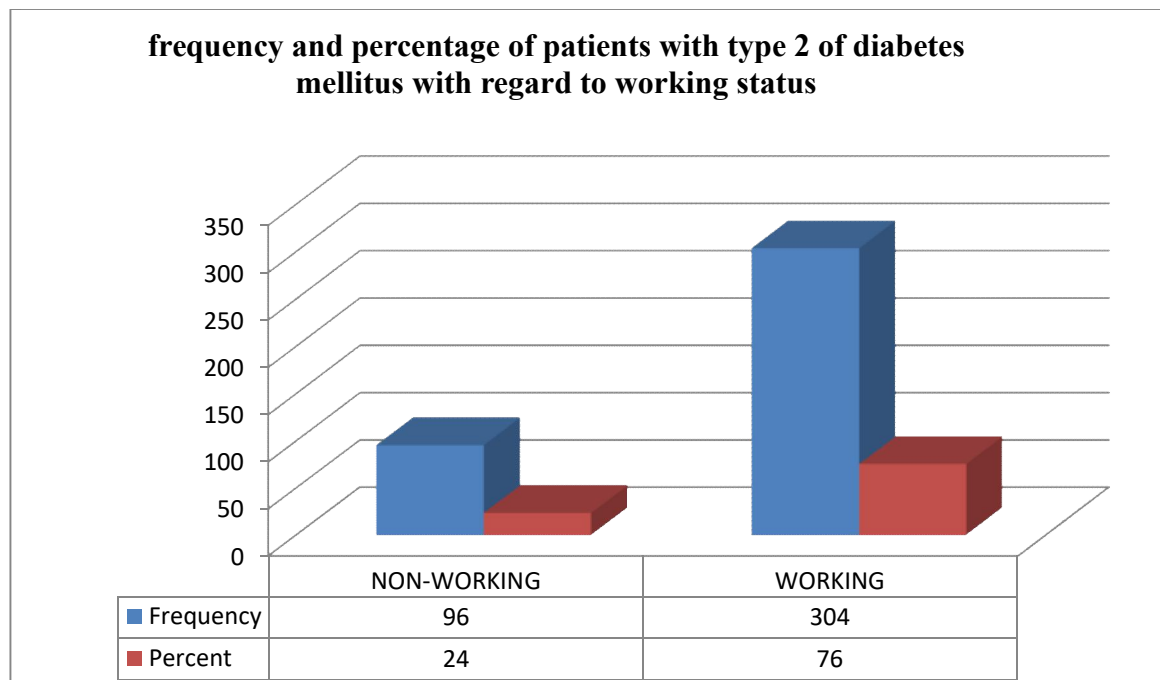


Figure3. Frequency and percentage of patients with Type 2 of diabetes mellitus with regard to working status

76% patients with Type 2 of diabetes mellitus were working in majority and follow by 24% were non-working.

Table4. Frequency and percentage of patients with Type 2 of diabetes mellitus with regard to education

Education			
	Frequency	Percent	Cumulative Percent
Doctorate	4	1.0	1.0
Graduate	204	51.0	52.0
Illiterate	8	2.0	54.0
Post graduate	164	41.0	95.0
Undergraduate	20	5.0	100.0
Total	400	100.0	

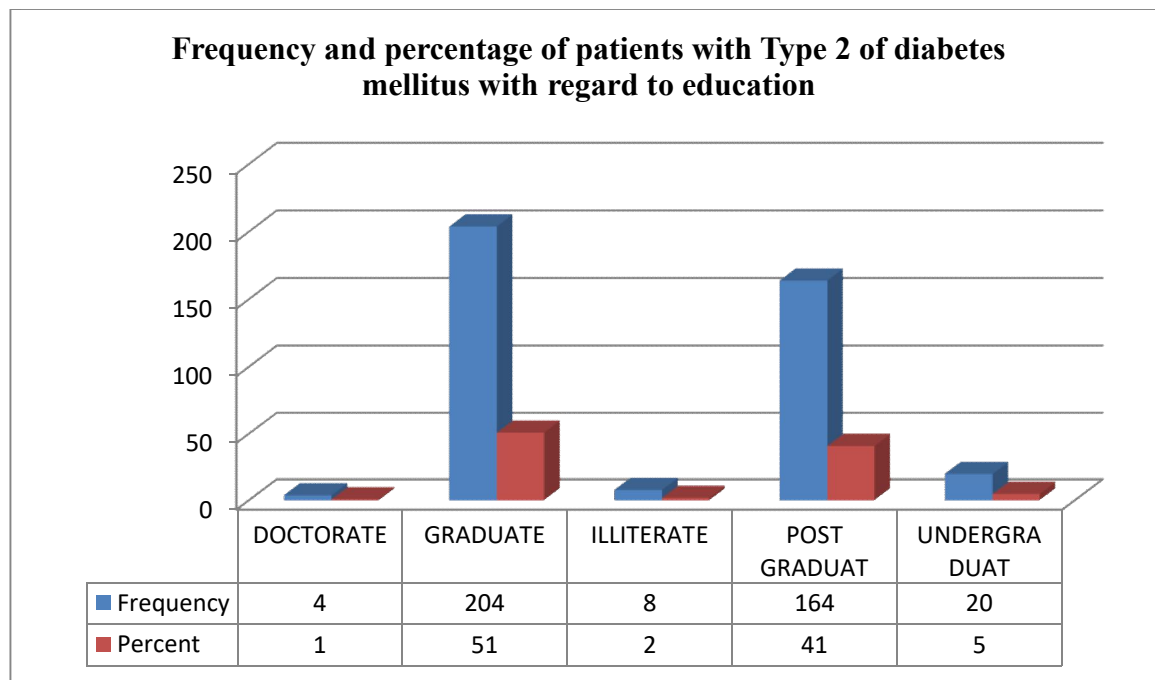


Figure4. Frequency and percentage of patients with Type 2 of diabetes mellitus with regard to education

51% patients with Type 2 of diabetes mellitus having qualification of graduate in majority and follow by 41% were post-graduate.

CORRELATIONAL ANALYSIS

Relationship between Psychological Well-Being and Quality Of Life among Patients with Type 2 of Diabetes Mellitus

Table5. Relationship (Correlation Coefficient Values) between psychological well-being and quality of life among patients with Type 2 of diabetes mellitus (N=400)

Variables	N	r	p
Psychological well-being	400	.434	Sig ^{**}
Quality of life	400		

**** Correlation is significant at the 0.01 level (2-tailed)**

RELATIONSHIP BETWEEN PSYCHOLOGICAL WELL-BEING AND QUALITY OF LIFE

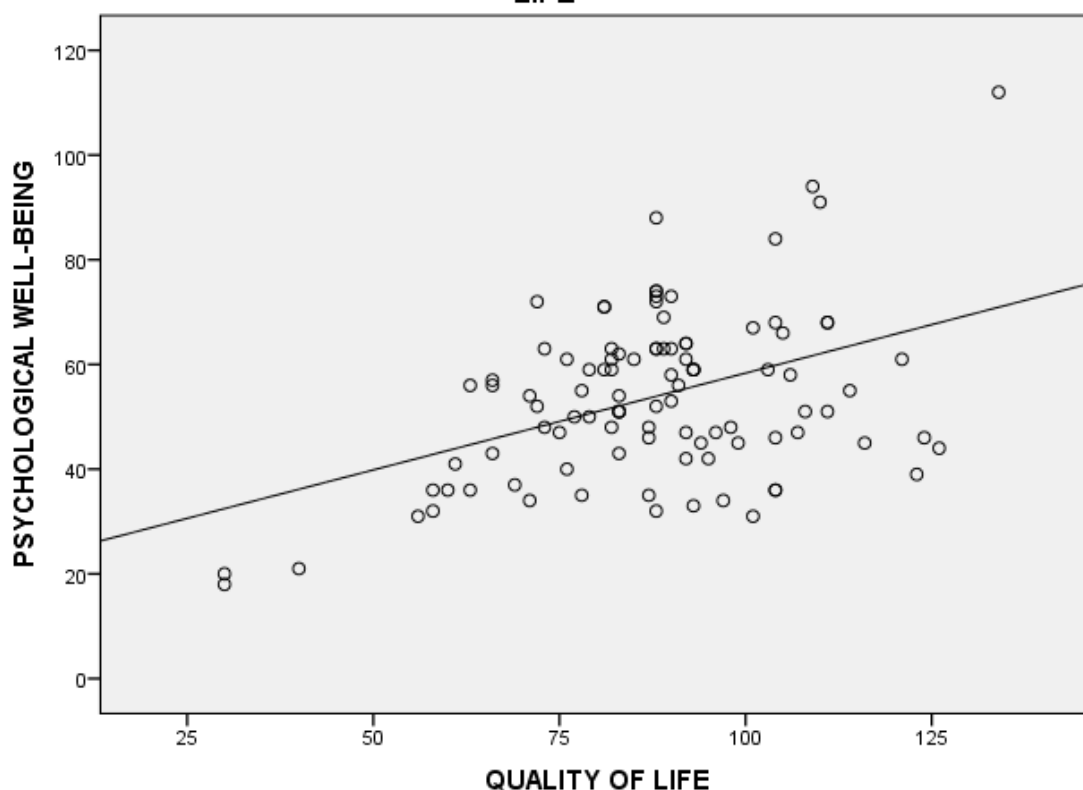


Figure5. Relationship between psychological well-being and quality of life among patients with Type 2 of diabetes mellitus

The co-efficient of correlation between psychological well-being and quality of life among patients with Type 2 of diabetes mellitus is 0.434, which is significant at 0.01 level of significance and

the calculated p-value (0.000) is less than significant level ($\alpha = 0.01$). Therefore, the variables i.e. psychological well-being and quality of life are significantly and positively correlated with each other.

DIFFERENTIAL ANALYSIS

Comparison of Psychological Well-Being among Male and Female Patients with Type 2 of Diabetes Mellitus

Table6. Mean, S.D. and 't' ratio between male and female patients with Type 2 of diabetes mellitus computed on the basis of their psychological well-being (N =400)

	Gender	N	Mean	Std. Deviation	Std. Error Mean	t-value	p-value
Psychological well-being	Male	200	57.24	14.331	2.027	2.261	Sig*
	Female	200	50.20	16.720	2.365		

*significant at level (0.05)

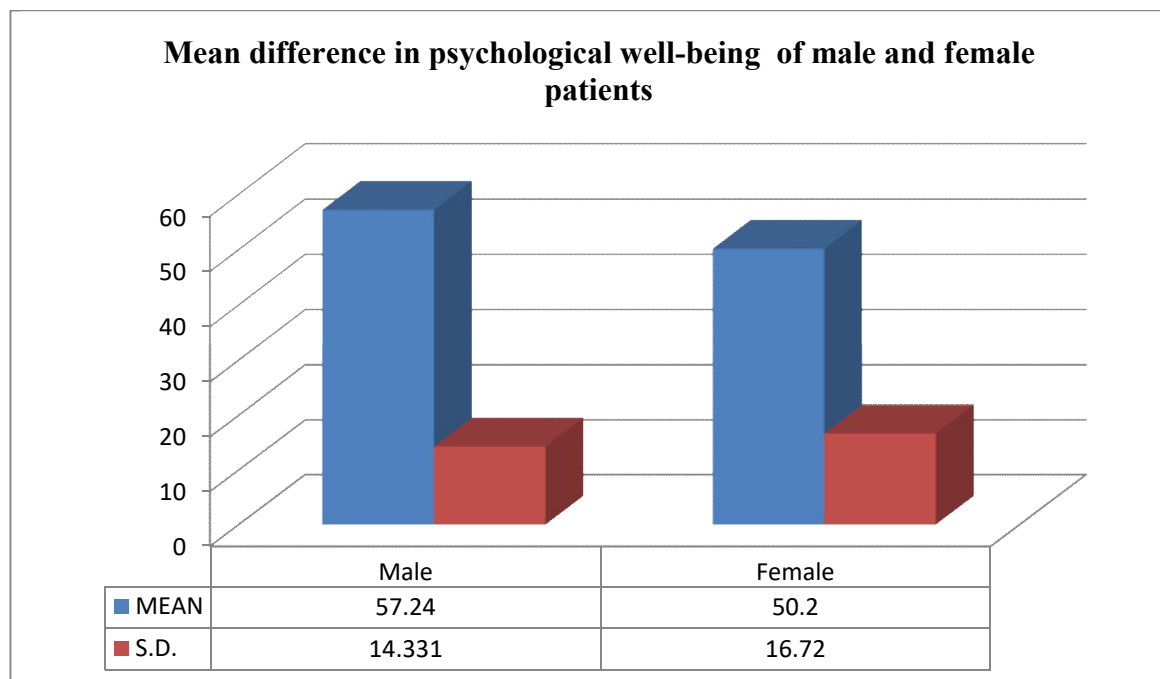


Figure6. Mean difference in psychological well-being of male and female patients

Table6. Shows that the calculated p-value (0.026) is less than significant level ($\alpha = 0.05$) and 't' value 2.261 significant at 0.05

level. The mean values of male patients (57.24) higher than male patients (50.2) with regard to psychological well-being and differ significantly.

Table7. Mean, S.D. and 't' ratio between male and female patients with Type 2 of diabetes mellitus computed on the basis of their quality of life (N =400)

	Gender	N	Mean	Std. Deviation	Std. Error Mean	t-value	p-value
Quality of life	Male	200	88.30	16.601	2.348	.460	Insig.
	Female	200	86.58	20.589	2.912		

Insignificant at level (0.05)

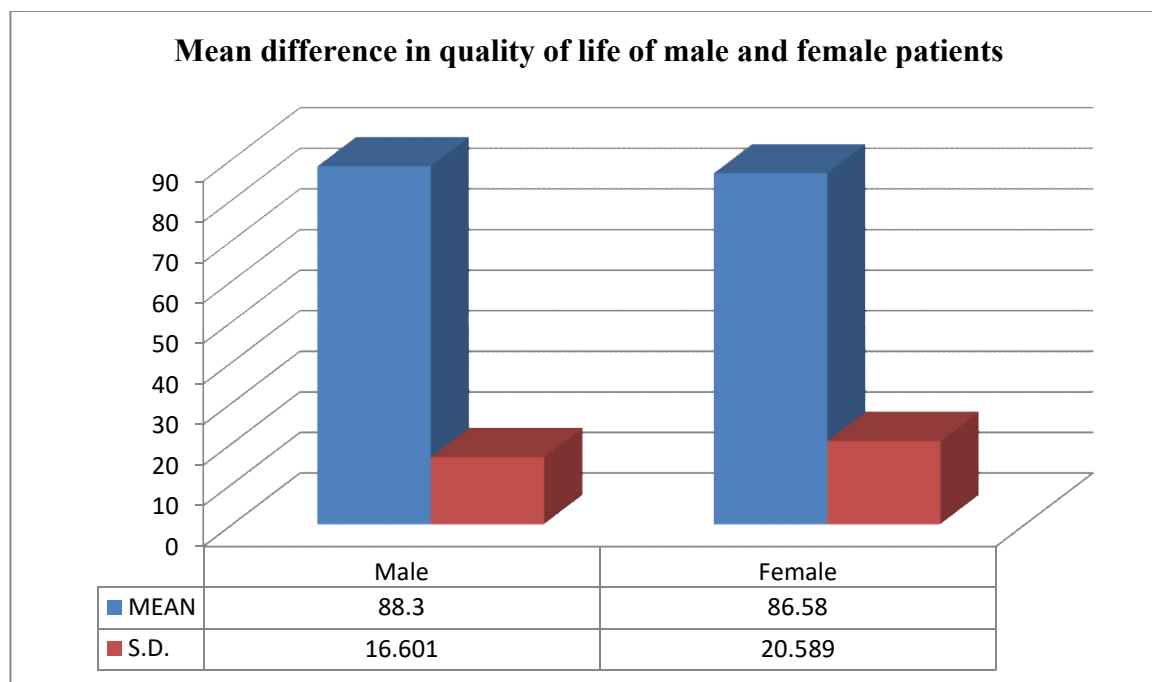


Figure7. Mean difference in quality of life of male and female patients

Table7. Shows that the calculated p-value (0.647) is higher than significant level ($\alpha = 0.05$) and 't' value 0.460 not significant at 0.05 level. The mean values of male patients (86.58) less than male patients (88.3) with regard to quality of life but not differ significantly.

While analyzing, demographic profile of patients with type 2 of diabetes mellitus, there were both equal patients with Type 2 of diabetes mellitus. 75% patients with Type 2 of diabetes mellitus with age group of 35-40 years and follow by 19% of 45-50 years age group. 76% patients with Type 2 of diabetes mellitus were working in majority and follow by 24% were non-working. 51% patients with Type 2 of diabetes mellitus having qualification of graduate in majority and follow by 41% were post-graduate. The co-efficient of correlation between psychological well-being and quality of life among patients with Type 2 of diabetes mellitus is 0.434, which is significant at 0.01 level of significance and the calculated p-value (0.000) is less than significant level ($\alpha = 0.01$). While analyzing the gender wise psychological well-being of patients with Type 2 of diabetes mellitus, it was seen,

the calculated p-value (0.026) is less than significant level ($\alpha = 0.05$) and 't' value 2.261 significant at 0.05 level. The mean values of male patients (57.24) higher than male patients (50.2) with regard to psychological well-being and differ significantly. While analyzing the gender wise quality of life of patients with Type 2 of diabetes mellitus, it was seen, the calculated p-value (0.647) is higher than significant level ($\alpha = 0.05$) and 't' value .460 not significant at 0.05 level. The mean values of male patients (86.58) less than male patients (88.3) with regard to quality of life but not differ significantly.

CONCLUSION

This research will play a significant role for the betterment of the society. Diabetes as the most prevailing illness in India has become one of the major reasons of death. The study will be helpful to counselors and health psychologists to measure and manage the diabetes patients psychologically and emotionally. The health care professional can educate the diabetes patients as well as the caregivers. The purpose of patient education is to help patients make decisions about their care and obtain clarity about their goals, values,

and motivations. Patient education should be given by the health psychologists and diabetes educators about diabetes as a chronic illness, various treatment options and their benefits and cost, modification of self-care behaviors and risk of complications so that the adjustment can be enhanced. Hospitals and clinics can plan seminars, camps and conferences for the patients. Clinical psychologists with expertise in learning behavior and cognitive behavioral modifications can help the patients to develop their health behavior and enhance the self-efficacy. Diabetes distress which is negatively associated with adjustment should be taken into consideration. Therapies such as stress-management, anxiety-reduction and relaxation can be used to manage the diabetes distress. Measuring personality in clinical settings will be helpful to know the patients and his future health care behaviors which will help the health psychologist to plan the management and treatment regimen in a better way. Diabetes patients who go through appropriate medical treatment regimen and psychological counseling are less vulnerable to emotional burden and are able to achieve the diabetes goals.

REFERENCES

- Aqueleem, U. N., Tabeer A., & Mohd, I. K., (2016). "Hope and Psychological Well Being among Diabetes Patients: A Correlational Study". *The International Journal of Indian Psychology*, Volume 3, Issue 4, No. 63, ISBN: 978-1-365- 32518-2
- Brey, P. (2015). *Design for the Value of Human Well-Being*. In J. van den Hoven, P. Vermaas & I. van de Poel (Eds), *Handbook of Ethics, Values, and Technological Design. Sources, Theory, Values and Application Domains* (pp. 365-382). Springer.
- Delamater, A., Jacobson, A., Anderson, B., Cox, D., Fisher, L., Lustman, P., et al. (2001). Psychosocial therapies in diabetes. *Diabetes Care*, 24, 1286 – 1292.
- Egede, L. E., Zheng, P., & Simpson, K. (2002). Comorbid depression is associated with increased health care use and expenditures in individuals with diabetes. *Diabetes Care*, 25, 464 – 470.
- Grey, M., Boland, E. A., Davidson, M., Yu, C., Sullivan-Bolyai, S., & Tamborlane, W. V. (1998). Short-term effects of coping skills training as adjunct to intensive therapy in adolescents. *Diabetes Care*, 21, 902 – 908.
- International Diabetes Federation. (2004). Putting people at the centre of care: DAWN in action. *Diabetes Voice*, 49, 1 – 49.
- Jacobson, A. M. (1996). The psychological care of patients with insulin-dependent diabetes mellitus. *New England Journal of Medicine*, 334, 1249 – 1253.
- Lloyd, C., & Orchard, T. (1999). Physical and psychological well-being in adults with Type 1 diabetes. *Diabetes Research and Clinical Practice*, 44, 9 – 19.
- Lockington, T., Farrant, S., Meadow, K., Dowlatshahi, D., & Wise, P. (1988). Knowledge profile and control in diabetic patients. *Diabetic Medicine*, 5, 381 – 386.
- Mathur Kamayani & Munjal, S. (2012). "Strees, Well-being and Personality in the Patients of Diabetes Type-II – A Correlation Study". Research Aaj Tak, Vol.1, No.3, ISSN 2278-2001, p.129-131.
- Naess, S., Midtjhell, K., Moum, T., Sorensen, T., & Tambs, K. (1995). Diabetes mellitus and psychological wellbeing. Results of the Nord-Trondelag health survey. *Scandinavian Journal of Social Medicine*, 23, 179 – 188.
- Rankin, S., & Stallings, K. (2001). *Patient education: Principles & practice*. Philadelphia, PA: Lippincott.
- Rubin, R. R., Peyrot, M., & Saudek, C. (1989). Effect of diabetes education on self-care, metabolic control, and emotional well-being. *Diabetes Care*, 12, 673 – 679.
- Singh, Tara, (2015). Co-morbid Depression and Health-Related Quality of life in diabetes. *Recent Advances in Psychology : An International Journal Peer Reviewed*, Vol.2. pp.43-56.

Testa, M., & Simonson, D. (1998). Health economic benefits and quality of life during improved glycemic control in patients with Type 2 diabetes mellitus. *Journal of the American Medical Association*, 280, 1490 – 1496.

Yavari, A., Naimeh, M., Abbasi, R., Vahidi, F. & Mirtaghi, G., (2011). “Effect of Exercise on Psychological Well-being in T2DM”. *Journal of Stress Physiology & Biochemistry*, Vol. 7 No. 3 2011, p.132-142.