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A Study on Assessment of Health Related Quality of Life and Treatment Satisfaction in type 2 Diabetic Patients

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Abstract
Introduction: *Type 2 diabetes which currently is one of the most important chronic diseases in the world reduces the quality of life in patients.*
Materials and Methods: *Our research as a descriptive analytical observational study was performed on 103 type 2 Diabetes Mellitus patients in Mahabubnagar (INDIA). Diverse domain scores of patients (HRQOL), well-being index and treatment satisfaction were evaluated by SF-36standard questionnaire, WHO(5) well being index and diabetes treatment satisfaction questionnaire(DTSQ).Gained data was analysed by using SPSS 16.0 software through statistical tests including independent T test, one-way ANOVA and sample T- test.*
Results: *The type 2 diabetic population has a quality of life score of more than 50 in most of the survey aspects. We found the lowest scores for the aspect of "role physical"(25). Extremely high scores were found for the aspects: "social function"(71.50) and "role emotional"(60.92). Statistically different observations were found between men and women for "social function"(P=0.002). Age had significant reverse relationship with physical functioning, vitality, and mental component score. The WHO well-being score for men (58.23) and women (75.05). 50%of patients scored 33 or higher for diabetes treatment satisfaction questionnaire.*
Conclusion: *Type 2 diabetes mellitus is associated with poor self- perceived health- related quality of life (HRQOL).Taken together, the findings of this population studies indicate that people using either pharmacological therapy or lifestyle modification to treat diabetes rated their physical health as poor.*
Keywords: *Type 2 Diabetes, Health Related Quality Of Life (HRQOL), Diabetes Treatment Satisfaction Questionnaire (DTSQ).*

Introduction

Diabetes Mellitus is a metabolic disorder characterised by chronic hyperglycaemia with impaired carbohydrate, fat and protein metabolism, which results in defects of inslin secretion, insulin action, or both. It has characteristic symptoms like thirst, polyuria, blurred vision and weight loss[1].

Common complications of Diabetes are retino-pathy, nephropathy, neuropathy, cardiovascular diseases and infections. Diabetes is a serious health problem which threats the patients' quality of life. So it seems to be important to study the patient's quality of life. Complications may further affect quality of life in diabetes in patients [2,3,4].

WHO defines quality of life as individuals perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. It is a board ranging concept affected in a complex way by the persons physical health, psychological state, level of independence, social relationships, personal beliefs and their relationship to salient features of their environment[5].

Health related Quality of Life (HRQOL) is "a multidimensional concept referring to a person's total well-being, including his or her psychological, social, and physical health status [6].

The aim of modifiedSF-36 questionnaireis to describe the health-related quality of life in people with diabetes, compared to those without diabetes. It measures quality of life which profiles eight domains namely Physical Functioning (PF), Role Physical (RP), Bodily Pain (BP), General Health (GH),Vitality (VT),Social Functioning (SF),Role Emotional (RE), Mental Health (MH). Higher scores indicate better health or level of functioning[7,8].

Using a short questionnaire of WHO-5 can help to monitor emotional well-being in patients as part of clinical routine and enhance the likelihood of recognizing depression[9].

We tried to measure quality of life in type 2 diabetes patients and identify related effective factors in it.

Material and Methods

This research- is a prospective observational study conducted at a 300 bedded super speciality teaching hospital at Mahabubnagar. The study was conducted for a period of six months and the study was approved by approved by the Institutional Ethical Committee (IEC) of the hospital ref.id. SVSMC/IEC/2016/47(4). Sample size was 103 patients.

We evaluated diverse domains of diabetic patients quality of life scores through SF-36 standard questionnaire composed of 36 questions. This questionnaire is one of most common tools for quality of life measurement. Validity and reliability of SF-36 questionnaire have been approved in several studies. The quality of life was also evaluated by WHO- Well Being Questionnaire, WHO- Diabetes Treatment Satisfaction Questionnaire and Likert type 7 point satisfaction scale.

We also measured some other personal characteristics including age, sex, body mass index (BMI), education level, family income level, smoking, alcoholism, c morbidity, family history.

Analyzing all the questionnaires, we tried to find their relations to diverse domains of patients' quality of life by SPSS16.0, graph pad prism software though statistical tests including One sample t test, Student t test (two tailed, independent) and One way ANOVA. Microsoft word and excel (2007) have been used to generate graphs, tables etc.

Results

A total of 103 people participated in the study with an average age of 50.16±0.81. The majority of participants were between the age group of 46-55(43.7%). As we can observe from Table 1, women make up 49.5% of the sample study with 51 participants and men make up the remaining 50.5% with 52 participants. The youngest and oldest patients were 25 and 60 years old, respectively. Mean BMI of participants was 24.8 (SEM = 0.42).Minimum and maximum BMIs were 18 and 33, respectively. 52.4% of patients were illiterate and 47.6% literates. 83.5% of patients were non-smokers and 16.5% of patients were smokers. 74.8% of patients were non-alcoholic and 25.2% of patients were alcoholic. Co morbidity was present in 59.2% of patients and 40.8% were without Co morbidity [Table 1].

The resultant mean and standard error mean for diverse domain of patients quality of life (both genders) were as followed, respectively: Physical functioning 53.96 (2.32), role physical 25.00 (3.79), bodily pain 60.31 (2.83), general health 53.79 (1.88), vitality 55.02(1.93), social functioning 71.50 (1.97), role emotional 60.92 (1.96), mental health 41.10 (4.46), physical component score 48.27(1.51), mental component score 57.13 (1.92) [Table2]. Overall variables of the resultant mean and standard error mean for diverse.

Domain of patients quality of life can be seen from the [Table 3].

Our research showed that age variables had meaningful reverse relationship with physical functioning (P = 0.043), vitality (P = 0.007), physical component score (P = 0.054), mental component score (P = 0.003) domains. There was no relationship between age and other quality of life domains [Table 3,4].

Gender correlated to bodily pain (P = 0.085), social functioning (P = 0.002), role emotional (P = 0.011) physical component score (P = 0.064), mental component score (P = 0.042) as women score was higher than men. There was no relationship between gender and other quality of life domains.

Education level had direct correlation with role physical (P =0.016), general health (P = 0.019), social function (P = 0.007), role emotional (P = 0.054), mental health (P = 0.003), mental component score (P = 0.008). There was no relationship between education level and other quality of life domains.

Smoking status correlated with bodily pain (P = 0.007), physical component score (P =0.007). There was no relationship between smoking status and other quality of life domains.

Alcoholic correlated with bodily pain (P = 0.007), general health (P = 0.012), vitality (P = 0.050), social functioning (P = 0.003), role emotional (P = 0.029) physical component score (P = 0.013). There was no relationship between alcoholic and other quality of life domains.

No relation was found between co morbidity's and other quality of life domains.

WHO well-being had direct correlation with bodily pain (P = 0.000), general health (P = 0.000), vitality (P = 0.003), social functioning (P = 0.001), role emotional (P = 0.001), mental health (P = 0.024), physical component score (P = 0.002) mental component score (P = 0.001). Who well-being had no correlation with physical funct-ioning, role physical of quality of life domains.

According to who well-being score 16.50% of patients scored between (29-50) and 83.50% of patients scored between (51-100). Although we found some unexpected associations. For example, who well being score reported less in the age group of (18-25) and (55-65) [Table 5].

Complete DTSQ scores were available for 103 patients. Given the maximum possible score of 36, satisfaction was high (mean 32.74, SEM 0.21). Presence of co morbidities, patients on insulin therapy and (18-35) age group patients were less satisfied with the treatment than other patients [Table 6].

Figure:1

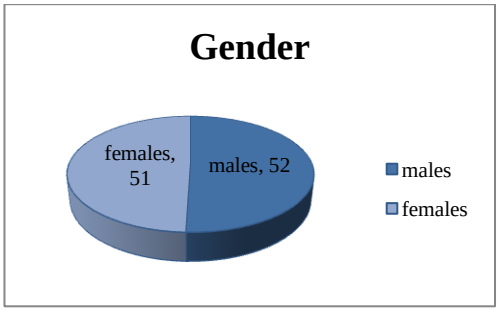


Figure:2

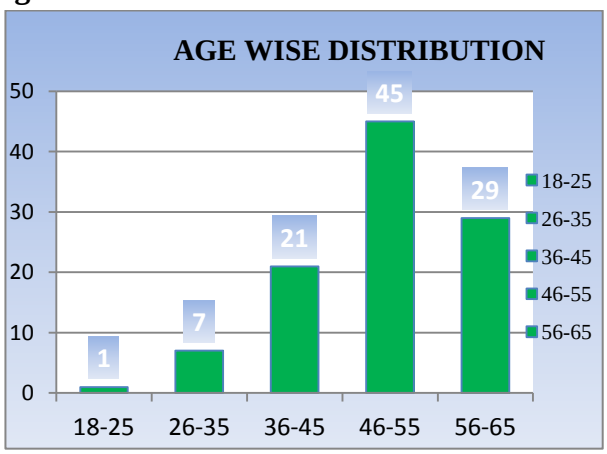
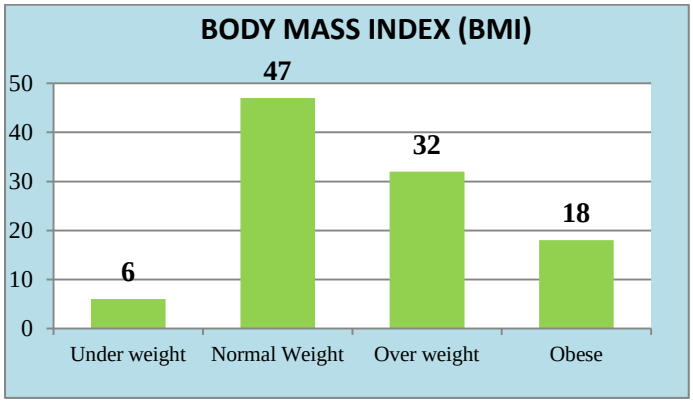


Figure: 3



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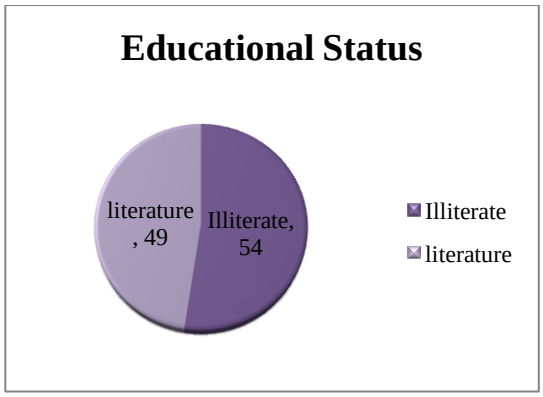

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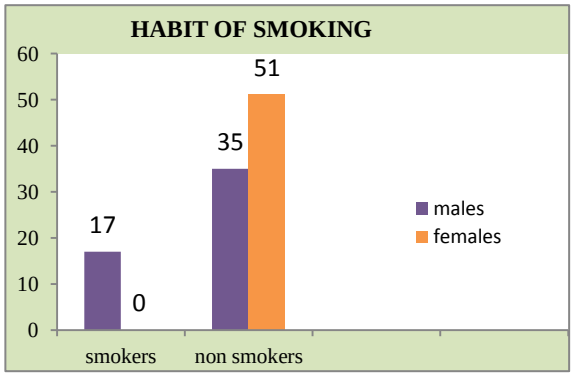

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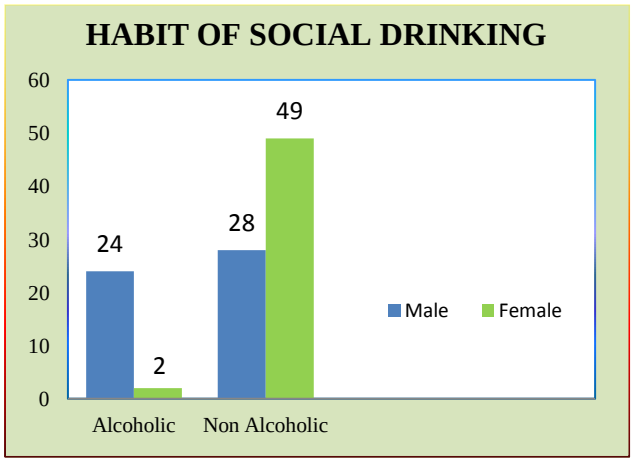

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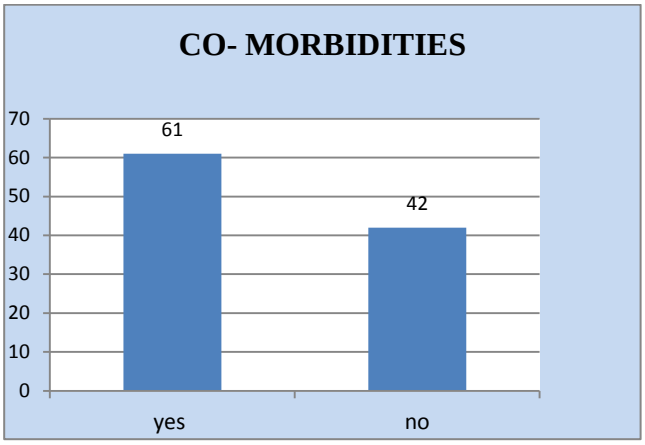

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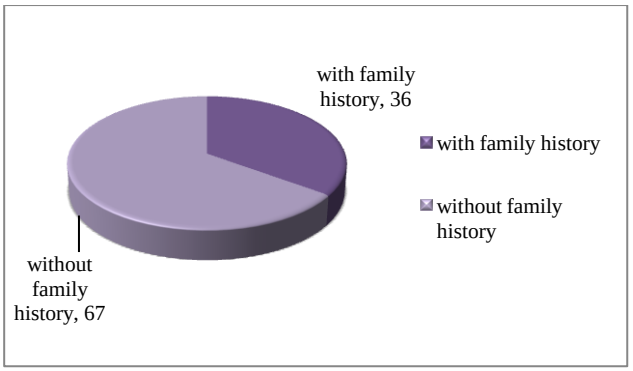

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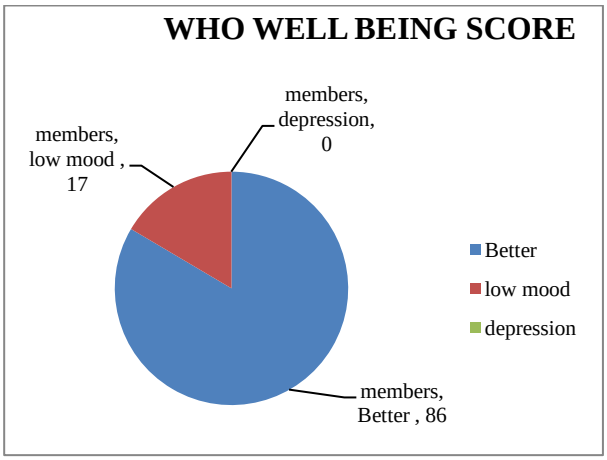

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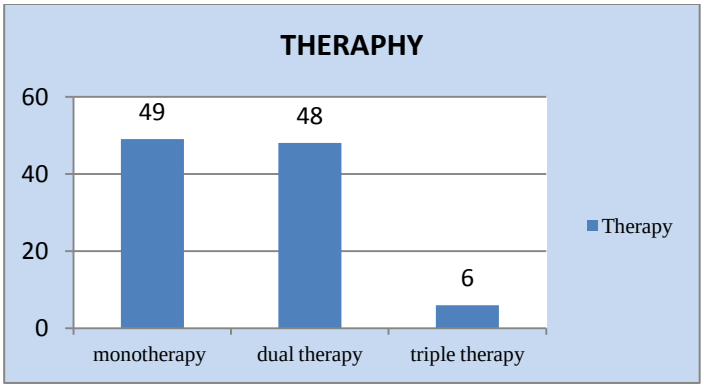
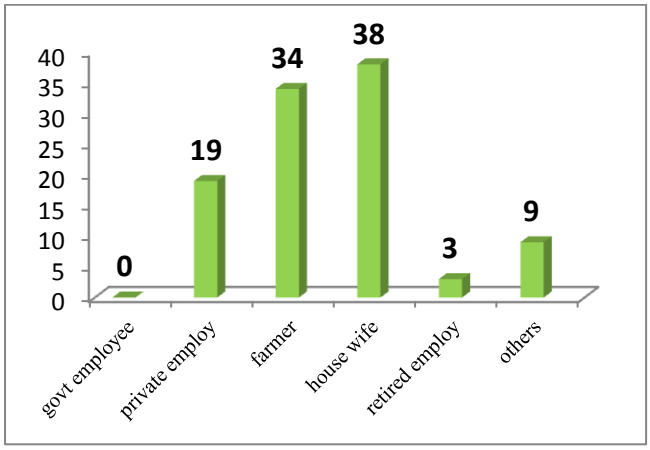


Figure: 11 Occupation Status



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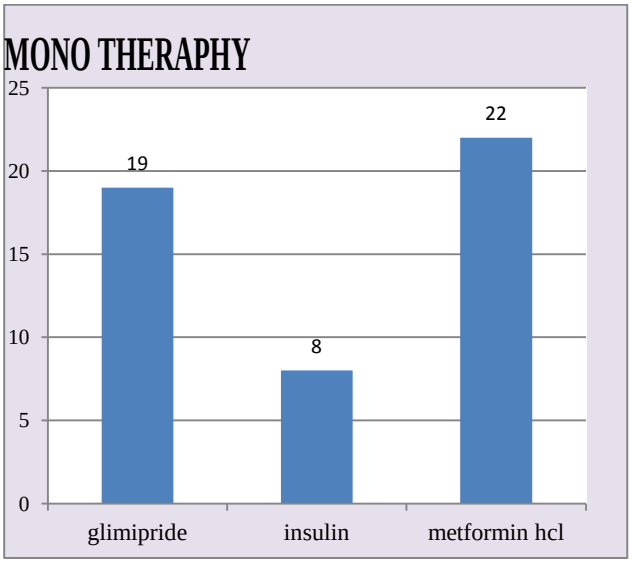

Table 1: Characteristics of the sample (*N*=103) of type 2 diabetics

Variable	N	%
Gender		
Male	52	50.5
Female	51	49.5
Age group		
18-25	1	0.9
26-35	7	6.8
36-45	21	20.4
46-55	45	43.7
56-65	29	28.2
BMI		
≤ 18	6	5.8
19-24	47	45.6
25-29	32	31.1
≥ 30	18	17.5
Education		
Illiterate	54	52.4
Literate	49	47.6
Smoker		
Yes	17	16.5
No	86	83.5
Alcoholic		
Yes	26	25.2
No	77	74.8
Co morbidity		
Yes	61	59.2
No	42	40.8
Family history		
Yes	36	35.0
No	67	65.0
Who-well being score		
Better (51-00)	86	83.5
Low mood(29-50)	17	16.5
Therapy		
Mono therapy	49	47.6
Dual therapy	48	46.6

Triple therapy	6	5.8
Occupation status		
Govt employee	0	0
Private employee	19	18.4
Farmer	34	33.1
House wife	38	36.9
Retired employee	3	2.9
Others	9	8.7
Mono therapy drugs (*N*=49)		
Glimipride	19	38.8
Metformin hcl	22	44.9
Insulin	8	16.3

Table 2: Domain score in both gender.

Domains	Mean	SEM
Physical functioning	53.96	2.32
Role physical	25.00	3.79
Bodily pain	60.31	2.83
General health	53.79	1.88
Vitality	55.02	1.93
Social functioning	71.50	1.97
Role emotional	60.92	1.96
Mental health	41.10	4.46

Table 3 : Mean, Sem, P-Value of SF-36 QOL scores according to the various variables.

	QOL								
Variables	**PF**	**RP**	**BP**	**GH**	**VT**	**SF**	**RE**	**MH**	
	MEAN± SEM	**MEAN±SEM**	**MEAN±SEM**	**MEAN±SEM**	**MEAN±SEM**	**MEAN±SEM**	**MEAN±SEM**	**IEAN±SEM**	**TOTAL MEAN**
Age in years									
18-25	30.00±0.00	0.00±0.00	10.00±0.00	40.00±0.00	25.00±0.00	50.00±0.00	44.00±0.00	0.00±0.00	24.87
26-35	45.0±14.43	60.70±18.79	68.20±15.65	58.57±4.60	61.40±8.40	83.90±6.50	64.60±5.95	61.90±18.40	63.03
36-45	50.89±5.70	22.61±8.78	71.54±5.01	64.81±2.84	69.04±2.98	79.76±3.28	72.04±3.31	39.68±10.69	58.79
46-55	50.66±2.89	25.55±5.53	58.66±4.51	54.77±3.01	54.94±2.82	70.88±2.88	62.26±3.31	46.66±6.64	53.04
56-65	64.31±3.95	18.10±3.95	54.56±4.53	43.62±3.32	44.48±3.18	64.22±4.10	50.48±2.81	29.88±7.81	46.20
P- value	0.043*	0.206	0.123	0.327	0.007**	0.178	0.107	0.328	
Gender									
Indian Males	53.17±3.79	22.59±5.50	55.48±4.38	50.76±2.69	51.05± 2.87	65.67± 3.03	56.00± 2.63	40.38±6.55	49.38
Indian Females	54.78±2.67	27.45±5.25	65.24±3.48	56.88±2.57	59.06±2.47	77.45±2.26	65.94±2.76	41.83±6.11	56.08
P- value	0.729	0.525	0.085+	0.104	0.372	0.002**	0.011*	0.872	
Therapy									
Monotherapy	61.12±2.79	16.83±4.51	59.23±4.13	50.91±2.84	50.86±2.58	70.30±3.78	58.40±3.16	26.53±5.58	49.27
Dual therapy	48.43±3.62	32.29±6.22	61.14±4.19	56.48±2.53	57.50±2.96	73.07±3.10	62.27±2.56	54.16±6.77	55.66
Triple therapy	39.83±10.7	33.00±17.17	62.50±12.21	55.83±9.78	69.16±6.75	68.75±5.35	70.66±6.16	55.55±20.48	56.91
P- value	0.008**	0.122	0.932	0.348	0.046*	0.751	0.299	0.007**	
Mono –drugs									
Glimipride	56.84±4.46	9.21±5.47	57.10±7.54	38.15±3.40	44.21±3.57	64.47±5.83	46.31±3.50	15.78±7.37	41.51
Metformin hcl	64.09±4.40	20.45±7.28	61.02±6.12	57.27±4.15	53.97±4.33	75.34±2.89	66.09±5.42	34.84±9.40	54.13
Human insulin	63.12±5.82	25.00±14.17	59.37±7.67	63.75±5.64	58.12±4.71	70.31±5.24	66.00±4.78	29.16±13.26	54.35
P- value	0.483	0.390	0.914	0.001**	0.104	0.208	0.007**	0.297	

Physical component score	48.27	1.51
Mental component score	57.13	1.92

BMI (kg/m^2)									
≤18.5	60.00±8.85	33.33±17.85	64.58±8.25	58.33±8.02	61.66±6.54	81.25±8.38	68.00±7.65	61.11±18.08	61.03
18.6-24.9	52.12±3.57	23.40±5.17	67.76±3.67	60.42±2.31	60.05±2.59	74.46±2.56	64.21±2.61	60.05±2.59	57.80
25-29.9	54.25±4.29	25.00±7.36	50.07±5.42	46.09±3.70	47.96±3.80	65.46±3.61	54.12±3.29	39.58±8.52	47.81
≥30	56.04±5.05	26.38±9.79	57.30±7±65	48.67±4.24	52.22±4.39	71.25±5.58	62.05±5.95	46.29±11.15	52.52
P- value	0.854	0.945	0.056+	0.005**	0.038*	0.148	0.120	0.637	
Smoker									
Yes	52.64±6.30	29.41±10.33	43.09±7.69	49.41±5.37	52.05±3.61	61.91±6.38	56.23±3.11	54.90±11.41	49.95
No	54.32±2.50	24.12±4.08	63.72±2.92	54.66±1.99	55.61±2.20	73.40±1.96	61.48±2.26	38.37±4.82	53.21
P- value	0.817	0.639	0.021*	0.370	0.408	0.102	0.154	0.196	
Alcoholic									
Yes	47.30±4.56	21.15±7.92	45.09±6.53	44.80±4.11	48.84±3.43	60.19±4.33	54.46±3.04	42.30±9.52	45.51
No	56.22±2.66	26.29±4.33	65.45±2.88	56.83±1.99	57.11±2.27	75.32±2.04	63.10±2.37	40.69±5.06	55.11
P- value	0.099+	0.572	0.007**	0.012*	0.050*	0.003**	0.029*	0.882	
Comorbidities									
Yes	57.11± 2.75	20.49±4.35	63.07±3.15	53.60±2.10	53.36±2.30	71.06± 2.35	58.52±2.22	36.06± 5.35	51.65
No	49.40±3.98	31.54±6.76	56.30±5.21	54.07±3.48	57.44±3.36	72.14±3.46	64.40±3.53	48.41±7.63	54.21
P- value	0.116	0.174	0.271	0.909	0.320	0.798	0.164	0.190	
Well being									
Better 51-100	53.88±2.49	26.45±4.20	65.78±2.79	57.57±1.89	57.70±2.02	75.23±1.84	63.21±2.10	45.34±4.89	55.69
Low mood 29-50	54.41±6.34	17.64±8.77	32.64±6.57	34.70±3.54	41.47±4.49	52.64±5.74	47.29±3.94	19.60±9.50	37.54
P -value	0.934	0.392	0.000***	0.000***	0.003**	0.001**	0.001**	0.024*	

Education									
Illiterate	59.23±3.17	25.92± 5.16	54.02±3.83	51.57±2.67	50.09±2.42	67.91±2.91	55.44±2.41	35.80±5.63	49.99
Literature	48.16±3.22	23.98± 5.64	67.24±4.01	56.24±2.61	60.45±2.89	75.45±2.54	66.95±2.94	46.93±7.00	55.67
P- value	0.218	0.016*	0.800	0.019*	0.215	0.007**	0.054+	0.003**	

Above table shows the comparative distribution of individual QOL domain scores (i:e PE± RP± BP± GH± VT± SF± RE± and MH) of patient with respect to the various variables.

< 0.001 *** extremely significant
0.001-0.01 ** strongly significant
0.01-0.05 * moderately significant
0.05-0.10 + slightly significant
> 0.10 not significant

Table 4: Mean, Sem, P-Value of PCS and MCS scores according to various variables.

VARIABLES	QOL PCS MEAN± SEM	QOL MCS MEAN± SEM
Age in years		
18-25	20.00±0.00	29.75± 0.00
26-35	58.12±8.33	67.95± 8.79
36-45	52.47±3.07	65.13±3.89
46-55	47.41±2.29	58.69±2.95
56-65	45.15±2.38	47.26±2.72
P- value	0.054+	0.003**
Gender		
Male	45.50±2.44	53.32± 3.00
Female	51.09± 1.70	61.08± 2.28
P- value	0.064+	0.042*
Therapy		

Monotherapy	47.02±1.97	51.52±2.40
Dual therapy	49.58±2.38	61.75±3.03
Triple therapy	47.87±7.86	66.03±6.62
P-value	0.717	0.017*
MonoTherapy drugs		
glimipride	40.32±3.50	42.69±3.83
Metformin hcl	50.71±2.54	57.56±3.52
Human insulin	52.81±3.23	55.90±2.57
P- value	0.021*	0.011*
BMI (kg/m^2)		
≤18.5	54.06±4.27	68.00±8.93
18.6-24.9	50.95±1.71	59.08±2.57
25-29.9	43.85±3.34	57.78±3.55
≥30	47.18±4.00	57.95±5.02
P- value	0.171	0.190
Smoker		
Yes	40.17±3.56	56.27±5.37
No	49.18±1.52	57.30±2.05
P- value	0.030*	0.860
Alcoholic		
Yes	39.59±4.17	51.45±4.42
No	51.20± 1.31	59.05±2.06
P- value	0.013*	0.128
Co morbidities		
Yes	48.57±1.48	54.75±2.08
No	47.83±3.05	60.60±3.57
P- value	0.829	0.163
Well being		
Better (51-100)	50.92±1.46	34.85±4.13
Low mood (29-50)	60.47± 1.93	40.25± 4.58
P- value	0.002**	0.001**
Education		
Illiterate	47.69±2.07	52.31± 2.37
Literature	48.90±2.23	62.45±2.91
P- value	0.690	0.008**

Above table shows the comparison of PCS and MCS scores with the various Variables.

Table 5: Who-Well Being Score according to age wise distribution.

Age in years	Well being score
18-25	44
26-35	73.14
36-45	90
46-55	78.62
56-65	70.13

Table 6: DTSQ scores:

Variables	DTSQ Score
Over all	32.74±0.21
18-25 age	28
26-35 age	29.50±0.37
Insulin	30.75±0.25
Co-morbidities	32.01±0.17

Discussion

Totally, type 2 diabetics of our study had lower quality of life in diverse domains in comparison with similar studies. Our research indicated that quality of life decreases with age which is similar to previous studies carried out on diabetic patients [10,11,12,13,1,4,15]. The patients with type 2 DM had better mental component score than physical component score which was similar to previous studies carried out on diabetic patients [16]. Male gender had a lower quality of life than females which was opposite to other studies carried [10, 11, 15]. Our study reported that WHO well-being score was lesser in the age group of (18-25) and (56-65). These results are in accordance with other studies carried out on diabetic patients[10]. Our research showed that age variable had meaningful reverse correlation with physical functioning, vitality, physical component score, and mental component score domains. A direct correlation was found between age and physical functioning in[17]. Our research showed that gender variable correlated to bodily pain, social functioning, role emotional, physical component score, mental component score. Earlier author[17] observed a relationship between gender and all quality of life domains as men's scores was higher in all domains. We found it out that education level has a direct relationship with role physical, general health, social functioning, role emotional, mental health, and mental component score. Some authors observed a direct relationship between education level and all quality of life domains other than general health and role emotional [17].

Conclusion

Diabetic patients perceive a decrease in health related quality of life (HRQOL) as their age increases. High health related quality of life (HRQOL) represents an ultimate goal and important outcomes of all medical intervention in diabetic patients. Factors related to lower (HRQOL) include presence of obesity, smoking, alcoholic, illiterate and low mood. Men had lower well being score than women. Improving of (HRQOL) by appropriate education and follow-up must be emphasized to the management of diabetic patients. Clinical and (QOL) instruments should be used together to get an appropriate overview of the health status of patients with diabetes and QOL measures should be routinely employed in clinical, research, population and policy-related situation. Individualized care of patients with diabetes should be considered for improving the QOL.The public health concern about the increasing number of people with diabetes should be addressed especially in people with impaired HRQOL. Taken together, the findings of these population studies indicate that people using either pharmacological therapy or lifestyle modification to treat diabetes rated their physical health as poor.

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