

# Effect of pandemic on Quality of life in Diabetics (QOLID) assessment: Data from a teaching hospital in Bhubaneswar, Odisha, India

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## ABSTRACT

**Background:** Quality of life in Diabetics (QOLID) questionnaire is a validated tool to assess the quality of life affected by diagnosed diabetic patients and has 8 sub domains, which are essential factors that have proven effect on the management. In a state of art Diabetic clinic in Bhubaneswar city, the tool was used to add more quality to diabetic management.

**Methods:** The ongoing assessment through the months of 2020 (study period being from December 2019 to August 2020), offered an opportunity to assess the effect of the pandemic on QOLID scores and review some nascent or strong factors which may be affecting chronic disease management.

**Results:** Complete data could be collected from 599 subjects, 343 from pre pandemic and 256 from pandemic period. The overall scores which were on 100, did not show any significant difference for pre covid and the Covid period, interestingly nearly 1.93 points better in Covid period (69.69±11.10 vs 71.62±8.49; p=0.396). Mild difference in overall scores of 4.82 points is seen in females in Covid period; and as seen in age group data maximum gain in sub domains, more for females is seen in the emotional and mental health. Though women reporting to the clinic in both periods are usually in 1:2 ratios, as against men; but QOLID scores in both men and women in Covid period was 71 to 80 points. After the univariate analysis for significant factors, it was that Covid (1.50; 1.08 - 2.07); compliance to medications (2.27; 1.48 - 3.50) and reporting of all diabetic complications especially that of eye and depression are coming out to be strong associative factors to affect QOLID scores. Interestingly, rising education has a protective effect on QOLID scores that was significant as higher awareness and better job or earning opportunities may be a contributor for higher QOLID scores for the well educated.

**Conclusion:** This brings out a strong emphasis on QOL assessments to be made an inbuilt part of Diabetic management at all centers to maximize treatment outcomes

**Keywords:** COVID period, diabetic management, pandemic, QOLID scores

## Introduction

“Quality of life” evaluation has emerged as an indispensable outcome measure, more so for chronic disease management. In

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NCDs, now diabetes is at par with hypertension as a disease priority, given the benefit that can be earned by its early detection and impact on morbidity. At the same time, it is increasingly recognized that in diabetes psychosocial, social and financial factors play a determining role on self-care, acceptance of therapeutic regimens and even treatment control<sup>[1,2]</sup> and that, metabolic measures like glycemic control are inversely correlated with quality of life<sup>[3-5]</sup> necessitating separate assessment. The tools of assessment of QOL are now widely used in India, in various centers as supportive tools to optimize and improvise diabetic management.

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Kalinga Institute of Medical Sciences, in Eastern state of India, has a state of art Diabetic clinic, where QOLID (Quality of Life in Diabetics) tool was validated and used since 2019. The pandemic lockdown in the state of Odisha happened in March 22, 2020 and the state as well as the clinic experienced fluctuations in the patient load owing to the lockdown as well the unlocking stages, whereas the study was underway. This gave the study team an opportunity to capture the QOL in the pre-pandemic and the pandemic period.

This study presents a simple, yet pertinent comparison between the QOLID scores in the pre-pandemic and the pandemic period and also an a stratified analysis of the subdomains of the score, which offer good insight into diabetic management in Eastern India, even in an unanticipated emergency scenario.

### Objectives

- To assess the QOLID scores in the pre-pandemic and pandemic period in the study site stratified for age and gender
- To compare the domain wise QOLID scores in the two groups
- To generate recommendations for management in diabetic patients in pandemic situation.

### Methods

The study was undertaken after due Institutional Ethics Committee (IEC) approval in 2016 (Ref. No. KIMS/KIIT/

IEC/048/2016), as a collaborative endeavor by departments of Community Medicine and Endocrinology, in an effort to build up a state of art Diabetic clinic. The study was revived in December 2019 with the afore mentioned objectives, and had acquired good pace until the first nationwide lockdown was imposed from March 22, 2020. It continued till August 2020, overseeing the period of state imposed extended lockdowns and unlock downs. The primary objective of the study was to validate and use the QOLID questionnaire<sup>[6]</sup> for the early diabetics (regardless of type), who are visiting the Out Patient Clinics, have had been on treatment and stable, without any debilitating complications or hospitalizations and willing to participate in the study Those not offering consent or with complications and impending hospitalizations were excluded. A total of 599 completed questionnaires were taken up for the final analysis and 20 incomplete or doubtful entered sets were ignored. The data set was stratified into pre COVID which is from the date of initiation of the current analysis, that is, December 2019 till March 22, 2020; and COVID period, which included data of all subjects after March 23, 2020 till data collection concluded in end of August 2020.

The initial objective of the study which is published,<sup>[7]</sup> of validating the QOLID tool in eastern India population, 10 samples per item were needed for validation of questionnaire<sup>[8,9]</sup> for 34 items in the scale, thus minimum sample of 340 subjects. For this study, to assess the effect of the pandemic, we had a ready sample size of 599 respondents, stratified for 343 respondents in pre COVID and 256 in COVID period. The questionnaire included general socio economic information of the subjects, duration of disease, symptoms, complications and modality of management.

The results were interpreted at 5% level of significance and Stata 15.1, Statacorp, Texas was used for analysis. The QOLID score for each of the eight domains was calculated by simple addition of items scores. Each individual domain score was then standardized by dividing by maximum possible domain score and multiplying by 100. All individual standardized domain scores were then added and divided by 8 (number of domain) to obtain an overall score for the study.<sup>[7]</sup>

For same of analysis, the scores were analyzed domain wise for pre COVID and COVID period, stratified for gender, age and for

**Table 1: Overall QOLID scores and subdomain scores in two periods**

QOL Scores	Pre-COVID (Mean±SD)	Post-COVID (Mean±SD)	P
Treatment Satisfaction	76.23±15.50	75.27±12.85	0.687
General Health	54.09±17.20	51.61±14.44	0.166
Symptom Bothersness	73.56±23.0	79.08±17.48	0.541
Financial Worries	57.33±21.13	61.64±21.93	0.009
Emotional and Mental health	78.47±14.62	83.59±9.73	0.015
Diet Satisfaction	69.13±12.61	70.44±12.71	0.241
Physical Endurance	69.84±24.17	72.34±18.99	0.254
Role limitation due to physical health	78.84±18.15	78.97±16.80	0.309
Overall Quality of Life	69.69±11.10	71.62±8.49	0.396
Diabetic Care Scale	36.03±8.99	38.08±9.26	0.102

**Table 2: QOLID scores stratified for age and compared in 2 periods**

QOLID Scores	Age (n=343) Pre COVID		Age (n=276) COVID	
	<55 (n=165)	>55 (n=178)	<55 (n=131)	>55 (n=125)
Treatment Satisfaction	75.82±14.80	76.62±16.16	73.62±13.08	77.00±12.42
General Health	55.60±17.63	52.69±16.73	53.23±15.73	49.92±12.80
Symptom Bothersness	74.54±22.90	72.65±23.12	75.73±18.43	79.46±16.49
Financial Worries	57.24±21.56	57.41±20.80	59.38±22.14	64.00±21.55
Emotional and Mental health	78.71±14.76	78.24±14.52	84.48±8.99	82.65±10.41
Diet Satisfaction	69.57±12.54	68.72±12.69	72.92±12.36	67.84±12.58
Physical Endurance	77.25±22.28	62.97±23.87	76.81±17.97	67.65±18.97
Role Limitation due to physical health	81.27±16.90	76.60±19.01	82.49±15.27	75.28±17.60
Overall Quality of Life	71.25±10.70	68.24±11.30	72.71±8.41	70.47±8.44

various socio demographic factors as a part of univariate analysis to derive significant factors at 5% significance and 95% CI.

## Results

Table 1 shows that the overall scores which were on 100, did not show any significant difference for pre COVID and the COVID period, interestingly nearly 1.93 points better in COVID period. This may be attributed to the lockdown and restricted discipline life forced upon everyone in the pandemic period. The pandemic caused caution and enhanced adherence to doctor's advice among the already diagnosed and that is being reflected in the mild improvement in QOLID scores. But this may be an inherent limitation for this data, as those few who had access and ready facilities, could come to OPD and seek advice during the COVID period. The patient visit turnover in clinic had been drastically reduced, which can be seen by the margin of difference in the subjects coming in a December to March (3 months and 20 days) and those coming from March last to August end, that is, 276 subjects. As per records till July the subject turnover was in double digits and it resurged in the last 2 months of un lockdowns, wherein subjects rushed to functional clinics for their checkups. Thus the scores may be deemed non representative of the true diabetic population and may be taken as a dipstick measure.

The diabetic care scale<sup>[10]</sup> which was also inbuilt in questionnaire, as a proxy measure for patient satisfaction, too was not significantly different. This scale is measured on a liker scale for 15 items, that determine patient behavior and satisfaction thereof. The higher the scale, the more dissatisfied is the respondent with the total score being 45. In this study, very predictably the patient dissatisfaction increased by 2.05 points in the pandemic period, which would be largely attributed to the inconveniences experienced in the pandemic situation. Again, an alert is penned that this score would have been higher in perhaps a frank community estimate, whereas in this study it is measured out of the OPD attendees who could come in spite of the COVID restrictions.

Table 2 shows that overall QOLID scores in the pre COVID data, stratified for age as per median age cut off of 55 for the given sample, showed rise in both <55 and more than 55 years

of age group, not significant and domain wise, all domain scores improved, barring general health which showed mild dip. Best improvement was seen in emotional and mental health, attributed mainly to lockdown restrictions in work. Financial worries had maximum standard deviations, showing wide variations in the responses of the sample.

As evident from Table 3, mild difference in overall scores of 4.82 points is seen in females in COVID period; and as seen in age group data maximum gain in subdomains, more for females is seen in the emotional and mental health. Women reporting to the clinic in both periods are usually in 1:2 ratios as against men, but QOLID scores in both men and women in COVID period was 71 to 80 points.

Tables 4 and 5 show the frequencies for the socio demographic as well as clinical parameters of the study sample and the univariate analysis affecting QOLID scores at 5% significance and 95% CI. The COVID sample was poor for visits from rural areas. In both periods the attendees were more from the well-read populations. Tobacco users (both smokers and chewers) visited in the pandemic period more, although this data was based only on queries and hence reliability is poor. The hospital visits were almost 4 times in COVID period as clinics were mostly nonfunctional and even otherwise for Diabetes, now a day's people prefer visiting large scale tertiary care facility for the ease of availability of comprehensive set ups. After the univariate analysis for significant factors, it was that COVID (1.50; 1.08–2.07); compliance to medications (2.27; 1.48–3.50) and reporting of all diabetic complications especially that of eye and depression are coming out to be strong associative factors to affect QOLID scores. Interestingly, rising education has a protective effect on QOLID scores that was significant as higher awareness and better job or earning opportunities may be a contributor for higher QOLID scores for the well-educated.

## Discussion

People with Diabetes warrant routine planned checkups and glucose monitoring, besides lifestyle modifications. But the current COVID pandemic, presented to us an extra ordinary situation wherein the facility visits are to be kept to minimum and demanded the assessment of Quality of Life in chronic diseases

**Table 3: QOLID scores QOLID scores stratified for gender and compared in the 2 periods**

QOLID Scores	Gender (n=343) Pre COVID		Gender (N=256) COVID	
	Male (n=216)	Female (n=127)	Male (n=163)	Female (n=93)
Treatment Satisfaction	76.01±14.74	76.61±16.78	74.75±12.44	76.18±13.56
General Health	55.92±16.30	50.97±18.29	51.94±14.10	51.03±15.08
Symptom Botherness	75.12±22.71	70.91±23.33	77.87±17.86	81.21±16.67
Financial Worries	59.18±21.21	54.17±20.70	61.38±21.29	62.09±23.12
Emotional and Mental health	80.55±12.82	74.92±16.72	83.11±10.70	84.43±7.74
Diet Satisfaction	69.32±13.11	68.81±11.75	71.32±12.33	68.88±13.27
Physical Endurance	74.84±21.65	61.33±25.88	73.61±18.70	70.10±19.39
Role Limitation due to physical health	82.03±15.57	73.41±20.83	80.79±15.01	75.77±19.23
Overall Quality of Life	71.62±9.96	66.39±12.16	71.85±8.31	71.21±8.81

**Table 4: Distribution of socio demographic determinants in 2 periods**

Factors	Freq (%) Pre-COVID	Freq (%) Post-COVID
Residence		
Urban	176 (51.31)	178 (69.53)
Rural	167 (48.69)	78 (30.47)
Education		
Illiterate	17 (4.96)	8 (3.13)
Primary	10 (2.92)	7 (2.73)
Middle School	33 (9.62)	26 (10.16)
Secondary	131 (38.19)	91 (35.55)
Higher Secondary	152 (44.31)	124 (48.44)
Tobacco Chew		
Yes	90 (26.24)	87 (33.98)
Something	28 (8.16)	9 (3.52)
Tobacco Smoke		
Yes	20 (5.83)	28 (10.94)
Something	17 (4.96)	7 (2.73)
Alcohol Intake		
Yes	15 (4.37)	16 (6.25)
Sometimes	31 (9.04)	19 (7.42)
Facility of Diagnosis		
Clinic	144 (41.98)	70 (27.34)
Hospital	199 (58.02)	186 (72.66)
Compliance to medications		
Yes	65 (18.95)	44 (17.32)
Morbidity HTN		
Yes	193 (56.27)	131 (51.57)
Morbidity Other		
Yes	206 (60.06)	131 (51.57)
Recovery		
No Hospitalization	224 (65.31)	179 (70.47)
No fresh complaints, stable	67 (19.53)	46 (18.11)
Partially	40 (11.66)	28 (11.02)
No Relief	12 (3.50)	1 (0.39)
Complication of Eye	203 (59.18)	147 (58.57)
Complication of Foot	140 (40.82)	59 (23.14)
Complication of Kidney	34 (9.91)	16 (6.27)
Complication of Ear	65 (18.95)	37 (14.51)
Complication Neuro	248 (72.30)	195 (76.47)
Complication Depression	206 (60.06)	151 (59.68)

in an in depth manner, to understand and adjust to patient demands more appropriately in line with disease promotion and prevention measures.<sup>[11-13]</sup>

Our article is a corollary of a major study that deals with QOLID assessments in subjects who came just before and after the pandemic and draw comparisons and draw suitable inferences in order to shift management focus.

The study brings out that rural population are worst hit in lockdowns due to lack of access to tertiary care centers,<sup>[14,15]</sup> which is also adequately substantiated by study from West Bengal and S India. The latter study,<sup>[15]</sup> also complied with our findings of the inability of subjects to seek consults from clinics and for their dependency to attend comprehensive tertiary care centers

maybe far from their homes, which also be because of the fear compounded of superposed danger of 2 pandemics, that is, Diabetes as well as COVID.

Women respondents were always low, irrespective of pre or post pandemic, akin to other Studies,<sup>[11,16]</sup> the reassuring fact in our study is that the QOLID scores in women show no significant difference pre or post COVID; and in the sub domain analysis the emotional and mental health scores were higher in COVID time by 10 points as compared to 3 points rise in men. This could be because of the relaxed burden of work and more inmates confined to home, which normally is a psychological reliever for women.

QOLID scores for age too were not affected significantly, except for subdomain general health that dipped maybe due to lack of ease of facility based checkups.

Overall QOLID scores though not showing any statistically significant difference in the pre and pandemic times ( $69.69 \pm 11.10$  vs.  $71.62 \pm 8.49$ ;  $P < 0.396$ ), subdomains of financial worries and emotional and mental health were statistically significant as has been reinforced in several studies on NCDs,<sup>[11,17]</sup> though in those studies, other QOL scoring patterns were used, which were validated in those indigenous populations.

This study, which has less generalizability, but far more assertiveness for local population, gives evidence that factors proving significant for higher QOLID scores like the pandemic situation itself, adherence to medications, and any complications are seen to affect QOLID scores in the study sample. This reasserts that uninterrupted medical services through telemedicine or telephonic consults, medication reminders with psychosocial support as well as home pharmacy delivery systems, should be planned for diagnosed subjects, in unprecedented times.

Some form of counseling (preventive and health promotive) sessions should be provided to complicated diabetic patients and follow-up QOLID scores should be reviewed aggressively, in these patients to know the optimum outcome of the treatments.

It also brings out the need to do QOL assessments in chronic diseases and offers qualitative tips to physicians to improvise the management. The limitations of the study are the onetime assessment scores of QOLID, and one-center data, but it does offer a dipstick measure of the impact of the management of Diabetes management in the eastern India population.

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**Table 5: Factors affecting overall QOLID scores for whole sample**

Factors	Univariate		
	Odds ratio	95% CI	P
Age			
>50	1.00		
<50	1.10	0.80-1.51	0.559
HTN	1.01	0.73-1.39	0.944
BMI	0.84	0.67-1.04	0.112
Waist			
Normal	1.00		
Abnormal	0.71	0.45-1.12	0.148
COVID	1.50	1.08-2.07	0.015
Gender			
Male	1.00		
Female	1.02	0.73-1.43	0.871
Residence			
Rural	1.00		
Urban	1.05	0.76-1.46	0.737
Education			
Illiterate	1.00		
Primary and Above	0.76	0.64-0.90	0.002
Tobacco Chewing			
Yes	1.00		
No	0.80	0.60-1.06	0.132
Tobacco smoke			
Yes	1.00		
No	0.73	0.45-1.16	0.190
Alcohol Intake			
Yes	1.00		
No	0.78	0.50-1.20	0.259
Facility of Diagnosis	1.09	0.79-1.53	0.588
Compliance to medications	2.27	1.48-3.50	<0.001
Morbidity HTN	1.15	0.83-1.59	0.381
Morbidity Cancer	4.42	0.50-39.84	0.184
Morbidity Other	0.72	0.52-0.10	0.050
Recovery patterns	1.39	1.12-1.71	0.002
Complications Eye	2.16	1.54-3.02	<0.001
Complications Foot	1.47	1.04-2.07	0.026
Complications Kidney	2.50	1.34-4.62	0.004
Complications Ear	1.79	1.16-2.76	0.008
Complications Neuro	1.77	1.22-2.58	0.003
Complications Depression	2.17	1.55-3.04	<0.001

### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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### Conflicts of interest

There are no conflicts of interest.

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