6.0 RESULTS

As seen in the CONSORT Flow Diagram (**Fig 4**), out of 61 participants who enrolled, 45 remained until the end of this study and received the intended treatment. Dropouts were almost equal in both the groups and were at random. Mean (SD) of age and duration of T2D for the Yoga group (n=22, Male/Female: 11/11) was 49.5 (4.7) and 5.44 (1.49) and that of the Control group (n=23, Male/Female: 13/10) were 50.6 (3.9) and 5.73 (1.44) respectively. No medication changes were reported by any participant during the study. The socio-demographic characteristics of the participants are given in the **Table 2.**

Table 2. Baseline Characteristics of Study Participants

	Yoga	**Control**
	(n=31)	**(n=30)**
Characteristic		
Age, mean (SD), y	49.8(4.6)	50.8(3.8)
Sex, No. (%)		
Male	16(51.6)	17(56.7)
Female	15(48.4)	13(43.3)
Education, no. (%)		
1 ≤ High school	5(16)	6(20)
2 = Pre-University	13(42)	14(47)
3 = Graduate	9(29)	8(27)
4 = Post-Graduate	4(13)	2(7)
Employed, No. (%)	22(71)	24(80)
Household income/year, no. (%)		
1 ≤ $ 5000	5(16)	2(7)
2 = $ 5000 - $ 6999	14(45)	18(60)
3 = $ 7000 - $ 8999	11(35)	5(17)
4 ≥ $ 9000	1(3)	5(17)
Blood pressure, mean (SD)		
Systolic (mm Hg)	126.2(9.7)	129.1(9.5)
Diastolic (mm Hg)	86.7(8.4)	88.6(8.1)
Body Mass Index, mean (SD)	26.3(1.2)	26.5(1.7)
Waist-Hip Ratio, mean (SD)	0.93(0.04)	0.95(0.05)
T2D duration, mean (SD), y	5.5(1.3)	5.6(1.4)
Medications, No. (%)		
T2D	31(100)	30(100)
Hypertension	5(16)	6(20)
Cholesterol	4(13)	2(6.7)

Demographic, socioeconomic, and clinical characteristics of the participants.

Baseline outcome measures showed no significant difference between groups (**Table 3**).

Table 3. Anthropometric, Biochemical, and Molecular measures of study participants

	Baseline Characteristics			**Between Group Analysis (post-intervention data)**					
	Yoga (n = 22)	**Control** (n = 23)		**Yoga** (n = 22)	**Control** (n = 23)				
Variables (units)	Mean (SD)	Mean (SD)	*P-value*	Mean (SD)	Mean (SD)	95% CI		*ES*	*P-value*
Age	49.5 (4.7)	50.6 (3.9)	.279						
BMI (kg/m^2)	26.5 (1.3)	26.6 (1.9)	.757	26.1 (1.4)	26.8 (2.1)	-1.84	0.27	0.45	.14
WHR	0.93 (0.05)	0.95 (0.05)	.147	0.92 (0.05)	0.96 (0.06)	-0.07	-0.01	0.77	.013*
SBP (mmHg)	125.2 (11.2)	129.7 (10.7)	.169	123.8 (8.2)	130.8 (11.6)	-13.05	-0.97	0.7	.024*
DBP (mmHg)	85.6 (9.6)	89.1 (9.10)	.222	84.6 (8.1)	89.4 (9.4)	-10.08	0.48	0.55	.074
FBS (mg/dL)	178.3 (32.9)	180.7 (35.3)	.81	162.7 (34.8)	185.3 (37.4)	-44.33	-0.83	0.62	.042*
LDL (mg/dL)	141.2 (15.9)	142.6 (19.4)	.795	134.4 (17.4)	146.7 (22.5)	-24.51	-0.24	0.61	.046*
HDL (mg/dL)	39.8 (2.7)	40.8 (3.24)	.336	43.0 (4.2)	39.7 (3.7)	0.98	5.71	0.85	< .01**
TG (mg/dL)	145.2 (50.7)	168.7 (55.4)	.256	130.7 (45.2)	178.9 (69.8)	-83.75	-12.71	0.82	< .01**
TC (mg/dL)	210.1 (17.7)	217.2 (23.0)	.255	203.5 (18.1)	222.2 (27.9)	-32.88	-4.46	0.79	.011*
Cr (mg/dL)	0.93 (0.15)	0.94 (0.11)	.668	0.87 (0.11)	0.95 (0.12)	-0.14	-0.01	0.67	.031*
Urea (mg/dL)	20.0 (5.9)	19.0 (2.4)	1	18.9 (5.6)	19.6 (3.0)	-3.47	2.07	0.16	.241
UA (mg/dL)	5.04 (1.4)	5.2 (0.86)	.651	4.9 (1.4)	5.3 (0.86)	-1.04	0.34	0.31	.316
Albumin (g/dL)	4.9 (0.29)	5.1 (0.38)	.156	4.7 (0.33)	5.1 (0.44)	-0.63	-0.16	1	< .01**
TP (g/dL)	7.3 (0.40)	7.5 (0.37)	.207	7.0 (0.48)	7.5 (0.40)	-0.82	-0.29	1.26	< .001***
TAC (TE/mL)	24.7 (10.8)	28.7 (12.4)	.256	34.0 (10.2)	28.2 (11.9)	-0.86	12.47	0.52	.086
8-OHdG (pg/dL)	256.1 (48.9)	237.2 (58.2)	.246	207.1 (48.3)	267.5 (58.0)	-92.55	-28.23	1.13	< .001***
OGG1 (AU)	62.5 (25.0)	68.1 (33.1)	.526	79.3 (24.2)	61.8 (29.3)	1.37	33.73	0.65	.034*
TM (AU)	13.8 (5.5)	16.9 (8.6)	.159	11.8 (6.0)	17.7 (8.9)	-10.47	-1.30	0.77	.013*
OTM (AU)	7.4 (2.3)	8.7 (3.9)	.196	6.2 (2.5)	9.2 (3.8)	-4.87	-1.00	0.91	< .01**

Table 3. All results expressed as Mean (SD). BMI: Body Mass Index; WHR: Waist to hip ratio; SBP/DBP: Systolic/Diastolic Blood Pressure; FBS: Fasting Blood Sugar; LDL/HDL: Low/High Density Lipoprotein; TG: Triglycerides; TC: Total Cholesterol; Cr: Creatinine; UA: Uric Acid; TP: Total Protein; TAC: Total Antioxidant Capacity; 8-OHdG: 8-hydroxy-2'-deoxyguanosine; OGG1: 8-Oxoguanine glycosylase; TM: Tail Moment; OTM: Olive Tail Moment; TE: Trolox Equivalents; AU: Arbitrary Units; CI: Confidence Interval; ES: Effect Size (Cohen's *d*) ; $P < .05$ considered as statistically significant; *significant; **highly significant; ***very highly significant.

Primary outcome variables

Among primary outcome variables (**Table 3**), at the end of 10^{th} week, participants in the Yoga group showed significant reduction (expressed as between-group mean difference (Δ_G) with 95% CI, effect size and significance) in DNA damage markers, TM (Δ_G = -5.88[95%CI: -10.47 to -1.30]; d=0.77, *P*=.013) and OTM (Δ_G = -2.93[95%CI:-4.87 to -1.00]; d=0.91, *P*< .01) compared to the Control. Though FBS (Δ_G = -22.58[95%CI: -44.33 to -0.83]; d=0.62, *P*=.042) reduced significantly for Yoga group, improvement observed in TAC (Δ_G = 5.80[95%CI: -0.86 to 12.47]; d=0.52, *P*=0.086) was not significant. While OGG1 protein expression (Δ_G = 17.55[95%CI:1.37 to 33.73]; d=0.65, *P*=.034), representing DNA repair improved significantly, 8-OHdG (Δ_G = -60.39[95%CI: -92.55 to -28.23]; d=1.13, *P*< .001), the marker for oxidative DNA damage showed highly significant reduction in Yoga group compared to the Control.

Secondary outcome variables

Among secondary outcome variables (**Table3**), participants in the Yoga group showed significant improvements in WHR, SBP, while the improvement observed in BMI and DBP were insignificant. While the improvement observed in lipid parameters (LDL, HDL, TG, and TC), Creatinine, Albumin, and Total Protein were significant, that of Urea and Uric acid were not significant.

Results from the mediation analysis

As for assumption testing, the linear regression-based analysis showed a significant causative relationship between 'Group' and the outcome variable (TM) (*P*=.013) and also with the mediators [8-OHdG (*P*<.001), OGG1(p=.03)]. Also, 8-OHdG (*P*<.001) and OGG1(*P*=.024) showed a significant causative relationship with TM. Multicollinearity, a measure of the correlation between the predictors (8-OHdG and OGG1 predicting TM), as indicated by the variance inflation factor (VIF) (8-OHdG =1.002166 and OGG1=1.002166), were found to be within the acceptable levels (< 5).

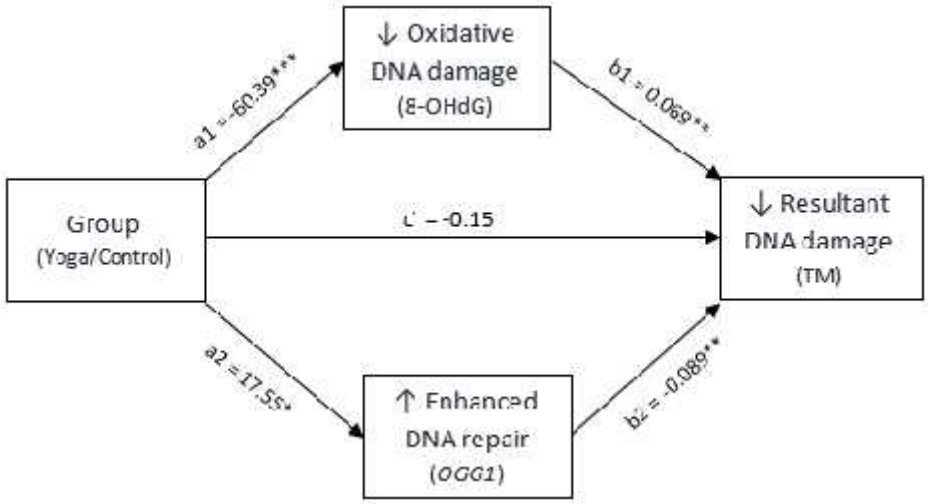

Fig 6. Mediation model

Path diagram showing mediation effect with regression coefficients and their significance for the proposed mediation model. Mediatory paths (indirect) are *Group → 8-OHdG → TM* (a1, b1) and *Group → OGG1 → TM* (a2, b2). Direct path *(Group → TM)* is represented by *ć*. Regression coefficients are a1, b1, a2, b2, and ć.

Fig 6. represents the proposed mediation model with details of regression coefficients, and theirsignificance for each path: Direct path *(Group → TM)*is represented by ć**,** and Indirect paths by *Group → 8-OHdG → TM* (a1, b1) and *Group → OGG1 → TM* (a2, b2). SEM-based mediation analysis showed that the mediatory effect of 8-OHdG (a1*b1= -4.174[95%CI: -8.412 to -1.395]; *P*=.02) as a proportion of total effect was 70.9% and that of OGG1 (a2*b2= -1.563[95%CI:-3.338 to -0.104]; *P*=.063) was 26.6%, while that of direct path (ć = -0.150[95%CI: -4.23 to 4.32]; *P*=.944) was only 2.5%. Proportional contribution of total indirect effect (a1*b1 + a2*b2 = -5.737[95%CI: -10.173 to -2.558]; *P*=.005) was found to be highly significant at 97.4%.