

Table 1. Demographic and anthropometric characteristics of participants at the baseline and at the end of the study.

Variable	Dill powder (n=21)	Placebo (n=21)	P- value*
Age (year)	50.66 ± 8.22	50.42 ± 8.61	0.927
Gender***	14 (46.7%)	16 (53.3%)	0.495
Female (11)	7 (58.3%)	5 (41.7%)	
Male (11)			
Duration of disease (year)	8.1 ± 5.49	8.57 ± 6.72	0.714
Weight (kg)			
Baseline	78.22 ± 11.08	77.29 ± 8.42	0.761
End	78.08 ± 11.07	77.30 ± 8.25	0.796
P-value**	0.602	0.987	
BMI			
Baseline	29.42 ± 3.24	28.95 ± 1.94	0.753
End	29.37 ± 3.29	28.95 ± 1.90	0.725
P-value**	0.627	0.904	
Physical activity (MET-min/week)			
Baseline	1314.33 ± 1036.19	1428.66 ± 1053.76	0.725
End	1254.33 ± 960.52	1495.66 ± 953.10	0.419
P-value**	0.626	0.451	

Values are expressed as means ± SD. $P < 0.05$ was considered as significant. * $P < 0.05$ was considered as significant using Mann–Whitney U (for duration of disease and BMI) and Independent T-test (for other variables) between the two groups at baseline and after the intervention). ** $P < 0.05$ was considered as significant using Wilcoxon Signed Ranks Test (for BMI) and Paired T- test (for other variables). *** $P < 0.05$ was considered as significant using chi-square test.

Table 2. Mean \pm SD of energy, macronutrients and micronutrients intake at baseline and post-intervention

Variables	Dill powder (n=21)	Placebo (n=21)	<i>P-Value</i> ¹	<i>P value</i> ²
Energy (kcal)				
Baseline	1881 \pm 161	1796 \pm 167	0.100	0.113
End	1861 \pm 176	1811 \pm 163	0.339	0.257
<i>P-Value</i> ³	0.412	0.593		
Carbohydrate(gr)				
Baseline	249.61 \pm 23.19	240.40 \pm 20.46	0.180	0.146
End	246.51 \pm 23.61	238.23 \pm 14.28	0.179	0.113
<i>P-Value</i> ³	0.270	0.536		
Protein (gr)				
Baseline	75.41 \pm 6.15	73.43 \pm 6.09	0.303	0.240
End	74.61 \pm 5.72	72.04 \pm 6.65	0.187	0.145
<i>P-Value</i> ³	0.210	0.135		
Fat (gr)				
Baseline	61.53 \pm 5.37	59.66 \pm 4.74	0.241	0.196
End	60.26 \pm 6.24	61.93 \pm 4.32	0.169	0.098
<i>P-Value</i> ³	0.147	0.113		
Vitamin A (U)				
Baseline	377.38 \pm 103.76	321.32 \pm 85.71	0.064	0.034*
End	368.66 \pm 115.02	352.93 \pm 88.03	0.622	0.693
<i>P-Value</i> ³	0.779	0.159		
Vitamin C (mg)				
Baseline	87.03 \pm 27.87	91.36 \pm 29.58	0.628	0.744
End	91.44 \pm 30.92	96.85 \pm 32.20	0.582	0.633
<i>P-Value</i> ³	0.592	0.541		
Vitamin E (mg)				
Baseline	2.03 \pm 0.72	2.38 \pm 0.85	0.166	0.205
End	1.85 \pm 0.52	2.12 \pm 0.63	0.146	0.136
<i>P-Value</i> ³	0.171	0.095		

Values are expressed as means \pm SD. $P < 0.05$ was considered as significant.

P-Value1: Between group comparison of variables at baseline and after intervention resulted from Independent T-test (for all variables).

P-Value2: Between group comparison of variables at baseline and after intervention resulted from Analysis of Covariance (Ancova) in the adjusted models (adjusted for age, duration of disease, and body mass index).

P-Value3: Within group comparison of variables resulted from paired sample t test (for all variables)

Table 3. Serum levels of glyceimic parameters and lipid profile at baseline and post-intervention.

Variables	Dill powder (n=21)	Placebo (n=21)	<i>P-Value</i> ¹	<i>P-Value</i> ²	<i>P-Value</i> ³	<i>P-Value</i> ⁴
FBS (mg/dl)						
Baseline	145.76 ± 50.81	148.61 ± 56.56	0.864	0.883		
End	141.14 ± 40.37	154.23 ± 36.72	0.278	0.623		
<i>P-value</i> ⁵	0.668	0.671				
Difference	-4.61 ± 48.56	5.61 ± 59.76			0.17	0.752
Insulin (μU/ml)						
Baseline	13.27 ± 3.8	11.61 ± 4.91	0.230	0.474		
End	10.54 ± 4.51	12.12 ± 4.23	0.250	0.796		
<i>P-value</i> ⁵	0.004*	0.604				
Difference	-2.7 ± 3.83	0.50 ± 4.36			0.015*	0.05
HOMA-IR						
Baseline	4.88 ± 2.37	4.37 ± 3.01	0.544	0.762		
End	3.86 ± 2.32	4.60 ± 2.02	0.276	0.848		
<i>P-value</i> ⁵	0.039*	0.698				
Difference	-1.02 ± 2.12	0.23 ± 2.68			0.101	0.447
TG (mg/dl)						
Baseline	196.52 ± 60.16	194.66 ± 75.58	0.930	0.626		
End	172.38 ± 69.86	190.19 ± 79.93	0.447	0.664		
<i>P-value</i> ⁵	0.055	0.811				
Difference	-24.14 ± 54.29	-4.47 ± 84.69			0.376	0.343
TC (mg/dl)						
Baseline	120.04 ± 33.5	128.76 ± 32.96	0.401	0.807		
End	124.42 ± 28.88	131.52 ± 36.63	0.490	0.643		
<i>P-value</i> ⁵	0.449	0.319				
Difference	4.38 ± 25.97	2.76 ± 12.38			0.798	0.996
LDL-C (mg/dl)						
Baseline	81.00 ± 34.79	71.71 ± 23.55	0.318	0.516		
End	71.23 ± 26.63	74.80 ± 22.80	0.643	0.357		

<i>P-value</i> ⁵	0.029*	0.325		
Difference	-9.76 ± 19.08	3.09 ± 14.07		0.017* 0.04*
HDL-C (mg/dl)				
Baseline	41.85 ± 11.68	43.14 ± 8.05	0.680	0.939
End	44.80 ± 9.89	41.76 ± 6.33	0.243	0.343
<i>P-value</i> ⁵	0.007*	0.185		
Difference	2.59 ± 4.51	-1.38 ± 4.60		0.004* 0.04*

Values are expressed as means ± SD. *Statistically significant. **P-Value1:** Between-group comparison of variables at baseline and after intervention, resulted from Independent T-test (for all variables).

P-Value2: Between-group comparison of variables at baseline and after intervention, resulted from Analysis of Covariance (Ancova) in the adjusted models (adjusted for age, duration of disease, dietary intake of energy, macronutrients, antioxidant vitamins such as vitamins A, C, and E, physical activity, and BMI).

P-Value3. Between group comparisons change of studied variables resulted from Mann–Whitney U (for FBS) and Independent T-test (for other variables).

P-Value4: Between group comparisons change of studied variables resulted from Analysis of Covariance (Ancova) (adjusted for age, duration of disease, changes of body mass index, dietary intake of energy, macronutrients, Vitamin A, C, and E, and physical activity).

P-Value5: Within-group comparison of variables, resulted from Paired T-test (for all variables).

Abbreviations; Fasting blood sugar (FBS), homeostatic model assessment of insulin resistance (HOMA-IR), triglyceride (TG), total cholesterol (5), high-density (HDL) and low-density lipoprotein (LDL) cholesterol.

Table 4. The effects of dill supplementation on serum levels of antioxidant and inflammatory markers at baseline and post-intervention

Variables	Dill powder (n=21)	Placebo (n=21)	<i>P-Value</i> ¹	<i>P-Value</i> ²	<i>P-Value</i> ³	<i>P-Value</i> ⁴
MDA (µM)						
Baseline	3.34 ± 2.05	3.72 ± 2.09	0.554	0.886		
End	2.22 ± 1.57	4.06 ± 2.32	0.005*	0.000*		
<i>P-value</i> ⁵	0.034*	0.354				
Difference	-1.11 ± 2.24	0.33 ± 1.62			0.021*	0.013*
TAC (mM)						
Baseline	0.19 ± 0.05	0.17 ± 0.39	0.103	0.137		
End	0.25 ± 0.09	0.16 ± 0.06	0.001*	0.004*		
<i>P-value</i> ⁵	0.025*	0.793				
Difference	0.58 ± 0.11	-0.045 ± 0.7			0.339	0.145
Hs-CRP (mg/L)						
Baseline	4.13 ± 0.84	4.29 ± 0.70	0.506	0.388		
End	3.87 ± 0.89	4.32 ± 0.93	0.122	0.143		
<i>P-value</i> ⁵	0.283	0.872				
Difference	-0.25 ± 1.06	0.2 ± 0.8			0.332	0.649

*Statistically significant. Values are expressed as means ± SD. *P* < 0.05 was considered as significant.

P-Value1: Between-group comparison of variables at baseline and after intervention, resulted from independent sample t-test (for all variables).

P-Value2: Between-group comparison of variables at baseline and after intervention, resulted from analysis of covariance in the adjusted models (adjusted for age, duration of disease, dietary intake of energy, macronutrients, antioxidant, vitamins such as vitamins A, C, and E, physical activity, and BMI).

P-Value3: Between group comparisons change of studied variables resulted from Mann–Whitney U (for TAC) and Independent T-test (for other variables).

P-Value4: Between group comparisons change of studied variables resulted from Analysis of Covariance (Ancova) (adjusted for age, duration of disease, changes of body mass index, dietary intake of energy, macronutrients, Vitamin A, C, E, and physical activity).

P-Value5: Within-group comparison of variables, resulted from Paired T-test (for all variables).

Abbreviations; Hs-C-reactive protein (hs-CRP), total antioxidant capacity (TAC) and malondialdehyde (MDA)

Table5. The effects of dill powder supplementation on gastrointestinal symptoms at baseline and post-intervention

Scores	Dill powder (n = 21)			Placebo (n= 21)		
	0	1	2 ≤	0	1	2 ≤
Gastrointestinal symptoms						
Gastroesophageal reflux						
Baseline	5(23.8%)	7(33.3%)	9(42.9%)	7 (33.3%)	5 (23.8%)	9 (42.9%)
End	6(28.6%)	9(42.9%)	6(28.6%)	7 (33.3%)	5 (23.8%)	9 (42.9%)
P-value	0.135			1.00		
Esophageal motility disorders						
Baseline	18(85.7%)	1 (4.8%)	2 (9.5%)	16(76.2%)	3 (14.3%)	2(9.5%)
End	16(76.2%)	3(14.3%)	2 (9.5%)	16(76.2%)	3 (14.3%)	2(9.5%)
P-value	0.317			1.00		
Dyspepsia						
Baseline	15(71.4%)	2 (9.5%)	4 (19%)	14(66.7%)	3 (14.3%)	4 (19%)
End	12(57.1%)	7(33.3%)	2 (9.5%)	13(61.9%)	5 (23.8%)	3 (14.3%)
P-value	0.198			0.368		
Gastric motility disorders						
Baseline	12(57.1%)	1 (4.8%)	8(38.1%)	11(52.4%)	2 (9.5%)	8 (38.1%)
End	10(71.4%)	3(14.3%)	3(14.3%)	11(52.4%)	2 (9.5%)	8 (38.1%)
P-value	0.112			1.00		
Colonic motility disorders						
Baseline	7 (33.3%)	3(14.3%)	11(52.4%)	6 (28.6%)	5 (23.8%)	10(47.6%)
End	10(47.6%)	10(47.6%)	1 (4.8%)	7 (33.3%)	4 (19%)	10 (47.6%)
P-value	0.010*			0.317		

P <0.05 was considered as significant. Data are expressed as Percent of relative frequency of gastrointestinal symptoms. P-value within group comparison of variables resulted from Chi-Square Tests.

The numbers 0, 1 and 2 indicate the severity of gastrointestinal symptoms. 0; the patient hadn't gastrointestinal symptoms, 1; patient had occasional gastrointestinal symptoms. 2 ≤; the patient had permanently gastrointestinal problems