

Effect of Goji berry consumption on physiological, biochemical and traditional Chinese medicine (TCM) outcomes

G.M.R. Gonçalves¹, L. Zhao², S. Patel¹ and B.A. Graf¹

¹Food and Nutrition, Department of Health Professions, Faculty of Health, Psychology and Social Care, Manchester Metropolitan University, M15 6BG Manchester, UK and ²Health Academy, OL10 1AA Heywood, UK.

Traditional Chinese medicine (TCM) prescribes food as medicine⁽¹⁾, and Goji berry (*Lycium barbarum*) were used to treat imbalances of ‘Yin’, ‘Yang’ and ‘Qi’ for >2500 years⁽²⁾. Recent animal studies report that Goji berry reduced total cholesterol, body weight and fasting blood glucose^(3,4,5,6). In human trials Goji berry were evaluated as part of a complex juice, which contained a large number of other ingredients and reported effects could not be attributed to Goji berry^(7,8). Thus, we investigated the effect of dried Goji berry in a double-blind randomised controlled study design. Stratified by BMI, participants were randomly allocated into Goji berry (20 g/d, n = 14) or control group (15.7 g green raisins/d, n = 13). On day 1 and day 21 of the study, conventional outcomes (line 1–8, Table 1) and TCM outcomes (line 9–14, Table 1) were evaluated.

Table 1. Effect of Goji berry consumption on physiological, biochemical and traditional Chinese medicine (TCM) outcomes.

									Statistical analysis			
	Control group				Goji berry group				2 way ANOVA interaction (P value)	Main effect analysis for time (P value)	Main effect analysis for group (P value)	
	Day 1	SD	Day 21	SD	Day 1	SD	Day 21	SD				
1	Weight (kg)	86.00	11.66	85.00	11.85	83.89	12.41	83.79	12.61	0.18	0.10	0.73
2	Waist Circumference (cm)	98.62	8.93	97.73	9.36	99.29	9.31	98.36	9.04	0.96	0.03	0.86
3	BMI	30.30	4.33	29.93	4.23	31.07	3.69	31.04	4.02	0.16	0.12	0.55
4	Systolic BP	133.00	26.62	124.92	18.88	123.50	18.17	117.64	18.19	0.64	0.01	0.28
5	Diastolic BP	83.54	15.33	80.15	10.97	79.79	8.89	77.29	10.70	0.68	0.01	0.45
6	Pulse (beats p/min)	66.92	8.13	67.00	8.53	68.71	7.58	71.43	8.93	0.33	0.30	0.30
7	Total Cholesterol (m mol/L)	3.92	0.87	4.58	1.57	4.36	0.83	4.69	1.07	0.73	0.06	0.26
8	Fasting Glucose (m mol/L)	4.20	0.89	5.03	0.81	4.46	1.02	4.51	0.85	0.14	0.73	0.48
9	Time to fall asleep (1)	2.31	0.85	2.46	1.05	2.36	0.74	2.36	0.74	0.62	0.62	0.93
10	Energy levels (2)	5.77	1.69	5.31	1.44	5.57	0.94	5.36	1.22	0.67	0.25	0.86
		Change score		SD	Change score		SD					
11	Tongue evaluation I (3)	3.85		5.46	2.50		4.27					
12	Tongue evaluation II (4)	1.15		5.06	1.79		3.17					
13	Bowel movement (5)	3.85		5.46	2.50		4.27					
14	Self-assessment (6)	2.31		3.30	2.86		5.08					

(1) Time to fall asleep was categorised: 1=>20 min, 2 = 11–20 min, 3 = 5–10 min; (2) Energy levels: 1 = Extreme low, 5 = Medium, 10 = Excellent, (3) Tongue evaluation I: TCM tongue diagnosis: –10 = Reduction of health (2 or more tongue areas changed negatively), –5 = Slight reduction (1 area changed negatively), 0 = No change, 5 = Slight improvement (1 area changed positively), 10 = Improvement (2 or more areas changed positively); (4) Tongue evaluation II: TCM tongue diagnosis based on tongue photograph by external TCM practitioner: same scale as before; (5) Bowel movement and (6) Self-assessment: –10 = Negative change, –5 = Slight negative change, 0 = No change, 5 = Slight positive change, 10 = Positive change.

Two-way ANOVA (group and time interaction analysis) revealed that there was no difference between control and Goji berry group ($P > 0.16$). Main effect analysis showed that some outcomes changed over time (waist circumference, $P = 0.03$; systolic BP $P = 0.01$; diastolic BP, $P = 0.01$). These changes however occurred in both, control and Goji berry group. Therefore changes seen were either a) due to a factor not measured in the study or b) Goji berry AND green raisins delivered the same bioactivity. In summary, this study cannot confirm that Goji berry consumption has beneficial effects.

1. Maciocia G (2005) *The Foundations of Chinese Medicine*. 2nd ed., New York, USA: Elsevier Health Sciences.
2. Potterat O (2010) *Journal of medicinal plant and natural product research* 76, 7–19.
3. Ming M, Guanhua L, Zhanhai Y *et al.* (2009) *Journal Food Chemistry* 113(4), 872–877.
4. Luo Q, Cai Y, Yan J *et al.* (2004) *Life Sciences* 76(2), 137–149.
5. Jing L, Cui G, Feng Q & Xiao Y (2009) *African Journal of traditional, complementary alternative medicines* 6(4), 579–584.
6. Li XM (2007) *International Journal of Biological Macromolecules* 40(5), 461–465.
7. Amagase H & Nance DM (2011) *Journal of the American College of Nutrition* 30(5), 304–309.
8. Amagase H & Nance DM (2012) *Journal of Food Research* 1(2), 3–12.