



Original Article

Effect of warm lemon water drink on selected physical parameters among the overweight female nursing students of RIMS & R, U.P

Abstract:

Introduction: Overweight is considered when an individual have 20% above ideal weight while obesity refers to 50% above ideal weight. Overweight is a common issue of sedentary lifestyle and most often results in obesity. Hence, a nurse must have a thorough knowledge regarding prevention of obesity.

Objectives: It was intended to assess the effect of warm lemon water drink on selected physical parameters among the overweight female nursing students and to assess the association of effect of warm lemon water drink on physical parameters and selected demographic variables.

Methods and Materials: This pre experimental one group pretest posttest study was conducted among 30 overweight female nursing students residing at student nurse's hostel RIMS & R, U.P. Sample was selected using non probability purposive sampling technique. The data was collected by using invivo bio-physiological measurements such as height, weight and waist circumference.

Results: The findings of the study showed that the average BMI reduced from 25.725 to 24.541 kg/m², weight reduced from 60.766 to 57.966 kgs and waist circumference cut back from 94.066 to 88.1 cms after specified intervention.

Conclusion: Although study was conducted during early winter, the effect of warm lemon water drink on selected parameters among the overweight students showed effectiveness. Warm lemon water drink is effective for assured weight loss of 1 to 4 kgs and decrease waist circumference of 4 – 6 cms during 3 weeks.

Key Words: Warm lemon water, Physical parameters, Overweight, Weight reduction, Nurse

Samundy Kumbhakar¹, Ranjana Verma¹, Biji Biju²

¹ Demonstrator/ Nursing tutor, College of Nursing, RIMS & R, Saifai, Etawah, U.P

² Principal, College of Nursing, RIMS & R, Saifai, Etawah, U.P

Corresponding Author:
Samundy Kumbhakar
Email: samundyk@gmail.com

© 2016 IINRP All rights reserved.

Introduction

Overweight and obesity means abnormal or disproportionate fat accumulation that leads to poor health. In 2014, WHO global current estimate showed that > 1.9 billion adults (aged 18 years and above) fall under overweight. In the same year, 39% of the adults aged 18 years and above (38% of men and 40% of women) were overweight. The global prevalence of obesity was more than doubled between 1980 and 2014. There are ample numbers of morbidity due to obesity. Based on WHO fact sheet, the major risk factors of raised BMI include heart disease, stroke (a leading cause of death in 2012), diabetes, osteoarthritis, and cancers (endometrial, breast and colon). Increased intake of energy dense foods (containing high fat), sedentary life style, changing modes of transportation and urbanization are the primary common reasons for increased body weight more than

normal¹. Hence, there is a need to reduce weight for that common people who follow sedentary life style. This interventional research emphasized on cost effective, easily accessible and with negligible adverse effects.

Normally, drinking warm water in the morning may help with natural weight loss. The scientific principle is that warm water increases body temperature, which therefore boosts the metabolic rate. Thus, a raise in metabolic rate allows the body to burn more calories. Furthermore, it can also help the gastrointestinal tract and kidneys to function enhanced².

Hypothesis

H1: There will be significant difference in the pre test and post test physical parameters among over weight female nursing students at 0.05 level of significance .

H2: There will be a significant association between the physical parameters among overweight female nursing students and selected demographic variables

Methodology

Pre experimental one group pre test and post test design was conducted among the 30 female overweight nursing students residing at nursing students hostel RIMS & R, U.P. Sample was chosen using non probability purposive sampling. The selection criteria included was those subjects, with BMI and waist circumference, more than 23.0 kg/m² and more than 80 cm respectively as well as age group below 30 years. Subjects who were taking treatment for other weight reduction or with other associated medical problems for instance diabetes mellitus, hypertension and hormonal problems are excluded from the study. Also, during procedure, the samples were contra-indicated to do exercises and dietary restrictions. The data was collected by using in vivo bio-physiological measurements such as height, weight and waist circumference. Samples were advised to drink 500 ml of warm water with temperature 45 – 50 degrees Celsius mixed with half squeezed lemon juice and taken twice a day 20 minutes before breakfast and dinner. The selected physical parameters such as dietary pattern and family history of obesity were assessed before and after intervention with 3 weeks interval. Baseline data were collected with the help of interview schedule and physical parameters were assessed by using standard measurement scales and compared with standard set by Indian Health Ministry consensus guidelines for the prevention and management of obesity and Metabolic syndrome (October 2008)³. Validity and reliability of tool was established. Data was analysed using descriptive and inferential statistics.

Result

Table 1: Socio demographic profile of subjects n=30

Variable	f	%
Age (years)		
17-23	13	43
24-30	17	57
Education		
ANM	8	26
G.N.M	11	37
B. Sc (N)	11	37
Dietary Pattern		
Vegetarian	22	73
Non vegetarian	8	27
Marital Status		
Single	26	87
Married	4	13
Family history of obesity		
Yes	5	17
No	25	83

As depicted in table 1 the highest percentages (57%) were in age group 23 – 30 years. Equal numbers of participants were from GNM and BSN. The greater part of subjects (73%) was vegetarians. Majority of the participants (87%) were single. Among the total subjects, majority (83%) had no family history of obesity.

Table 2: Association between physical parameters and selected demographic variables n=30

Variables	Subjects	BMI	t	df	p	Weight	t	df	p	Waist Circumference	t	df	p
Diet													
Non Veg	8	25.4	4.53	1	0.03	60.63	6.02	1	0.01	89.25	5.74	1	0.01
Veg	22	24.23				57				87.68			
Family h/o Obesity													
Yes	5	25.19	9.32	1	0.002	61.8	12.15	1	0.0004	93	12.65	1	0.0003
No	25	24.41				57.2				87.12			

Table 2 indicated that there was significant association between post test physical parameters and type of diet intake and family history of obesity ($p < 0.01$).

Table 3: Comparison of mean pre test and post test scores of physical parameters n=30

Physical parameters	Pre test		Post test		t	p	df
	Mean	SD (±)	Mean	SD (±)			
BMI	25.72	1.99	24.54	1.36	51.20	0.009	58
Weight	60.77	4.12	57.97	4.23	57.96	0.01	58
Waist Circumference	94.07	3.71	88.00	5.00	53.53	0.001	58

Table 3 shows the overall mean post test BMI scores were 24.5407 when compared to the pre test mean score of 25.72. The obtained 't' value 51.20 is highly significant at $p < 0.001$ level. Thus, it indicates that the warm lemon water drink was highly effective in reducing weight.

Discussion

The present study was conducted to assess the effect of warm lemon water drink on selected physical parameters among the overweight female nursing students residing at nurses hostel RIMS & R, U.P. The result showed that the average BMI reduced from 25.73 to 24.54 Kg/m², Weight reduction between 60.77 and 57.97 KGs and waist circumference cut back reduced from 94.07 to 88.1 CMs respectively.

Warm water supports in increased metabolic rate compared to cold water. Drinking 500 ml of water increased metabolic rate by 30% after 30-40 minutes with a total thermogenic response of 100 kJ (24 kcal). Furthermore, the warm water should be

between 22 and 37 °C which result in about 40% of the thermogenic effect. The subjects included in his study had subjects who followed sedentary lifestyle⁴. On the other hand; a study reported approximately 500 mL cold water with 3°C caused only 4.5% of energy expenditure for 60 minutes⁵. In the current study, 500ml of warm water with temperature of 45 to 55 °C was advised.

Replacing sugar containing foods definitely will reduce more calorie intake, thereby preventing fat accumulation. A systematic review with six electronic bases (cohort studies and RCTs) suggested that there is a potential advantage on body weight outcomes when substitution of sugar – sweetened beverages is replaced by water or low – calorie beverages⁶. Either increased water consumption, or replacement of energy-containing beverages with energy-free beverages aids in loss of body weight⁷. Drinking fewer sugary beverages will aid to consume fewer total calories⁸. In this study only, one lemon which gives only 15 -30 calories was used.

Some studies proved that vitamin C is essential for moderate lipolysis. Anorfolk cohort study in the European prospective investigation into cancer and nutrition illustrated that abdominal obesity measured by waist circumference was inversely related to plasma vitamin C among 19000 adults⁹. A study illustrated that there is a significant inverse relationship between BMI and plasma Vitamin C concentration among 11,592 participants of the NHANES.¹⁰ A study pointed out that normal plasma Vitamin C enhances fat oxidation during exercise. Vitamin C is a co factor necessary for the biosynthesis of carnitine, a metabolite. This carnitine is essential for the transport of long chain fatty acids across the mitochondrial membrane for subsequent fat degradation and oxidation¹¹. Carnitine deficiency is associated with reduced fat oxidation but enhances lipid accumulation in muscle¹². In the present study, lemon is used as a main source of vitamin C.

Adequate water intake helps in weight loss. A study concluded that drinking water is associated with weight loss in overweight dieting women independent of diet and activity¹³. A study demonstrated that loss of 2 kg body weight when 500 ml of water given 30 minutes before meals daily for 12 weeks in middle-aged and older adults (aged ≥40 years)¹⁴. Another study also concluded that loss of body weight when subjects were given 500 mL given 3 times daily for 8 weeks¹⁵. In this study, nearly 1000 ml of water was used.

Although, no parallel studies been conducted but the significant
Kumbhakar S, Verma R, Biju B 2016

studies verifies warm lemon water drink aids in weight loss. Some subjects shared that their problems of acidity, constipation, and feeling of heaviness reduced in addition to weight loss.

Conclusion

In conclusion, the current study, showed assured weight loss of 1 to 4kgs and decrease waist circumference of 4 – 6cms for 3 weeks. The significant association found between physical parameters with selected demographic variables such as dietary pattern and family history of obesity concludes that the warm lemon water drink is effective in reducing weight.

Recommendations

On the basis of the findings the study recommends a follow up of study can be undertaken with large samples for better generalization. A comparative study also can be done between the effect of black tea and warm lemon water drink.

Acknowledgement

Although Indian folklores consider “lemon cause cold” but still they took initiation to participate in the study, hence, we heartily grateful to them.

Ethical clearance

All administrative permission from ethical committee of RIMS &R, U.P was taken. Informed written consents were taken from participants before data collection.

References

1. Media Centre, Fact sheet N°311, Obesity and overweight, [Online] [cited January 2015]: Available from: URL: www.who.int/mediacentre/factsheets/fs311/en/. Assessed on 15/01/2016.
2. LizetteBorreli , Healthy living, health benefits of warm water: 6 ways drinking warm water can heal your body, [Online] [Cited may/14/2014] Available from: URL: <http://www.medicaldaily.com/health-benefits-warm-water-6-ways-drinking-warm-water-can-heal-your-body-282218>. Assessed on 21/01/2016.
3. BMI In Indians [Online] [Cited 26/11/2012] Available from: URL: [www.healthizen.com>world-obesity-day](http://www.healthizen.com/world-obesity-day). Assessed on 21/01/2016.
4. Boschmann M, Steiniger J, Hille U, et al. (December 2003). "Water-induced thermogenesis". *The Journal of Clinical Endocrinology and Metabolism* 88 (12): 6015–9.
5. Brown CM, Dulloo AG, Montani JP (September 2006). "Water-induced thermogenesis reconsidered: the effects of osmolality and water temperature on energy expenditure after drinking". *The Journal of Clinical Endocrinology and Metabolism* 91 (9): 3598–602.

6. Journal of the Academy of Nutrition and Dietetics 2015 May, 115(5): 767-79doi:10.1016/j.jand.2015.01.006.Epub 2015Mar 4. Substitution of sugar – sweetened beverages with other beverage alternatives: a review of long - term health outcomes. Zheng M, Allman- Farinelli M, Heitmann BL, RanganA A. Also available from URL:<http://www.ncbi.nlm.nih.gov/pubmed/25746935>
7. Dennis EA, Flack KD, Davy BM (December 2009). "Beverage consumption and adult weight management: A review". *Eating Behaviors* 10 (4): 237–46.
8. Stookey JD, Constant F, Gardner CD, Popkin BM (December 2007). "Replacing sweetened caloric beverages with drinking water is associated with lower energy intake". *Obesity* 15 (12): 3013–22.
9. Canoy, Wareham N, Welch A, Bingham S, Luben R, Day N, Khaw KT. Plasma ascorbic Acid concentration and fat distribution in 19,068 British Men and Women in the European Prospective investigation into cancer and nutrition. Norfolk Cohort Study. *American Journal of Clinical Nutrition*.2005;82:1203-9.
10. Schectman G, ByedJC ,Gruchow HW. The influence of smoking on Vitamin C status in adults. *American Journal Public health*. 1989;79:158-62.
11. Rebouche CJ. Ascorbic acid and carnitine biosynthesis. *American Journal Clinical Nutrition*.1991;54:suppl:11475-525.
12. Vielhaber S, Feistner H, Weis J, Kreuder J, Sailer M, Schroder JM, Kunz WS. Primary carnitine deficiency: adult onset lipid storage myopathy with a mild clinical course. *Journal of clinical Neuroscience*.2004;11:919-24.
13. Stookey JD, Constant F, Popkin BM, Gardner CD (November 2008). "Drinking water is associated with weight loss in overweight dieting women independent of diet and activity". *Obesity* 16 (11): 2481–8.
14. Dennis EA, Dengo AL, Comber DL, et al. (February 2010). "Water consumption increases weight loss during a hypocaloric diet intervention in middle-aged and older adults". *Obesity* 18 (2): 300–7.
15. Vij VA, Joshi AS (September 2013). "Effect of 'water induced thermogenesis' on body weight, body mass index and body composition of overweight subjects". *Journal of Clinical and Diagnostic Research* 7 (9): 1894–6.