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A SYSTEMATIC REVIEW ON EFFICACY AND SAFETY OF UNANI MEDICINES USED IN THE TREATMENT OF OBESITY

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ABSTRACT

The prevalence of obesity is alarmingly increasing across the world. It is an emerging perplexing issue that not only itself a health problem but also associated with many other diseases ranging from cardiovascular disorders to some type of cancers. Important concern for health care providers is the limited availability of an effective medical treatment for obesity. Some clinical trials conducted recently, reported the efficacy of Unani medicine in obesity. Therefore, a systematic review was conducted to assess the weight reducing effect of Unani therapeutics in overweight and obese adults. A comprehensive search of electronic databases, viz., PubMed, Google Scholar, Cochrane library, MedIND was carried out using keywords like 'Unani Medicine', 'Obesity', 'Clinical trial', 'Weight loss' 'Siman-i-mufrit' or combination of these. In addition, journals and dissertations in the library of the National Institute of Unani Medicine, Bangalore, India was manually searched. Among the retrieved studies, only six clinical trials met the criteria and were included in the review. Total 267 participants were enrolled in these studies and treatment duration ranged from 2 to 3 months. Included studies reported significant anti-obesity effects (decline in certain parameters) with the administration of test formulations without any adverse effect. Although, overall evidence suggested the efficacy of Unani therapeutics in the treatment of obesity without any adverse effects; however, the effect size found in some studies was very small in comparison to control. Hence, studies with an effect size of clinical relevance are further required to determine the use of these drugs in routine clinical practice.

Keywords: Efficacy; Safety; Obesity; Unani Medicine

INTRODUCTION

Abnormal or excessive fat accumulation in the body that presents a risk to health is known as overweight and obesity[1]. The crude population measure for obesity is body mass index (BMI). A person with a BMI of >25 kg/m^2 is generally considered as overweight and with BMI ≥30 kg/m^2 is considered as obese. As per W.H.O. estimates, worldwide prevalence of obesity has nearly tripled between 1975 and 2016[2]. About 13% of the world's adult population (11% of men and 15% of women) was obese in 2016[2]. Despite the increasing magnitude of obesity, a little attention has been paid to this health problem in both developed and developing countries[3]. Obesity increases the risk of morbidity and mortality; hence, it is considered as the fifth leading risk of death globally[2]. Moreover, it is also associated with several disorders like diabetes, hypertension, dyslipidemia, cardiovascular disease and even some cancers[3]. Due to the emergence of obesity as an important public health problem, its prevention and treatment are important concern for health system; whose focus is to reduce the prevalence of obesity and problems associated with it across the globe[4].

Various treatment modalities for weight reduction like dietary restrictions, lifestyle modifications, and pharmacotherapy (appetite suppressing drugs, lipase inhibitors etc.) have been considered by the health professionals[5,6] Nonetheless, these treatment approaches does not fulfill the need of the population in terms of efficacy and safety[7]. Moreover, studies show that only 5-10% subjects can maintain their weight loss over the years[8]. Due to this limited availability of effective conventional medical treatments for obesity, patients are seeking alternative forms of health care for weight loss[9].

In India, a considerable proportion of population is using Unani medicine for various health problems and obesity is one among them. Clinical trials conducted recently also reported the efficacy of Unani therapeutics in the treatment of obesity. However, the systematic reviews to provide reliable information on its efficacy were lacking. Hence, this review is conducted to provide up-to-date information on the efficacy and safety of Unani therapeutics in the treatment of obesity.

MATERIALS AND METHODS

Comprehensive search of electronic databases like PubMed, Google Scholar, Cochrane library, MedIND was carried out to retrieve the clinical studies (published in English between 2000 to 2017) investigating the effect of Unani therapeutics in overweight and obese subjects. In addition, journals and dissertations in the library of the National Institute of Unani Medicine were also searched manually. For electronic databases search, medical subject headings (MeSH) and other relevant terms to the topic were used as major constructs to build the search strategy. The MeSH or other relevant terms were related to Unani medicine, obesity and intervention constructs. To combine these, Boolean operators "AND" "OR" and "NOT" as appropriate were used. The search terms were 'Siman-i-mufrit', 'Unani Medicine', 'Greco-Arabic medicine', 'Obesity', 'Traditional medicine', 'Clinical trial', 'RCT', and 'Unani therapy'.

Inclusion and Exclusion Criteria

To select the relevant studies for this review, screening of titles and abstracts were done, and it was guided by the following inclusion criteria: Original research articles conducted to assess

the efficacy of Unani therapeutics (single or compound formulations or regimenal therapy) in overweight and obese subjects were considered for review. Studies of at least 4 weeks duration were included. Studies published in peer-reviewed journals of English language between 2000 and 2017 were included. Any comparison arm or group used against the Unani therapeutic was accepted for this review. The main outcome measures sought at the end of treatments as anti-obesity effects were body weight, body mass index, waist circumference, waist-hip ratio, skin-fold thickness and mid-upper arm circumference. Animal studies, review articles, single group studies and studies those primarily examined obesity related complications such as infertility were excluded.

Data Extraction and Synthesis

Two reviewers independently examined the title, abstract and full text of each article meeting the inclusion criteria and eliminated duplications and those showing exclusion criteria. Two reviewers extracted data using a standardized data extraction form built according to the Consolidated Standards of Reporting Trials for Herbal interventions (CONSORT). Data extracted included participant, interventions, comparator, and outcome detail (PICO). The third reviewer checked the extracted data and any discrepancy found in the data was resolved through discussion between reviewers.

Quality Assessment of the Articles

The Cochrane risk of bias tool [10] was used to assess the quality of the studies included in this systematic review by determining the risk of bias. This validated tool consists of six categories namely: (1) random sequence generation (2) allocation concealment (3) blinding of participants (4) incomplete outcome data (5) selective outcome reporting (6) other bias. Scoring for each category was done as high, uncertain or low risk of bias.

RESULTS

From an initial search of electronic databases, 55 studies were identified and reviewed for inclusion or exclusion. After initial screening, 35 studies (2 duplicated studies, 3 animal trials, 3 systematic reviews and 27 review articles) were excluded. After that 20 RCTs were identified, among which 14 studies (7 on herbal medicines, 6 were primarily on obesity associated complications and 1 single group study) were excluded. Finally 6 RCTs fulfilling the inclusion criteria were included for review. Summary of the included trials is given in Table 1.

One RCT was conducted in Iran and others in India. Five RCTs had a two-arm parallel design (test and control group) and one study had three-arm parallel design. These studies enrolled 267 participants and the treatment duration ranged from 2 to 3 months. All these studies included overweight and obese adults with BMI between 25-50 kg /m^2. Outcome measures encountered in these studies were body weight, body mass index, waist circumference, hip circumference, waist-hip ratio, and mid-upper arm circumference and skin-fold thickness. Assessment of the efficacy parameters was done weekly[12], fortnightly[13], monthly[11,16] and even before and after treatment.[14,15] Four included trials studied Unani medicine versus a placebo; one studied Unani medicine versus a Unani control and one study compare the effect of single herb and steam bath separately and in combination. No trial was restricted to participants based on sex, while age restriction was found.

Obesity status was determined by anthropometric measurements (weight, BMI, MUAC, WC, HC, WHR and SFT). Comparison of the effect size of Unani therapeutics and comparator on the outcome variables is given in Table-2. None of the included study reported any adverse event (Table 3).

The risk of bias assessment for the included trials is presented in Table-4. Random sequence generation, allocation concealment, blinding of the patient/practitioner or assessor, and reporting of drop-outs were clearly described in one of the included studies[11]. Four studies[13 16] described the random sequence generation, and drop-outs; while the allocation concealment and blinding methods were inadequately described. One[12] was lacking in providing the detail of random sequence generation, allocation concealment and blinding method.

DISCUSSION

Single herbs or compound formulations containing plants and minerals or regimenal techniques were investigated in included studies for their anti-obesity effect; the ingredients of compound formulations and scientific names[17] of single herbs used in this review are given in table 5 and 6**.**

All included studies[11-16] reported anti-obesity effects (such as decline in body weight, body mass index, waist and hip circumferences, waist-hip ratio, skin-fold thickness and mid-upper arm circumference) of the test drugs. Summary of the included studies and the effect size of test drugs on outcome variables in comparison to control are presented in table 1 and 2. Anti-obesity mechanism of test drugs has been given in included studies. Kamali et al., (2012) mentioned that anti-obesity effect of Itrifal Saghir can be attributed to its metabolism stimulant, appetite suppressant, serotonin inhibitor, antioxidant and impeding the digestion of fat properties[11].

Minhaj et al., (2014) mentioned that the effect of test formulation may be due to its har-yabis mizaj (hot and dry temperament). Because, obesity results due to the preponderance of shaham (fat) and sameen in the body and the drugs of har-yabis mizaj (hot and dry temperament)[17] act against this accumulation of shaham and sameen and dissolve them slowly[12].

Ali M et al., (2014) stated that weight reducing effect observed with the test formulation can also be attributed to its muhallil (resolvent), muhazzil, mulattif (demulcent), mudir (diuretic), qatae balgham (concoctive of phlegm) and qatae akhlate ghaleeza (concoctive of morbid humours) properties[13]. Because accumulation of morbid humours, particularly ghalbae balgham (dominance of phlegm) is the main cause of obesity and the drugs possessing the above-mentioned properties can evacuate the fasid maddae balghamia (morbid matter of phlegm) from the body and thereby effective in the management of obesity. Similarly Siddiqi et al., (2014) attributed the anti-obesity effect of test formulation to the diverse pharmacological action of its ingredients, like mulattif (demulcent) action of marzanjosh (*Origanum majorana*), hazim (digestive) wa mulattif (resolvent) effect of ajwain (*Trachyspermum ammi*), zeera (*Carum carvi*) and badiyan (*Foeniculum vulgare*), musakkhin (calorific) effect of ajwain (*Trachyspermum ammi*), zeera (*Carum carvi*), karafs (*Apium graveolens*) and marzanjosh (*Origanum majorana*) and qate akhlate ghaleeza (concoctive of morbid humour) properties of bora armani (*Armenian bole*) that might complement or synergize each other and facilitate the anti-obesity effect[14].

Table 1: Summary of included clinical trials investigating the effect of Unani interventions in overweight/obese persons

Author (Year) Place of study	Study design	Sample size & Target population	Intervention/test drug (dose and duration)	Control	Effect on main outcome variable(s)
Kamali HS et al. (2012); Iran	Randomized controlled trial [Double blind]	N=62 [31 in test and 31 in control group] Subjects with BMI between 30-50 kg/m^2	Itrifal Saghir [5 gms twice a day before breakfast and after dinner for 3 months]	Placebo [Same dose and duration as test drug]	Comparing mean differences between group, significant decline in body weight, BMI, waist and hip circumferences ($p<0.001$) were found in test group, while no remarkable changes in these variables were noticed in placebo group.
Minhaj S et al. (2014); India	Randomized controlled trial [single blind]	N= 60 [30 in test and 30 in control group] Subjects with type 1 obesity	Sudab, Zarawand mudahraj, Juntiyana and Tukhme Karafs [5gm thrice a day for 2 months]	Placebo [Same dose and duration as test drug]	Comparing mean differences between group, significant reduction in body weight, BMI, skin fold thickness ($p<0.001$) and MUAC ($p=0.0071$) was observed in test group in comparison to control group. No significant reduction was observed in waist-hip ratio (P= 0.1075).
Ali M et al. (2014); India	Randomized controlled trial [single blind]	N=30 [20 in test and 10 in placebo group] Subjects with BMI between 25- 35kg/m^2	Ajwain desi, Tukhme Sudab, Zeera siyah, Marzanjosh, Bora Armani [5gm once a day with cane vinegar 7.5ml just after breakfast for 2 months]	Placebo [Same dose and duration as test drug]	In test group, significant effect was noted after completion of treatment as compared to baseline values on body weight, BMI, MUAC, waist-hip ratio and skin fold thickness ($p<0.001$). On inter-group comparison, effect on MUAC, waist-hip Ratio were found significant ($p<0.05$) in test group; while effect on body weight, BMI and skin fold thickness were found insignificant ($p>0.05$).
Siddiqi M et al.(2014); India	Randomized controlled trial [single blind]	N=40 [25 in test and 15 in placebo group] Subjects with BMI between 25- 35kg/m^2	Safoofe Muhazzil Khaas [5 gm (tablet form) once a day in the morning for a duration of 2 months]	Placebo [Same dose and duration as test drug]	In test group, significant effect was noted after completion of treatment as compared to baseline values on Body weight, BMI and waist circumference ($p<0.001$). On inter-group comparison, effect was found to be insignificant in comparison to control on above mentioned variables ($p>0.05$).
Danishmand et al. (2015); India	Randomized controlled trial [single blind]	N= 30 [20 in test and 10 in control group] Subjects with BMI ≥25 kg/m^2	Qurs-e-Luk [5gm (powder form) twice a day for a duration of 2 months]	Lipotab [2 tablets twice a day for 2 months]	Significant effect on body weight was observed in both test and placebo groups, but the test drug ($p<0.001$) was comparatively found to be more effective than placebo ($p=0.0171$).
Fatima S et al. (2017); India	Randomized three arm, comparative clinical study	N= 45 [15 in each group] Subjects with BMI between 30-39.9 kg/m^2	**Gp A:** Kundur gum resin [3gm in a powdered form orally once daily in the morning]. **Gp B:** Steam bath for 15 minutes on every sitting. [Total 12 sittings; every 4th day upto 4th week followed by weekly till completion of treatment] **Gp C:** Gp. A+ Gp. B intervention [In all groups treatment was given for 8 weeks]	Comparison between 3 groups • Kundur • Steam Bath • Kundur+Steam Bath	Significant reduction ($p<0.001$) in body weight, BMI, waist circumference, waist-hip ratio and skin-fold thickness was found in all the groups. On inter-group analysis, group C followed by group A in comparison to group B had exhibited substantial decrease in weight and waist circumference.

BMI: Body mass index; MUAC: Mid- upper arm circumference

Table 2: Comparison of the effect size of Unani medicines and control drug on outcome variables in overweight/obese persons

Study	Intervention and duration	Body weight (kg)	BMI (kg/m²)	WC (cm)	HC (cm)	WHR	MUAC (cm)	Skin-fold thickness (mm)
Kamali HS et al.(2012); Iran	Itrifal Saghir (3 months)	4.82	1.47	4.01	3.21	-	-	-
	Placebo	+0.45	+0.18	+0.5	+0.43	-	-	-
Minhaj S et al. (2014); India	Sudab, Zarawand mudahraj, Juntiyana and Tukhme Karafs (2 months)	2.99	0.9	-	-	0.03	1.55	6.0
	Placebo	1.42	0.57	-	-	+0.08	0.03	+1.4
Ali M et al. (2014); India	Ajwain desi, Tukhme Sudab, Zeera siyah, Marzanjosh and Bora Armani (2 months)	4.13	1.59	-	-	0.09	2.45	14.25
	Placebo	1.36	0.56	-	-	0.03	0.68	5.3
Siddiqi M et al.(2014); India	Safoofe Muhazzil Khaas (2 months)	2.6	1.00	1.00	-	-	-	-
	Placebo	2.1	0.9	0.8	-	-	-	-
Danishmand et al.(2015); India	Qurs-e-Luk (2 months)	1.38	0.53	-	-	-	-	-
	Lipotab	0.51	0.35	-	-	-	-	-
Fatima S et al. (2017); India	Kundur (8 weeks)	4.06	1.75	7.17	-	0.02	-	9.53
	Steam Bath	2.99	1.22	3.39	-	0.02	-	9.13
	Kundur + Steam Bath	5.19	2.19	8.18	-	0.02	-	14.06

BMI: Body mass index; WC: Waist circumference; HC: Hip circumference; WHR: Waist-hip ratio; MUAC: Mid- upper arm circumference, + Sign indicate increase in the value of variable in comparison to baseline values

Table 3: Reported adverse events from included studies

	Study 1	Study 2	Study 3	Study 4	Study 5	Study 6
Adverse events [n/N]	I= 0/31 C= 0/31 T=0/62	I=0/30 C=0/30 T=0/60	I=0/20 C=0/10 T=0/30	I=0/25 C=0/15 T=0/40	I=0/20 C=0/10 T=0/30	I_1=0/15 I_2=0/15 I_3=0/15 T=0/45
Serious adverse events [n/N]	I= 0/31 C= 0/31 T=0/62	I=0/30 C=0/30 T=0/60	I=0/20 C=0/10 T=0/30	I=0/25 C=0/15 T=0/40	I=0/20 C=0/10 T=0/30	I_1=0/15 I_2=0/15 I_3=0/15 T=0/45
Drop-out due to adverse events[n/N]	I= 0/31 C= 0/31 T=0/62	I=0/30 C=0/30 T=0/60	I=0/20 C=0/10 T=0/30	I=0/25 C=0/15 T=0/40	I=0/20 C=0/10 T=0/30	I_1=0/15 I_2=0/15 I_3=0/15 T=0/45
Hospitalization due to adverse events [n/N]	I= 0/31 C= 0/31 T=0/62	I=0/30 C=0/30 T=0/60	I=0/20 C=0/10 T=0/30	I=0/25 C=0/15 T=0/40	I=0/20 C=0/10 T=0/30	I_1=0/15 I_2=0/15 I_3=0/15 T=0/45
Liver toxicity [n/N]	I= 0/31 C= 0/31 T=0/62	I=0/30 C=0/30 T=0/60	I=0/20 C=0/10 T=0/30	I=0/25 C=0/15 T=0/40	I=0/20 C=0/10 T=0/30	I_1=0/15 I_2=0/15 I_3=0/15 T=0/45
Renal toxicity [n/N]	I= 0/31 C= 0/31 T=0/62	I=0/30 C=0/30 T=0/60	I=0/20 C=0/10 T=0/30	I=0/25 C=0/15 T=0/40	I=0/20 C=0/10 T=0/30	I_1=0/15 I_2=0/15 I_3=0/15 T=0/45
Other side effects [n/N]	I= 0/31 C= 0/31 T=0/62	I=0/30 C=0/30 T=0/60	I=0/20 C=0/10 T=0/30	I=0/25 C=0/15 T=0/40	I=0/20 C=0/10 T=0/30	I_1=0/15 I_2=0/15 I_3=0/15 T=0/45

I: Intervention group; I_1: Intervention group 1; I_2: Intervention group 2; I_3: Intervention group 3; C: Control group; T: Total number of participants

Table 4: Risk of bias assessment of the included studies using cochrane risk of bias tool

	Random sequences generation	Allocation concealment	Blinding of participants and practitioner	Outcome Assessor blinding	Reporting drop-out or withdrawal	Selective outcome reporting	Other Bias
Study 1	L	L	L	L	L	L	L
Study 2	L	H	H	H	H	U	U
Study 3	L	H	U	H	L	L	U
Study 4	L	H	L	H	L	L	U
Study 5	L	H	U	H	L	L	U
Study 6	L	H	H	U	L	L	U

L= Low risk of bias, H= High risk of bias, U= Uncertain

Table 5: Ingredients of compound formulations used in included studies

Itrifal Saghir[11]	Safoofe Muhazzil Khaas[14]	Qurs-e-Luk[15]
Haleela (*Terminalia chebula*) 1 part	Ajwain (*Trachyspermum ammi*) 1 part	Luk maghsool (*Cocos lacca*) 4 part
Baleela (*Terminalia bellerica*) 1 part	Sudab (*Ruta graveolens*) 1 part	Rewand chini (*Rheum emodi*) 2 part
Amla (*Phyllanthus emblica*) 1 part	Zeera (*Carum carvi*) 1 part	Asaroon (*Valeriana wallichii)* 1 part
	Marzanjosh (*Origanum majorana*) 1 part	Sumbul-ut-teeb (*Nardostachys jatamansi*) 1 part
	Badiyan (*Foeniculum vulgare*) 1 part	Mastagi (*Pistacia lentiscus*) 1 part
	Karafs (*Apium graveolens*)1 part	Tukhme karafs (*Apium graveolens*) 1 part
	Luk maghsool (*Cocos lacca*) 2 part	Anisoon (*Pimpinella anisun*) 1 part
	Bora Armani (*Armenian bole*) ¼ part	Nankhwah (*Trachyspermum ammi*) 1 part
		Izkhar (*Andropogon jwarancus*) 1 part
		Qust (*Saussurea lappa*) 1 part
		Filfil siyah (*Piper nigrum*) 1 part
		Zanjabeel (*Zingiber officinalis*) 1 part

Table 6: Scientific names [17] of test drugs used in included studies

S.N.	Unani Name	Scientific Name
1	Sudab	*Ruta graveolens*
2	Zarawand mudahraj	*Aristolochia rotunda*
3	Juntiyana	*Gentiana lutea*
4	Tukhme Karafs	*Apium graveolens*
5	Ajwain desi	*Trachyspermum ammi*
6	Zeera siyah	*Carum carvi*
7	Marzanjosh	*Origanum majorana*
8	Bora Armani	*Armenian bole*
9	Kundur	*Boswellia serrata*

Danish mand et al., (2015); reported the observed efficacy of Qurs-e-luk and attributed it to har-yabis mizaj (hot and dry temperament) of the ingredients inherent in the test formulation. Due to this, these drugs have exerted demulcent, and resolving actions on the accumulated body fat producing excess heat and dryness in liver, which in turn plays an important role in metabolism of fat, and thus decrease in weight is ensued[15].

Fatima S et al., (2017) reported that weight reduction with administration of kundur (*Boswellia serrata*) is attributable to muhazzil, mujaffif-e-balgham (desiccant of phlegm) and qate balgham (concoctive of phelgm) action by virtue of its haar yaabis mizaj (hot and dry temperament) [16].

From the above points, it is clearly evident that anti-obesity effects of test formulations can be attributed to their har-yabis mizaj (hot and dry temperament); which in turn stimulates thermogenesis, increases the metabolism, suppress appetite, reduce the fat absorption, as well as decrease the lipogenesis and increase lipolysis.

Though all test drugs studied showed statistically significant results. However, taking all results collectively, Itrifal Saghir and Kundur (*Boswellia serrata*) were found to have acceptable anti-obesity effects. None of the included study has reported adverse effects, but, we believe that safety of these drugs remains to be elucidated on larger population by further long-term studies.

CONCLUSION

Although, overall evidence suggesting the efficacy and safety of Unani therapeutics in the treatment of obesity. However, effect size found in some studies was very small in comparison to control. Hence, further studies with a sufficient magnitude of effect size to determine relevant clinical effects are needed to validate the use of this therapeutics in routine clinical practice.

Abbreviations: BMI, Body Mass Index; WC**,** Waist circumference; HC**,** Hip circumference; WHR, Waist- hip ratio; MUAC**,** Mid-upper arm circumference; SFT**,** Skin-fold thickness; RCTs**,** Randomized controlled trials.

REFERENCES

1. World Health Organization. Obesity. Available from http://www.who.int/topics/obesity/ en. [Last accessed on 2018 April 5]
2. European association for the study of obesity (EASO).Obesity Facts and Figures. Available from https://easo.org/education-portal/obesity-facts-figures/. [Last accessed on 2018 April 5]
3. Pradeepa R et al. Prevalence of generalized and abdominal obesity in urban and rural India-the ICMR-INDIAB Study (Phase-I) [ICMR-INDIAB-3]. The Indian Journal of Medical Research 2015; 142(2):139-150
4. Wirth A, Wabitsch M, Hauner H. The prevention and treatment of obesity. Deutsches Ärzteblatt International 2014; 111(42):705-13

5. Erlanger SR, Henson EA. Classification and pharmacological management of obesity. Pharmacy and Therapeutics 2008; 33(12):724-28
6. Kang JG, Park CY. Anti-obesity drugs: a review about their effects and safety. Diabetes and Metabolism Journal 2012; 36(1):13-25
7. Rodgers RJ, Tschöp MH, Wilding JP. Anti-obesity drugs: past, present and future. Disease Models and Mechanisms 2012; 5(5):621-6
8. Hasani-Ranjbar S, Jouyandeh Z, Abdollahi M. A systematic review of anti-obesity medicinal plants-an update. Journal of Diabetes and Metabolic Disorders 2013; 12:28. doi: 10.1186/2251-6581-12-28
9. Bertisch SM, Wee CC, McCarthy EP. Use of Complementary and Alternative therapies by overweight and obese adults. Obesity 2008; 16(7):1610-15
10. Cochrane Risk of Bias Tool for Randomized Controlled Trials. Available from https:// www.ncbi.nlm.nih.gov/ books/NBK115843/bin/appe-fm2.pdf. [Accessed on 7 April 2018]
11. Kamali et al. Efficacy of 'Itrifal Saghir', a combination of three medicinal plants in the treatment of obesity; a randomized controlled trial. DARU Journal of Pharmaceutical Sciences 2012; 20:33. doi:10.1186/2008-2231-20-33
12. Minhaj S, Ansari NA, Siddiqui AM, Ali JS. A Clinical study of Simane Mufrit Ibtedai (Type-1 obesity) and efficacy of a Unani formulation in its management. Journal of Research in Unani Medicine 2014; 3(1): 22-26
13. Ali M, Anwar M, Shoaib M. Clinical Efficacy of a Unani Formulation in the Treatment of Saman-e-mufrat (Obesity). Hippocratic Journal of Unani Medicine 2014; 9(1):23-39
14. Siddiqi M, Khan BD, Akhtar Wasi M, Azam M. Therapeutic Evaluation of a Unani Formulation (Safoofe Muhazzil Khaas) in the Management of Samane Mufrat (Obesity). Hippocratic Journal of Unani Medicine 2015; 10(2):33-42
15. Danishmand, Ahmad Tanzeel, Khalid M, Jafar M. Effect of Qurs-e-Luk in overweight adults: A randomized clinical study. Spatula DD 2015; 5(3):155-159
16. Fatima S, Ahmad T, Shahid M, Sofi G. Comparative study of Kundur (Boswellia serrata) and Tareeq (Diaphoresis) in the management of Samne Mufrit (Obesity)- a randomized clinical trial. Int J Health Sci Res. 2017; 7(10):186-196
17. Ahmed F, Nizami Q, Aslam M. Classification of Unani drugs. Delhi: Published by Authors; 2005:267-79

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