ROLE OF UDVARTANA ON PSYCHOPHYSICAL PARAMETERS OF HEALTHY VOLUNTEERS - A RANDOMIZED CONTROLLED TRIAL

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ABSTRACT
The world community on healthcare is on a lookout for more appropriate life style modifications to prevent the life threatening non communicable life style disorders. Āyurveda has many of them in its store in the form of dinacaryā and āyurveda. Udvartana is one among them. Udvartana is massage technique of whole body below the neck with powders of medicinal plants. Udvartana alleviates vitiated kapha doṣa, reduces excess of fat in the body, increase the stability of body and promotes the excellence of skin. Many of the life style modification practices are not in use as a preventive measure. Probably due to practical difficulty, lack of awareness and lack of convincing evidence for its efficacy. No studies have been conducted for evaluating the role of udvartana as mentioned in our classics and the psychophysical changes in human body after udvartana. Hence this study is aimed to prove the effect of udvartana on psychophysical parameters of healthy volunteer to prevent kapha and meda related diseases. Considering overall effect of udvartana significant changes were observed in physical parameters such as Body Weight, Body Mass Index, Waist Circumference, Hip Circumference, Waist Hip Ratio and Skin Fold Thickness, Hand Grip Strength, score of Skin Texture and physical domain of WHO QOL in study group and also significant changes were observed in psychological parameters such as score of stress inventory scale and psychological domain of WHO QOL and improvement in quality of sleep in study group. So
finally it is concluded that udvartana has significant role on psychophysical parameters of healthy volunteers.

KEYWORDS: Udvardana, Psychophysical parameters, Health.

INTRODUCTION
Main objectives of Āyurveda are maintenance of health and treatment of diseases.\(^1\) Here health refers to both physical and psychological health. To maintain health, one should follow principles of Svasthavṛtta.\(^2\) In Svasthavṛtta Ācāryas has given prime importance for the prevention of diseases both communicable and non-communicable disease. Observance of systematic daily routine (Dinacaryā), life in accordance with the season (Ṛtuḥcaryā) and well planned schedules of āhāra and vihāra help to preserve health. Ācārya’s have explained daily regimen and seasonal regimen to be followed under Dinacaryā and Ṛtuḥcaryā for health preservation. Various procedures are explained under Dinacaryā and Ṛtuḥcaryā that had to be implemented. The procedures like abhyaṅga, udvartana, pradēha, pariṣēka, mardana, vyāyāma etc. are explained under Dinacaryā with an aim of maintaining total health.

Here external purification procedure, udvartana will be helpful to eliminate the aggravatated doṣas by its property. Many Ācāryas have mentioned udvartana for the management of obesity or sthaulya. It is having properties like kaphahara, medovilayana, aṅgasthirīkaraṇa etc.\(^3\) and also udvartana removes bad odour, restricts the process of excessive sweating and alleviates the aggravatated doṣas by its effect.\(^4\) Udvardana is a simple process and has no harmful effect when compared with other fat reducing packages and treatments. Economically too it is affordable and volunteer’s friendly.

Udvartana is a procedure which can be undertaken daily with a preliminary training to the individual. Its efficacy has been proved in reduction of Hyperlipidemia in the earlier studies; and also it is proven in case of obese patients. Healthy volunteers those who are having Kapha predominant prakṛti are more prone to get kapha diseases. Hence it is necessary to implement preventive measures in such high risk groups.

The effect of Udvardana in reducing weight, BMI, WHR and serum lipid values and other scales like stress inventory, quality of life and sleep were also considered. So, to study effect of udvartana in healthy volunteers on their physical as well as psychological parameters such as stress, sleep, quality of life and to document and analyze this procedure for statistical
interpretation the study entitled “Role of udvartana on psychophysical parameters of healthy volunteers- A randomized controlled trial” was undertaken.

MATERIALS AND METHODS
The present study was planned as a Randomized Controlled Trial and methodology of the study is described below.

ETHICAL CONSIDERATIONS
Informed consent
Details about the intervention and duration of the study were explained. Those who were willing, the consent obtained from participants, only included in the study. They were given the freedom to quit from the study at any part of it at their own will.

AIMS AND OBJECTIVES
To evaluate the role of udvartana in healthy volunteers as
1) Alleviation of excess Kapha
2) Reduction of body fat
3) Stability to the body parts
4) Keeping the skin lustrous

RESEARCH QUESTION
Does the 20 minutes daily practice of udvartana for 14 days in morning have a significant role on psychophysical parameters of healthy individuals, in comparison with individuals who are not undergoing any intervention?

NULL HYPOTHESIS
Udvartana has no significant role on psychophysical parameters of healthy volunteers.

ALTERNATE HYPOTHESIS
Udvartana has significant role on psychophysical parameters of healthy volunteers.

INCLUSION CRITERIA
• Healthy volunteer- Selected from pre designed and pre tested questionnaire
• Age group 20- 40 years
• BMI Between 25 – 29.9 kg/m²
• Kapha predominant prakṛti
• Haemoglobin, TLC, DLC within normal range
• Willing to give written consent

EXCLUSION CRITERIA
• Under any medication
• Any systemic illness

METHODOLOGY
• Study Design: Randomized controlled trial
• Setting – V.P.S.V. Ayurveda college, Kottakkal
• Period of study- 18 months
• Sample size-15 {study 15, Control 15}

Control Wait list control
• Selection of subjects- college campus and news paper announcement
• Sample technique-Random sampling- By random number table
(Randomization of 30 participants- given in Appendices)

ASSESSMENT CRITERIA
Prakṛti
• In the present study kapha predominant prakṛti is considered.
  Assessment is done in three ways
• Physical examination by anthropometrical examination.
• Physiological examination by subjective interrogation
• Psychological examination by subjective interrogation.

A pre-designed pre tested questionnaire was used for screening the volunteers, which include all the points mentioned in the classics of Āyurveda, regarding prakṛti.

• Physical Parameters- assessed before and after intervention
  o Body weight- measured in kilograms.
  o Body Mass Index- BMI is calculated as weight (kg)/height in meter squared (m²)
  o Waist circumference- should be measured as the maximum circumference over waist.
  o Hip circumference- should be measured as the maximum circumference over the buttocks.
Waist Hip Ratio (WHR) - WHR is the ratio of a person's waist circumference to their hip circumference

Hand grip strength

In the present study handgrip power is measured. For this purpose the cuff of sphygmomanometer folded, tied and inflated to such an extent so that the manometer records 20 mm of Hg constantly. Then the person is asked to press the cuff with maximum power gripping the cuff in his hand. The record of the maximum grip is noted down. To avoid the errors 3 consecutive readings were taken giving a sufficient rest to the hand and the mean is considered. The procedure recommended by Melvin 8 is the use of an inflated blood pressure cuff as the squeezing device.

Skin fold thickness

All measurements were taken, with the subject seated on a stool, on the right side of the body. The calliper takes measurements of fat lying just below the skin from Suprailiac: just above the iliac crest in the mid-axillary line. At this site, the skinfold was pinched up firmly between the thumb and forefinger and pulled away slightly from the underlying tissues before applying the callipers for the measurement. The instrument used was the skin fold calliper.

Skin texture

For assessing the tvak prādana On the basis of skin structure and the roles of the various cells (i.e. keratinocytes, melanocytes, fibroblasts and endothelial cells), the definition of healthy skin emerges in a clear, precise and scientific fashion. The definition encompasses objective and subjective criteria. Objectively, healthy skin is smooth, firm evenly, colored, free of clinical evident disease or damage and has a normal texture (no defects, scars, wrinkles, dermatoheliosis etc.). Histologic findings of healthy skin correlate to objective clinical observations:

1. Smoothness- soft and compact stratum corneum
2. Firmness- intact collagen and elastin fibers
3. Even pigmentation- proper production and distribution of melanin
4. Normal texture- absence of epidermal or dermal atrophy, fibrosis or solar elastosis
5. Free of clinically evident disease- no histopathologic evidence of disease states
6. Properly hydrated- rich in glycosaminoglycans in the dermis, ceramide, lipids and natural moisturizing factor in the epidermis
7. Normal tolerance- intact barrier function of the stratum corneum and epidermis
Subjectively, healthy skin is well hydrated (does not feel dry) and has normal tolerance (does not feel sensitive). Although healthy skin implies youthfulness and beauty, these terms should not be used to describe healthy skin because they are extremely subjective. When the definition of healthy skin is compared to a healthy baby’s skin (in the absence of any disease state) there is a perfect match; hence, baby’s skin will be used on to imply healthy skin. Grading of each element in the scoring system [minimal (1), average (2), maximal (3)], and subsequently the final score [excellent (12 to 15), average (7 to 11), poor (<7)] are done with reference to the healthy skin model defined.[9]

**WHO QOL BREF Physical Domain**

Facets included under this domain are activities of daily living, dependence on medicinal substances and medical aids, energy and fatigue, mobility, pain and discomfort, sleep and rest, work capacity.[10]

**Psychological Parameters**

**Stress inventory questionnaire**

assessed before and after intervention. This scale was having 12 questions, first 8 questions YES will give 1 point and then 9- 12 questions NO will give 1 point. If total score is above 4 after answering 12 questions, then the person is under stress.

**National sleep foundation sleep diary** throughout the study period as daily assessment criteria.

**WHO QOL BREF Psychological Domain**

Facets included under this domain are bodily image and appearance, negative feelings, positive feelings, self-esteem, spirituality / religion / personal beliefs, thinking, learning, memory and concentration.[10]

A pre-designed questionnaire for assessing the health status before and after intervention

**WHO QOL (BREF)**

**Ayurveda Health Status Assessment**

Haematological parameters:- Haemoglobin, TLC, DLC, ESR

Biochemical parameters:- Lipid Profile
All haematological and biochemical parameters were conducted before and after intervention in the pathology lab of V.P.S.V Ayurveda College Kottakkal.

**PLAN OF STUDY**
- Literature review was done on concept of udvartana which includes physiological effect of massage, concept of health and Drug review of yava.
- Yava (Hordeum vulgare L.) was purchased from raw drug shop, Kottakkal and identified and authenticated by Department of Dravyaguṇa vijñān of VPSV Ayurveda College, Kottakkal. Then it was grinded and sieved.
- Clinical study was carried out in selected healthy volunteers during the year 2012 and study parameters were assessed before and after intervention.
- One month follow up was done and incidence of any general health problems was noticed.

**Intervention Provided**
Among the willing healthy volunteers 30 participants were selected allocated randomly into study group and control group. Of that the study group was given intervention udvartana with yava cūrṇa. A standard procedure of udvartana was formulated on consultation with experts for a period of 14 days in the morning for 20 minutes. Udvartana was done in four positions, before udvartana powder was heated. After udvartana 15 minute rest, then they were asked to take bath after cleaning the body with dry cotton towel.

**FOLLOW UP**
- Period of 1 month
- Health status assessment

**Wait list Control**
After completion of follow up period when study was completed, control group was also given udvartana for 14 days daily for 20 minutes, because control group was kept in waiting list.

**Statistical analysis**
Statistical test was done by using GraphPad InStat v3.05 software for estimating the proportions.
RESULTS
In study group statistically significant changes were observed in body weight, BMI, waist circumference, hip circumference, waist hip ratio, skin fold thickness, hand grip strength, score of skin texture, score of stress inventory scale, physical domain, psychological domain of WHO QOL and in lipid profile at the level of 0.1% (p<0.001), moreover time taken to get sleep (p<0.01) and feeling of freshness in the morning (p<0.001) in national sleep foundation sleep diary.

Statistically significant positive changes were observed in study group in, social domain (p<0.01) and environmental domains (p<0.01) of WHOQOL (BREF). vāta (p<0.001), pitta (p<0.05) and kapha (p<0.01) domains of Āyurvēda Health Status Assessment Scale.

Incidence of general health problems during follow up period were 80% in control group, against 13 % in study group. In control group 26.6 % were suffered from common cold and 20 % each by cough and fever. As per dōṣic analysis 33.33 % belonged to kapha pitta and 26.66 % belonged to kapha vāta. Control group showed statistically significant (p<0.001) high incidence rate.

CONCLUSION
The present study entitled “Role of udvartana on psychophysical parameters of healthy volunteers- A randomized controlled trial” was an attempt to evaluate the role of udvartana in healthy volunteers as alleviation of excess kapha, reduction of body fat, stability to the body parts and keeping the skin lustrous. After a detailed literary review, clinical observation and analysis of the data and discussions, the following conclusions are evolved.

- Significant decrease in physical parameters such as Body Weight, Body Mass Index, Waist Circumference, Hip Circumference, Waist Hip Ratio and Skin Fold Thickness was observed in study group.
- Significant increase in physical parameters such as Hand Grip Strength, score of Skin Texture and score of physical domain of WHO QOL was observed in study group.
- Significant reduction in psychological parameter such as score of stress inventory scale was observed in study group.
- Score of psychological domain of WHO QOL was significantly increased in the study group.
- Significant improvement in quality of sleep in study group was found.
So, the Null Hypothesis is rejected and the Alternate Hypothesis is accepted that is—
“Udvartana has significant role on psychophysical parameters of healthy volunteers.”

REFERENCES

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