International Journal of Science and Research (IJSR)
ISSN: 2319-7064
ResearchGate Impact Factor (2018): 0.28 | SJIF (2018): 7.426

Effectiveness of Application of Neem Paste on Face Acne among Teenagers in Selected Area of Sangli, Miraj and Kupwad Corporation

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Abstract: ***Objectives: 1) To assess the pre-test condition of face acne among teenagers. 2) To assess the post-test condition of face acne among teenagers. 3) To find out the association between face acne and demographic variable. Method: The content validity of tool was done by 21 experts; the pilot study was conducted on 10 samples from20/9/2017 to 26/9/2017 in KhajaBasti, Miraj. The sample was selected by non-probability purposive sampling technique. The final study 23/10/2017 to 04/11/2017. On total 60 sample; consist of two group, Neem application group and control. Each group consisted of 30 samples. The quasi-experimental two group pre test research design was used, informed consent was taken from women above 40 to 60 years of age and suffering from arthritis information demographical data is obtained, acre-intervention Neem paste is applied to the face acne in experimental group ones a day and nothing to control group. Everyday face acne is assessed for signs of side effects or rash. Finally the result was compared with each other by analysis of the data. Result & Conclusion: In the present study pretest face acne score was assessed in teenagers with acne 60 sample were collected and divided into two groups. One experimental and one control. It was statistically found that the pre test mean 22.4 and reduced to 19.0 were as in control group the mean of face acne score was 22.8 and reduced to 22.5. The research hypotheses H_0 was not expected as Neem application is highly effective in reduction face acne in teenagers.***

Keywords: Effectiveness of application, Neem Paste, Acne Among Teenagers

1. Background of the Study

The purpose of this study is to assess the effectiveness of Neem Paste on face acne. As prevalence is increasing in India regarding face acne in teen-agers, and medicine are getting costlier and effectiveness is less seen. Nearly 14 million of people see the doctor for face acne per year.[1]

Neem kills bacteria that causes acne/ pimples and prevents it from coming back. Neem can either be applied topically, through creams and lotions (Neem leaves also can be crushed and applied on acne) or it can be taken internally (Neem supplement is completely safe because it is nothing but a wonderful herb). Going for Neem supplement will be a wise decision because it takes care of facial acne.

Many herbalists recommend Neem products as some of the most efficient home acne treatments.[2]

There are many myths about what causes acne. Things like stress, lack of cleanliness, wrong food, etc. may all make existing acne worse, but they are not the root cause for developing acne.

Hormones make the oil glands produce too much oil. This hormonal imbalance is the reason that so many teenagers develop acne. Puberty is a time where the hormone metabolism undergoes major changes. Boys are prone to severe acne than girls, because boys have higher level of hormones. Women are more likely to suffer from on going acne, since the female hormone metabolism is prone to imbalance. Neem does not fix this hormonal imbalance.[2]

The Neem plant possesses powerful antidermatonic band anthelmintic, insect repellent, anti bacterial, anti-fungal, anti-viral, anti-septic, anti-inflammatory, anti-ulcer and strengthens the body's overall immune responses. It is widely used in treating chronic malaria, bed bugs ulcer, bed teeth, syphilis, leprosy, spermicidal in preventing pregnancies and other diseases. Externally it's the oil applied as an antiseptic for urticaria and chronic skin diseases like eczema, scabies, ring worm and maggot infested wounds. It is also used for killing lice, fleas, ticks, insecticide and bacterial growth in mouth.

This tree's beneficial values have been known for 4000 years is described by the naïve as the village pharmacy due to its wide spectrum of medical qualities. Over 65 patents have been derived from its various uses, which clearly indicates its practical utility in our daily lives. It has been traditionally used by families for curing household aliments, spermicidal in preventing pregnancies.[3]

a) **Anti-inflammatory**: Nimbidin, a component of Azadirachtaindica, has been shown to possess potent anti-inflammatory and antirthritic activity. Nimbiden suppresses the functions of macrophages and neutrophils involved in inflammation. Nimbidin, a compound isolated from the oil of seeds of Azadirachtaindica, has been screened in comparison with two standard anti-inflammatory agents, phenylbutazone, a non-steriod and prednisolone, a steroid; against various experimental models of inflammation. It was found to significant reduce acute paw oedema in rats induced by phlogistic agents, carageenan and kaolin. The test drug significantly suppressed the formalin-induced arthritis of ankle joint

and the fluid exudation in croton oil induced granuloma in rats.[12-13]

b) Antioxidant: The process, through which free radicals are created, is a normal function of the body but the resulting molecules are unstable and can damage other cells.A series of disorders, including cardiovascular disease, eye health, cataracts and macular degeneration, age related neurodegeneration (decline of the brain cells and nervous system) and even cancer occurs due to high levels of free radicals. Azadirachtaindica protects against chemically induced carcinogens and liver damage by boosting antioxidant levels.[12]

To control the harmful bacteria is one of the goals of successful acne treatment.

Research studies have shown that all components of the neem tree are strongly anti- bacterial. And not just that, neem also contains aspirin like substances that reduce redness and inflammation. These two qualities are the main reasons for the beneficial effect of neem and oil for acne. The other goal is to balance the oil balance the oil levels of the skin.[2]

1.1 Need for Study

Neem, correctly stated as "Tree for Solving Global Problems" is one of the most precious gift by nature to us. It is indeed a 'Green Gold', which we should nourish and cherish for centuries to come.[1]

Acne is the most common skin condition affecting late adolescents across the globe. Although prior studies have evaluated epidemiologic patterns of acne.

Geographic region-level disability-adjusted life year rates (per 100,000 persons) associated with acne in years 1990 through 2010. Median percentage change in disability-adjusted life year rates was estimated for each region across the specified study period.

Acne vulgaris-associated disease burden exhibits global distribution and has continued to grow in prevalence over time within this population. This continued growth suggest an unmet dermatologic need worldwide for this disorder and potential opportunities for improved access and delivery of dermatologic care.[14]

According to the Global Burden of Disease (GBD), acne vulgaris affects ~85% of young adults aged 12-25 years[15] and is the tenth highest cause of DALYs in the late adolescent period (15-19-year olds) across developed countries.The consideration of the effects of acne on patients in their late adolescence should not be confined to the dermatological realm due to the pervasive psychosocial comorbities among patients among patients plagued with the disease. While girls are often more susceptible than boys, both sexes frequently suffer from anxiety, depression, and suicidality along with their acne vulgaris.

According to Darren D Lynn, Tamara Umari, Cory A Dunnick and Robert P Dellavalle, there are many contributing factors that uniquely influence the incidence, prevalence, and persistence of acne vulgaris in the late adolescent population.[14]

It is considered almost impossible to treat teenage acne and acne marks without cosmetic treatments. Such treatments are very expensive, and they also involve long terms-risks. However, neem is unique solution that can put an end to teenage acne as well. Neem is not just an ultimate acne killer; it is also a powerful healer. It heals the acne hit skin that has suffered from numerable issues since teenage. It treats issues like too oiliness or dryness of the skin, red rashes due to permanent inflammation and painful big acne lumps. Neem is an anti-inflammatory agent that reduces redness and rashes with gradual use. It offers freedom from pain as well.[16]

Use of neem for acne pimples and scars, neem leaves, oil, bark, and fruits have significant medicinal properties that help to fight the inflammation, redness (red marks) and scar tissue formation associated with acne breakouts. Among the most significant healing benefits of neem for acne prone skin are antibacterial properties, natural astringent and antioxidant.[17] Since, neem has been renowned for healing. The earliest Sanskrit medical writings refer to the benefits of its fruits, seeds, oil, leaves, roots and barks.[18]

1.2 Problem Statement

A study to assess the effectiveness of application of Neem paste on face acne among the teenagers in selected areas of Sangli, Miraj, Kupwad, Corporation.

1.3 Objectives

1) To assess the pre-test condition of face acne among teenagers.
2) To assess the post-test condition of face acne among teenagers.
3) To find out the association between face acne and demographic variable

1.4 Hypothesis

H0- There will be no significant effect of neem paste application on face acne.

1.5 Operational Definitions

1) **Assess**: -According to "Oxford dictionary" Estimate the quality or 'estimate the values of a property.
   In this study, the quality of Neem will estimate.
2) **Effect:-**According to "Oxford dictionary" it means change result produced or outcome or consequences of an action.
   In this study, effect is change result of Neem paste.
3) **Application:-**According to "Oxford dictionary" it means the action of applying something to a surface.
   In this study, application is of Neem past

1.6 Delimitations

Period of data collection is only 1week.

2. Review of literature

2.1 Review of literature related to neem.

The Neem plant possesses powerful antidermatonic and anthelmintic, insect repellent, anti-bacterial, anti-fungal, anti-viral, anti-septic, anti-inflammatory, anti-ulcer, and strenghthens the body's overall immune response. It is widely used in treating chronic malaria, bed bugs, ulcer, bad teeth, syphilis, leprosy, spermicidal in preventing pregnancies and other diseases. Externally it's the oil applied as an antiseptic for urticaria and chronic diseases like eczema, scabies, ring worm and maggot infested wounds. It is also used for killing lice, fleas, ticks insecticide and bacterial growth in mouth.[3]

Azadirachtaindica, commonly known as Neem, belongs to Family Meliaceae, is one of the most versatile medicinal plants that has gained worldwide importance due to medicinal and insecticidal properties. There are several studies showing the effects of Azadirachtaindica in experimental and clinical models.[19]

Limonoids from the neem tree (Azdirachtaindica) have attracted considerable research attention in recent years owning to their potent antioxidant and anti-proliferative effects. The present study was designed to investigate the cellular and molecular mechanism by which Azadirachta and Nimbolide exert cytotoxic effects in the human cervical cancer (HeLa) cell line. Both Azadirachta and limonids significantly suppressed the viability of HeLa cells in a dose-dependent manner by inducing cell cycle areest at G0/G1 phase accompanied by p53-dependent p21 accumulation and down regulation of the cell cycle regulatory proteins cyclin B, cyclin D1 and PCNA. Characteristic changes in nuclear morphology, presence of subdiploid peak and annexin-V staining pointed to apoptosis as the mode of cell death. Increased generation of reactive oxygen species with decline in the mitochondrial transmembrane potential and release of cytochrome c confirmed that the neemlimonoids transduced the apoptotic signal via the mitochondrial pathway. Altered expression of the Bcl-2 family of proteins, inhibition of NF-kB activation and over-expression of caspases and surviving provide compelling evidence that Azadirachta and Nimbolide induce a shift of balance toward a pro-apoptotic phenotype. Antioxidants such as azadirachtin and Nimbolide that can simultaneously arrest the cell cycle and target multiple molecules involved in mitochondrial apoptosis offer immense potential as anti-cancer therapeutic drugs.[20]

Christine Y S Peng, Son Trinh, Julio E Lopez, Eric C Mussen, A Hung & Ronald Chuang conducted a series of experiments under laboratory conditions to evaluate the feasibility of using a neem-based (Azdirachtaindica) insecticide to control varroa (Varroajacobsoni). The experiments included studies of anti-feeding effects of azadirachtin, the active ingredient of neem-based insecticides, on adult worker honey bees (Apismellifera); toxicity of azadirachtin to adult workers, worker larvae and associated mites; and the effects of Azadirachta on female V. jacobsoni reproduction. Both commercially formulated and purified Azadirachta were used in the experiments. The results of adult feeding experiments showed that azadirachtin significantly reduce syrup consumption by worker bees ($P< 0.05$) and exhibited a dose response in mortality; with an oral $LC_{50}$of 10.87 ug/ml in mite-free bees, 13.69 ug/ml in mite infested bees, and 35.43 ug/ml in the associated mites. The results of larval feeding experiments showed that worker larvae were more sensitive to azadirachtin than adult worker bees: exhibiting an $LC_{50}$of 180.92 ug /ml to purified azadirachtin and 100.13 ug/ml to formulated azadirachtin. More than 90% of treated, normal-appearing, white prepupae and pupae showed precocious and abnormal pigmentation on their mouth parts and other appendages. LC_{50}'sof topical applications of formulated azadirachtin were 104.91, 99.12 and 171.37 ug/ml for mite free worker larvae, mite-inoculated larvae and associated mites, respectively. In addition, feeding host larvae with azadirachtin significantly reduced the fecundity of mother mites ($p< 0.001$) as well as egg hatching rate ($p< 0.001$). However, more research is needed to evaluate the reproductive effects of azadirachtin on drones, queens and varroa under hive conditions.[21]

Ethanolic extracts of fresh neem seeds were formulated as aqueous suspensions and defatted ground neem kernels were formulated as non-wettable dust for greenhouse studies with fall armyworm were fed neem-treated Golden Bantam sweet corn. The antifeeding potency of 0.2 and 0.4% aqueous solutions of the neem seed extract was maintained for at least 21 days. Test with formulated dusts showed moderate activity against 1st stage fall armyworm larvae.[22]

This study is conducted by Kanth M.S. Sundaram on the analytical chemistry, environmental behavior and biological effects of azadirachtin-A, aneem-based pesticide.

Azadirachtin-A (AZ-A) was isolated from sample so f neem seed kernels, leaves, bark, root and stem, obtained from Kanthayapalayam, South India. The extracts were subjected to column cleanuo and AX-A concentration liquid chromatographic (HPLC) method.AZ-A was also isolated from four commercial formulations and from several foresty substrates, and its concentration in each sample was quantified by HPLC.

To investigate the environmental behavior of AZ-A, five studies were conducted: (i) persistence of AZ-A on balsam fir and red oak follage, (ii) dissipation of AZ-A in forest nursery soils, (iii) leaching in sandy loam forest soil, and (v) rate of hydrolysis in buffer solutions and natural waters.

The biological effects of Azadirachtin on two spotted spider mites infecting young trembling aspen plants was studied after applying AZ-A and its four formulations onto aspen leaf discs. The repellency, oviposition deterrence. Mortality and fecundity were investigated. The data indicated that the toxic effects were significantly influenced by AZ-A concentration and formulation ingredients.

The photostability of AZ-A was examined following application onto red maple follage and the effect of three UV stabilizers on the rate of degradation was investigated over a 10-dperiod. The data indicated that the half-life of degradation could be increased on maple follage by the

addition of 2,4-dihydroxybenzophenone to AZ-A at a concentration of 1:1 w/w. In addition, the mechanisms of energy transfer between AZ-A and the UV protectant molecules are also described.[23]

2.2 Review of literature on acne

Acne vulgaris is the most common skin diseases of the youth especially in puberty age. One of the most common complications of acne is scarring. It has been found to have a significant impact on their psychological well-being and has been associated with depression and suicide ideation. Acne causes emotional upset and impact to the patient by disfiguring face and scarring skin. Multiple surgical treatments are available for acne scars, which include dermabrasion, microdermabrasion (MDA), laser treatments and dermal filters.[24]

Acne (synonymous: Varus) is the most common disease of the adolescent age. Acne causes emotional upset and impact to the patient by disfiguring face and scarring skin.[25]

Scars from at the site of an injury to tissue. In the case of acne, the injury is caused by the body's inflammatory response to sebum, bacteria and dead cells in the plugged sebaceous follicle.[26] There is considerable variation in scarring between one person and another, indicating that some people are more prone to scarring than others. Scarring frequently results from severe inflammatory nodulocystic acne that occurs deep in the skin.[27]

A number of treatments are available for acne scars through dermatologic surgery. The type of treatment selected should be the one that is best in terms of type of skin, the cost, what the patient want to accomplish and the possibility that some types of treatment may result in more scarring if patient is very susceptible to scar formation.[28]

Acne vulgaris is an extremely common disorder. Prevalence of acne varies among different population in different studies. There is general recognition that there are many factors in the etiology of acne vulgaris.[29] Causes could be attributed to both genetic and environmental factors. There is familial predisposition of severe forms of acne that support a genetic component. Acne usually occurs around puberty but it may start late in the thirties and forties (in adulthood).[30, 31,32]It takes several years before spontaneous remission.[30]Prognosis of the disease is usually good but, as a chronic disease, replaces even during treatment could occur. It can remit spontaneously.[33]

A recently published study shows that even eating moderate amounts of high quality dark chocolate can cause acne.

The study, published in the International Journal of Dermatology in December 2015, asked 25 acne-prone men to eat 25g (0.9 ounce) of quality dark chocolate every day 4 weeks. Researchers says that according to nutrition facts label the amount of sugar on the 25g daily dose used in the study is negligible, less than 1g. This study shows that growing body of scientific evidence suggesting that chocolate can cause acne. This applies even to high-quality dark chocolates that have little to no sugar.[34]

Acne is a common disease in Westernized nations, particularly among adolescents and young adults. Acne has substaintial effects on quality of life, marking treatment essential. Medical nutrition therapy as a potential treatment for acne is not new, although the literature examining diet and acne during the past100 years is mixed. During the late 1800s and early 1900s, diet was commonly used as an adjunct treatment for acne. During the 1960s, however, the diet-acne connection fell out of favor. In recent years, dermatologist and registered dietitians have revisited the idea and become increasingly interested in the role of medical nutrition therapy in acne treatment. Although the total number of studies conducted within the past 40 years is relatively small, the growing body of epidemiologic and experimental evidence suugests a relationship between diet and acne. While dermatologists and registered dietitians continue to debate and research the potential relationship between diet and acne, the best dietary approach is to address each acne patient individually, carefully considering the possibility of dietary counseling.[35]

Angela Mina-Vargas, Lucia Colodro-Conde Katrina Grasby, Gu Zhu, November 2017. Acne vulgaris is a skin disease with a multifactorial and complex pathology.While several twin studies have estimated that acne has a heritability of up to 80%, the genomic elements responsible for the origin and pathology of acne are still undiscovered. This study extends by a factor of 3 an earlier analysis of the genetic factor of acne. Acne severity rated by nurses on a 4-point scale (1= absent to 4= severe) on up to three body sites (face, back, chest) and on up to three occasions (age 12, 14 and16). The phenotype that we analyzed was the most severe rating at any site or age. The polychoric correlation for monozygotic twins was higher (r_{MZ}= 0.86. 95% CI [0.81, 0.90]) than for dizygotic twins (r_{DZ} =0.42, 95% CI [0.35, 0.47]). And the estimated heritability was 0.85(95% CI [0.82, 0.87]). We then conducted a genome wide analysis including an additional 271 siblings – for a total of 4,762 individuals. A genome-wide association study (GWAS) scan did not detect loci associated with the severity of acne at the threshold of 5E-08but suggestive association was found for three SNPs.[36]

Prakash C, Bhargava P, Tiwari S, Majumdar B, Bhargava RK, 2017. There were more subjects with normal skin pH in the control group compared to the case group ,and the majority of acne occurances in the case group were related to high skin pH (p=0.000).Mean pH among cases was higher than normal reference value(pH 4.5-5.5 for women, 4-5.5 for men) and that of controls p (<0.001).No significant association was observed between sex and skin pH in either cases or controls (p>0.05).

Increased facial skin pH in patients with acne at basal conditions mirrors a chronic state of stratum corneum instability, which could be predisposing individuals to acne occurrence and/or recurrence. It could possibly be a common domain via which the classical pathomechanisms might be acting in acne. Integrating measures that maintain stratum coreneum pH during therapy might prove worthwile.[37]

2.3 Information Related To Various Applications Of Neem

All parts of plants Azdirachtaindica have been widely useful in the life of humankind. The current update of use of this plant is prescribed below.

1) Against microorganisms:

a) Use as antibacterial and antimicrobial agent: Azadirachtaindica A. Juss leaves extracts exhibit power of antibacterial activity. It has shown to possesses significant effects on both gram-positive and gram-negative organisms and other bacteria that causes a wide array of human and animal diseases including E.coli, Streptococcus and Salmonella.[6]
b) Use as antifungal agent: The leaf extracts of Azdirachtaindica has great potential to strongly inhibit the members of the Trichophyton and microsporum species causing superficial infection of the skin. Antifungal study conducted by Margathavali S, Brindha S, Kaviyarasi NS et al. on Azadirachtaindica showed significant on value and confirm the therapeutic potency of such plant used in traditional medicine.[7-11]
c) Antiviral compounds in Azdirachtaindica: Neem inhibits to the growth of dengue virus, a hemorrhage fever related to Ebola and interferes with the reproduction of the B virus, one of a group "enterovirus" that are second only to the common cold as the most infectious viral agents in human beings.
d) Anti-plasmodial: Malaria is a major public health problems in the world in general and developing countries in particular. It is becoming more difficult to manage malaria particularly in areas of multi-drug resistance. Azdirachtaindica leaf and stem bark extracts are able to reduced 68% plasmodia in malaria.
e) Anti-parasitic: Giardia lamblia is both the most common intestinal parasite
f) In the United States and a frequent causes of diarrheal illness throughout the world. In spite of its recognition as an important human pathogen, there have been relatively few agents used in therapy. Azdirachtaindica plant was found to reduce Giardiasis and decrease the anorexia. As reported by Akpek EK, Vittow J et al.[38]
g) Azadirachta in chicken pox: Azadirachtaindica leaves are used to soothe the patients and prevent further spreading of the virus during the course of the infection. The patient is given a bath with water in which Neem leaves are soaked as a post treatment care.[7]

2) Antioxidant and anti-inflammatory:

a) Anti-inflammatory: Nimbidin, a component of Azadirachtaindica, has been shown to possess potent anti-inflammatory and antirthritic activity. Nimbiden suppresses the functions of macrophages and neutrophils involved in inflammation. Nimbidin, a compound isolated from the oil of seeds of Azadirachtaindica, has been screened in comparison with two standard anti-inflammatory agents, phenylbutazone, a non-steriod and prednisolone, a steroid; against various experimental models of inflammation. It was found to significant reduce acute paw oedema in rats induced by phlogistic agents, carageenan and kaolin. The test drug significantly suppressed the formalin-induced arthritis of ankle joint and the fluid exudation in croton oil induced granuloma in rats.[12-13]
b) Antioxidant: The process, through which free radicals are created, is a normal function of the body but the resulting molecules are unstable and can damage other cells.A series of disorders, including cardiovascular disease, eye health, cataracts and macular degeneration, age related neurodegeneration (decline of the brain cells and nervous system) and even cancer occurs due to high levels of free radicals. Azadirachtaindica protects against chemically induced carcinogens and liver damage by boosting antioxidant levels.[12]
c) Neuroprotective: Antioxidant compounds in Azdirachtaindica help to prevent brain damages, who had suffered a stroke by enhancing lipid peroxidation and increasing ascorbic acid (Vitamin C) concentration in the brain.[39]
d) Inhibition of nitricoxide production: Leukocytes play an important role in defense of the mammary gland; similarly they are also involved in the pathophysiologyof many inflammatory diseases by releasing cytotoxic molecules such as reactive nitrogen intermediates and damage surrounding tissues. The extract of A. indica has shown to inhibit the enzyme nitric oxide synthese thereby inhibiting the nitric oxide production by milk leukocytes.[40]

3) Immune stimulatory

Immune stimulating properties of Azdirachtaindica are most important benefit. It boots both the lymphocyticand cell mediatedsystems, including "Killer T" cells which are able to destroy microbes,viruses and cancer cells by injecting toxic chemical into the invaders. Stimulation and sedation both depend on dose. Chewing of 8-10 A. indica leaves early in the morning for twenty four days protect the body from diseases like diabetic and hypertension. The body also becomes immune to skin problems.[41]

4) Effect on ANS:

Nimbidin the major bitter principle from oil of seeds of Azdirachtaindica was investigated for various pharmacological actions in numbers animal models. On central nervous system it exhibited moderate sedative effect but it did not show any significant cardiovascular effects in experimental animals. Nimbidin possessed moderate diuretic activity and was found to be devoid of local anaesthetic and antiandrogenic effects in rodents.[42]

Anti-anxiety: Low doses of Azdirachtaindica leaf extracts have sedative effects. The effect disappears at high doses, approximately 400 or 800 mg per kg of body weight. It also reduces anxiety and stress.[42]

5) Liver protectant

It helps to protect the liver from damage which in turns to help to cleanse the blood .Azdirachtaindica leaf minimize, chemically induced liver damage by stabilizing levels of serum marker enzymes and boosting levels of antioxidants like those found in vitamin C and E and caretenoids , which neutralize free radicals and prevent damage.[43]

Anti- allergic:

a) Azdirachtaindica in urticaria: Urticaria commonly reffered to as hives,is a kind of skin rash notable for pale

red, raised, itchy bumps. A decoration of Azadirachtaindica bark, sandal and guduchi is taken internally.[44]

b) Cures Asthama: Traditionally it is believed that 3 drops of neem oil should be placed at the center throat and swallowed to cure asthama. The dose can be increased by a drop each week upto one teaspoon.[44]

6) Antipyretic properties

Azdirachtaindica juice is widely used as antipyretic agent. It reduce the body temperature and usually acts as antipyretic agent.[45]

7) Potential Contraceptive Properties:

Azadirachtaindica is either a pre or post test coital contraceptive, nothing that it prevented proliferation of sperm cells in concentrations as low as 0.05 to 1% . Purified extracts contain immunomodulators that stimulate the cells and macrophages that terminate pregnancies. Fertility was regained after one two cycles with no apparent impact to future pregnancies. It posses spermicidal activity also.[45-47]

In dysmenorrhea: Azadirachtaindica helps in curing painful menstruation. Juice of Neem leaves and ginger juice mixed well and taken internally cure painful menstruation.[46]

In post-delivery care: Azdirachtaindica is beneficial in post-delivery care as well as in pregnancy. To bring back structure and function of uterus after delivery, one of juice of Azdirachtaindica leaves should be taken for 27 days in the morning on an empty stomach. A. indica have shown they have contraceptive effects; however trials in humans to determine its effectiveness in preventing pregnancy have not yet been conducted.[45]

Wound healing: Wound in skin heals in multiple processes. Azadirachtaindica oil contains active ingredients that directly deal with wound healing process. It has a high content of essential fatty acids. This plays an important in adding moisture role and a soft texture to the skin during the healing process. A. indica plays another important role in wound healing by imhibiting inflammation as effectively as cortisone acetate.[48]

Neem patents: Sixty-five patents for products derived from the Neem tree have been filed with the EPO till 2013 of which 22 have been granted, 28 are “dead” for various reasons, and 15 are currently being examined. These include claims for insecticides, fungicidal effects, methods ofextraction, and storage stable formulations of one of the active ingredients, azadirachtin, contraceptives and medical uses. Although some Indian companies have claimed patients on the Neem, they are outnumbered 2 to 1by multinational corporations, such as the U.S. pharmaceutical company Rohm and Has and the agrochemical giant W.R. Grace. It is important to note that the Neem patents do not involve a genetically engineered product; neither has thetree itself been patened, notany of its parts.[23]

3. Research Methodology

Research approaches

The choice of the research approach constitutes one of the major decisions, which must be made in conducting research study the approach taken on the research project can greatly effects its outcome. In this research quantitative quasi experimental research approach was adopted.

Research Design

A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure. The location where the study would be conducted.

The present study was aimed at assessing the effectiveness of neem paste on face acne. Keeping in view that objective of the study the researches selected pre test post test quasi experimental research design.

After collection of data for face acne among teenagers the invistigator observed the existing condition of face acne and application of neem paste was done in a day and was continued for seven days and effect was observed.

A quasi experimental design - 2 group pre and post test design.

- **Experimental 30-** pre observation→Treatment→Post observation
- **Control 30-** pre observation→ No treatment→ post observation

Variables

Independent variable:

The presumed cause is independent variable. In this study the independent variable is application of neem paste.

Dependent variable:

The presumed effect is dependent variable. In this study the dependent variable is face acne among teenagers.

Setting:

The main study was proposed to be conducted in Sangli, Miraj, Kupwad,Corporation. The study was conducted in the areas of Miraj KhajaBasti, Sangli Laxminagar & kupwad Hamalwadi

Population:

Population is entire collection of people, things from we collect data in the entire group we are interested, in which we wish to describe or draw conclusion about. The population for the present study comprises, teenagers from age 13-19 years. From Sangli, Miraj, Kupwad corporation.

Sample:

Sample is the subset of the unit that compose the population. In the present study, the sample selected for data collection were teenagers having face acne from age 13-19 years those who fulfilled the criteria and who were available during the period of data collection.

Sampling criteria

Inclusion criteria:
1) Teenagers between age group of 13 to 19 years.
2) Teenagers having face acne.

Exclusion criteria:
1) Teenagers having Neem allergy.
2) Teenagers less than or more than age group of 16 to 19.

Sample size:
Sample size consisted of 60 teenagers who fulfilled the inclusion criteria of the study. Out of 60 samples 30 were selected for experimental group and 30 were selected for control group.

Sampling technique:
In this study non probability purposive sampling technique wasused. This was the most suitable technique which can be applied to the study.

Data collection tool:
The most important and crucial aspect of research is data collection , which provide the answer to the question under study. Data collection relies on instrument or tool.

Validity:
20 experts did the content validity of the tool. The experts were selected from various fields based on the topic. 6 from Medical surgical nursing, 3 Gyn, 4 Psy, 3 Paed, 3 CHN, 2 M D Ayurvedic, 1 Skin specialist, 1 statistic. These expertise gave some corrections which were made and the final tool

Ethical consideration:
Permission was obtained from the research committee of BharatiVidyapeeth Deemed University College of Nursing, Pune and authorities of health sector from Sangli- Miraj-Kupwad health department. Informed consent was obtained from subjects who are selected for the study.

Reliability:
- The reliability of measuring instrument is a major criterion for assessing its quality andadequacy.
- The reliability of the tool was done by paired t-test.

Procedure of data collection:
A formal permission was obtained from the Govt. Health Officer Sangli, Miraj, Kupwad, Corporation. The invistigator discussed the study with Dermatologist, Ayurvedic and Lecturer in Medical Surgical Nursing.

A total 60 samples were collected for the study as per the criteria of selection. 30 were selected for experiment and 30 were selected for control group.

Plan for data analysis:
1) Frequency, Percentage, Mean, Standard deviation will be calculated.
2) Informed consent.
3) Non-probability purposive sampling technique will be used to select the sample. Selected samples will be placed in two groups i.e experimental and control group

4. Analysis and Interpretation of Data

The data was analyzed as per the objectives of the Study.
1) To assess the pre-test condition of face acne among teenagers.
2) To assess the post-test condition of face acne among teenagers.
3) To find out the association between face acne and demographic variable.

The analyzed data is presented under the following headings

Section I
a) Frequency distribution based on age.
b) Frequency distribution based on sex.
c) Frequency distribution based on occupation.

Section-II
a) Existing condition of face acne (before application of Neem paste)
b) Comparison of mean score and standard deviation among experimental group and control group

Section-I

Table 1: Frequency Distribution based on age, n = 30

Experimental Group			Control Group		
Age in Yrs	Frequency	Percentage	Age in Yrs	Frequency	Percentage
13-14	10	33.33%	13-14	06	20%
15-16	09	30%	14-15	08	26.66%
17-18	06	20%	17-18	10	33.33%
19	05	16.66%	19	07	23.33%

The data presented in above table shows that Maximum teenagers were from age group 13-14 in experimental group & maximum teenagers were from age group 17-18in control group.

Table 2: Frequency Distribution based on Sex, n =60

Variable	Experimental Group		Control Group		%
Sex	Frequency	Percentage	Sex	Frequency	Percentage
Male	13	43.33%	Male	14	46.66%
Female	17	56.66%	Female	16	53.33%

The data presented in the table shows that all samples taken for the study were male and female. Maximum teenagers were females having acne.

Section II

Table 4: Score of acne of control group Pre test and Post test, n=30

variable	Control Group	
Mean	Pre Test	Post Test
	22.8	22.5
Median	22.5	22.5
S.D	4.7	5.2
Coefficient of variation	20.80%	23.47%
Paired t Test at (n-1) d.f with 5% l.o.s	5.4	

Table 5, Score of acne of experimental group Pre test and Post test, n=30

Variables	Experimental Group	
Mean	Pre Test	Post Test
	22.4	19.0
Median	23	19.5
S.D	4.9	4.8
Coefficient of variation	29.95%	25.27%
Paired t Test at (n-1) d.f with 5% l.o.s	24.1	

The data in the table shows that there was severe grade of acne in pre test of control group and did not reduced in post test in the samples of control group the standard deviation score was 4.7 in pre test, 5.2 in post test. This indicates that the score of acne did not reduced much in pre test 22.8 to post test 22.5

The above data also shows that there was severe grade of acne in pre test of assessment and gradually reduced in post test in samples of experimental group.

The data in the table shows that there was severe score of acne on pre test of assessment 22.4 and gradually reduced in the post test 19 in samples of experimental group and standard deviation in pre test 4.9 and reduced to 4.8 This indicates that the acne score gradually reduced from severe to mild acne and application of Neem paste is highly effective to reduce face acne.

Table 6: Comparison of Mean Score And Standard Deviation Among Experimental Group And Control Group, n=30

	Control Group	Experimental Group	Significance
Mean	22.5	19.0	Highly Significant
Median	22.5	19.5	Highly Significant
S.D	5.2	4.8	Highly Significant
Coefficient of variation	23.47	25.27	Highly Significant

The above table shows that there is statistically highly significance difference in mean and standard deviation of face acne in control and experimental group.

The above figure shows that there is reduction in face acne after the intervention of neem paste. The figure shows there was no reduction in control group and the mean is = 22.5 and in experimental group the face acne was reduced and mean was found tobe = 19.0 till seventh day.

Conclusion

In the present study the findings of the study have been discussed with references to objective and hypothesis.

It was found that in the demographic dates of age teenagers33.33% teenagers belongs to 13-14 years, 30% teenagers belongs to 15-16 years, 20% teenagers belongs to 17-18 years and 16.66% teenagers belongs to19 years.

In control group 20 % of teenagers belong to age group 13-14 years, 26.66% teenagers belongs to14-15 years, 33.33% teenagers belongs to 17-18 years 23.33%belongs to 19 years.

In control group, 53.33% were females and 46.66% were males. In experimental group 56.66%were females and 43.33% were males.

In the present study, assessment was done on face acne and data was collected by standardized tool.

In pretest control group the Mean acne score 22.8 and standard deviation score was 4.7.

In pretest experimental group the Mean acne score was 2.4 and standard deviation score was 4.9.

In post test of control group the Mean score was 22.5 and standard deviation score was 5.2

In post test experimental group the Mean score was 19.0 and standard deviation score was 4.8.

This results shows that there is effect of neem paste application of face acne as Mean in the Experimental group has reduced by 3.36 and standard deviation by 0.76.

5. Discussion, Conclusion and Recommendations

6.1 Objectives of the study

1) To assess the existing condition of face acne among teenagers.
2) To assess the existing condition of face acne among teenagers.
3) To find out the association between face acne and demographic variable.

6.2 Major findings of the study

Section-I

a) Existing condition of face acne

Findings shows that all the samples from experimental group and control group have face acne and are taking medicine for acne.

Section- II

a) Findings from the table, frequency distribution based on age shows that maximum number of teenagers from age group 13-14(33.33%) are in experimental group and in control group maximum number of teenagers are seen in age group from 17-18 (33.33%).
b) Data from table frequency distribution based on sex (43.33%) were males in experimental group and (56.66%) were females. In control group (46.66%) were males and (53.33%) were females.

Section- III

Comparison of mean scores and standard deviation among experimental group and control group for reduction of face acne. The statistical data shows that there is highly significant difference in the mean score and standard deviation of reduction of face acne in experimental and control group.

1) Assessment and observation of face acne is done initially. The knee was checked and assessed and a standard tool was used to assess the existing condition of

face acne and was recorded for 7 consecutive days. The researcher found that teenagers on face acne treatment are still with face acne without any reduction in acne.

2) The intervention is done that is neem paste is applied to face acne once in a day and observation is done according the standard numeric acne scale, and finding were recorded.
3) Post intervention finding for face acne shows that minimum (mean 19.0 and standard deviation 4.8) time is required to reduce face acne in experimental group.

It was not included in the objectives that researcher observed the signs of infections and swelling and it was found that there were no signs of infections in experimental group.

Above all data shows that the face acne is highly effective than leaving it with acne.

Neem paste contains anti-bacterial and anti-inflammatory which helps to reduce acne.

6.3 Discussion of the Study

The findings of present study have been discussed as per the objectives of the study. A findings of study shows that intervention of neem paste application was significantly effective for early recovery of face acne among teenagers with face acne. And when compared it was statistically found that there is highly significant difference among the experimental group and control group.

It was found that in the demographic dates of age of teen agers 33.33 % of teen agers belong to age group of 13-14 years, 30% 15-16, 20% 17-18and 16.66% 19 years in Experimental group.

In control group 20%13-14 years, 26.66% 15-16 years, 33.33% 17-18 years and 23.33% belongs to 19 years.

In present study, assessment was done on face acne and data was collected by standardized tool.

In pre tent control group the Mean acne score was 22.8 and standard deviation score was 4.7

In pre-test Exp group the Mean acne score was22.4 and standard deviation was 4.9.

The Mean of post test control group was 22.4 and standardized deviation was 4.9.

The Mean of post test of experimental group was 19.0 and standardized deviation was 4.8.

This result shows that there is effect of neem paste application on face acne as Mean in the Experimental group has reduced by 3.3 and standard deviation by 0.7.

The 'z' value was computed to find out effectiveness of application of neem paste on face acne in teenagers. The calculated of Z = 2.57 which is more than table value of Z at 5% I.o.s. is 1.96 and the result calculated Z greater than table value. This show there will be effect of neem paste on reduction of face acne.

6.4 Conclusion

Neem paste with its anti-bacterial and anti-inflammatory properties acts as a bacteria killing agent and does nothave any side effects in addition to this Neem paste has very less side effects this can be used as complementary alternative medicine and has better effect than chemical therapy for face acne. Also it is inexpensive and easily available and can be used as a home remedy in teenagers with face acne. The purpose of this study was to assess the effectiveness of Neem paste application on in teen agers in reduction of face acne.

6.5 The major findings of the study

- Majority i.e.33.33 % of them were between the age group of13 –14 years.
- Majority i.e.56.66 % of them were females.
- It was evident that mean $\pm$ SD post test acne score was (19.0 $\pm$4.8) was low than that pre test acne score was (22.4$\pm$ 4.9).

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