

**EFFECTIVENESS OF NEEM FLOWER POWDER FOR  
WORM INFESTATION IN PRE-SCHOOL CHILDREN (3-6  
YRS) IN SELECTED VILLAGES AT CHEYYUR TALUK**

By  
**Ms. K. INDUMATHI**



A Dissertation submitted to  
**THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY,  
CHENNAI.**

**IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE  
DEGREE OF  
MASTER OF SCIENCE IN NURSING.  
MARCH – 2011.**



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## **CERTIFICATE**

This is to certify that **EFFECTIVENESS OF NEEM FLOWER POWDER FOR WORM INFESTATION IN PRE-SCHOOL CHILDREN (3-6 YRS) IN SELECTED VILLAGES AT CHEYYUR TALUK** is a bonafide work done by **MS.K.INDUMATHI, Adhiparasakthi college of Nursing, Melmaruvathur – 603 319,** in partial fulfillment for the university rules and regulations towards the award of the **degree of master of science in nursing, branch - iv, community health nursing, under my guidance and supervision during the academic year 2009 - 2011.**

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**Internal Examiner**

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## ACKNOWLEDGEMENT

I express my deep sense of gratitude to **HIS HOLINESS ARUL THIRU AMMA, Founder- President** for his blessings and guidance, which enabled me to reach up to his step and to complete my study.

I express my heartfelt thanks to **THIRUMATHI.LAKSHMI BANGARU ADIGALAR, Vice President**, Adhiparasakthi Charitable Medical Educational and Cultural Trust, Melmaruvathur for given me the opportunity to pursue my study in this prestigious institution.

I am privileged to express my sincere thanks to our beloved sakthi Thiru **G.B.ANBALAGAN, Managing trustee** Adhiparasakthi Charitable Medical Educational and Culture trust, Melmaruvathur for his steadfast guidance and suggestions offered during the study.

With great respect and honour, I extend my thanks to our beloved **Managing Director** Sakthi Thiru. **Dr.T.RAMESH M.D.**, Melmaruvathur Adhiparasakthi Institute of Medical Sciences and Research for his excellence in providing skillful and compassionate spirit of unstinted support throughout the study.

I feel pleasure to extend my gratitude and sincere thanks to **Dr. N. KOKILAVANI, M.Sc.,(N), M.A., (Pub. Adm.), M.Phil., Ph.D., Principal**, Adhiparasakthi College of Nursing, Melmaruvathur for her patience and her excellent guidance, without whom this study would not have moulded in this shape. Her rich professional experience and efficient guidance and helped me to step cautiously in the right direction.

I wish to express my heartfelt gratitude and sincere thanks to **Prof. B.VARALAKSHMI, M.Sc.,(N), M.Phil., Vice Principal**, Adhiparasakthi College of Nursing, Melmaruvathur for her guidance and suggestions to complete the study.

I wish to extent my heartfelt thanks to **Prof. LAKSHMI M.Sc (N),, Principal Chettinad college of Nursing, Kelambakkam, Chennai** for content validity and valuable suggestions.

I feel pleasure to extend my gratitude and sincere thanks to **Mr. ASHOK, B. M.Sc., M.Phil.**, in Bio-Statistics Adhiparasakthi College of Nursing, Melmaruvathur for his constant support, patience, encouragement and guidance and support in statistical analysis for this study.

I wish to express my sincere thanks to **Mrs. A.N KALPANA M.Sc (N)**. Lecturer, Department of Community health nursing, Adhiparasakthi College of Nursing, Melmaruvathur for her suggestions and guidance throughout this study.

I feel pleasure to extend my gratitude and sincere thanks to **Mr. SURIYA NARAYANAN, A. M.A., M. Phil.**, Lecturer in English, Adhiparasakthi College of Nursing, Melmaruvathur for his constant support, patience, encouragement and guidance, which led to the completion of the study.

I wish to express my thanks to all the teaching staff members of Adhiparasakthi College of Nursing, Melmaruvathur, who encouraged me and provided support throughout my study.

I also sincerely convey my thanks to all the Non teaching staff of Adhiparasakthi College of Nursing, Melmaruvathur.

I would like to express my immense thanks to **THE TAMILNADU DR. M.G.R. MEDICAL UNIVERSITY** Library helped me to refer books and journals for my dissertation.

I whole heartedly thank my wonderful parents who supported and showered all their blessings in completing the dissertation.

I express my deep sense of gratitude to my friends for their constant support, prayers and encouragement.

I am especially grateful thanks to Pre-school children who participated in the study and their mothers for their sincere co operation and interest which showered upon the successful completion of the study.

Finally, I thank all who provided their contributions to this work.

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# CHAPTER I

## INTRODUCTION

Children are particularly vulnerable to infection because of low immune power. Infections due to intestinal parasite are common posing serious public health problems in developing countries due to bad hygienic practices, low socio-economic status, poor sanitation and unsafe drinking water supplies. Health is an important aspect of life. Children are the one who are more prone to infection. Health in its concept signifies physical, mental, social and spiritual well being children are regarded as the future hope of nation and to nurture and strive for their well being of the massive load of 750 million people in India. 40% are children under the age of 15 years i.e. 300 million, equal to the total population of North America, Of these, 17% are under the age of 5 years. In contrast, children are from only 10-15% of the population in the developed countries.

The family is the central focus in the life of the preschooler. The preschool in turn, exerts considerable influence on all other family members. The preschooler period is from 3 years to 6 years. The combined biologic, psychosocial, cognitive, spiritual and social achievements during this

preschool period, prepare preschooler for their most significant change in lifestyle entrance into school.

The preschool age where there are more incidence for communicable disease, intestinal parasitic disease and ingestion of injurious agents and thus the preschooler are vulnerable and are developing the complications. Because of this, common health problem such as impaired nitrogen balance, malabsorption and that leads to malnutrition lie vitamin A deficiency, anaemia, growth retardation and cognitive impairment.

Worm infestation is an infection of the intestinal tract caused by the various types of worms. Round worm infestation is the common one, on ingestion by man the embryonated egg hatch in the small intestine, this resulting larva penetrate the gut wall and are carried to the liver and then into the lungs via the blood stream. It is estimated 1.3 million people are infected worldwide and the prevalence of the infestation is about 250 million through the feco-oral route by ingestion of infective eggs with food or drink. Foods that are eaten raw are salads and vegetables readily convey the infection. Effective drugs are available for the treatment of the human reservoir, periodic deworming at intervals of 2 to 3 months may be undertaken.

According to the recent report by the Washington based International Food Policy Research Institute by 2010, neem leaves and root are good for the blood circulation and blood purification. Neem has been the extensively ayurveda, unani and homeopathic medicine. Neem elaborates a vast array of biological active components that are chemically diverse and structurally complex. More than 140 components have been isolated from different parts of neem. All the part of the trees, leaves, flower, seed, fruits and roots and bark have been used traditionally for the treatment of inflammatory infection, fever and dental caries.

### **NEED FOR THE STUDY**

The school age children are more vulnerable to get many health problems in home and outside home. They are around more than before, but they donot have the judgement or control to guide them, and are more independent in their work. To create awareness and reduce the prevalence, it is vital to make the periodic deworming for the school children. The magnitude of parasitic infestation among children is such as to continue major public health problems in many part of the world it has been estimated that 617 of the total incidence of helminthiasis is perhaps due to ineffective disposal of human excreta even in well developed countries like the USA and Canada, Nigeria the

one-third of the population harbours some parasites or the other.

The problem of helminthic infestation in children is wide spread in all tropical countries due to prevalent methods of defecation and disposal of excreta, which invariably contaminate the soil. In India, the infestation is particularly heavy in areas with warm damp climates with heavy rainfall as in the west coast helminthic infestation is generally confined to the rural areas in the cities where open fields are present and are used for defecation. Necessarily, it can only occur in children of above 2 years who walk barefoot in the field where the worms are sometimes a problem even in children between 1-2 years of age. Intestinal infestation throws an additional burden on the rapidly growing child whose state of health is already compromised by illnesses and malnutrition.

Ascariasis is one of the most common human parasitic infections. An estimated 1.4 billion people worldwide have ascariasis and the disease is most common in children between the age of 3 and 8. According to WHO, ascariasis causes approximately 60,000 deaths annually worldwide (2009).

Hookworm is estimated that between 576-740 million individuals are infected with hookworm today, about 80 million

were severely affected which is found in sub-saharan Africa and East Asia.

In India, roundworm is most common. Heavily infected areas are Assam, West Bengal, Bihar, Orissa, Andhra Pradesh, Tamilnadu, Kerala , Maharashtra. 60-80% population of certain areas of West Bengal, Uttar Pradesh, Bihar, Orissa, Piunjab, Tamilnadu and Andhra pradesh affected.

Pinworms are particularly common in children, with prevalence rates in this age group having been reported as high as 61% in India, 50% in England, 39% in Thailand, 37% in Sweden and 59% in Denmark.

Trichuris trichiura is estimated that 100-800million people are infected worldwide with 3.2billion individual at risk.

## **STATEMENT OF THE PROBLEM**

**Effectiveness of Neem Flower Powder on Worm Infestation among Pre-School Children (3-6 Years) In Selected Villages in Cheyyur Taluk at Kancheepuram district.**

## **OBJECTIVES**

1. To assess the prevalence of worm infestation among pre-school children.

2. To compare the degree of worm infestation among pre-school children before and after administration of neem flower powder.
3. To associate between the demographic variables and the degree of worm infestation among pre-school children before and after administration of neem flower powder.
4. To associate between the selected standard of living and the degree of worm infestation among pre-school children before and after administration of neem flower powder.

## **OPERATIONAL DEFINITIONS**

### **Worm infestation**

It refers to state in which stool is positive ova/cysts confined with the help of microscope and measured using observational checklist for degree of worm infestation

### **Neem flower powder**

It is a form of powder made from neem flower.

### **Pre-school children**

Children between the age group of 3-6 years.

### **Effectiveness**

It is an expected outcome of neem flower powder for worm infestation in pre-school children measured by observational checklist for degree of worm infestation is considered effectiveness in this study.

## **ASSUMPTIONS**

- Periodic deworming can help to prevent many health problem, growth failure, anaemia, vitamin deficiencies and pica.
- Neem flower is effective to treat the worm infestation.

## **HYPOTHESES**

1.  $H_0$  – There will be no significant difference between degree of worm infestation before and after administration of neem flower powder.
2.  $H_1$  – There will be significant difference between degree of worm infestation before and after administration of neem flower powder.

## **DELIMITATIONS**

- Pre-school children who belong to the age group of 3-6 yrs.
- The pre-school children who are willing to participate in the study.
- Pre-school children who can speak Tamil / English.

## **PROECTED OUTCOME**

The study will give a clear understanding of pre-school children with worm infestation. The outcome of the study will help the nursing personnel to implement the herbal medicine to the pre-school children and also create awareness among mothers regarding the

medicine. Hence, the quality of life of pre-school children can be improved.

## **CONCEPTUAL FRAMEWORK**

Polit and Beck (2004) defined the conceptual framework is a particular study abstract, logical structure to link the findings to nursing body of knowledge. It is developed from existing theory and helped in identifying and defining concepts of interests and proposing relationship among them the mode gives direction for planning research design, data collection and interpretation of findings.

The present study to assess the effectiveness of neem flower in deworming among pre-school children at selected school in Madurantakam and the framework for this study is based on Kristen M. Swanson (1991) theory of caring.

### **Maintaining belief**

Sustain in others capacity get through an event or transition and face future with meaning, believing others capacity maintain a hopeful attitude, offering a realistic optimism, helping to meaning and standing by the one care for no matter what the situation.

Swanson (1991) in this study maintaining belief is finding the capacity, attitude of their living and degree of worm infestation.

### **Knowing**

Knowing is striving to understanding the meaning of an event in life (identify the need). In this study knowing is the result of stool examination is pretest.

### **Being with and doing for**

Being with, means being emotionally present to others. It includes a person conveying availability and sharing feeling with burden (plan for care).

In this study, with empathy, the investigator planned care for the infestation among pre-school children.

‘Doing for’ means to do for others what would be for self if at all possible, including anticipating needs (implementing the plan). Swanson (1991) the present study ‘doing for’ was introducing neem flower for worm infestation.

### **Enabling**

Enabling facilitating the others passage through the life transitions and unfamiliar events for focusing on the events, informing, explaining and supporting, validating feeling (validating the need for help was fulfilled).

Swanson (1991) the participants of the study were tested again for the stool ova cyst to validate the effectiveness of neem flower on worm infestation.

## **CHAPTER II**

### **REVIEW OF LITERATURE**

Review of literature helps the research to build an existing work he/she should understand what is already known as topic.

**-Polit and Beck 2008**

Review of literature helps to plan and conduct the study in a systematic manner. Review of literature is the task of reviewing literature while involves the identification, selection critical analysis and reporting of existing information on the topic of interest. It provides the bases to locate the data, new ideas that need to be included in the present study. It helps the researcher to find the accurate data could be used for supporting the present finding and drawing conclusion.

Research literature were received and organized under the following headings

- 1 Studies related to prevalence of worm infestation.
2. Studies related to risk factors of worm infestation.
3. Studies related to effects of worm infestation on health.
4. Studies related to medicinal effect of neem.

### **SECTION I**

#### **STUDIES RELATED TO PREVALENCE OF WORM INFESTATION**

**Rayan, et al., (2010)** conducted a study on geographical location and age affects the incidence of parasitic infestation among primary school children in rural and urban communities around Chennai, Tamilnadu. The fecal sample was 195 school children ranging from 5-11 years. Study shows that the prevalence of different pathogenic species of amoeba such as *Entamoeba histolytica* (4.2 Vs 0%) and *G. lamblia* (17.9 Vs 14%) was significantly higher among the rural children compared to children to urban area. In contrast the prevalence of nematodes such as *A. lumbricoides* (21 Vs 1.1%) *T. trichiura* (8 Vs 0%) and *A. duodenale* (1%) was significantly higher among rural children.

**Knopp, et al., (2009)** conducted a study among school children in Unguja Island, Zanzibar. Three serial stool samples from each of 342 school children were examined using the kato-katz (k-k) koga agar plate (KAP) and Baermann (BM) techniques it was estimated that the prevalence for *T.trichiura* hookworm, *A.lumbricoides* and *S. stercoralis* were 47.9%, 22.5%, 16.5% and 10.8% after examining three stool samples.

**Akbar and Ahmed (2009)** conducted cross sectional study among children between the ages 5-12 years, a total of 283 subjects were tested and screened for different intestinal parasites at department of physiology, Ayub medical college, Abbtabad, it revealed that the frequency of helminthic infestation was found to be

above 81%. There were 8 different species of helminthes and protozoa found in the specimens. By far the highest frequency of 48% was noted for *Ascaris lumbricoides* while 6.9% (16 cases) of the specimens examined had mixed infestation.

**Wagbatsoma V.A.C., (2009)** investigated among all patients 0-15 years totaling 1030 who visited the communicable disease clinic of the University of Benin teaching Hospital, Benin City. It was found that intestinal helminth ova prevalence includes *A. lumbricoides* 23 (11.1%), hookworm 12 (5.8%), *T. trichiuria*, eight (3.8%), *Schistosoma mansoni*, two (1.0%), *Strongyloides stercoralis*, one (0.5%) multiple infection were recorded in 11 (5.3) patients.

**Faulkner C.T., et al., (2009)** conducted study in a community in the state of Tamaulipas, Mexico, fecal samples from 438 children were collected through that parasitic infections occurred in 131 of 438 children (30%). *Giardia lamblia* accounted for 12.5% of all infections, other were *Ascaris lumbricoides*, *Trichiuris trichiura* and *Enterobius vermicularis*.

**Shallyarvathi and Vinod kumar pande. (2009)** conducted a survey on prevalence of malnutrition and intestinal parasite in preschool slum children in Lucknow. The main prevalence of intestinal parasite was 17.5% among these 68% were affected by *Ascaris lumbricoides* and reported that helminthic infestation is one of

the multiple etiologies of malnutrition. The children with parasitic infection had lower haemoglobin than non-infected ones.

**Maria Carol Fernandez et al., (2008)** compared that an intestinal parasites among children living in rural and urban setting in and around Chennai. Out of 324 stool sample, 125 were obtained from rural and 199 from urban setting respectively. The positive rate in rural setting was found to be 9% with *Ascaris lumbricoides*. The percentage of prevalence of intestinal parasite in age group of three to fourteen years in the rural setting ranged from 89.3% to 92.2% and in the urban setting ranged from 32% to 38% respectively.

**Ulukanligil M. (2008)** conducted the study among school in Sanliurfa of south Eastern Turkey, three primary school were randomly selected a total of 1820 school children between seven to fourteen years were took part, it was estimated that the prevalence of helminthic infection was 77.1%. *Ascaris lumbricoides* was the most prevalent species and followed by *trichuris trichiura*.

**Quilong et al., (2008)** conducted national wide survey in China by stool examination by using the kata-katz thick smear method and larval culture technique. Overall prevalence of 47%, 18.8% and 17.2% were obtained for *Ascaris lumbricoides*, *trichuris trichiura* and hookworm infection respectively. Higher prevalence of ascaris and trichuriasis were found in the age group five to nine years.

**Hopkins D.R. et al., (2008)** reported that the status of the global dracunculiasis eradication program by the end of 2007, dracunculiasis (guinea worm disease) transmission had been eliminated from 15 of the 20 countries where the disease was endemic in 1986, only 9,585 cases were reported worldwide and 2016 villages still add endogenous cases of disease.

## **SECTION II**

### **STUDIES RELATED TO RISK FACTORS OF WORM INFESTATION.**

**Chen J. et al., (2010)** investigated that human angiostrongyliasis caused by *angiostrongylus cantonensis*, a rat lungworm has been reported globally. Human infections are acquired by ingestion of raw or undercooked snails or slugs. Parasitic hosts such as prawns or contaminated vegetables that contain the infective larvae of the worm. So far, 2827 cases have been documented with worms.

**Ensink J.H., et al., (2010)** conducted study among farming families in Hyderabad, India found that an increased risk of hookworm (odds ratio or 3.5, 95% confidence interval (CI) =2.2-5.5), *Ascaris lumbricoides* (OR = 5.3, 95% CI=1.8-18) infection when untreated water (150 intestinal nematode ova/litre) was used for crop production. Use of partially treated waste water (28 intestinal nematode ova/litre) was only associated with an increased.

**Adams. V.J., (2009)** conducted survey among school going children around Cape Town, it was found that overall soil transmitted infestation rate was 55.8%. this prevalence trends in this old community would be indicated by swallowing eggs or cysts on food or in a water, more than by exposure to polluted soil, sewage sludge and effluent might be sources of infection.

**Charlen Smith (2009)** evaluated that some schools were either no toilet or they were permanently blocked or sewage spill on the floors. Sanitation in many areas was either inadequate or lacking, which means that millions of worm's eggs had passed faeces to pollute the environment to the extent that they reach the food of the people eats and the water they drink. Children who play in the grounds were particularly exposed to infestation.

**Anantha Krishnan. (2009)** stated that an intestinal geohelminthiasis in the developing world. It was noted that the parasitic infestation were acquired by ingestion, inhalation or penetration of the skin by the infective worms. Ascaris played an important role in precipitating protein-energy malnutrition in undernourished children. Hookworm infestation cause anaemia and hypoproteinaemia.

**Ganga and Ravichandran. (2008)** evaluated that the pattern of intestinal infestation in children from middle income families in around Kumbakonam, Tamilnadu. Stool sample were collected from 3 years children. The result revealed that 251 (73.4%) stool sample had parasites their result suggested that intestinal parasites were prevalent in children from urban area and among better socio-economic strata also. They reported that contrary to the common belief that only children from poor income family with parasites.

### **SECTION III**

#### **STUDIES RELATED TO EFFECTS OF WORM INFESTATION ON HEALTH**

**Rohar J. et al., (2010)** reported that use of sewage or waste water in agriculture is becoming increasingly common as a result of a global water scarcity. Intestinal nematode infections have been identified as the main health risk associated with this practice of waste water.

**Heinrich J.S. et al., (2010)** performed two surveys in Eastern German school children with a total of 4169 children participated who were on average 9.2 years old. Overall 17% reported a pin worm infestation and 18% had a history of eczema. Eczema occurred significantly less frequent in children more by pin worm infestation than the nematode.

**Roa et. al., (2009)** conducted a study on worm infestation and anaemia among tribal pre-school children in Madhya Pradesh. Overall prevalence rate in Madhya Pradesh were observed among 985 tribal pre-school children, they revealed that worm infestation particularly hookworms were cause or aggravate anaemia. Low socio-economic status, poverty, ignorance and bad hygienic practices in addition to inadequate nutrient intake were some of the factors which might be causing high prevalence of anaemia among pre-school children.

**United Nations International Children's Emergency Fund (2009)** reported that the 60% of the school age population were infected by worms came at a risk of anaemia as well as affecting the child's ability to concentrate on his or her studies which in turn had a negative impact on children's development.

**Sonia Puri., (2009)** conducted cross-sectional study among 26 slums. With 1.52-2 lakh population living in that slum area of modern city, 313 under 6 children were selected by systematic sampling technique. It was estimated that the overall prevalence of protein-energy malnutrition was observed as 62.62% which was higher among boys (65.87%) as compared to girls (58.90%) prevalence of worm infestation on the basis of history was recorded as 35.67%, over half (58.4%) of the children were anaemic.

**Shally Awarthy. (2008)** reported that the intestinal helminthes were known to cause malnutrition due to impaired absorption of nutrients from the alimentary tract and a significant improvement in weight had been documented in children who were dewormed every six months of one year.

**Sahil Kumar Mandal. (2008)** measured the plasma retinal level in 100 children with suspected intestinal parasites in West Bengal, India. Retinal level was inversely related to helminthic infestation. The infected 42 children had a mean retinal level of 51 units/dl where as the 58 non-infested children had a corresponding level of 75 units/dl.

### **SECTION III**

#### **STUDIES RELATED TO MEDICINAL EFFECT OF NEEM**

**Chanrawathani P. (2010)** conducted a study to evaluate the anthelmintic effect on neem flower to worm control for children. They were randomly selected both control (6) and experimental group (6) results shows that the number of parasites was significantly higher in the control group compared to the treated group.

**Bhowmik. (2010)** conducted a study related to medicinal effects of neem flower are used in vitiated condition of pitta (balancing of the body heat) and kapha (cough formation). They are astringents, anthelmintic and non-toxic.

**Malarial Journal (2008)** revealed in a study that larvicidal activity of neem oil (*Azadirachta indica*) formulation against mosquitoes. The neem oil formulation was found effective in controlling mosquito larvae in different breeding sites under natural field conditions. As neem trees are widely distributed in India, their formulation may prove to be an effective and eco-friendly larvicide, which could be used as an additional tool for malaria control.

**Mukherjee A.K. and Doley R. (2008)** conducted a study on the isolation of a snake venom phospholipase A (2) inhibitor (A1P1A1) from leaves of *Azadirachta indica*. A compound purified from the methanolic leaf extract of neem inhibits the cobra and Russell's viper venoms (RVVs) phospholipase A(2) enzymes in a dose dependent manner. Inhibitor of catalytic and tested pharmacological properties of cobra venom.

**Journal of Clinical Biochemistry (2008)** antiproliferative effect on human cancer cell lines after treatment with nimbolide extracted from an edible part of the neem tree. Nimbolide, a triterpenoid extracted from the flower of the neem tree, was found to have antiproliferative activity against some cancer cell lines. Treatment of cell with 0.5-5.0 (mg/ml) concentrations of nimbolide resulted in moderate to very strong growth inhibition in U937, HL-60 and B16 cell lines.

**Subapriya. R (2007)** conducted a study on medicinal properties of neem leaves in Tamilnadu. Neem elaborates a vast array of biologically active compounds that are chemically diverse and structurally complex. All parts of the neem tree – leaves, flowers, seeds, fruits, roots and bark have been used traditionally for the treatment of inflammation. The medicinal utilities have been described especially for neem leaf immunomodulator, anthelmintic, anti-inflammatory, antiulcer, antimalarial, antifungal, antibacterial, antiviral, anticarcinogenic properties.

**Food borne pathogens and disease (2007)** conducted a study on antibacterial activity of neem (*Azadirachta indica*) extracts against 21 strains of food borne pathogens were determined *Listeria monocytogenes*, *Staphylococcus aureus*, *Escherichia coli*.

**Jagannath JH and Radhika. (2007)** conducted a study on antimicrobial emulsion (coating) based on biopolymer containing neem and turmeric extract for wound covering can play important role in preventing infection. Therefore, a bioadhesive polymer was synthesized by semi-interpenetrating network process using blend of shellac, casein and polyvinyl alcohol and malefic anhydride (MA) as reactive compatibiliser. The synthesized polymer was mixed with neem and turmeric extract and homogenized using an emulsifier.

**Siddique B.S. et.al., (2007)** published an article which describes the analysis of an in-hexane soluble fraction of fresh flower of *Azadirachta indica*, processing larvicidal against *Anopheles strephensi liston*, a vector of malarial parasite. Forty-one compounds were identified in non-polar to less-polar fraction as well as in essential oil. These identifications were basically made through GC-EIMS. Thus 5 sesquiterpenes, 3 aromatics, 17 fatty acids, 5 fatty acid esters, 3 steroids and 8 hydrocarbons were identified.

**Journal of Pharmacological and Biochemical (2007)** conducted a study on the use of neem for controlling gastric hyperacidity and ulcer. Neem is known to have potent gastroprotective and antiulcer effects. This deals the antiulcer activities of neem extracts and their mechanism of action, including the inhibition of acid secretion.

**American Journal of Therapeutics (2007)** reported in a study about *vivo* antiviral activity of neem bark extract against herpes simplex virus type-I infection. An aqueous extract preparation from the barks of neem plant acts as a potent entry inhibitor against HSV-1 infection into natural target cells. The neem bark extract significantly blocked HSV-1 entry into cells at concentrations ranging from 50-100g/ml. Cells treated with neem bark extract also inhibited HSV-1 glucoprotein-mediated cell – cell fusion and polykaryocytes formation.

suggesting an additional role of neem bark extract at the viral fusion step.

**Bose A, Sarkar.K. (2007)** conducted a study about neem leaf glycoprotein directs T-beta associated type-1 immune commitment. Neem leaf glycoprotein mediated immune activation and associated immune polarization was studied. NLGP activated T-cells secrete greater amount of signature T-helper (th1) cytokines interferon-gamma and a lower amount of the Th-2 cytokine interleukin (IL)-4. Similar type 1 directiveness is also observed in antigen-presenting monocytes and dendritic cells by upregulation of IL-21, tumour necrosis factor-alpha and down regulation of IL.

## **CHAPTER III**

### **METHODOLOGY**

The methodology of the research study is defined as the way the data are gathered in order to answer the question to analyze the research problem. It enables the researcher to project a blue print of the research undertaken. The research methodology involves a systemic procedure by which the researcher had a start from the initial identification of the problem to its final confusion.

The present study was conducted to assess effectiveness of neem flower powder for worm infestation in pre-school children (3-6 yrs). The chapter deals with a brief description of different steps undertaken by the researcher for the study.

It deals with research approach, research design, setting of the study, population, sampling technique, and sample size, criteria for sample selection, development and description of the tool, content validity, pilot study report, reliability, data collection procedure and statistical analysis.

#### **RESEARCH APPROACH**

A quantitative approach was used to assess the effectiveness of neem flower powder for worm infestation in pre-school children (3-6 yrs) in selected rural area.

## RESEARCH DESIGN

Research design incorporates the most important methodological design that a researcher works in conducting a research.

A pre-experimental type one group pre-test and post-test for the pre-school children and the investigator manipulated the independent variables i.e. neem flower powder on worm infestation which was administered to the same group of children. Then, the post test was conducted ten days later. Finally the effectiveness of neem flower powder on dependent variables i.e. worm infestation of pre-school children was computed by the post-test.

Research design represented follows diagrammatically:

R    O<sub>1</sub>    ×    O<sub>2</sub>

R- Randomization

O<sub>1</sub>- Pre-test for the assessment of pre-school children

x- Administration of neem flower powder on worm infestation among pre-school children

O<sub>2</sub>- Post-test for the assessment of effectiveness of neem flower powder for worm infestation in pre-school children (3-6 yrs).

## **SETTING**

The research study was conducted in selected villages (Parukkal, Pudhur, and Perungaranai) at Cheyyur taluk, Kancheepuram district.

## **POPULATION**

The target population of the present study was on pre-school children (3-6 yrs) who were residing in Cheyyur taluk at Kancheepuram district.

## **SAMPLE SIZE**

The sample size of the present study was thirty pre-school children.

## **SAMPLING TECHNIQUE**

The participant of the present study was selected by stratified random sampling technique. It is a probability sampling technique in which the researcher selected participant based on the age group of children who were willing to participate in this study.

## **CRITERIA FOR SAMPLE SELECTION**

### **INCLUSION CRITERIA**

The study includes pre-school children 3-6 yrs who

- were with worm infestation
- were willing to participate in the study

- can speak tamil

## **EXCLUSION CRITERIA**

The study excludes

- the children above the age of 6 yrs
- who had negative stool ova cyst
- those were not willing to participate in the study

## **INSTRUMENT AND TOOLS FOR DATA COLLECTION**

The instruments were classified into three parts.

### **Part-I**

Demographic variable

### **Part-II**

Questionnaire on standard of living of pre-school children

### **Part-III**

Observational check-list for signs and symptoms of worm infestation.

## **CHAPTER IV**

### **DATA ANALYSIS AND INTERPRETATION**

This chapter deals with description of the tools, report of the pilot study, reliability and validity of the tool, data collection procedure, scoring interpretation and statistical methods.

#### **DESCRIPTION OF THE TOOLS**

##### **Part I**

Demographic variables includes age, gender, educational qualification of mother, family monthly income, weight of the child, immunization status and dietary pattern of child.

##### **Part II**

It consists of questionnaire on standard of living of pre-school children includes type of floor, type of water supply, type of drainage, type of toilet, disposing of kitchen waste, methods of disposal of wastes/feaces, frequency of giving bath to the child, frequency of changing clothes for the child per day, frequency of cutting nails, use of slippers for the child, general cleanliness around the house, play activities and personal habits of the child.

##### **Part III**

It consists of observational check-list for signs and symptoms of worm infestation to assess the health status of the pre-school children who were in village. It includes white patches on the body,

anal scratching, crawling sensation in the anus, abdominal pain, abdominal distension, nausea, vomiting, fatigue, constipation, insomnia, loss of appetite, capricious appetite, pica, malaise/weakness, restlessness, tenesmus (feeling of incomplete defecation), shortness of breath, fever, cough, rashes, growth retardation, irritability, weight loss, pallor, enuresis, dysuria, edematous rectum, nutritional deficiency, intense pruritus, loss of concentration.

## **REPORT OF THE PILOT STUDY**

Prior permission from the higher authority was obtained and individual consent taken from five samples selected for the study. The pilot study was conducted in Parukkal in Kancheepuram district for the period of two weeks. The modified tools were used to find out the reliability, validity, feasibility and practicability of the tool and were evaluated by experts of the research committee. Content validity was obtained from community health nursing experts.

According to simple random sampling technique, five samples were taken and by using the observational checklist the health condition of the pre-school children with worm infestation was assessed and then neem therapy was given and evaluated and the data was analyzed.

## **VALIDITY**

The tool were prepared by the investigator which was assessed, evaluated and accepted by the experts of research committee, content validity was obtained from the community health nursing experts.

## **RELIABILITY**

The reliability was checked by interrater method. The reliability was 0.85 (85%). Reliability and practicability of tool was tested through the pilot study and used for main study.

## **INFORMED CONSENT**

Investigator had obtained approval from the dissertation committee and from the president of villages at Cheyyur taluk. Written consent was taken from the study participant mothers to conduct the study. The data collection was done for six weeks by using interview and observational methods.

## **DATA COLLECTION PROCEDURE**

Formal permission was obtained from the community nursing experts. The data collection was done for a period of one month and the pre-school children were selected on the basis of selection criteria.

The researcher introduced herself and maintained good rapport and made the pre-school children and their mothers to co-operate and accepted as study participants. Pre-school children were assessed by using observational check-list to find out any signs and symptoms of worm infestation. If any, by getting oral consent, stool examination was done to check ova cyst positive cases.

The ova cyst positive cases were selected as study participants and written consent was taken from them. Neem therapy was given for five consecutive days. Post-test observational checklist and stool examination was done to evaluate the neem flower therapy on worm infestation after a week.

### **SCORE INTERPRETATION**

The observational check-list consists of thirty signs and symptoms of worm infestation regarding the health condition of pre-school children with worm infestation. Each symptom carries maximum score of 2. The minimum score is 1.

The obtained data sources were interpreted by the following procedure.

$$\text{Score interpretation} = \frac{\text{Obtained score}}{\text{Total Score}} \times 100$$

<b>CONDITION</b>	<b>PERCENTAGE</b>
Mild	<50%
Moderate	51-75%
Severe	>75%

## **STATISTICAL METHOD**

The descriptive statistical analysis method was used to find out the mean score, standard deviation score and percentage of score. The correlation tests were adapted and interpreted with each score and health progress result shows that pre-school children health condition was improved.

## **DATA ANALYSIS AND INTERPRETATION**

Statistical analysis is a method of rendering quantitative information in meaningful and intelligible manner. The statistical procedure enables the researcher to analyse, organize, evaluate, interpret and communicate numerical information meaningfully.

The data collected from 30 samples of pre-school children with worm infestation and the findings of the study were grouped, analysed and interpreted under the following session.

The statistical methods used for analysis were number, percentage, mean, standard deviation and correlation.

<b>S. No</b>	<b>DATA ANALYSIS</b>	<b>METHODS</b>	<b>REMARKS</b>
1.	Descriptive statistical analysis.	Number, Percentage, Mean and Standard deviation	To describe the demographic variables of pre-school children with worm infestation.
2.	Inferential statistical analysis.	Paired 't' test  Correlation Co-efficient	Analyzing the effectiveness of neem flower therapy of pre-school children with worm infestation.  Analyzing the correlation between the degree of worm infestation and selected demographic characteristics of pre-school children with worm infestation.  Analyzing the correlation between the degree of worm infestation and selected standard of living and the degree of worm infestation among pre-school children.

The data were interpreted under following headings

### **SECTION - A**

Frequency and percentage Distribution of demographic variables of pre-school children with worm infestation.

### **SECTION – B**

Frequency and percentage Distribution of standard of living of pre-school children with worm infestation.

### **SECTION – C**

Comparison of degree of worm infestation among pre-school children before and after administration of neem flower powder

### **SECTION – D**

Comparison of mean and standard deviation of degree of worm infestation among pre-school children before and after administration of neem flower powder

### **SECTION – E**

Improvement score of degree of worm infestation among pre-school children before and after administration of neem flower powder

### **SECTION – F**

Association between the selected demographic variable and standard of living with worm infestation among pre-school children before administration of neem flower powder.

## SECTION A

**TABLE 4.1: FREQUENCY AND PERCENTAGE DISTRIBUTION OF DEMOGRAPHIC VARIABLES OF PRE-SCHOOL CHILDREN WITH WORM INFESTATION**

**N=30**

<b>S.No</b>	<b>Demographic variables</b>	<b>Frequency</b>	<b>Percentage</b>
1	Age in years		
	a) 3-4	14	46.67
	b) 5-6	16	53.33
2	Gender		
	a) Male	16	53.33
	b) Female	14	46.67
3	Educational qualification of mother		
	a) Illiterate	8	26.67
	b) Primary education	13	43.33
	c) High school education	9	30.00
	d) Higher secondary education	0	0.00
4	Family monthly income in rupees		
	a) Up to 1000	14	46.67
	b) 1001 – 3000	16	53.33
	c) 3001 -5000	0	0.00
	d) Above 5000		

<b>S.No</b>	<b>Demographic variables</b>	<b>Frequency</b>	<b>Percentage</b>
5	Weight of the child		
	a) 5-10 kg	8	26.67
	b) 11-15 kg	16	53.33
	c) 16-20 kg	6	20.00
	d) Above 20 kg	0	0.00
6	Immunization status		
	a) Regularly immunized	21	70.00
	b) Irregularly immunized	9	30.00
	c) Not at all immunized	0	0.00
7	Dietary pattern		
	a) Vegetarian	5	16.00
	b) Non-vegetarian	25	83.33

Table 4.1 implies the distribution of respondents according to the demographic data age, gender, educational qualification of mother, family monthly income, weight of the child, immunization status and dietary pattern.

Out of 30, 14 (46.67%) pre-school children were in the age group of 3-4 years, 16 (53.33%) pre-school children were in the age group of 5-6 years.

Regarding gender of the pre-school children, 16 (33.33%) were male children and 14 (46.67%) were female children.

In relation to educational qualification of mother 8 (26.67%) were illiterate, 13 (43.33%) were qualified primary education, 9(30%) were qualified up to high school education.

Regarding family monthly income in rupees, 14(46.67%) families got between 1001-3000, 16(53.33%) families were between 3001-5000.

Regarding weight of the child, 8(26.67%) were under 5-10 kg, 16(53.33%) were under 11-15kg, 6(20%) were under 16-20kg.

In terms of immunization status of pre-school children, 21(70%) were regularly immunized and 9(30%) were irregularly immunized.

With regards to dietary pattern, 5(16.67%) were vegetarian and 25(83.33%) were non-vegetarian.

## SECTION – B

**TABLE 4.2: FREQUENCY AND PERCENTAGE DISTRIBUTION OF STANDARD OF LIVING OF PRE-SCHOOL CHILDREN WITH WORM INFESTATION**

**N=30**

<b>S.No</b>	<b>Demographic variables</b>	<b>Frequency</b>	<b>Percentage</b>
1	Type of floor		
	a) Pucca	9	30.00
	b) Mud	21	70.00
2	Type of water supply		
	a) Public tap water	26	86.67
	b) Pond water	0	0.00
	c) Bore water	0	0.00
	d) Well water	4	13.33
3	Type of drainage		
	a) Open system	30	100.00
	b) Closed system	0	0.00
4	Type of toilet		
	a) Open field defecation	30	100.00
	b) Latrine at home	0	0.00
	c) Common public latrine	0	0.00

S.No	Demographic variables	Frequency	Percentage
5	Disposing of kitchen waste		
	a) In garden	7	23.33
	b) In street	15	50.00
	c) In home	8	26.67
6	Method of disposal of wastes/faeces	0	0.00
	a) Burial	3	10.00
	b) Incineration	27	90.00
7	c) Digging		
	Frequency of giving bath to the child	19	63.33
		10	33.33
	a) A day	1	3.33
	b) Twice or more a day	0	0.00
8	c) Once in two days		
	d) Occasionally		
	How many times did you change the dress for your child per day?	16	53.33
		12	40.00
		2	6.67
	a) Once a day	0	0.00
	b) Twice/more a day		
	c) Once in two days		
	d) Occasionally		

<b>S.No</b>	<b>Demographic variables</b>	<b>Frequency</b>	<b>Percentage</b>
9	How frequently do you cut the nails of your child?		
	a) Once in five days	1	3.33
	b) Weekly once	1	3.33
	c) Monthly once	14	46.67
	d) occasionally	14	46.67
10	When will you use slippers for your child?		
	a) Always	0	0.00
	b) Only when going outside	19	63.33
	c) While playing in streets	2	6.67
	d) Never	9	30.00
11	General cleanliness around the house	7	23.33
	a) Good	12	40.00
	b) Poor	11	36.67
12	c) Very poor		
	Play activities of the child	3	10.00
	a) Indoor	14	46.67
	b) Outdoor	13	43.33
	c) Both		

<b>S.No</b>	<b>Demographic variables</b>	<b>Frequency</b>	<b>Percentage</b>
13	Personal habit of the child		
	a) Thumb sucking	0	0.00
	b) Pica	7	23.33
	c) Nail biting	6	20.00
	d) Nil	17	56.67

Table 4.2 depicts the frequency and percentage distribution of standard of living of pre-school children with worm infestation.

Regarding type of floor, 9(30%) were living in pucca and 21(70%) were in mud floor.

In relation to type of water supply, 26(86.67%) were using public tap water and 4(13.33%) using well water.

In terms of type of drainage, 30(100%) were using open system.

Regarding type of toilet, 30(100%) was using open field defecation.

In terms of disposing of kitchen waste, 7(23.33%) were disposing in garden, 15(50%) were disposing in street and 8(26.67%) were disposing in home.

Regarding methods of disposal of wastes/faeces, 3(10%) were incinerate the waste and 27(90%) were dispose by digging method.

With regards to the frequency of giving bath to the children, 19(63.33%) bath once a day and 10(33.33%) were giving bath twice in two or more days and 1(3.33%) was once in two days.

In terms of changing the cloth to the child per day, 16(53.33%) change once a day, 12(40%) change twice or more a day and 2(6.67%) change once in two days.

Regarding frequency of cutting nails, 1(3.33%) cut once in five days and weekly once, 14(46.67%) cut monthly once and occasionally.

In relation to general cleanliness around the house, 7(23.33%) were keep good, 12(40%) keep poor and 11(36.67%) keep very poor.

Regarding use of slippers for the child, 16(63.33) use only when going outside, 2(6.67%) use while playing outside and 9(30%) never use slippers.

In terms of play activities of children, 3(10%) play indoor games, 14(46.67%) play outdoor, 13(43.33%) play both.

Regarding habit of the children, 7(23.33%) eating pica, 6(20%) had the habits of biting nails and 17(56.67%) did not have any bad habits.

## SECTION - C

**TABLE 4.3: FREQUENCY AND PERCENTAGE DISTRIBUTION OF DEGREE OF WORM INFESTATION AMONG PRE-SCHOOL CHILDREN BEFORE AND AFTER ADMINISTRATION OF NEEM FLOWER POWDER**

**N= 30**

Level of progress	Mild health condition		Moderate health condition		severe health condition		Total	
	No	%	No	%	No	%	No	%
Assessment Day	00	00	2	6.7	28	93.3	30	100
Evaluation day	27	90.0	3	10.0	00	00	30	100

The above table 4.3 shows the health status of pre-school children in the form of worm infestation at the time of assessment day and evaluation day. On assessment day, 2(6.7%) were moderately affected and 28(93.3%) were severely affected. On evaluation day, 3(10%) were moderately affected and 27(90%) were mildly affected and none was affected severely.

## SECTION D

**TABLE 4.4: COMPARISON OF MEAN AND STANDARD DEVIATION OF DEGREE OF WORM INFESTATION AMONG PRE-SCHOOL CHILDREN BEFORE AND AFTER ADMINISTRATION OF NEEM FLOWER POWDER**

**N=30**

<b>S. No</b>	<b>Health status</b>	<b>Mean</b>	<b>Standard deviation</b>
1.	Assessment day	53.53	4.11
2.	Evaluation day	36.07	2.66

Table 4.4 shows the comparison of mean and standard deviation of degree of worm infestation among pre-school children before and after administration of neem flower powder. The mean value of degree of worm infestation on assessment day was 53.53 and standard deviation was 4.11. On evaluation day, the mean value was 36.07 and standard deviation was 2.66.

## SECTION - E

**TABLE 4.5: MEAN AND STANDARD DEVIATION OF IMPROVEMENT SCORE OF DEGREE OF WORM INFESTATION AMONG PRE-SCHOOL CHILDREN BEFORE AND AFTER ADMINISTRATION OF NEEM FLOWER POWDER**

**N=30**

<b>S.No</b>	<b>HEALTH STATUS</b>	<b>MEAN</b>	<b>S.D</b>	<b>'t' VALUE</b>
1	Improvement score	17.46667	2.84948	33.574

P<0.05 Significant

Table 4.5 shows that improvement of score mean with the value of 17.466 with standard deviation of 2.84 and the paired t test 33.574. since the calculated value is greater than table value at 0.01 level of significance, it implies that there was a statistically highly significant improvement in the health status of the pre-school children with the worm infestation after the neem flower powder. Thus the effectiveness of neem flower powder and worm infestation among pre-school children was very effective.

**SECTION – F**

**TABLE 4.6: ASSOCIATION BETWEEN THE SELECTED DEMOGRAPHIC VARIABLE AND WORM INFESTATION AMONG PRE-SCHOOL CHILDREN BEFORE ADMINISTRATION OF NEEM FLOWER POWDER**

**N=30**

S.No	DEMOGRAPHIC VARIABLES	PRE SCORE				POST SCORE						r
		Moderate		Severe		Mild		Moderate		Severe		
		No	%	No	%	No	%	No	%	No	%	
1	Age in years											
	c) 3-4	2	6.7	12	40	2	6.7	12	40	0	0	.134
d) 5-6	0	0	16	53	1	3.3	15	50	0	0		
2	Gender											
	c) Male	1	3.3	15	50	1	3.3	15	50	0	0	.481
d) Female	1	3.3	16	43	2	6.7	12	40	0	0		
3	Educational qualification of mother											
	e) Illiterate	1	3.3	7	23	1	3.3	7	23	0	0	.391
	f) Primary education	1	3.3	12	40	2	6.7	11	36	0	0	
	g) High school education	0	0	9	30	0	0	9	30	0	0	
h) Higher secondary education	0	0	0	0	0	0	0	0	0	0		
4	Family monthly income in rupees											
	e) Below 1000	0	0	0	0	0	0	0	0	0	0	.093
	f) 1001 – 3000	0	0	14	47	0	0	14	47	0	0	
	g) 3001 -5000	2	6.7	14	47	3	10	13	43	0	0	
h) Above 5000	0	0	0	0	0	0	0	0	0	0		
5	Weight of the child											
	e) 5-10 kg	0	0	8	27	0	0	8	27	0	0	.299
	f) 11-15 kg	1	3.3	15	50	2	6.7	14	47	0	0	
	g) 16-20 kg	1	3.3	5	17	1	3.3	5	17	0	0	
h) Above 20 kg	0	0	0	0	0	0	0	0	0	0		

S.No	DEMOGRAPHIC VARIABLES	PRE SCORE				POST SCORE						r
		Moderate		Severe		Mild		Moderate		Severe		
		No	%	No	%	No	%	No	%	No	%	
6	Immunization status											.899
	d) Regularly immunized	1	3.3	20	67	2	6.7	19	63	0	0	
	e) Irregularly immunized	1	3.3	8	27	1	3.3	8	27	0	0	
	f) Not at all immunized	0	0	0	0	0	0	0	0	0	0	
7	Dietary pattern											.432
	c) Vegetarian	0	0	5	17	1	3.3	4	13	0	0	
	d) Non-vegetarian	2	6.7	23	77	2	6.7	23	77	0	0	

Table 4.6 shows that there is no significant association between the selected demographical variables and degree of worm infestation among pre-school children before and after administration of neem flower powder.

**TABLE 4.7: ASSOCIATION BETWEEN THE SELECTED STANDARD OF LIVING AND WORM INFESTATION AMONG PRE-SCHOOL CHILDREN BEFORE ADMINISTRATION OF NEEM FLOWER POWDER**

**N=30**

S.No	STANDARD OF LIVING	PRE SCORE				POST SCORE						r
		Moderate		Severe		Mild		Moderate		Severe		
		No	%	No	%	No	%	No	%	No	%	
1	Type of floor											.899
	c) Pucca	1	3.3	8	27	1	3.3	8	27	0	0	
	d) Mud	1	3.3	20	67	2	6.7	19	63	0	0	
2	Type of water supply											.491
	e) Public tap water	2	6.7	24	80	3	10	23	77	0	0	
	f) Pond water	0	0	0	0	0	0	0	0	0	0	
	g) Bore water	0	0	0	0	0	0	0	0	0	0	
	h) Well water	0	0	4	13	0	0	4	13	0	0	
3	Type of drainage											.00
	c) Open system	2	7	28	93	3	10	27	90	0	0	
	d) Closed system	0	0	0	0	0	0	0	0	0	0	
4	Type of toilet											.00
	d) Open field defecation	2	7	28	93	3	10	27	90	0	0	
	e) Latrine at home	0	0	0	0	0	0	0	0	0	0	
	f) Common public latrine	0	0	0	0	0	0	0	0	0	0	
5	Disposing of kitchen waste											.455
	d) In garden	0	0	7	23	0	0	7	23	0	0	
	e) In street	1	3.3	14	47	2	6.7	13	43	0	0	
	f) In home	1	3.3	7	23	1	3.3	7	23	0	0	

S.No	STANDARD OF LIVING	PRE SCORE				POST SCORE						r
		Moderate		Severe		Mild		Moderate		Severe		
		No	%	No	%	No	%	No	%	No	%	
6	Method of disposal of wastes/faeces d) Burial e) Incineration f) Digging	0	0	0	0	0	0	0	0	0	0	.559
7	Frequency of giving bath to the child e) A day f) Twice or more a day g) Once in two days h) Occasionally	2	6.7	17	57	2	6.7	17	57	0	0	.833
8	How many times did you change the dress for your child per day? e) Once a day f) Twice/more a day g) Once in two days Occasionally	1	3.3	15	50	1	3.3	15	50	0	0	.180
9	How frequently do you cut the nails of your child? e) Once in five days f) Weekly once g) Monthly once h) occasionally	0	0	1	3	0	0	1	3.3	0	0	.934

S.No	STANDARD OF LIVING	PRE SCORE				POST SCORE						r
		Moderate		Severe		Mild		Moderate		Severe		
		No	%	No	%	No	%	No	%	No	%	
10	When will you use slippers for your child? a) Always b) Only when going outside c) While playing in streets d) Never	0	0	0	0	0	0	0	0	0	0	.519
11	General cleanliness around the house d) Good e) Poor f) Very poor	1	3.3	6	20	1	3.3	6	20	0	0	.646
12	Play activities of the child d) Indoor e) Outdoor f) Both	1	3.3	2	7	1	3.3	2	7	0	0	.064
13	Personal habit of the child e) Thumb sucking f) Pica g) Nail biting h) Nil	0	0	0	0	0	0	0	0	0	0	1.00

Table 4.7 shows that there is no significant association between the selected standard of living and degree of worm infestation among pre-school children before and after administration of neem flower powder.

# CHAPTER V

## RESULTS AND DISCUSSION

The aim of the present study was to evaluate the effectiveness of neem flower powder on worm infestation among pre-school children in selected villages in Cheyyur Taluk. Total numbers of thirty samples were selected for the study. Assessment was done by modified observational checklist after the neem flower therapy was given as far five days and after one week evaluation was done by using observational checklist and ova cyst was assessed.

The result of the study has been discussed according to the objectives of the study, conceptual framework and on related literatures.

**The first objective was to assess the prevalence of worm infestation among pre-school children.**

It was observed in the present study that demographic data of pre-school children were 3-4 yrs of age group (46.67%), 5-6 yrs of age group (53.33%) studying population. The researcher assumed that in this age pre-school children the maor factor that contribute to worm infestation namely increased independence, desire to play in the mud, increased involvement in challenging activities due to peer influence and poor desire to maintain the personal hygiene. The worm infestation were quite common in India were poor-sanitary and hygiene practice. Hence, the worm infestation is common in pre-

school children. So, these were the reason for the researcher to select the pre-school children.

The findings was constant with the study findings Ulukanligil M.Seyrek et.al (2003) conducted a study and inferred that the worm infestation is most commonly seen in the children with the age group of 4-6 yrs, as the age increasing the prevalence of worm infestation and decreasing above 6yrs.

In the present study, the male distribution was 16(53.33%) and female were 14(46.67%).

Akbar.E.Aluned et al evidenced that the overall infestation was 30%. The intestinal infestation is common among male children rather than the female children and might be the reason of anaemia and malabsorption in the pre-school children.

**The second objective was to compare the degree of worm infestation among pre-school children before and after administration of neem flower powder.**

While assessing the degree of worm infestation through pre-test, it was found that most (93.3%) were with the severe degree of worm infestation before administration of neem flower powder. The finding of degree of worm infestation of pre-school children after

administration of neem flower powder was found that many (90%) were mild signs and symptoms.

A similar study was conducted by Raman Kutty, Soma Vijaykumar (2003) stated that helminthic infestation is a serious public health problem. In the growing stage, children are more susceptible to the ill-effects of parasitic attack, as their need for nutritious is high. In young children, physical and mental development may be affected by malabsorption and also protein loss, diarrhea, generated often by severe type of worm infestation that affects the gut. The worms interfere with the process of intestinal absorption of nutrients. They feed on the nutrients, depriving the child of its source of nutrition.

Hence, hypothesis 'H<sub>1</sub> – There will be significant difference between degree of worm infestation before and after administration of neem flower powder' was supported.

**The third objective was to associate between the demographic variables and the degree of worm infestation among pre-school children before and after administration of neem flower powder.**

There was a significant correlation between the age, gender, family monthly income, weight of the child, dietary pattern and educational qualification of the mother and degree of worm infestation before administration of neem flower powder.

The similar study was conducted by the findings of Williamson P (2000), a study was conducted to assess the anthelmintic drugs for treating the worms in children and affects on growth and cognitive performance. It was found that there was some limited evidence that routine treatment in areas were worms as small effects on weight gain, but there was a insufficient evidence to know whether this intervention improve the demographic variables such as age, sex and socio-economic status. The expectation that there will be an improvement in growth and learning, were not based on constant or reliable evidence.

**The fourth objective was to associate between the selected standard of living and the degree of worm infestation among pre-school children before and after administration of neem flower powder.**

There was a significant association exists between the type of toilet, type of latrine, disposal of kitchen waste, use of slipper to the child, methods of disposing wastes/faeces, general cleanliness around the house, play activites of the children, bathing and changing of cloth to the children and degree of worm infestation before administration of neem flower powder.

## **CHAPTER VI**

### **SUMMARY AND CONCLUSION**

#### **SUMMARY OF THE STUDY**

This chapter presents the summary, implications and recommendations which create a base for the future researchers and for evidence-based nursing practice.

The study focused on the effectiveness of neem flower powder on worm infestation among pre-school children (3-6 years) in selected villages at Cheyyur taluk, Kancheepuram district.

The objective of the study was to assess the prevalence of pre-school children with worm infestation and to compare the degree of worm infestation before and after administration of neem flower powder and to correlation of demographic variables and standard of living of pre-school children before and after administration of neem flower powder.

Reviewed literatures were the backbone of this study. Kristen M.Swanson (1991) theory of caring provided a conceptual base for the study.

A pre-experimental research approach with a pre-experimental of one group pre and post design was used to achieve the objectives of the study. The present study was conducted in selected villages in Cheyyur taluk with the sample size was 30, selected through

probability stratified random sampling technique between the periods of one month.

The researcher used demographic variable, structured questionnaire on standard of living, observational checklist level of worm infestation for the data collection. The data collection tools were validated and reliability was established. After the pilot study, the data collection of main study was done. After the pre-test, the neem flower powder was administered to the pre-school children with worm infestation. The post-test was conducted one week after the pre-test.

The collected data were tabulated and analyzed using descriptive and inferential statistics, frequency and percentage were computed to summarize the sample characteristics and standard deviation was used to compare the pre-test and post-test level of worm infestation. Correlation Co-efficient was done to find out the association between the demographic variable and level of worm infestation, and relationship between the standard of living and level of worm infestation. T-test value was calculated to find out the difference between the pre and post test level of worm infestation score of pre-school children.

## **MAJOR FINDINGS**

The statistical analysis was showed that during the initial assessment with the mean value 53.53 and standard deviation value were 4.11. This result shows that the evaluation mean 36.07 and standard deviation 2.66 and the t-value is 33.574 shows highly

significant and the correlation shows that there was a correlation between demographic variable and standard of living with effectiveness of neem flower powder. So, it was concluded that a significant improvement in the health status on worm infestation among pre-school children.

## **CONCLUSION**

The findings of the study indicate that the worm infestation is a major health problem faced by pre-school children which need a non-pharmacological healing approach. Administration of neem flower is simple and easy to implement, easily available, no notable side effects and most by acceptable to reduce the degree of worm infestation among pre-school children. To evaluate the result supported that the incorporation of neem flower powder administration among pre-school children is the best intervention to treat worm infestation.

## **NURSING IMPLICATIONS**

The findings of the study has implications in different branches of nursing profession, i.e., nursing practice, nursing education, nursing administration and nursing research. By assessing the effectiveness of neem flower powder, we get a clear picture regarding different steps to be taken in all these fields to improve the standards of nursing profession.

## **NURSING PRACTICE**

Community health nurse have favourable offer to educate the mothers of pre-school children regarding worm infestation. The study findings also showed that through the participant mothers were aware about the worm infestation but majority of them had not taken any treatment for worm infestation. This shows that the health care provider plays a vital role in educating mothers about the worm infestation.

With emerging health care trends nurses must also know about the naturaceutical supplements and its benefits, health promoting properties and its availability. This helps the community health nurse to use neem flower powder and recommend in preventing the worm infestation and many other complications. Nurses need evidence-based practice in managing the children with worm infestation.

## **NURSING EDUCATION**

Nurse educators when planning and instructing nursing students should provide opportunities for students to gain the knowledge in teaching students the naturaceutical supplements. The study outlines, the significance of short term courses and inservice education to equip nurses with the current knowledge on worm infestation. Nurse educator should check out suitable programme to educate the public on the importance of indigenous system of medicine. The nurse educators can make a practical situation for the student nurses on treatment modalities and sign and symptoms.

Nurse educators can also plan a child to child programme to conduct a global worm infestation programme and also to improve teacher level of knowledge on signs and symptoms, prevention and treatment modalities.

## **NURSING ADMINISTRATION**

With technology advanced and ever growing challenges of health care needs, the college and hospital administrators, have a responsibility to provide nurses, nurse educators with continuing education opportunities on naturaceutical supplements and its benefits, health promoting properties and its availability. This will enable the nurses to update their knowledge and to acquire special skills in preparing and use of indigenous system of medicine in nursing. Nurse as administrators should formulate approximate networking so as to facilitate implementation of indigenous system of medicine especially herbal medicine. The nurse administrator can conduct global programme through which the mortality and morbidity rate can be decreased and it helps to improve the public knowledge on worm infestation.

## **NURSING RESEARCH**

There is a need for intensive and extensive research in this area. It opens a big avenue for research on innovative methods of creating awareness, development of teaching material and setting up multimedia centres for teaching and for creating awareness among

the public regarding naturaceutical supplements and its benefits, health promoting properties and its availability. Encourage further research studies on the effectiveness of neem flower in treating worm infestation. Disseminate the findings through conferences, seminars, publications in professional, national, international journals and World Wide Web.

## **RECOMMENDATIONS**

- The same study can be conducted on a larger sample to generalize the results.
- A similar study can be conducted by using true experimental design.
- A similar study can be conducted for all age groups to assess the effectiveness of neem flower powder.
- The effectiveness of neem flower powder administration may be assessed upon the level of satisfaction of participants.
- A comparative study can be conducted to evaluate the effectiveness of neem flower powder.
- It may be conducted in different settings among various populations where more estimated cases were present.

# BIBLIOGRAPHY

## BOOKS

1. Achar's (1995) "**Text book of Paediatrics**", 4<sup>th</sup> edition, Orient Longman Limited.
2. Basavanthappa B.T. (1999), "**Community Health Nursing**", 1<sup>st</sup> edition, Jaypee Publishers.
3. Bhaskara Rao J. (2002), "**Principles of Community Medicine**", 3<sup>rd</sup> edition, Aitbs publication.
4. Dorothy.R.Marlow (2005), "**Textbook of Paediatric Nursing**", 6<sup>th</sup> edition, W.B.Saunders Company.
5. Fawcett Jacqualline (1995), "**Analysis and evaluation of conceptual models of Nursing**", 3<sup>rd</sup> edition, F.A. Davis Company.
6. Ghai O.P. (2001), "**Essential of Paediatrics**", 4<sup>th</sup> edition, Mehta Offset Works.
7. Gupta S.P. (2000), "**Statistical Method**", 18<sup>th</sup> edition, Sultan Chand and Sons.
8. Gupta Swaraj (2001) "**The short book of Paediatrics**", Jaypee Brothers Medical Publishers Ltd.
9. Gulani K.K. (2005), "**Community Health Nursing**", 1<sup>st</sup> edition, Kumar Publishing House.
10. Joyce.J.Fitspatric (1993), "**Conceptual Models of Nursing Analysis and Applications**", 2<sup>nd</sup> edition, Prenntice Hall.

11. Judith Ann Allender (2002), "**Community Health Nursing Promoting and Protecting The Public Health**" 4<sup>th</sup> edition, Lippincott Publications.
12. Julia (1999), "**Nursing Theories, The Base For Professionals**", 7<sup>th</sup> edition, Harpercollins College.
13. Kamalam.S (2005), "**Essential in Community Health Nursing**", 4<sup>th</sup> edition, Jaypee publications.
14. Kasthuri Sundar Rao (2002), "**Community Health Nursing**" 2<sup>nd</sup> edition, K.V.Mathew B.I.Publications Pvt. Ltd.
15. Mahajan.B.K. (1991), "**Methods of Biostatistics**", 3<sup>rd</sup> edition, Jaypee Publishers.
16. Mary A. Nies (2002), "**Community Health Nursing**", 3<sup>rd</sup> edition, Saunders Publications.
17. Marcia Stanhope (2006), "**Community and Public Health Nursing**", 4<sup>th</sup> edition, Mosby publication.
18. Maxcy Rorennau Last (1992), "**Public Health and Preventive Medicine**" 13<sup>th</sup> edition, INC Publication.
19. Monica Byrne (1986), "**Community Nursing in developing**", 2<sup>nd</sup> edition, Oxford University Press Publishers.
20. Park's (2007), "**Textbook of Prevention and Social Medicine**", 19<sup>th</sup> edition, MS Banarsidas Bhanot Publishers.
21. Polit.F.(2004), "**Nursing Research : Principles and Methods**", 7<sup>th</sup> edition, Lippincott Publications.

22. Premalatha Dwivedi (1995), "**Communicable disease**", 5<sup>th</sup> edition, Usha Deshpande Publishers.
23. Shyam A. Shtekar (2000), "**Health and Healing, A Manual of Primary Health care**", 1<sup>st</sup> edition, Orient Longman Limited.
24. Sundar Rao P (1987), "**An Introduction to Biostatistics**", 2<sup>nd</sup> edition, Presographic printers.
25. Sunitha (2005), "**Textbook of Community Health Nursing**", 1<sup>st</sup> edition, Modern Publications
26. Trained Nurses Association of India (1998), "**Community Health Nursing Medicine**", 3<sup>rd</sup> edition
27. Viay.E (2002), "**Community Medicine**", 1<sup>st</sup> edition, Beacon Zen Publishers.
28. Wesley L.Ruby (1995), "**Nursing theories and Models**", 2<sup>nd</sup> edition, Pennsylvania Spring House.
29. Wong's (2005), "**Essentials of Paediatric Nursing**", 7<sup>th</sup> edition, Elsevier Publishers.

## JOURNAL REFERENCE

1. Banaif N and Chaturpedi P (2002), "**Pattern of Helminthic infestation**", Indian Journal of Paediatrics, Vol 67.
2. Bhatia V. (2004), "**Malnutrition among under six children**", Health Education Research, Vol 6.
3. Charmaine Lloyd A.C. (2008), Menon T, Uma maheswari. K., "**Medicinal effects of Neem**", Indian Journal of Pharmacology, 37(6): 386-389.
4. Chen J. (2001), "**Epidemiological and Anthropological**", Inter Science Journal, Vol 56.
5. Charlen Smith (2004), "**Frequency of Intestinal parasites**", Inter Science Journal, Vol 66.
6. Dass K (1995), "**Programme of Child Survival and Deelopment**", Indian Journal of Paediatrics, Vol 62.
7. Davis.M (2001), "**Intestinal parasites in Children**", Journal of Royal College of Paediatrics and Child Health, Vol 20.
8. Ekpo U.F.(2008), "**Helminthiasis and Hygiene conditions of schools in Lkenne**", Health Education Research, Ogun state.
9. Faulkner C.T. (2004), "**Prevalence of endoparasitic infection in children**" Rev panam Salud publication, Vol 6.
10. Heinrich J (2005), "**Effect of worm infestation**", Inter Science Journal, Vol 60.
11. Kabatereine N.B. (2008), "**Effect of Chemotherapy on worm infestation**", Pharmacological Journal, Vol. 32.

12. Knopp,.S. (2007), ***“Intestinal Parasites in school children”***, Public Health Journal, Vol.4
13. Kumarasamy,.N (2007), ***“Human Immuno-Deficiency Virus and worm infestation”*** National Institutes of Health, Bethesda.
14. Maizel R.(2006), ***“Effect of Drugs on worm infestation”***, the Pharmaceutical Journal, Vol.27
15. Natarajan V., et al.,(2003), ***“A Review of intestinal Helminthiasis” Indian Journal of Medical Microbiology”***, 21(2):98-101.
16. Nihar Ranjan Sarkar (2002), ***“Effect of deworming on Nutritional status”***, Health Education Research.
17. Nguyen PH. (2006), ***“Intestinal Helminthic infections”***, Peer Reviewed Journal, Vol 4.
18. Phiri,.K (2002), ***“Prevalence of endoparasitic infestation in Children”***, Public Health Journal, Vol 6.
19. Riley David (2008), ***“Intestinal Parasites in school children”***, Peer Reviewed Journal, Vol 8.
20. Rohar J. (2008), ***“Risk of waste water”***, BMC Public Health, Vol 12.
21. Ulukanligul (2003), ***“Prevalence of endoparasitic infestation in children”***, Public Health Journal, Vol.6
22. Wagbatsoma V.A (2005), ***“Helminthiasis in selected children seen at the University of Benin Teaching Hospital”***, Health Education Research.

## NET REFERENCES

- WWW. Neem foundation.org.
- WWW. JOCPR.com
- [http://using neem.com/res-reader.php](http://using.neem.com/res-reader.php).
- <http://en.Wikipedia.org/wiki/>
- <http://google.com>
- <http://www.pubmed.com>