

“A Study to Assess the Knowledge and Attitude Regarding The Side Effects of Mosquito Coil Smoke Exposure on Children among the mothers of under Five Children.”

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Abstract: To assess the effectiveness of self instructional module on knowledge regarding the side effects of mosquito coil smoke exposure on children among the mothers of under five children was carried out for the partial fulfillment of the requirement for the award of Master of Nursing at Florence Nightingale College of Nursing, Gwalior, M.P.

Materials and Methods This prospective comparative study was carried out on patients of Department of immunization at J.R. Hospital, Gwalior, Madhya Pradesh from Jan 2015 to Jan 2016. A total 60 under five mothers were selected conveniently to suit the study.

Results: This section deals with the Percentage wise distribution of under five mothers according to their demographic variables.

- Distribution of mothers according to their age in years shows that 33.33% of them belongs to 20-24years, 3 5% of them belongs to 25-29years, 26.67% of them belongs to 30-34 years, 5% of them belongs to more than 35 years respectively.
- Distribution of mothers according to their number of children shows that 45% of them have one child, 35% of them have two children's, 20% of them have three children's, 0% of them have more than three children's respectively.
- Distribution of mothers according to their religion shows that 46.67% % belongs to Hindu religion, 16.67% belongs to Muslim religion, 3.33% belongs to Christian religion, 33.33 % belongs to Buddhist religion, 0% of them belongs to Sikh religion and 0% of them belongs to others respectively .
- Distribution of mothers according to their types of family shows that 51.67% belongs to nuclear family, 33.33% belongs to joint family, 15% belongs to extended family respectively.
- Distribution of mothers according to their education shows that 3.33% of them were educated up to primary education, 28.33% were educated up to secondary education, 38.33% were educated up to higher secondary education, 21.67% were graduate, 8.33% were post graduate respectively.
- Distribution of mothers according to their occupation shows that 33.33% were homemaker, 30% of them works on daily wages, 8.33% of them were government employee, 25% were private employee and 3.33% of them were self employed respectively.
- Distribution of mothers according to their family monthly income shows that 0% were belongs to Rs. <5000/-, 30 % were belongs toRs.5001-10001/-, 36.67% were belongs to Rs.10001-15000/-, 33.33 % were belongs to Rs 150001/- and above respectively.
- The pretest score is 8 (6.67%) of the mothers had poor knowledge, 38 (63.33%) mothers had average knowledge , 18 (30%) mothers had good knowledge, 0% of the mothers had very good and 0% of mothers had excellent knowledge regarding side effects of mosquito coil smoke exposure. The mean score was 11.93 ± 2.530 with a mean percentage score of 47.72%.
- The post test score is 0% of mothers had poor level of knowledge score is, 0% of mothers had average level of knowledge score, 12 (20%) of mothers had good level of knowledge score, 44(73.33%) of mothers had very good level of knowledge, 4 (6.67%) had excellent level of knowledge. The minimum score was 13 and the maximum score was 22, the mean score was 17.47 ± 2.221 with a mean percentage score of 69.88%.

Conclusion: In this study from detail analysis it shows that of post test mean score is 17.47 ± 2.221 and pretest mean score is 11.93 ± 2.530 . The hypothesis is tested statistically with distribution of pre test and post test mean, standard deviation and mean difference. There were significant no association between knowledge score with age, number of children, religion, types of family, education of mother, occupation of mother, total income of family respectively.

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I. Introduction

**“IT IS TO EASY TO BUILD STRONG CHILDREN, THAN TO REPAIR BROKEN MAN.-
FREDERICK DOUGLASS.**

A mosquito coil is widely known as an efficient mosquito repellent. The major active ingredients of mosquito coil is pyrethrin accounting for about 0.3-0.4% of coil mass. When a mosquito coil is burned the insecticides evaporate with smoke which prevents the mosquito from entering the room. Pyrethrin are low chronic toxicity to humans and low toxicity, although head ache, nausea and dizziness were observed.¹

The remaining components of mosquito coil are organic fillers binders dyes, and other additives capable of smoldering well the combustion of the remaining materials generated large amounts of submicrometer particles can reach the lower respiratory tract and may be coated with wide range organic compounds, some of which are carcinogens, such as polycyclic aromatic hydrocarbons.²

A mosquito coil is mosquito-repelling incense, usually shaped into a spiral, and typically made from a dried paste of pyrethrum powder. The coil is usually held at the center of the spiral, suspending it in the air, or wedged by two pieces of fireproof nettings to allow continuous smoldering. Burning usually begins at the outer end of the spiral and progresses slowly toward the center of the spiral, producing a mosquito-repellent smoke. A typical mosquito coil can measure around 15 cm in diameter and lasts around 8 hours. Mosquito coils are widely used in Asia, Africa, and South America.³ Active ingredients found in mosquito coils may include Pyrethrum, a natural, powdered material from a kind of chrysanthemum plant; performance moderate; Pyrethrins, an extract of the insecticidal chemicals in pyrethrum; Allethrin, sometimes d-trans-allethrin, the first synthetic pyrethroid; Esbiothrin - A form of allethrin; Dibutyl hydroxyl toluene (BHT), an optional additive to prevent pyrethroid from oxidizing during burning; Piperonyl butoxide (PBO) - an optional additive to improve the effectiveness of pyrethroid; N-(2-ethylhexyl)-bicyclo-(2,2,1) hept-5-ene-2,3-dicarboximide (MGK 264) - an optional additive to improve the effectiveness of a pyrethroid.⁴

Several hazards are known to be caused by mosquito coils. In 1999, sparks from mosquito coils ignited a fire that swept through a three-story dormitory building at a summer camp in South Korea; 23 people, including 19 children, died in the blaze. Recent studies showed that the smoke generated from a burning mosquito coil is of certain health concerns – one burning mosquito coil produces the same amount of particulate mass (diameter up to 2.5 µm) as 75-137 burning cigarettes would; and the emission of formaldehyde from one burning coil can be as high as that released from 51 burning cigarettes.⁵

The ingredients of mosquito coil are very effective against many genera of mosquitoes including aedes, anopheles and mansonina. The irritants released from the mosquito coil smoke such as aldehydes, sulphates and polycyclic aromatic hydrocarbons. When a mosquito coil is burned, insecticides evaporate with smoke which prevents the mosquito entering in the room. Kidney performs elimination of foreign substance. Inhalation of mosquito coil smoke may affect the functions of kidney. After inhalation histopathological observations showed marked symptoms of renal impairments.⁶

The toxicity of mosquito coil smoke is caused by its combustion product such as heavy metals allethrin and wide range of organic vapour. These particles can reach the lower respiratory tract. Its acute exposure produces mainly mucosal irritation of eye, and long term exposure to mosquito smoke induced asthma leads to the production of histopathologic changes in lung, liver and kidney.

• BACKGROUND OF THE STUDY

Burning mosquito coils indoors generates smoke that can control mosquitoes effectively. This practice is currently used in numerous households in Asia, Africa, and South America. However, the smoke may contain pollutants of health concern. We conducted the present study to characterize the emissions from four common brands of mosquito coils from China and two common brands from Malaysia. We used mass balance equations to determine emission rates of fine particles (particulate matter < 2.5 micron in diameter; PM_{2.5}), polycyclic aromatic hydrocarbons (PAHs), aldehydes, and ketones. Having applied these measured emission rates to predict indoor concentrations under realistic room conditions, we found that pollutant concentrations resulting from burning mosquito coils could substantially exceed health-based air quality standards or guidelines. Under the same combustion conditions, the tested Malaysian mosquito coils generated more measured pollutants than did the tested Chinese mosquito coils. We also identified a large suite of volatile organic compounds, including carcinogens and suspected carcinogens, in the coil smoke. In a set of experiments conducted in a room, we examined the size distribution of particulate matter contained in the coil smoke and found that the particles were ultrafine and fine. The findings from the present study suggest that exposure to the smoke of mosquito coils similar to the tested ones can pose significant acute and chronic health risks.⁷

Indoor air pollution is a major environmental and public health challenge in developing countries, where according to the World Health Organisation (WHO) exposure to indoor air pollution may be responsible for nearly two million excess deaths and it's about 4 per cent of the global burden of diseases such as asthma, heart

and lung ailments. Experts say effect of exposure to smoke are both long and short term. Examples of short-term effects include irritation to the eyes, nose and throat, and upper respiratory

Infections such as bronchitis and pneumonia. Other symptoms can include headaches, nausea, and allergic reactions. Long-term health effects can include chronic respiratory disease, lung cancer, heart disease, and even damage to the brain, nerves, liver, or kidneys.

A study was conducted in Myanmar to investigate the effects of household air pollution due to burning of mosquito coil on respiratory problems, it was across-sectional study, 412 and 153 children under 7 years old were included. Prevalence of symptoms such as cough with or without cold, wheeze with or without cold, shortness of breath, sore throat without cold, rhinitis and eye irritation in home were assessed in relation to mosquito coil use.⁸

• **NEED OF THE STUDY**

The under five age groups are vulnerable and special risk group constituting a major portion of total population with high death rate. Anything that affect negatively, that can affect the growth and development All mothers wish good health for their children, mothers are more concerned about the health of child ,they will usually use mosquito repellants to protect their babies from diseases like malaria, dengue etc, without knowing its adverse effects.

Chronic obstructive pulmonary disease (COPD) is a major cause of morbidity and mortality across the globe. According to World Health Organization estimates, 65 million people have moderate to severe COPD. More than 3 million people died of COPD in 2005 corresponding to 5% of all deaths globally and it is estimated to be the third leading cause of death by 2030. Most of the information available on COPD prevalence, morbidity and mortality comes from high-income countries. . Mosquito coils used in homes to get rid of mosquitoes are another source of exposure in Indian homes; burning of one mosquito coil in the night capable of emitting particulate matter equivalent to those with around 100 cigarettes.⁹

"The estimates shown above are derived based on the assumption that pollutant concentration in the room is homogeneous. In reality, concentrations actually inhaled by room occupants may be higher than the estimated concentrations because the room air may not necessarily be well mixed and the source (coil) may be placed in close proximity to the breathing zone (the bed level during sleeping). In houses using mosquito coils, children usually sleep in small rooms. To prevent them from excessive mosquito biting, the windows of their rooms are often closed during sleeping hours. Thus, the predicted indoor concentrations above are likely to be very conservative and underestimate actual concentrations."¹⁰

In INDIA, Researchers from the institute affiliated to the Indian Council of Medical Research found that 73% villagers in Tiruvallur use mosquito coils - and keep their windows closed while using them, adding to the health hazards of breathing chemical.¹¹

Urban areas like Chennai are no different. Other studies have shown that up to 42% of people in Chennai use mosquito coils and 28% use liquid vaporisers. Less than 5% use safer and cheaper alternatives like mosquito nets," said Chitra A Grace, one of the researchers.

"Plant-derived pyrethrins (organic compounds with insecticidal properties) are not toxic to humans, but we don't know the effects of burning the rest of the material that comprises 99% of the coil. We have to study that," said Prabhdeep Kaur, an NIE scientist.

Most of the People in India and some part of Karnataka do not have knowledge about effects of mosquito coil smoke exposure .So a study is to be conducted to evaluate the effectiveness of planned teaching programme on knowledge of mothers with under five children regarding effects of mosquito coil smoke exposure, will improve their knowledge through this programme.¹²

The investigator also felt the need to increase the knowledge on the adverse health effects to mother with under five children is essential in imparting information regarding the effects of mosquito coil smoke exposure.

• **TITLE OF THE STUDY**

To assess the effectiveness of self instructional module on knowledge regarding the side effects of mosquito coil smoke exposure on children among the mothers of under five children

• **OBJECTIVES**

1. To assess the existing knowledge of mothers of under five children regarding side effects of mosquito coil smoke exposure.
2. To evaluate the effectiveness of self instructional module on knowledge regarding side effects of mosquito coil smoke exposure on children among the mothers of under five children.
3. To associate the post test knowledge scores with selected demographic variables.

- **HYPOTHESIS**

H₁- There is significant difference in the knowledge score of mothers of under five children regarding the side effects of mosquito coil smoke exposure.

H₀- There is no significant difference in the knowledge score of mothers of under five children regarding the side effects of mosquito coil smoke exposure.

- **ASSUMPTIONS**

1. Mothers with under five children may have some knowledge regarding side effect of mosquito coil smoke exposure.

2. Self instructional will enhance knowledge of mothers with under five Children regarding effects of mosquito coil smoke exposure.

- **OPERATIONAL DEFINITIONS**

1. **Assess:-**According to the oxford dictionary, "to examine for the purpose of evaluation or to estimate the nature of ability and quality."

In this study it is defined as statistical measurement of knowledge of mothers regarding the side effects of mosquito coil smoke exposure

2. **Effectiveness:-**According to free dictionary, "the ability to produce a specific result or to exert a specific measureable influence."

In this study effectiveness means improvement of knowledge of mothers regarding side effects of mosquito coil smoke exposure on under five after children after administration of self instructional module.

3. **Knowledge:-** According to oxford dictionary, "understanding of or information about a subject that you get by experience or study".

In this study knowledge refers to the response of mothers of under five children regarding the knowledge of side effects of mosquito coil smoke exposure.

4. **Self instructional module:-** According to Cambridge dictionary, "pertaining to or constituting learning materials and conditions arranged so that students can proceed to learn on their own little."

In this study it means a block prepared by the investigator that will help mothers for self directed learning regarding the knowledge of side effect of mosquito coil smoke exposure on children.

5. **Mosquito coil:-**According to oxford dictionary, "It is spiral shaped insecticide product, with green, red, brown, blue in color. It is made up of pyrethrum powder. It is used to prevent mosquito bite".

In this study it refers to a spiral shaped, paper form or the incense stick insecticide product with green, red, brown, blue in color.

6. **Mothers of under five children:-** According to the oxford dictionary, "mothers who have children between the age of 0-5 years."

In this study it refers to the mothers who are having children aged between 0 to 5 years.

7. **Side effects:-** According to oxford dictionary, "A secondary, typically undesirable effect of a drug or medical treatment"

In this study side effect refers to side effects of mosquito coil smoke exposure children suffers from various diseases due to short term and long term exposure they may suffer with pneumonia, asthma etc.

- **LIMITATIONS**

1. The findings of the study are limited to the selected samples only.

2. Only under five mothers were included in the study, other group can be included.

- **ETHICAL ASPECT**

Study was approved by the institutional ethical committee and the study was conducted in accordance with the ethical guidelines prescribed by Central Ethical Committee on Human Research.

- **CONCEPTUAL FRAMEWORK**

This study is based on J. W. Kenny's open system model (1991). Theoretical framework provides a certain framework of reference for clinical practice, research and education .A system is a group of elements that interact with one another in order to achieve a goal.¹³

Conceptual model selected for this study is based on J W Kenny's open system model. This system theory is concern with changes due to interaction between various factors in a situation. All living system are open which there is a continuous exchange of matter, energy, information. Open system has varying degree of interaction with the environment from which the system receives input and gives output in the system the concept of Kenny's open system model is input throughput output and feedback.¹³

In the present study To assess the effectiveness of self instructional module on knowledge regarding the side effects of mosquito coil smoke exposure on children among the mothers of under five children
The following are the concepts of the theory:

INPUT:

In this study the input is considered as awareness and existing knowledge of mother regarding the side effects of mosquito coil smoke exposure on children this is being influenced by varies factors like Age in years, number of children, religion, types of family, education, occupation, total income of family.

THROUGHPUT:

It refers to process by which the system process input and releases an output. In present study throughput refers to the process of transformation of knowledge regarding the side effects of mosquito coil smoke exposure on children through self instructional module.

OUTPUT:

In this study, output refers to increased knowledge score regarding side effects of mosquito coil smoke exposure on children is assessed by posttest feedback can be assessed by statistical measurement of score obtained by subject expert and post questionnaire.

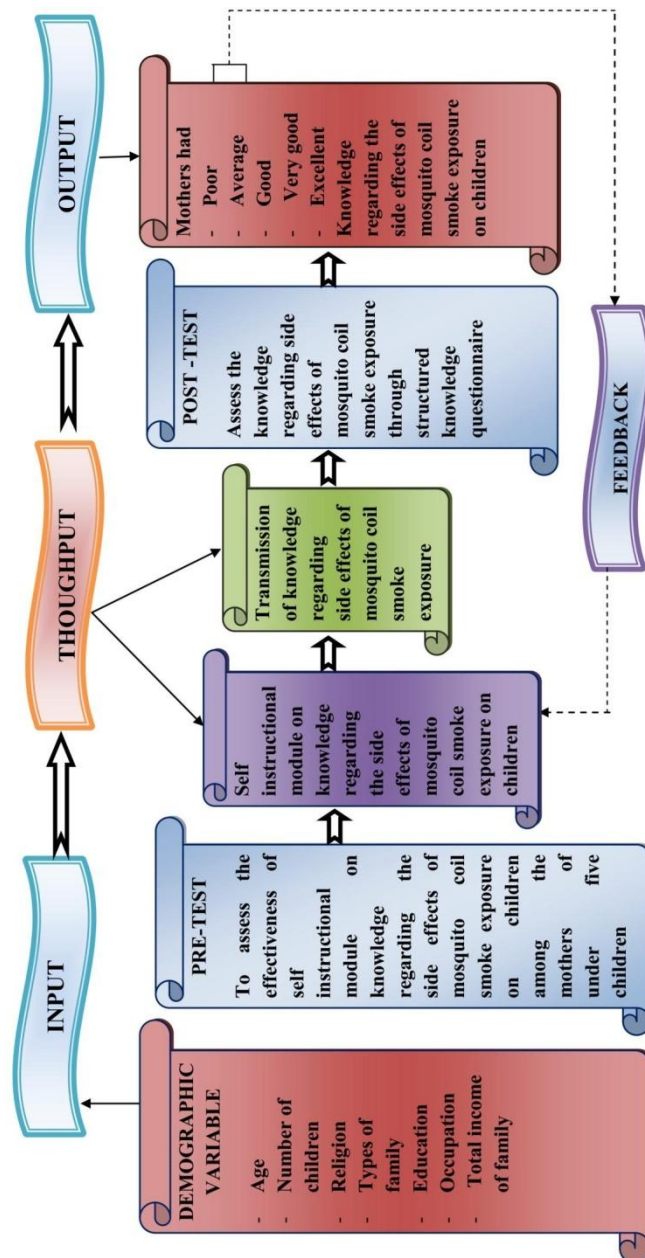


FIGURE 1: CONCEPTUAL FRAMEWORK BASED ON J. W. KENNY'S OPEN SYSTEM MODEL

SUMMARY

This section dealt with introduction, background of the study, need of the study, problem statement, objectives, hypothesis, assumption, operational definition, ethical considerations and conceptual framework.

II. Material And Methods

This prospective comparative study was carried out on patients of Department of immunization at J.R. Hospital, Gwalior, Madhya Pradesh from Jan 2015 to Jan 2016. A total 60 under five mothers were selected conveniently to suit the study.

- **STUDY LOCATION** This was a tertiary care teaching hospital based study done in Department of immunization at J.R. Hospital, Gwalior, Madhya Pradesh.
- **STUDY DURATION** Jan 2015 to Jan 2016
- **RESEARCH APPROACH:** Interventional approach
- **RESEARCH DESIGN:** The research design is One Group Pre Test Post Test Design
- **SAMPLE:** Under five mother.
- **SAMPLING TECHNIQUE:** Samples will be selected by Non-probability convenient sampling technique.
- **SAMPLE SIZE:** Sample size for this study is 100.
- **TOOL:** Structured knowledge questionarie including demographic variables and self instructional module was used for the study.

- **POPULATION**

The population is a complete set of individuals or objects that possess some common characteristics of interest to the researcher.

- **TARGET POPULATION**

Target population or universe is composed of the entire group of people or objects to which the researcher wishes to generalize the findings of study (Polit D.F 2004). The target population for the present study was under five mothers.

- **ACCESSIBLE POPULATION**

Accessible population is the aggregate of participants who confirm to the designated criteria and are accessible as a pool of subjects for a study (Polit and Beck 2004).

The accessible population for the study was under five mothers of selected area.

- **SETTING OF THE STUDY**

“Setting” refers to the area where the study is conducted. The setting of this proposed study was under five mothers of selected area.

The study was conducted in selected area of Department of immunization at J.R. Hospital, Gwalior, Madhya Pradesh.

- **SAMPLING TECHNIQUE**

“Sampling refers to the process of selecting of portion of the population to represent the entire population”.

The sampling technique used in this study was non- probability convenient sampling. According to Polit and Hungler convenient sampling entails the selection of the most readily available persons as subject in the study. The advantages of non-probability convenient sampling are that it represents typical condition and researcher’s knowledge about population and its elements can be used to do hand pick cases.

In this study, the sampling technique used was non-probability convenient sampling, the selection of sample depended upon the ready availability and fulfillment of the inclusion criteria until a designed size of sixty population was reached. The investigator preferred to choose this sampling technique because of the constraint of time in order to complete the data collection within the stipulated time.

INCLUSION CRITERIA

Mothers:

- i. Those who are available at the time of data collection.
- ii. Those who are willing to participate in the study.
- iii. Those who can read and write English, Marathi or Hindi.

EXCLUSION CRITERIA

Mothers :

- i. Those who have attended similar programs within 3 years.
- ii. Those who belongs to health profession.
- iii. Those who are mentally ill.

PROCEDURE / RESEARCH METHODOLOGY

“The research methodology refers to set of orderly disciplined procedure involved in the purposeful collection, analyses and interpretation of the data.”

Research methodology defines what the activity of research is, how to proceed, how to measure progress, and what constitutes success. The methodological decision paves crucial implication for validity and credibility of the study findings. Methodology of research indicates the general pattern for organizing the procedure for the empirical study together with the method of obtaining valid and reliable data for an investigation.

It includes research approach, research design, identification of target and assessible population, sampling technique, sample size, inclusion and exclusion criteria, tool preparation, and feasibility of the study, pilot study, validity, reliability, data collection and method of data collection. Research design helps the researcher to plan of performing research. It also helps the researcher for selection of subject, manipulation of experimental variables, control of extraneous variables, procedure for data collection and the type of statistical analysis to be used to interpret the data.(**ABDELLA G 1979**)



FIGURE 2: Schematic presentation of one group pre test and post test design for the present study

RESEARCH APPROACH

Interventional approach was used in this study. This approach was selected because the aim of this research study was to assess the knowledge of under five mothers regarding side effects of mosquito coil smoke exposure after pre test and post test.⁴⁴

RESEARCH DESIGN

According to Polit and Hungler research design is an overall plan as in how to obtain answer to the question being studied and how to handle some of the difficulties encountered during research process.

A one group pretest and posttest design was chosen for the study.

In the present study a pre test was administered by means of structural questionnaire depicted as O_1 and then self instructional module given depicted as X , a post test was conducted using the same structured depicted O_2 . The design was depicted as

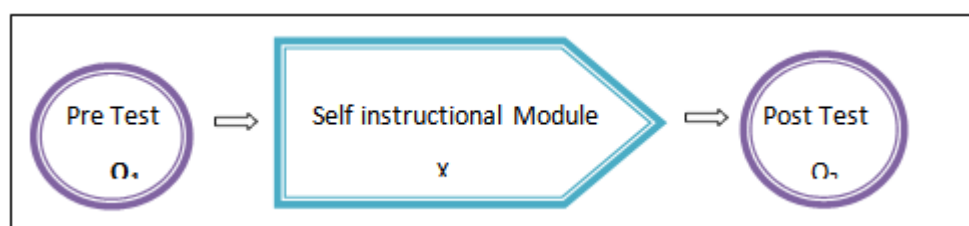


FIGURE 3: Schematic diagram of one group pre-test- post-test des

POPULATION

The population is a complete set of individuals or objects that possess some common characteristics of interest to the researcher.

TARGET POPULATION

Target population or universe is composed of the entire group of people or objects to which the researcher wishes to generalize the findings of study (Polit D.F 2004). The target population for the present study was under five mothers.

ACCESSIBLE POPULATION

Accessible population is the aggregate of participants who confirm to the designated criteria and are accessible as a pool of subjects for a study (Polit and Beck 2004).

The accessible population for the study was under five mothers of selected area.

SETTING OF THE STUDY

“Setting” refers to the area where the study is conducted. The setting of this proposed study was under five mothers of selected area.

The study was conducted in selected area of gajanan nagar arvi naka wardha.

SAMPLING TECHNIQUE

“Sampling refers to the process of selecting of portion of the population to represent the entire population”.

The sampling technique used in this study was non- probability convenient sampling. According to Polit and Hungler convenient sampling entails the selection of the most readily available persons as subject in the study.

The advantages of non-probability convenient sampling are that it represents typical condition and researcher’s knowledge about population and its elements can be used to do hand pick cases.

In this study, the sampling technique used was non-probability convenient sampling, the selection of sample depended upon the ready availability and fulfillment of the inclusion criteria until a designed size of sixty population was reached. The investigator preferred to choose this sampling technique because of the constraint of time in order to complete the data collection within the stipulated time.

Statistical analysis / DATA ANALYSIS AND INTERPRETATION

This chapter deals with analysis and interpretation of the data collected for this study. Analysis and interpretation was done based on objective of the study. The data was analyzed and is presented in the following section.

Statement:- To assess the effectiveness of self instructional module on knowledge regarding the side effects of mosquito coil smoke exposure on children among the mothers of under five children.

OBJECTIVES OF THE STUDY:

To assess the existing knowledge of mothers of under five children regarding side effects of mosquito coil smoke exposure.

- To evaluate the effectiveness of self instructional module on knowledge regarding side effects of mosquito coil smoke exposure on children among the mothers of under five children.
- To associate the post test knowledge scores with selected demographic variables.

HYPOTHESIS

H₁- There is significant difference in the knowledge score of mothers of under five children regarding the side effects of mosquito coil smoke exposure.

H₀- There is no significant difference in the knowledge score of mothers of under five children regarding the side effects of mosquito coil smoke exposure.

ORGANIZATION OF FINDINGS

Section I Demographic variables.

Section II Structured knowledge questionnaire regarding mosquito borne diseases.

Section III Structured knowledge questionnaire regarding mosquito coil.

Section IV Structured knowledge questionnaire regarding side effects of mosquito coil smoke exposure.

SECTION I

DISTRIBUTION OF SUBJECTS WITH REGARD TO THEIR DEMOGRAPHIC VARIABLES.

This section deals with percentage wise distribution of subjects according to their demographic variables. A convenience sample of 60 subjects were drawn from the study population, who were selected from selected urban area of Wardha district, the data was obtained to describe the subject characteristics including age, number of children, religion, types of family, education of mother, occupation of mother, total income of family.

Table No. 3: Percentage wise distribution of under five mothers with regards to selected demographic variables. n =60

Sr.no.	Demographic variable	Frequency	Percentage (%)
1.	AGE		
	20-24 years	20	33.33%
	25-29 years	21	35%
	30-34 years	16	26.67%
	More than 35 years	3	5%
2.	NUMBER OF CHILDREN		
	One	27	45%
	Two	21	35%
	Three	12	20%
	More than three	0	0%
3	RELIGION		
	Hindu	28	46.67%
	Muslim	10	16.67%
	Christian	2	3.33%
	Buddhist	20	33.33%
	Sikh	0	0%
	Others	0	0%
4	TYPES OF FAMILY		
	Nuclear	31	51.67%
	Joint	20	33.33%
	Extended	9	15%
5.	EDUCATION OF MOTHER		
	Primary education	2	3.33%
	Secondary education	17	28.33%
	Higher secondary education	23	38.33%
	Graduation	13	21.67%
	Post graduation and above	5	8.33%
6.	OCCUPATION OF MOTHER		
	Home maker	20	33.33%
	Daily wages	18	30%
	Government employee	5	8.33%
	Private employee	15	25%

	Self employed	2	3.33%
7.	TOTAL INCOME OF FAMILY		
	Rs < 5000	0	0%
	Rs. 5001-10,000	18	30%
	Rs. 10,001-15000	22	36.67%
	Rs. 15001 and above	20	33.33%

- Distribution of mothers according to their age in years shows that 33.33% of them belongs to 20-24years, 35% of them belongs to 25-29years, 26.67% of them belongs to 30-34 years, 5% of them belongs to more than 35 years respectively.
- Distribution of mothers according to their number of children shows that 45% of them have one child, 35% of them have two children’s, 20% of them have three children’s, 0% of them have more than three children’s respectively.
- Distribution of mothers according to their religion shows that 46.67% % belongs to Hindu religion, 16.67% belongs to Muslim religion, 3.33% belongs to Christian religion , 33.33 % belongs to Buddhist religion, 0% of them belongs to Sikh religion and 0% of them belongs to others respectively .
- Distribution of mothers according to their types of family shows that 51.67% belongs to nuclear family, 33.33% belongs to joint family, 15% belongs to extended family respectively.
- Distribution of mothers according to their education shows that 3.33% of them were educated up to primary education, 28.33% were educated up to secondary education, 38.33% were educated up to higher secondary education, 21.67% were graduate, 8.33% were post graduate respectively.
- Distribution of mothers according to their occupation shows that 33.33% were homemaker, 30% of them works on daily wages, 8.33% of them were government employee, 25% were private employee and 3.33% of them were self employed respectively.
- Distribution of mothers according to their family monthly income shows that 0% were belongs to Rs. <5000/-, 30 % were belongs to Rs.5001-10001/-, 36.67% were belongs to Rs.10001-15000/-33.33 % were belongs to Rs 150001/- and above respectively.

SECTION II PART A

Assessment of existing knowledge regarding side effect of mosquito coil smoke exposure on children among the mothers of under five children

This section deals with the assessment of knowledge regarding side effect of mosquito coil smoke exposure on children among the mothers of under five children

Table 4: Existing knowledge regarding side effects of mosquito coil smoke exposure n=60

Level of knowledge score	Score	Percentage score	Pretest score	
			Frequency	Percentage
Poor	0-5	0-20%	4	6.67%
Average	6-10	21-40%	38	63.33%
Good	11-15	41-60%	18	30%
Very good	16-20	61-80%	0	0%
Excellent	21-25	81-100%	0	0%
Minimum score	6			
Maximum score	18			
Mean score	11.93±2.530			
Mean Percentage	47.72			

The above table shows that 0% of the mothers had poor knowledge, 18 (50%) mothers had average knowledge, 38 (63.33%) mothers had good knowledge, 4 (6.67%) of the mothers had very good and 0% of mothers had excellent knowledge regarding side effects of mosquito coil smoke exposure. The minimum score was 6 and the maximum score was 18. The mean score was 11.93± 2.530 with a mean percentage score of 47.72.

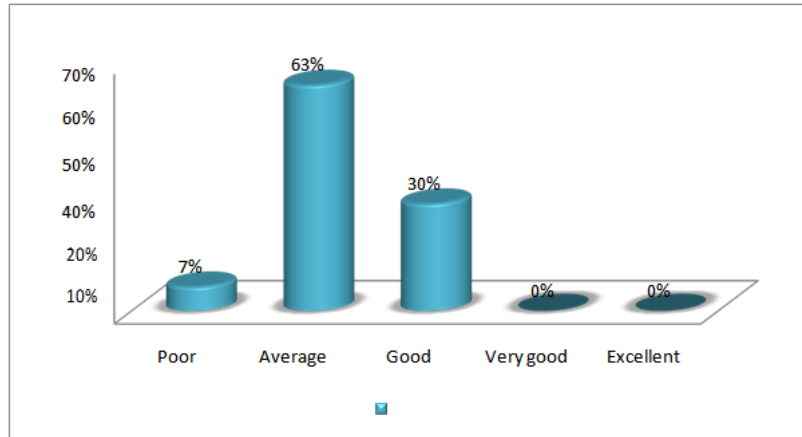


Figure No. 4: Knowledge score regarding side effects of mosquito coil smoke exposure among under five mothers in Pre test

PART B

Assessment of posttest knowledge regarding side effect of mosquito coil smoke exposure on children among the mothers of under five children

This section deals with the assessment of posttest knowledge regarding side effect of mosquito coil smoke exposure on children among the mothers of under five children

Table 5: Existing knowledge regarding side effects of mosquito coil smoke exposure n=60

Level of knowledge score	Score	Percentage score	Posttest score	
			Frequency	Percentage
Poor	0-5	0-20%	0	0%
Average	6-10	21-40%	0	0%
Good	11-15	41-60%	12	20%
Very good	16-20	61-80%	44	73.33%
Excellent	21-25	81-100%	4	6.67%
Minimum score	13			
Maximum score	22			
Mean score	17.47±2.221			
Mean Percentage	69.88			

The above table shows that 0% of mothers had poor level of knowledge score is, 0% of mothers had average level of knowledge score, 12 (20%) of mothers had good level of knowledge score, 44(73.33%) of mothers had very good level of knowledge, 4 (6.67%) had excellent level of knowledge. The minimum score was 13 and the maximum score was 22, the mean score was 17.47±2.221with a mean percentage score of 69.88%.

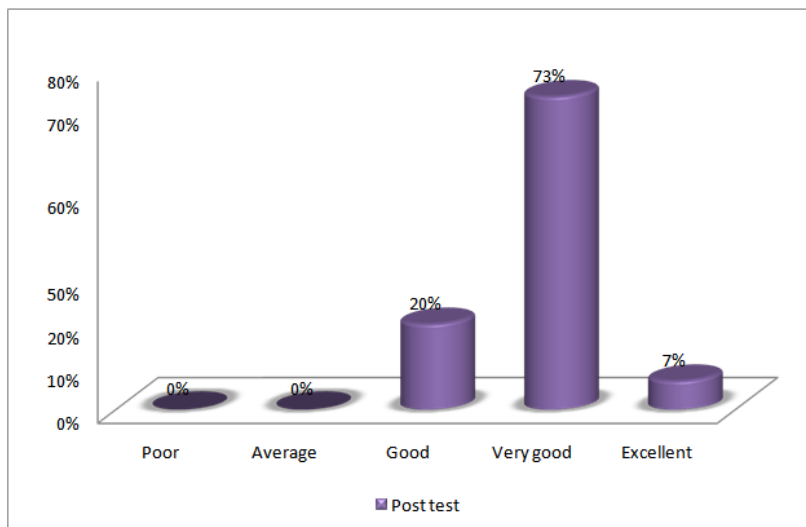


Figure No. 5: Knowledge score regarding side effects of mosquito coil smoke exposure among under five mothers in Post test

SECTION III

The effectiveness of self instructional module on knowledge regarding side effect of mosquito coil smoke exposure on children among the mothers of under five children

Table 6: Percentage wise distribution of Effectiveness of self instructional module on knowledge regarding side effect of mosquito coil smoke exposure on children among the mothers of under five children

Tests	Mean	SD	t-value	Degree of freedom	p-value	Significant
Pre Test	11.93	2.530	12.767	59	0.00	S, p<0.05
Post Test	17.47	2.221				

The table shows the significant difference between pretest and post test knowledge scores. Mean knowledge score in pre test is 11.93 and in post test it is 17.47 and standard deviation values of pre test is 2.530 and post test is 2.221. The calculated t- value is 12.767 and the tabulated t-value is 2.02 and p-value is 0.00. Hence it is statistically interpreted that the self instructional module on knowledge regarding the side effect of mosquito coil smoke exposure was effective. Thus the H₁ is accepted and H₀ is rejected.

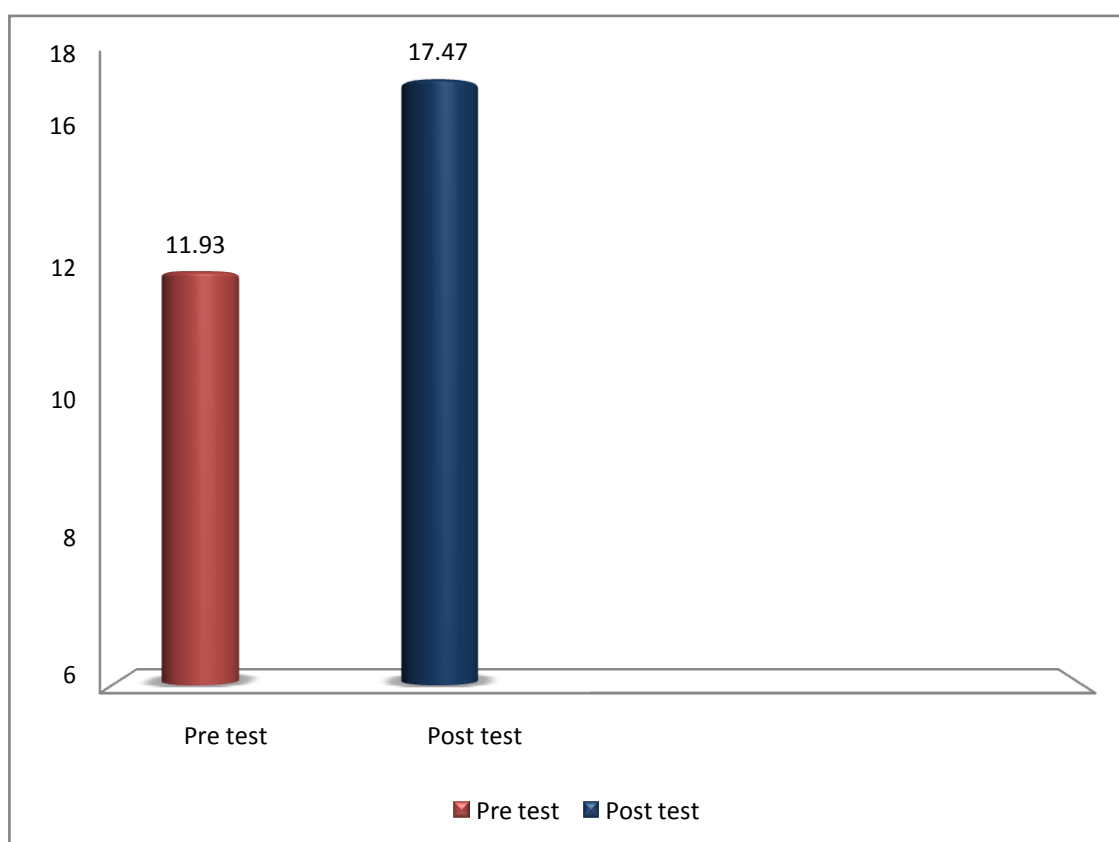


Figure No. 6: Effectiveness of self instructional module on knowledge regarding side effects of mosquito coil smoke exposure among under five mothers

SECTION IV

ASSOCIATION OF KNOWLEDGE SCORE WITH SELECTED DEMOGRAPHIC VARIABLES.

Table 7: Significance of association of knowledge in relation to age. n=60

Age (yrs)	Frequency	Mean knowledge score	f-value	P value
20-24 years	20	16.65±2.089	0.568	0.638
25-29 years	21	17.71±2.531		
30-34 years	16	17.81±2.136		
More than 35 years	3	17.33±1.528		

The table shows the association of knowledge scores with the age of samples. The „f* was calculated 0.568 at 5% level of significance with df 3,56 Also calculated „p*=0.638 which was more than the acceptable

level of significance i.e. „p“=0.05. Hence it is interpreted that the age of samples is significantly not associated with their knowledge scores

Table 8: Significance of association of knowledge in relation to number of children. n=60

Number of children	Frequency	Mean knowledge score	f-value	p-value
One	27	17.56±2.063	0.045	0.956 NS, p>0.05
Two	21	17.43±2.638		
Three	12	17.33±1.923		
More than three	0	0.00±0.00		

The table shows the association of knowledge scores with the number of children of samples. The „f“ was calculated 0.045 at 5% level of significance with df 2,57 Also calculated „p“= 0.956 which was more than the acceptable level of significance i.e.

„p“=0.05. Hence it is interpreted that the number of children of samples is significantly not associated with their knowledge scores.

Table 9: Significance of association of knowledge in relation to religion n=60

Religion	Frequency	Mean knowledge score	f-value	p-value
Hindu	28	17.36±2.231	0.224	0.879 NS, p>0.05
Muslim	10	18.00±2.211		
Christian	2	17.50±0.707		
Buddhist	20	17.35±2.390		
Sikh	0	0.00±0.00		
Others	0	0.00±0.00		

The table shows the association of knowledge scores with the religion of samples. The „f“ was calculated 0.224 at 5% level of significance with df 3,56 Also calculated

„p“= 0.879 which was more than the acceptable level of significance i.e. „p“=0.05. Hence it is interpreted that the religion of samples is significantly not associated with their knowledge scores.

Table 10: Significance of association of knowledge in relation to types of family n=60

Types of family	Frequency	Mean knowledge score	f-value	p-value
Nuclear	31	17.13±1.979	1.465	0.240 NS, p>0.05
Joint	20	17.50±2.351		
Extended	9	18.56±2.603		

The table shows the association of knowledge scores with the types of family of samples. The „f“ was calculated 1.465 at 5% level of significance with df 2,57 Also calculated „p“= 0.240 which was more than the acceptable level of significance i.e.

„p“=0.05. Hence it is interpreted that the types of family of samples is significantly not associated with their knowledge scores.

Table 11: Significance of association of knowledge in relation to education of mother

n=60

Education of mother	Frequency	Mean knowledge score	f-value	p-value
Primary education	2	16.50±2.121	1.355	0.261 NS, p>0.05
Secondary education	17	17.53±2.528		
Higher secondary education	23	17.70±2.098		
Graduation	13	16.54±2.184		
Post graduation and above	5	19.00±1.00		

The table shows the association of knowledge scores with the education of mother of samples. The „f“ was calculated 1.355 at 5% level of significance with df 4,55 Also calculated „p“= 0.261 which was more than the acceptable level of significance i.e.

„p“=0.05. Hence it is interpreted that the education of mother of samples is not significantly associated with their knowledge scores.

Table 12: Significance of association of knowledge in relation to occupation of mother

n=60

Occupation of mother	Frequency	Mean knowledge score	f -value	p-value
Home maker	20	17.70±2.473	0.677	0.611 NS, p>0.05
Daily wages	18	17.94±2.209		
Government employee	5	16.60±1.817		
Private employee	15	16.93±2.120		
Self employed	2	17.00±1.414		

The table shows the association of knowledge scores with the occupation of mother of samples. The „f“ was calculated 0.677 at 5% level of significance with df 4,55 Also calculated „p“= 0.611 which was more than the acceptable level of significance i.e.

„p“=0.05. Hence it is interpreted that the occupation of mother of samples is significantly not associated with their knowledge scores.

Table 13: Significance of association of knowledge in relation to total income of family

n=60

Total income of family	Frequency	Mean knowledge score	f-value	p-value
Rs. <5000	0	0.00±0.00	0.603	0.551 NS, p>0.05
Rs. 5001-10,000	18	17.83±2.065		
Rs. 10,001-15000	22	17.55±2.345		

The table shows the association of knowledge scores with the total income of family of samples. The „f“ was calculated 0.603 at 5% level of significance with df 2,57 Also calculated „p“= 0.551 which was more than the acceptable level of significance i.e.

„p“=0.05. Hence it is interpreted that the total income of family of samples is significantly not associated with their knowledge scores.

SUMMARY

This chapter deals with the analysis and interpretation of the calculated data the descriptive statistics and inferential statistics are used to analyze the data as per the objective of the study. All relevant information regarding research findings is covered in this chapter.

ORGANIZATION OF FINDINGS

Section I Demographic variables.

Section II Structured knowledge questionnaire regarding mosquito borne diseases.

Section III Structured knowledge questionnaire regarding mosquito coil.

Section IV Structured knowledge questionnaire regarding side effects of mosquito coil smoke exposure.

SECTION I

DISTRIBUTION OF SUBJECTS WITH REGARD TO THEIR DEMOGRAPHIC VARIABLES.

This section deals with percentage wise distribution of subjects according to their demographic variables. A convenience sample of 60 subjects were drawn from the study population, who were selected from selected urban area of Wardha district, the data was obtained to describe the subject characteristics including age, number of children, religion, types of family, education of mother, occupation of mother, total income of family.

Table No. 3: Percentage wise distribution of under five mothers with regards to selected demographic variables. n =60

Sr.no.	Demographic variable	Frequency	Percentage (%)
1.	AGE		
	20-24 years	20	33.33%
	25-29 years	21	35%
	30-34 years	16	26.67%
	More than 35 years	3	5%
2.	NUMBER OF CHILDREN		
	One	27	45%
	Two	21	35%

	Three	12	20%
	More than three	0	0%
3.	RELIGION		
	Hindu	28	46.67%
	Muslim	10	16.67%
	Christian	2	3.33%
	Buddhist	20	33.33%
	Sikh	0	0%
	Others	0	0%
4.	TYPES OF FAMILY		
	Nuclear	31	51.67%
	Joint	20	33.33%
	Extended	9	15%
5.	EDUCATION OF MOTHER		
	Primary education	2	3.33%
	Secondary education	17	28.33%
	Higher secondary education	23	38.33%
	Graduation	13	21.67%
	Post graduation and above	5	8.33%
6.	OCCUPATION OF MOTHER		
	Home maker	20	33.33%
	Daily wages	18	30%
	Government employee	5	8.33%
	Private employee	15	25%
	Self employed	2	3.33%
7.	TOTAL INCOME OF FAMILY		
	Rs < 5000	0	0%
	Rs. 5001-10,000	18	30%
	Rs. 10,001-15000	22	36.67%
	Rs. 15001 and above	20	33.33%

- Distribution of mothers according to their age in years shows that 33.33% of them belongs to 20-24years, 35% of them belongs to 25-29years, 26.67% of them belongs to 30-34 years, 5% of them belongs to more than 35 years respectively.
- Distribution of mothers according to their number of children shows that 45% of them have one child, 35% of them have two children"s, 20% of them have three children"s, 0% of them have more than three children"s respectively.
- Distribution of mothers according to their religion shows that 46.67% % belongs to Hindu religion, 16.67% belongs to Muslim religion, 3.33% belongs to Christian religion , 33.33 % belongs to Buddhist religion, 0% of them belongs to Sikh religion and 0% of them belongs to others respectively .
- Distribution of mothers according to their types of family shows that 51.67% belongs to nuclear family, 33.33% belongs to joint family, 15% belongs to extended family respectively.
- Distribution of mothers according to their education shows that 3.33% of them were educated up to primary education, 28.33% were educated up to secondary education, 38.33% were educated up to higher secondary education, 21.67% were graduate, 8.33% were post graduate respectively.
- Distribution of mothers according to their occupation shows that 33.33% were homemaker, 30% of them works on daily wages, 8.33% of them were government employee, 25% were private employee and 3.33% of them were self employed respectively.
- Distribution of mothers according to their family monthly income shows that 0% were belongs to Rs. <5000/-, 30 % were belongs toRs.5001-10001/-, 36.67% were belongs to Rs.10001-15000/-33.33 % were belongs to Rs 150001/- and above respectively.

SECTION II PART A

Assessment of existing knowledge regarding side effect of mosquito coil smoke exposure on children among the mothers of under five children

This section deals with the assessment of knowledge regarding side effect of mosquito coil smoke exposure on children among the mothers of under five children

Table 4: Existing knowledge regarding side effects of mosquito coil smoke exposure

n=60

Level of knowledge score	Score	Percentage score	Pretest score	
			Frequency	Percentage
Poor	0-5	0-20%	4	6.67%
Average	6-10	21-40%	38	63.33%
Good	11-15	41-60%	18	30%
Very good	16-20	61-80%	0	0%
Excellent	21-25	81-100%	0	0%
Minimum score	6			
Maximum score	18			
Mean score	11.93±2.530			
Mean Percentage	47.72			

The above table shows that 0% of the mothers had poor knowledge, 18 (50%) mothers had average knowledge, 38 (63.33%) mothers had good knowledge, 4 (6.67%) of the mothers had very good and 0% of mothers had excellent knowledge regarding side effects of mosquito coil smoke exposure. The minimum score was 6 and the maximum score was 18. The mean score was 11.93± 2.530 with a mean percentage score of 47.72.

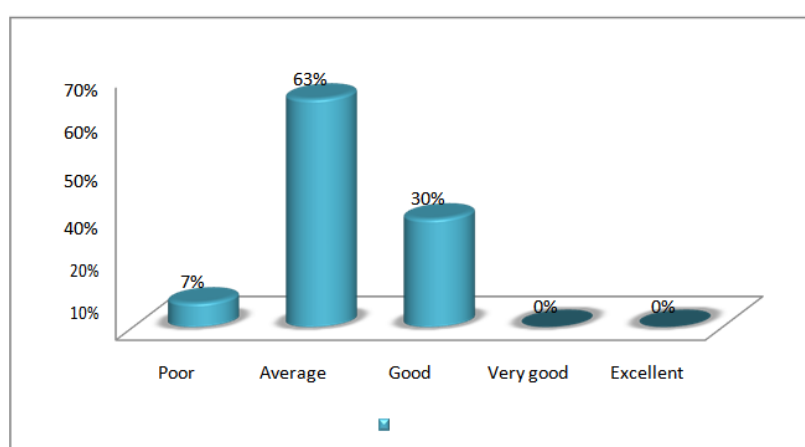


Figure No. 4: Knowledge score regarding side effects of mosquito coil smoke exposure among under five mothers in Pre test

PART B

Assessment of posttest knowledge regarding side effect of mosquito coil smoke exposure on children among the mothers of under five children

This section deals with the assessment of posttest knowledge regarding side effect of mosquito coil smoke exposure on children among the mothers of under five children

Table 5: Existing knowledge regarding side effects of mosquito coil smoke exposure

n=60

Level of knowledge score	Score	Percentage score	Posttest score	
			Frequency	Percentage
Poor	0-5	0-20%	0	0%
Average	6-10	21-40%	0	0%
Good	11-15	41-60%	12	20%
Very good	16-20	61-80%	44	73.33%
Excellent	21-25	81-100%	4	6.67%
Minimum score	13			
Maximum score	22			
Mean score	17.47±2.221			
Mean Percentage	69.88			

The above table shows that 0% of mothers had poor level of knowledge score is, 0% of mothers had average level of knowledge score, 12 (20%) of mothers had good level of knowledge score, 44(73.33%) of mothers had very good level of knowledge, 4 (6.67%) had excellent level of knowledge. The minimum score was 13 and the maximum score was 22, the mean score was 17.47±2.221with a mean percentage score of 69.88%.

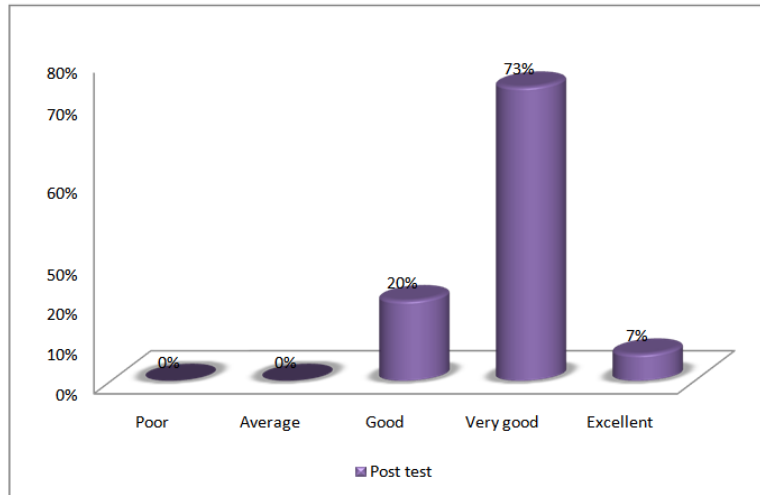


Figure No. 5: Knowledge score regarding side effects of mosquito coil smoke exposure among under five mothers in Post test

SECTION III

The effectiveness of self instructional module on knowledge regarding side effect of mosquito coil smoke exposure on children among the mothers of under five children

Table 6: Percentage wise distribution of Effectiveness of self instructional module on knowledge regarding side effect of mosquito coil smoke exposure on children among the mothers of under five children

Tests	Mean	SD	t-value	Degree of freedom	p-value	Significant
Pre Test	11.93	2.530	12.767	59	0.00	S, p<0.05
Post Test	17.47	2.221				

The table shows the significant difference between pretest and post test knowledge scores. Mean knowledge score in pre test is 11.93 and in post test it is 17.47 and standard deviation values of pre test is 2.530 and post test is 2.221. The calculated t- value is 12.767 and the tabulated t-value is 2.02 and p-value is 0.00. Hence it is statistically interpreted that the self instructional module on knowledge regarding the side effect of mosquito coil smoke exposure was effective. Thus the H_1 is accepted and H_0 is rejected.

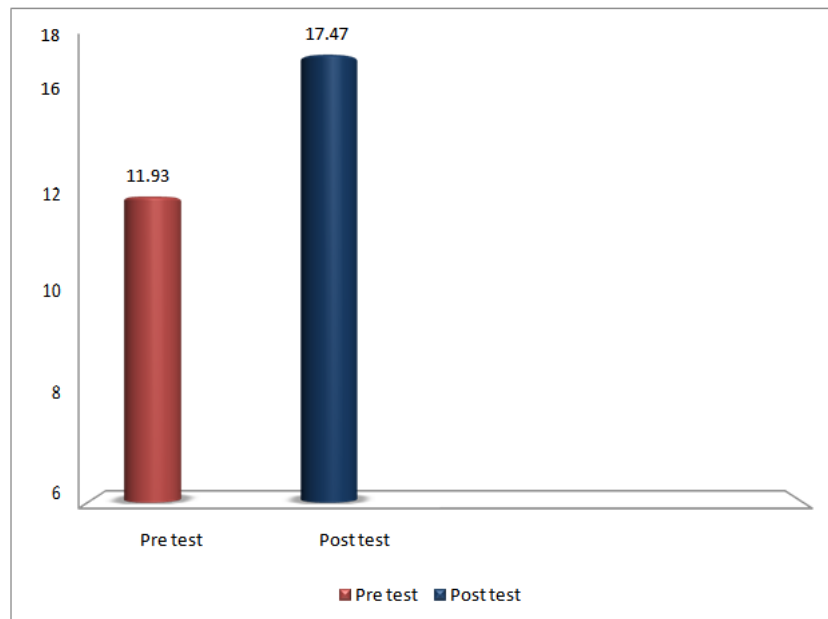


Figure No. 6: Effectiveness of self instructional module on knowledge regarding side effects of mosquito coil smoke exposure among under five mothers

SECTION IV

ASSOCIATION OF KNOWLEDGE SCORE WITH SELECTED DEMOGRAPHIC VARIABLES.

Table 7: Significance of association of knowledge in relation to age.

n=60

Age (yrs)	Frequency	Mean knowledge score	f-value	P value
20-24 years	20	16.65±2.089	0.568	0.638 NS, p>0.05
25-29 years	21	17.71±2.531		
30-34 years	16	17.81±2.136		
More than 35 years	3	17.33±1.528		

The table shows the association of knowledge scores with the age of samples. The „f“ was calculated 0.568 at 5% level of significance with df 3,56 Also calculated „p“=0.638 which was more than the acceptable level of significance i.e. „p“=0.05. Hence it is interpreted that the age of samples is significantly not associated with their knowledge scores

Table 8: Significance of association of knowledge in relation to number of children.

n=60

Number of children	Frequency	Mean knowledge score	f-value	p-value
One	27	17.56±2.063	0.045	0.956 NS, p>0.05
Two	21	17.43±2.638		
Three	12	17.33±1.923		
More than three	0	0.00±0.00		

The table shows the association of knowledge scores with the number of children of samples. The „f“ was calculated 0.045 at 5% level of significance with df 2,57 Also calculated „p“= 0.956 which was more than the acceptable level of significance i.e.

„p“=0.05. Hence it is interpreted that the number of children of samples is significantly not associated with their knowledge scores.

Table 9: Significance of association of knowledge in relation to religion

n=60

Religion	Frequency	Mean knowledge score	f -value	p-value
Hindu	28	17.36±2.231	0.224	0.879 NS, p>0.05
Muslim	10	18.00±2.211		
Christian	2	17.50±0.707		
Buddhist	20	17.35±2.390		
Sikh	0	0.00±0.00		
Others	0	0.00±0.00		

The table shows the association of knowledge scores with the religion of samples. The „f“ was calculated 0.224 at 5% level of significance with df 3,56 Also calculated

„p“= 0.879 which was more than the acceptable level of significance i.e. „p“=0.05. Hence it is interpreted that the religion of samples is significantly not associated with their knowledge scores.

Table 10: Significance of association of knowledge in relation to types of family

n=60

Types of family	Frequency	Mean knowledge score	f -value	p-value
Nuclear	31	17.13±1.979	1.465	0.240 NS, p>0.05
Joint	20	17.50±2.351		
Extended	9	18.56±2.603		

The table shows the association of knowledge scores with the types of family of samples. The „f“ was calculated 1.465 at 5% level of significance with df 2,57 Also calculated „p“= 0.240 which was more than the acceptable level of significance i.e.

„p“=0.05. Hence it is interpreted that the types of family of samples is significantly not associated with their knowledge scores.

Table 11: Significance of association of knowledge in relation to education of mother

n=60

Education of mother	Frequency	Mean knowledge score	f -value	p-value
Primary education	2	16.50±2.121	1.355	0.261 NS, p>0.05
Secondary education	17	17.53±2.528		
Higher secondary education	23	17.70±2.098		
Graduation	13	16.54±2.184		
Post graduation and above	5	19.00±1.00		

The table shows the association of knowledge scores with the education of mother of samples. The „f“ was calculated 1.355 at 5% level of significance with df 4,55 Also calculated „p“= 0.261 which was more than the acceptable level of significance i.e.

„p“=0.05. Hence it is interpreted that the education of mother of samples is not significantly associated with their knowledge scores.

Table 12: Significance of association of knowledge in relation to occupation of mother

n=60

Occupation of mother	Frequency	Mean knowledge score	f -value	p-value
Home maker	20	17.70±2.473	0.677	0.611 NS, p>0.05
Daily wages	18	17.94±2.209		
Government employee	5	16.60±1.817		
Private employee	15	16.93±2.120		
Self employed	2	17.00±1.414		

The table shows the association of knowledge scores with the occupation of mother of samples. The „f“ was calculated 0.677 at 5% level of significance with df 4,55 Also calculated „p“= 0.611 which was more than the acceptable level of significance i.e.

„p“=0.05. Hence it is interpreted that the occupation of mother of samples is significantly not associated with their knowledge scores.

Table 13: Significance of association of knowledge in relation to total income of family

n=60

Total income of family	Frequency	Mean knowledge score	f-value	p-value
Rs. <5000	0	0.00±0.00	0.603	0.551 NS, p>0.05
Rs. 5001-10,000	18	17.83±2.065		
Rs. 10,001-15000	22	17.55±2.345		

The table shows the association of knowledge scores with the total income of family of samples. The „f“ was calculated 0.603 at 5% level of significance with df 2,57 Also calculated „p“= 0.551 which was more than the acceptable level of significance i.e.

„p“=0.05. Hence it is interpreted that the total income of family of samples is significantly not associated with their knowledge scores.

SUMMARY

This chapter deals with the analysis and interpretation of the calculated data the descriptive statistics and inferential statistics are used to analyze the data as per the objective of the study. All relevant information regarding research findings is covered in this chapter.

III. Result

This section deals with the Percentage wise distribution of under five mothers according to their demographic variables.

- Distribution of mothers according to their age in years shows that 33.33% of them belongs to 20-24years, 35% of them belongs to 25-29years, 26.67% of them belongs to 30-34 years, 5% of them belongs to more

than 35 years respectively.

- Distribution of mothers according to their number of children shows that 45% of them have one child, 35% of them have two children's, 20% of them have three children's, 0% of them have more than three children's respectively.
- Distribution of mothers according to their religion shows that 46.67% % belongs to Hindu religion, 16.67% belongs to Muslim religion, 3.33% belongs to Christian religion, 33.33 % belongs to Buddhist religion, 0% of them belongs to Sikh religion and 0% of them belongs to others respectively .
- Distribution of mothers according to their types of family shows that 51.67% belongs to nuclear family, 33.33% belongs to joint family, 15% belongs to extended family respectively.
- Distribution of mothers according to their education shows that 3.33% of them were educated up to primary education, 28.33% were educated up to secondary education, 38.33% were educated up to higher secondary education, 21.67% were graduate, 8.33% were post graduate respectively.
- Distribution of mothers according to their occupation shows that 33.33% were homemaker, 30% of them works on daily wages, 8.33% of them were government employee, 25% were private employee and 3.33% of them were self employed respectively.
- Distribution of mothers according to their family monthly income shows that 0% were belongs to Rs. <5000/-, 30 % were belongs to Rs.5001-10001/-, 36.67% were belongs to Rs.10001-15000/-, 33.33 % were belongs to Rs 150001/- and above respectively.
- The pretest score is 8 (6.67%) of the mothers had poor knowledge, 38 (63.33%) mothers had average knowledge , 18 (30%) mothers had good knowledge, 0% of the mothers had very good and 0% of mothers had excellent knowledge regarding side effects of mosquito coil smoke exposure. The mean score was 11.93 ± 2.530 with a mean percentage score of 47.72%.
- The post test score is 0% of mothers had poor level of knowledge score is, 0% of mothers had average level of knowledge score, 12 (20%) of mothers had good level of knowledge score, 44(73.33%) of mothers had very good level of knowledge, 4 (6.67%) had excellent level of knowledge. The minimum score was 13 and the maximum score was 22, the mean score was 17.47 ± 2.221 with a mean percentage score of 69.88%.

IV. Conclusion

In this study from detail analysis it shows that of post test mean score is 17.47 ± 2.221 and pretest mean score is 11.93 ± 2.530 . The hypothesis is tested statistically with distribution of pre test and post test mean, standard deviation and mean difference. There were significant no association between knowledge score with age, number of children, religion, types of family, education of mother, occupation of mother, total income of family respectively.

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