

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

**The Role of Health Education in improving the Utilization
of Insecticide treated net in Malaria Control among
- ElGazira State Sudan: 2007-2008 Mothers in Elhosh**

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قال تعالى :-

بسم الله الرحمن الرحيم

(وَإِذَا مَرَضْتُ فَبِهِوَ يَشْفِينُ)

صدق الله العظيم

سورة الشعراء الآية (80)

Dedication

To all members of my family with much love, especially my father, to pure soul of my mother, to my colleagues in Faculty of Public & Environmental Health.

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ABSTRACT

This study was conducted in El-hosh in El Gazira state, in order to assess the role of Health Education in improving knowledge, attitude and practices of mothers towards the utilization of insecticide treated nets in malaria control. A sample size of 329houses hold was determined using the following formula:n

$$\frac{z^2pq}{d^2}$$

The sample was selected randomly from the nine residential area. The intervention was carried out using lectures, small group discussion, posters and messages for a period of six months. and it was carried out in El-hosh high secondary school for girls and from house to house. The pretest was conducted using questionnaire to determine knowledge, attitude and practices of Mothers toward ITNs utility. posttest was also conducted using the same questionnaire to document effectiveness of the intervention, three months after intervention.

Data were collected using questionnaire to determine knowledge, attitude and practices of Mothers toward ITNs utility. Data were analysed manually using X2 test and the results were demonstrated in tables and figures. The most important results showed that: Knowledge of Mothers about

ITNs benefit was (77.3%) in pre-intervention .In post intervention stage became (80%) (significant), about the suitable time for erecting ITNs was (53%) before intervention, It become (66%) in post intervention phase (significant), about the effect of washing to nets effectiveness was (54%) before intervention and in post intervention phase increased to (59.2%) (not significant). The rate of Attitude of Mothers who think that the size of ITNs is unsuitable was (45%) before intervention, and become (40%) in post intervention stage(significant).

Mothers' practice towards keeping ITNs inside room was (69%), and in post intervention stage became (93%) (significant), About folding ITNs when keeping it was (56.7%) before intervention, It became (70.3%) in post intervention phase(significant) . And about erecting ITNs on sticks when using it was (80.3%) before intervention, It increased in post intervention phase to (97.9%) (significant).

The rate of Mothers who don't re- treat their nets after they washed it frequency washings was (60%), before intervention, it became (50%) after intervention process(significant). The rate of using ITNs had increased from (43.2%) before intervention process to (51%) after intervention process (significant).

Finally the study recommended the following:

1. To establish and continue health educations programme to increase and promote the knowledge and awareness of the mothers towards ITNs utilization.
2. To teach the utilizers about how to re-treat the net after frequency washings .
3. To continue provision of ITNs freely to the community to increase the rate of utilization.

مستخلص البحث

أجريت هذه الدراسة في منطقة الحوض ولاية الجزيرة بهدف تحديد دور التنقيف الصحي في تحسين استخدام الناموسيات المشبعة وسط الامهات لمكافحة الملاريا .

تم تحديد عينة الدراسة بواسطة استخدام المعادلة التالية :

$$N = \frac{Z^2XPXq}{d^2}$$

قد كان التدخل باستخدام محاضرات ومجموعات نقاش وملصقات ورسائل لتحسين المعرفة والموقف والممارسة لدي الامهات تجاه استخدام الناموسيات المشبعة كوسيلة لمكافحة الملاريا وقد استغرقت مدة التدخل ستة أشهر وقد أجري التدخل بمدرسة الحوش الثانوية بنات .

تم جمع البيانات بتصميم استبيان لتحديد معرفة وموقف وممارسة الأمهات للناموسيات المشبعة قبل وبعد التدخل .

تم تحليل البيانات يدوياً باستخدام اختبار χ^2 وقد تم توثيق النتائج برسوم بيانية وجداول وقد توصلت الدراسة للنتائج التالية :

معرفة الامهات عن فائدة الناموسية المشبعة كان (77.3%) قبل عملية التدخل وأصبح (80%) بعد عملية التدخل ، وأما من ناحية معرفة الوقت المناسب لتصب الناموسية المشبعة كان (53%) قبل عملية التدخل وأصبح (66%) بعد عملية التدخل وأما من ناحية معرفة أثر الغسيل علي فعالية الناموسية المشبعة فقد كان (54%) قبل عملية التدخل وأصبح (59.2%) بعد عملية التدخل .

موقف الامهات الايجابي تجاه حفظ الناموسية المشبعة داخل الغرفة كان (69%) قبل عملية التدخل أزداد الي (93%) بعد عملية التدخل . اما موقفهم من ناحية تطبيق الناموسية المشبعة عند حفظها كان (56.7%) قبل عملية التدخل ارتفع الي

(70.3%) بعد عملية التدخل ، أما موقفهم من ناحية نصب ناموسية المشبعة بالعصي عند استخدامها كان (80.3%) قبل التدخل ازداد الي (97.9%) بعد عملية التدخل وهناك نسبة (60%) من الامهات لا يشبعن الناموسية بالمبيد بعد غسلها أكثر من مرة وقد أصبحت هذه النسبة (50%) بعد عملية التدخل .
معدل استخدام الناموسية المشبعة بواسطة الأمهات قد زاد من (43.3%) قبل عملية التدخل إلى (51%) بعد عملية التدخل .

وقد أوصت الدراسة المسؤولين في المجال الصحي بالمنطقة بالآتي :

1. عمل برامج تثقيف صحي مستمرة لرفع مستوى المعرفة والوعي الصحي لدي الأمهات تجاه استخدام الناموسية المشبعة .
2. توفير مراكز لإعادة تشيع الناموسيات وإمدادها بالمبيد المناسب مع تعليم المستخدمين كيفية إعادة تشيع الناموسية بالمبيد المناسب .
3. توفير ناموسيات مشبعة ومجانا وبصورة متواصلة وباعداد كافية حتي تؤثر علي معدل الإستخدام .

1.1 INTRODUCTION:

Health Education: Education that increases the awareness and favorably influences the attitudes and knowledge relating to the improving of health on a personal or community basis (National Science Dictionary,2007-2008).

Malaria is a public health problem in more than 90 countries, inhabited by a total of some 2.4 billion people, representing about 40% of the world's population (WHO,1998).

Best estimates currently describe the annual global burden of malaria as: 1.1 million deaths, 300-500 million cases, 44 million disability adjusted life years (DALYs). It has been estimated that the economic burden is also extremely high, accounting for a reduction of 1.3% in the annual economic growth rate of malaria endemic countries, and that the long-term impact in these countries is a reduction of GNP of more than half(Sachs &el, 2002) .

Insecticide treated bed nets (ITNs) have a mean protective efficacy (of approximately 50%) against malaria episodes in highly endemic areas of Africa; and have also been found to reduce over all mortality among children by 63% in villages using impregnated bed nets ^(WHO,2005), so that it will to be more widely available. In the 1980s and 1990s controlled trials confirmed that ITNs reduce malaria morbidity and mortality. Four large – scale trials in the Gambia, Kenya, Ghana and Burkina Faso have shown the efficacy of ITNs under trial conditions, but more research is needed on the effectiveness of ITNs under real life conditions where social, cultural and economic factors influence routine use

and regular treatment of nets^(Minja& el, 2001) .

The strategies of malaria prevention in Sudan are: annual indoor residual house spraying (IRHS), larviciding with chemicals (LWC), space spraying and recently insecticide treated nets (ITNs). All of them are important components of current efforts to Roll Back Malaria (RBM)^(National malaria control team,2003) . ITNs as a tool for personal protection and vector control in Sudan was assessed in a pilot project early in 1990s .In 1996 UNICEF introduced innovated tool in the Upper Nile State as small scale pilot project^(محمد,2007) .

In Khartoum State the distribution of ITNs implemented through Ministry of Health in 1999 with little number of ITNs .In 2006 the total number of ITNs distributed through localities were 13500 nets Also there were many NGOs that distributed ITNs in the State^(محمد,2007) .

1.2 Justification:

Malaria rate is 32.6% among mothers in Elhosh annually so the locality is too happy to do the study in Elhosh.

Malaria is a major health problem in El-hosh its affects families income.

The use of ITNs are more better to control Malaria than using insecticide in this agricultural area.

The Objectives of the Study:

1.3.1 General objective:-

1. To assess the role of health education in improving knowledge, attitude and practices of mothers in ITNs utilization.

3.2 Specific objectives:

1- To identify role of health education in increasing knowledge about ITNs among mothers. The study valuables are

2- To investigate the role of health education in promoting the attitude among mothers toward the utilization of ITNs. The study valuables are

3- To measure the role of health education in increasing the utilization rate of ITNs among Mothers. The study valuables are

2. LITERATURE REVIEW

2.1 Health education: is "any combination of learning experiences designed to facilitate voluntary actions conducive to health." (Green et.1991).

2.2 Insecticide-Treated Bed Nets

Insecticide-treated bed nets (ITNs) are a form of personal protection that has repeatedly been shown to reduce severe disease and mortality due to malaria in endemic regions. In community-wide trials in several African settings, ITNs have been shown to reduce all-cause mortality by about 20%. (National center for zoonotic, vector-borne& enteric disease,(2008).

Untreated bed nets form a protective barrier around persons using them. However, mosquitoes can feed on people through the nets, and nets with even a few small holes provide little, if any, protection. The application of a residual insecticide greatly enhances the protective efficacy of bed nets. The insecticides used for treatment kill mosquitoes and other insects. The insecticides also have repellent properties that reduce the number of mosquitoes that enter the house and attempt to feed. In addition, if high community coverage is achieved, the numbers and longevity of mosquitoes will be reduced. When this happens, all members of

the community are protected, regardless of bed net ownership. To achieve such effects, (National center for zoonotic, vector-borne& enteric disease,(2008).

high community coverage is required, as for indoor residual spray. There are several types of nets available. Nets may vary by size, material, and/or treatment. Most nets are made of polyester but nets are also available in cotton, polyethylene, or polypropylene.

Currently, only pyrethroid insecticides are approved for use on ITNs. These insecticides have very low mammalian toxicity but are highly toxic to insects and have a rapid knock-down effect, even at very low doses. Pyrethroids have a high residual effect: they do not rapidly break down unless washed or exposed to sunlight ().National center for zoonotic, vector-borne& enteric disease,(2008).

Previously, nets had to be retreated at intervals of 6-12 months, more frequently if the nets were washed. Nets were retreated by simply dipping them in a mixture of water and insecticide and allowing them to dry in a shady place. The need for frequent re-treatment was a major barrier to full implementation of ITNs in endemic countries. The additional cost of the insecticide and the lack of understanding of its importance resulted in very low re-treatment rates in most African countries.

Insecticide-treated bed nets (ITNs) are now an important method for controlling malaria. Their protective effect will be strongest if they are used by a high proportion of the population at risk. How to achieve this high coverage is currently the object of a debate(12).

The Global Fund says insecticide-treated bed nets are one of the most cost-effective ways to prevent malaria transmission.

Recently published studies show a combination of bed nets and treatment can reduce malaria transmission by as much as 90 percent in areas with high coverage rates (Schlein, 2007).

Most malaria-carrying mosquitoes bite at night. Mosquito nets, if properly used and maintained, can provide a physical barrier to hungry mosquitoes. If treated with insecticide, the effectiveness of nets is greatly improved, generating a chemical halo that extends beyond the mosquito net itself. This tends to repel or deter mosquitoes from biting or shorten the mosquito s life span so that it cannot transmit malaria infection.

Trials of insecticide-treated nets (ITNs) in the 1980s and 1990s showed that ITNs reduced deaths in young children by an average of 20%. Unfortunately, ITNs can be expensive for families at risk of malaria, who are among the poorest in the world, and cost is not the only barrier to their effective use. Often people who are unfamiliar with ITNs, or who are not in the habit of using

them, need to be convinced of their usefulness and persuaded to re-treat the nets with insecticide on a regular basis (WHO, UNDP, UNICEF and the World Bank ,1998).

In some areas where mosquito nets are already widely used, it has been estimated that less than 5% are re-treated to achieve their expected impact. WHO has worked with mosquito net and insecticide manufacturers to make re-treatment as simple as possible. However, the best hope lies with newly developed, long-lasting treated nets which may retain their insecticidal properties for four to five years the life span of the net thus making retreatment unnecessary(WHO, UNDP, UNICEF and the World Bank ,1998).

One of the targets set at the Abuja Summit in April 2000 was to have 60% of populations at risk sleeping under ITNs by 2005. This will require 32 million mosquito nets and a similar number of insecticide re-treatments each year. To achieve this, much work still needs to be done to make ITNs affordable, widely available, and most importantly, appealing to the consumer. A variety of different approaches are being taken to promote ITN use, reduce their cost and ensure their quality: Social marketing schemes, health education campaigns and the development of a 'net culture' through promotion and publicity will all play their part in creating the necessary demand.

In the Abuja Declaration, African governments committed themselves to reduce or eliminate the tariffs and taxes imposed on mosquito nets, netting materials and insecticides, in order to help lower retail prices. Almost 20 countries have reduced or waived such taxes and tariffs since the summit.

Countries are also working to encourage the development of local industries and competition among them by ensuring private sector investment in manufacturing and importing mosquito nets.

Further government action in the form of targeted subsidies, or subsidy schemes, is needed to bring ITN prices down to a level affordable to the poorest families . Since many mosquito nets currently in use have been distributed by NGOs or other organizations, WHO has recently drawn up a set of standard specifications for netting materials to make the procurement and quality control of ITNs easier. The Strategic Framework for Coordinated National Action for Scaling-up Insecticide-treated Netting Programmes in Africa (WHO/CDS/RBM/2002.42) reviews some of the generic issues frequently encountered in Africa south of the Sahara, during the integration of public and private sector activities, including issues of financing and distribution, and how limited public sector resources can be best used to provide the maximum possible long-term health benefits (WHO, UNDP, UNICEF and the World Bank in 1998).

Promoting the use of ITNs:

The Roll Back Malaria global partnership promotes the use of ITNs for everyone at risk of malaria, especially children and pregnant women.

To promote the use of ITNs, RBM is working to:

Organize public education campaigns in malaria-endemic areas;

lobby for reduction or waiver of taxes and tariffs on mosquito nets, netting materials and insecticides;

stimulate local ITN industries and social marketing schemes so that nets are available at a price everyone can afford; and

capitalize on the potential of newly developed long-lasting treated mosquito nets (WHO, UNDP, UNICEF and the World Bank in 1998).

The use of insecticide-impregnated bed nets to minimize human-vector contact may reduce the incidence of malaria. Consequently, several field trials have evaluated their effectiveness as a malaria prevention strategy. A meta-analysis of published reports of field trials that measured the incidence of infections was performed to provide a measure of the effectiveness of insecticide-treated bed nets in preventing clinical malaria. Subsetted analyses

were performed on the 10 field trials to calculate pooled incidence rate ratios of infection among the study groups. For the studies comparing insecticide-impregnated bed nets with untreated bed nets, the summary incidence rate ratio for acquiring malarial infections was 0.757 (95% confidence interval [CI] = 0.612–0.938), representing a reduction of 24%. For the studies comparing permethrin-impregnated bed nets with controls without bed nets, the summary incidence rate ratio was 0.497 (95% CI = 0.417–0.592) (Rothman-Boice heterogeneity statistics = 17.27 [$P = 0.004$] and 23.55 [$P = 0.0003$], respectively). These data suggest that insecticide-impregnated bed nets are effective in preventing malaria, decreasing the incidence rate ratio by approximately 50% in field trials performed to date. **(Han W. Choi and el)**

Applying residual insecticide to fabrics to prevent vector-borne disease such as malaria and leishmaniasis began during World War I I, when the soviet, German, and US forces used insecticide –impregnated nets and clothing (WHO.IDRC, 1996). In the late 1970s, synthetic pyrethroids were found to be effective for this purpose –they are both highly insecticidal and of low toxicity to mammals (WHO/IDRC, 1996).

Early ITN studies demonstrated the safety of pyrethroids and the significant impact of ITNs on various entomological parameters, such as the feeding success of the vector, *Victoria* capacity, and

human-biting rates. These studies also helped define the action mechanism (repelling and killing) and optimal dosages for various combinations of netting and insecticide (WHO.IDRC, 1996).

2.2.1 Impact of ITNs on malaria morbidity:

A growing body of evidence suggests that ITNs use substantially affects the frequency and severity of clinical episodes of malaria. More than 20 studies have been done in the areas where malaria is endemic, including more than 12 in Africa. A systematic review of the evidence is beyond the scope of this population, and interested readers should consult Curtis (WHO.IDRC, 1996).

The epidemiologic design of ITNs morbidity trials conducted in Africa was suboptimal, and their results should be interpreted cautiously. It is worth noting that most studies document a reduction of 20-63% in malaria disease, (WHO.IDRC, 1996).

2.2.2 Impact of ITNs on malaria mortality:-

Given the major role of *p.falciparum* malaria as a direct and indirect cause of death in Africa children, the main public-health issue associated with ITNs is their effect on child mortality. Assessing the effect of intervention mortality requires very large, long-term and therefore costly trials.

In the first randomized, controlled trials of ITNs for mortality,

reported a 63% reduction in all mortality in children 1-4 Years old, (WHO.IDRC, 1996).

2.2.3 Current use of nets:

Although information about sub-Saharan Africa is relatively sparse, it is clear that there is great variation, not only in the proportion of household using nets in given area but also in the proportion of use within households. Bed nets use seems to be higher in West Africa, especially The Gambia, than in East Africa and higher in cities than in rural areas.

A nationwide survey of 360 compounds in rural areas of the Gambia, carried out during the high mosquito season of 1991, indicated high levels of nets use: 58% of the 867 beds enumerated had a net, (WHO.IDRC, 1996). Net use was higher in the central region (79% of 1293 beds enumerated, with more than 90% of those used by pregnant women and young children) than in eastern or western regions (about 51% of the beds enumerated, with 55-65% of those used by pregnant women and young children). Use was related to ethnicity, as it has been in earlier studies in the central region, (WHO.IDRC, 1996).

2.3 Control of Malaria:

Malaria control programs have been defined as an organized effort to carry out anti-malaria measures that are possible with the

available resources and suitable, under the prevailing epidemiological condition, with the objective of achieving the greatest possible reduction of mortality and morbidity(Abdel Hameed, 2004).

Malaria control programmers are by nature limited in coverage, but unlimited in time that is they aim at the long term reduction of the disease at which it ceases to be a major public health problem(Abdel Hameed, 2004).

Anew approach to malaria control was approved by W.H.O in 1978 I.e implementation of malaria control in the context of the primary health care strategy this is because several anti malaria activities, including drug distribution, can be carried out by the most level of primary health system with community participation, where such system has been developed(Abdel Hameed,2004).

Malaria control is responsibility of individual, families and communities under the supervision of concerning authorities (Abdel Hameed, 2004).

Theoretically Malaria can be prevented and controlled by the following means:

1. Anti Malaria drugs are very important means in reducing mortality and prevent suffering from malaria, it also lower the probability of transmission of malaria parasite.

2. Measure designed to prevent man vector contact be applied by (Abdel Hameed, 2004):

a-Site selection: It is often the best of all means and should be employed where ever it possible.

b. Mosquito nets: The used of bed net for protection from mosquito bite during night has been practical from very early time.

c. Repellents: There are substances applied on skin to protect the person against mosquito bite e.g. oil dimethy, phthalate etc..... (Abdel Hameed, 2004).

d. Screening: The use of mosquito proofing of devilling in doors and windows is by no doubt the most effective method of malaria control (Abdel Hameed, 2004).

Elimination of Mosquito Breeding Site:

Biological Control: A.

∅This method of control is base on the introduction of various pathogens and pre doctors to insects vector, such agent are viruses bacteria protozoa, but the most effective agent reducing population level by fish mainly gombosia or any suitable local species (Abdel Hameed, 2004).

B. Larviciding:

This is a quite effective method in area with seasonal low rainfall or limited water surfaces the larvicide's must be repeated at frequently intervals during the mosquitoes breeding seasons to interrupt its life cycle, oil Parisgreen, temphos, fenthion have been used in this field with good result (Mobark, 1997).

C. Source Reduction:

These measures include filling digging drainages changes in the water level, flushing canal trimminry and other engineering methods of malaria control (Mobark, 1997).

Measures designed for reduction adult mosquitoes which include:-

residual Spraying Insecticides:

The spraying in the indoor surfaces of houses are still the most effective to reduce the density and longevity of endophil mosquitoes (Mobark, 1997).

The effective of this method may some time be of limited result and may have to by supplemented by other control measures, D.D.T the best and effective insecticides used in malaria area, but it has been replaced by new insecticide such as (Malathion, dieldrin, MCM ect.....(Mobark, 1997), because of development of resistance in malaria vectors to D.D.T (Mobark, 1997).

b. Space Spray:

This a major anti-epidemic measure in mosquitoes borne disease it is application involves the use of pesticide inform of (fog on mist) to control the adults mosquitoes by using the togging machines on all-low volume means, malathion fenthion have to be effective and economical in this method (Mobark,1997).

Balogun (2001), Knowledge, attitude and practices of mothers in prevention and control of malaria in Oumdrman and Bahri Hospital in Year 2001, Ahfad University for Women. He concluded that "concerning mothers practices they adapt methods likes mosquito bed net (25%) and sanitation (19%) to stamp out malaria in their homes".

Gaffer,N.A (2003), Knowledge and Community Participation in Mosquito Control efforts at ElHaj Yousif Locality 2003,University of Khartoum. He concluded that "from the study area, the majority of people complain that bed nets hot, expensive and complicated although they used them.

Osman, W.H (1998), Knowledge, Attitudes and practices of Malaria among Housewives in Mayo (Khartoum) during the period 1996-1998. M.B.B.S Research, Ahfad University for women. He concluded that "most of people are not using the

appropriate protective measure against mosquitoes, which is an indication of a poor health education".

Y.E. Himeidan (2004), *Annals of Tropical Medicine and Parasitology*, 2004;98(6):631-633 . He concluded that “The attractiveness of pregnant women for mosquitoes was investigated in a peri-urban site in New Halfa, eastern Sudan, in September–October 2003. For 20 nights, the mosquitoes feeding on nine pregnant and nine non-pregnant women sleeping under untreated bednets were collected. The women slept outdoors, in the yards of nine houses, each yard holding one pregnant and one non-pregnant woman. In general, each pregnant woman attracted significantly more *Anopheles arabiensis* (the main vector of *Plasmodium falciparum* in the area) than each non-pregnant women, with mean biting rates of 0.94 and 0.49 bites/woman-night, respectively ($P=0.005$). In contrast, the two groups of women attracted similar numbers of the other mosquito species collected, which were all culicine. Impregnated bednets need to be used in the study area, at least by the pregnant women (who appear to be at particularly high risk of acquiring malaria).”

3. METHODS&MATERIALS

This quasi experimental study was conducted in El-Hosh to assess the role of health education in improving knowledge, attitude and practices of mothers using insecticide treated nets in malaria control.

3.1 Study Area:

3.1.1 Location:

Elhosh belong to south of Gazira locality, Its bounded by El-Medina Arab from the North, El-Haj Abdalla from the East, El-Menagial from the West and Senar from the South. Its planned area.

3.1.2 Climate:

The climate is poor savanna.

3.1.3 Population:

The estimated total population was about 120000person and 24000 Families.

3.1.4 Water supply:

The main source for water supply is water pipe.

3.1.5 Environmental sanitation:

3.1.5.1 Liquid waste:

There are different systems used for the disposal of human excreta such as conventional pit latrine, septic tanks to which waste water is connected and also there are some public latrine in the area.

3.1.5.2 Solid waste:

House to house collection system.

3.1.6 Education services:

There are six basic schools, three for girls and three for boys, two secondary schools one for boys and the other for girls & one collage for Health & Environmental Sciences.

3.1.7 Health services:

There is a hospital, one health care center, two clinics and one health office.

3.2: Sampling size determination:

A sample size of 329 house hold, was randomly selected from the whole area size (24/000) Families, by using the following formula

$$n = \frac{z^2 \cdot p \cdot q}{d^2}$$

$$d^2$$

n = the sample size

$$z = 1.96$$

$p = \text{Utilization rate (0.31)}$

$q = 0.69$

$d = .05$

3.2.1

3.2.1 Sampling selection technique

The sample of 329 house hold was distributed proportionally upon the nine residential areas. Using the sampling firm model by the locality, sample random selection technique was used to select from each residential area the determined sample.

$$n_h = \frac{N_h}{N} \times n$$

$n_h =$ Sample size of residential area.

$N_h =$ size of residential area.

$N =$ population size. (House hold).

$n =$ Sample size.

3.2.1 Study period:

The study took over twelve months, from June (2007) up to May (2008), Intervention took six months, Pretest after three months after intervention.

3.2.2 Phases of the Study:

Phase one.

Pre-intervention:

1. A questionnaire was designed to determine the knowledge, attitude and practices of mothers towards the utilization of ITNs in malaria control using survey the questionnaire include questions about the following:-

Socio-economic status, The knowledge about ITNs , the benefit of ITNs, how to save (keep) it, the effect of washing to ITNs effectiveness, the suitable time to erect ITNs, re treated Mother's attitude towards the size, material which ITNs made and so on.

Phase two:

This is interventional phase. The intervention was carried out in El-hosh secondary school for girls using Lectures, posters, message and small group discussion in health education about ITNs for mothers (the targets group). It included how and when to use ITNs, how to improve the quality of using by erecting it with sticks, folding, saving it inside room .re treated ITNs with appropriate insecticide and so on. All these methods to improve knowledge, attitude and practices of mothers towards ITNs utility.

The past intervention survey was house to house survey.

Phase three:

This is a final evaluation phase in which the same techniques used in phase one were used, A comparison between the results before and after intervention took Place.

3.3Data Collection:

A questionnaire was designed to determine Mother's knowledge and attitude & practices about ITNs utility. It included open& closed ended questions. Its included questions about the following:

Socio-economic status, the knowledge about Malaria disease, ITNs, saturation of nets, benefit of using ITNs, how to use ITNs, the suitable time to erect ITNs, affect of washing to ITNs effectiveness, the attitude of Mothers towards ITNs size, material of which ITNs was made, the priority of owning ITNs, save (keep) of ITNs and so no.

3.4 Data analysis:

Data were analysed manually, χ^2 test was used to compare Causer cal data.

The level of significance was taken at 0.05.

4. RESULT

Table No. (1)

Distribution of Mothers according to age

((N=) 329)

The Age	No	%
15-25 year	36	11
26- 35 year	63	19
36-45 year	72	22
More than 45 year	158	48
Total	329	100

This table shows that 52% of the target group was at age range 15-45 years.

Table No. (2)

Distribution of Mothers According to Educational Level

((N=) 329)

Education Level	No	%
Post graduate	7	2.3
University	122	37
Secondary& Medium	99	30
Basic level or primary	35	10.7
khalwa	50	15
Illiterate	16	5
Total	329	100

This table shows that 69.3% of samples have high educational level.

Table No. (3)

Distribution of Mothers According to marital

((N=) 329)

The marital	No	%
Married	270	82
Widow	37	11
Divorced	22	7
Total	329	100

This table shows that most of mothers are married and have settled families.

Table No. (4)

Distribution of Mothers According to Occupations

((N=) 329)

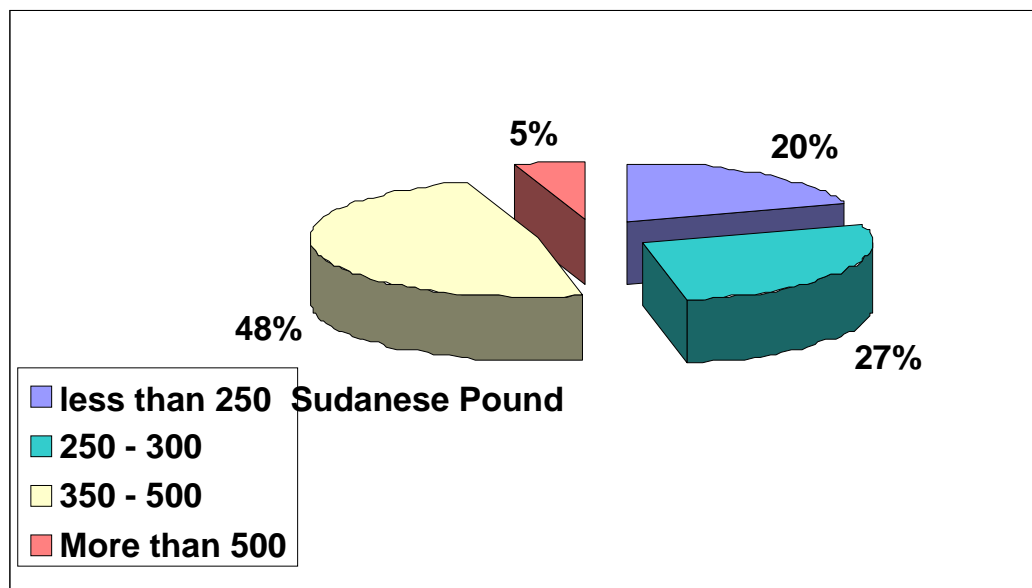
Type of Jobs	No	%
Laborer	33	10
Employee	59	18
House wife	233	70.9
Other jobs	4	1.1
Total	329	100

This table reflects that the majority of mothers were house wives.

Figure No (I)

Distribution of Families According to Monthly income

((N=) 329)

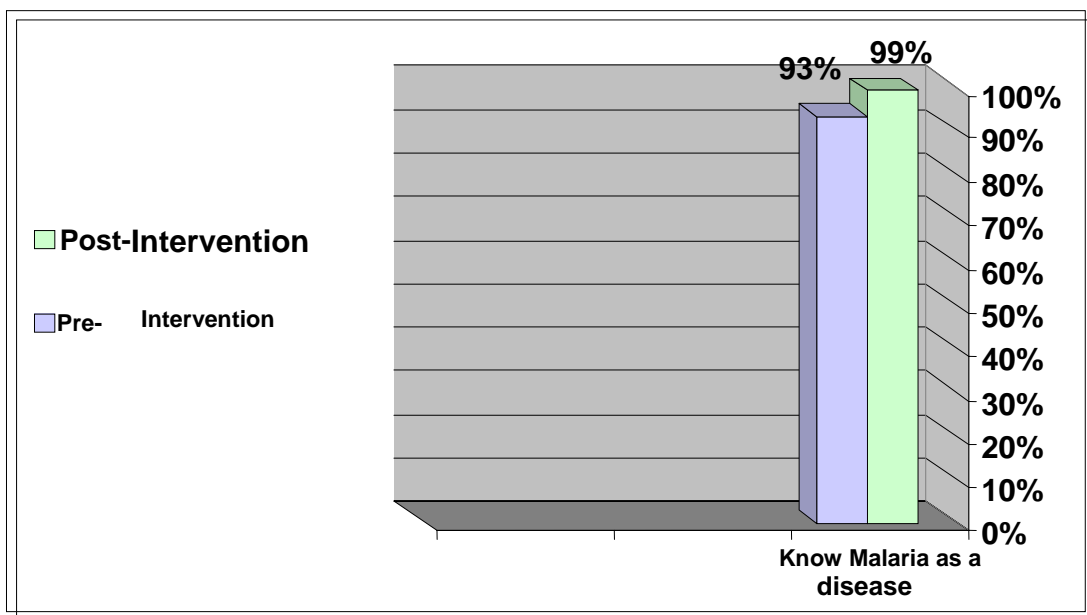


This figure shows that (48%) of the families had mediate socio-economic status.

Figure No (II)

Distribution of mothers according to the knowledge about malaria, before and after interventions

((N=) 329)



This figure shows that (93%) of pre-intervention target group knew malaria as a disease. Post-intervention percentage arises to (99%).

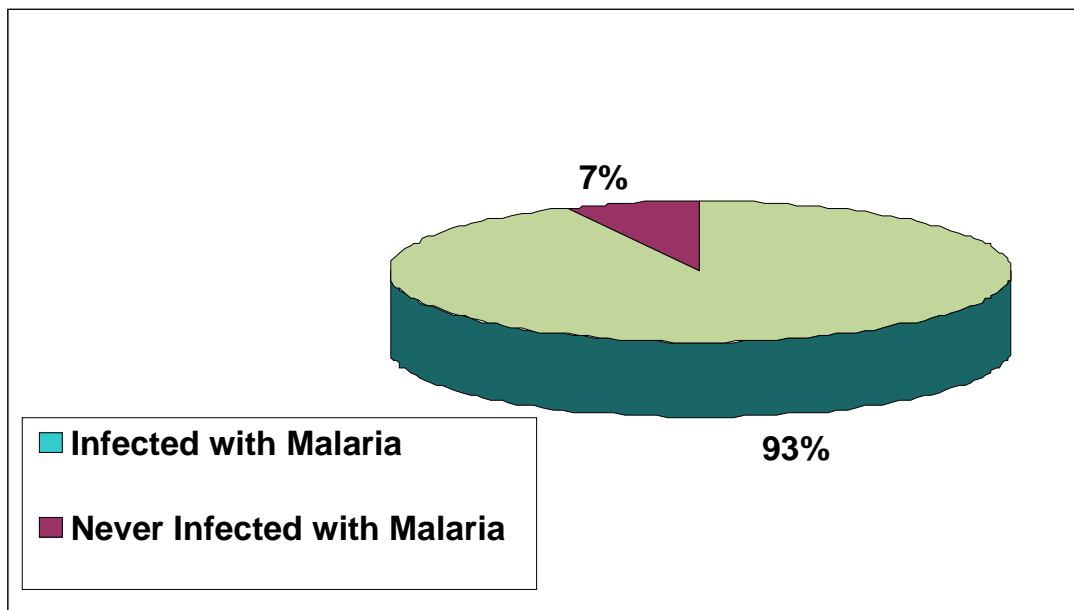
$X^2 = 27.05$

$P < 0.05$ (Significant result).

Figure No (III)

Distribution of mothers according to malaria infection during their lifetime

((N=) 329)



This figure shows that (93%) of the mothers infected with malaria.

Table No. (5)

Distribution of mothers according to the knowledge about malaria symptoms, before and after interventions

((N=) 329)

Symptoms	Pre-Intervention		Post- Intervention	
	No	%	No	%
Headache, fever& arthralgia	224	68	263	80
Vomiting	76	23	50	15
Other symptoms	16	5	16	5
Don't know	13	4	10	3

$$\chi^2 = 1.82$$

$$P > 0.05$$

This table shows that (68%) of the pre-intervention target group know malaria symptoms .post-intervention percentage arises to (80%). $\chi^2 = 1.82$

$P > 0.05$ (Not significant result).

Table No. (6)

Knowledge about the effect of malaria on the pregnant woman among mothers, before and after interventions

((N=) 329)

The Effect	Pre-Intervention		Post-Intervention	
	No	%	No	%
Abortion	16	5	30	9
Congenital anomalies	10	3	20	6
Affect both mother & her children health	30	9	7	2
All the mention above	10	3	211	64
Other effects	0	0	16	5
Don't know	263	80	46	14

This table shows that (80%) of the pre-intervention samples don't know the major complication of malaria to pregnant woman. post-intervention percentage decrease to (14%).

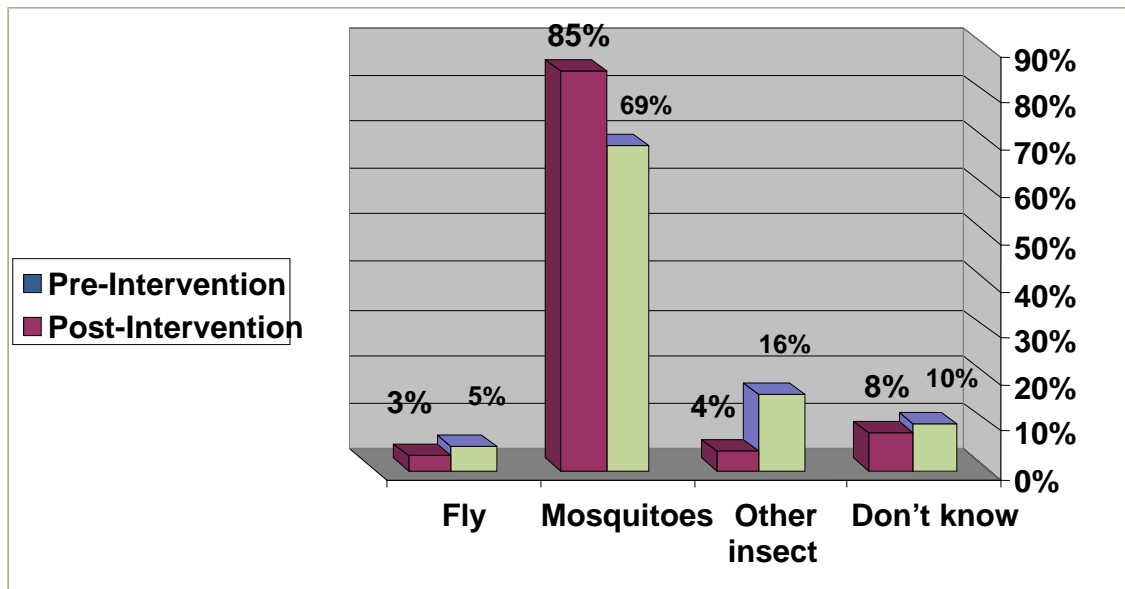
$$\chi^2 = 367.92$$

P < 0.05 (Significant result).

Figure No (IV)

Knowledge about Malaria Vector among Mothers, before and after interventions

((N=) 329)



This figure reflects that (69%) of the pre-intervention mothers know that mosquitoes transmitted malaria. post-intervention percentage increase to (85%).

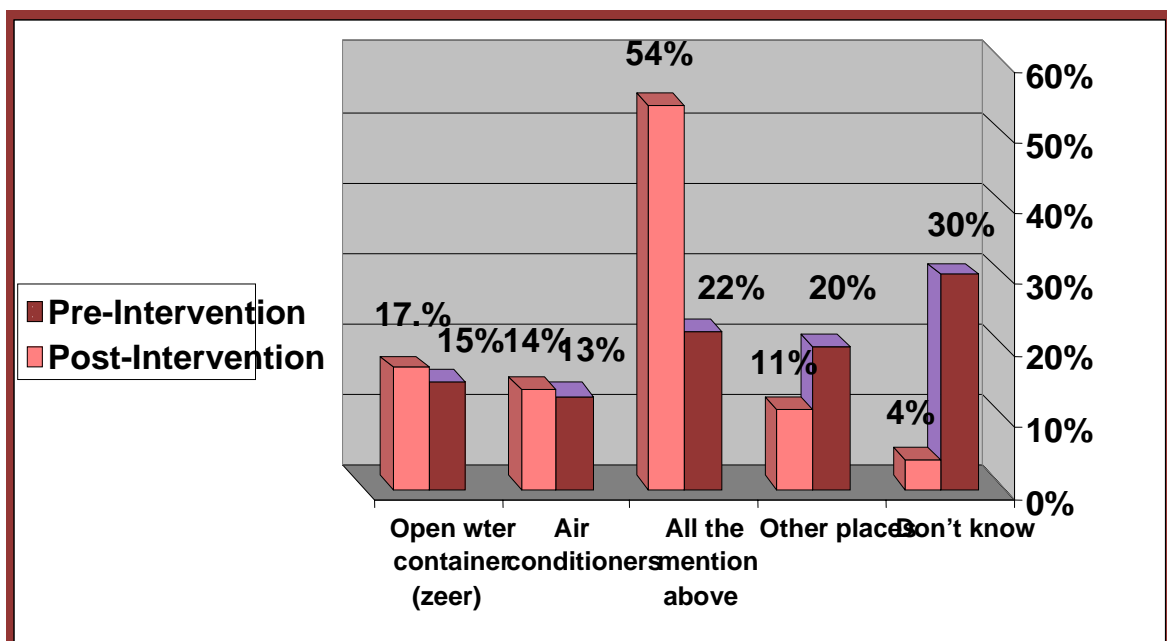
$$\chi^2 = 46.19$$

P < 0.05 (Significant result).

Figure No (V)

Knowledge about Breeding Sites of Mosquitoes inside Houses among mothers, before and after interventions

((N=) 329)



This figure shows that (50%) of the pre-intervention target group don't know the breeding site of mosquitoes inside the house. Post intervention (54%) of target group knew that mosquitoes are breed in open container (zeer) and air conditioners.

$$x^2 = 185.68$$

P < 0.05 (Significant result).

Table No (7)

Knowledge about Breeding Sites of Mosquitoes outside Houses among mothers, before and after interventions

((N=) 329)

The Site	Pre-Intervention		Post- Intervention	
	No	%	No	%
Farms	14	4.2	8	2.5
Water broken nets	54	16.5	16	5
Pools	76	23	81	24.5
All the mention above	57	17.3	174	53
Other places	71	21.5	39	11
Don't know	87	26.5	13	4

This table shows that (48%) of the pre-intervention samples don't know the breeding site of mosquitoes outside houses. Post intervention (53%) of samples knew that mosquitoes are breeding in some sites outside houses.

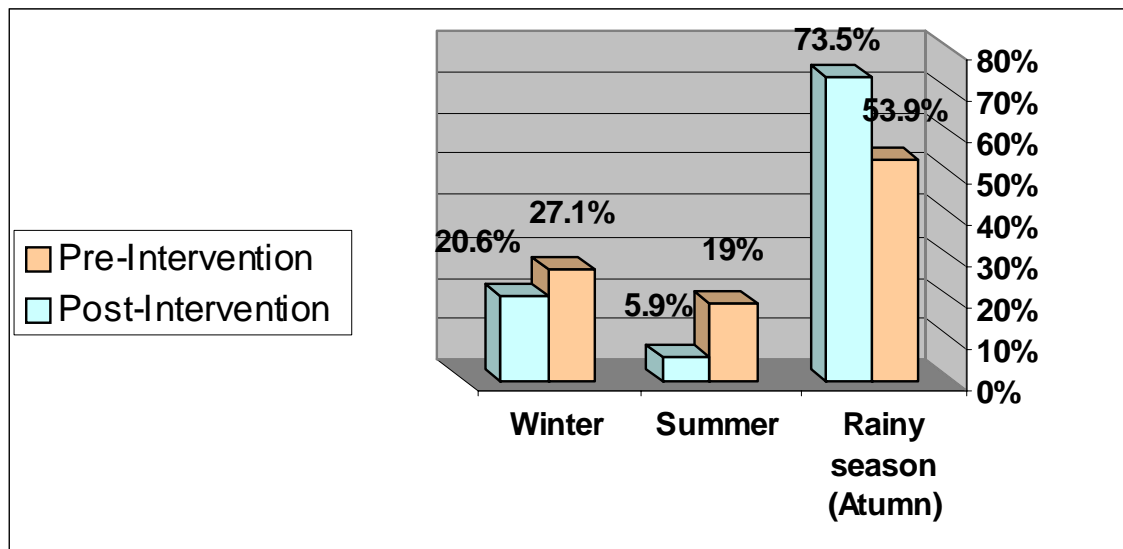
$$x^2 = 244.97$$

P<0.05 (Significant result).

Figure No (VI)

Distribution of mothers' knowledge about season of high breeding, before and after interventions

((N=) 329)



This figure shows that (53.9%) of the pre-intervention mothers knew that Autumn (rainy season) is the ideal season for mosquitoes to multiplied. Post intervention percentage increased to (73.5 %).

$$x^2 = 46.32$$

P < 0.05 (Significant result).

Table No. (8)

Distribution of mothers according to the knowledge about ITNs benefits, before and after interventions

((N=) 329)

The benefit	Pre-Intervention		Post-Intervention	
	No	%	No	%
Kills mosquitoes	33	10	59	18
prevent mosquitoes & insects to reach human body	254	77.3	263	80
Protection against malaria	166	50.4	197	60

This table shows that (77.3%) of pre intervention samples knew the benefit of ITNs. Post intervention percentage increased to (80%)

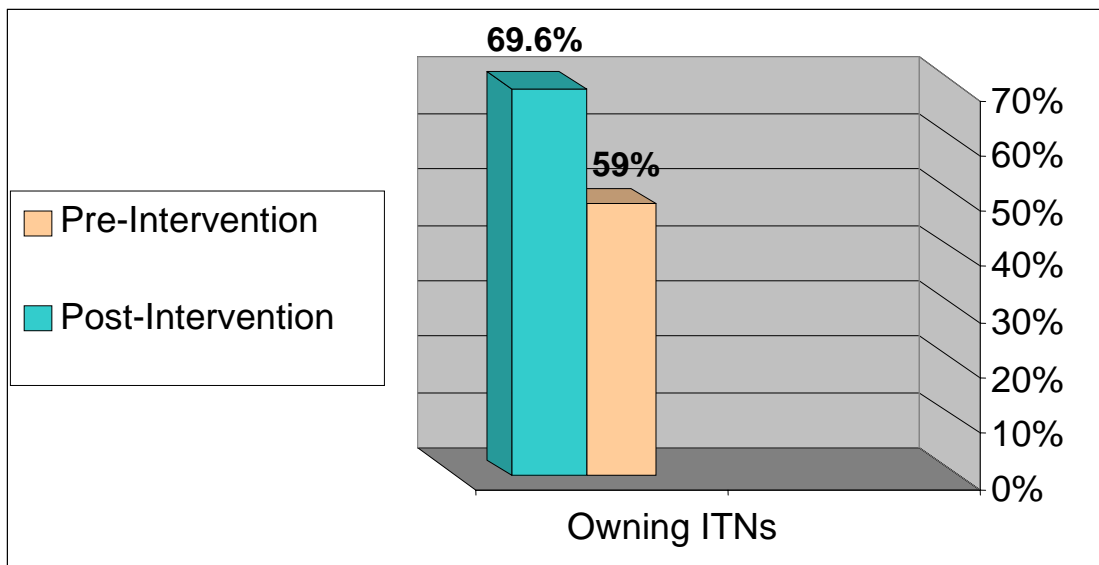
$$X^2 = 6.02$$

P<0.05 (Significant result).

Figure No (VII)

Distribution of Mothers according to their beliefs about owning ITNs, before and after intervention

((N=) 329)



This figure shows that (59%) of the pre-intervention target group owning insecticide treated nets (ITNs). Post- intervention percentage increased to (69.6%).

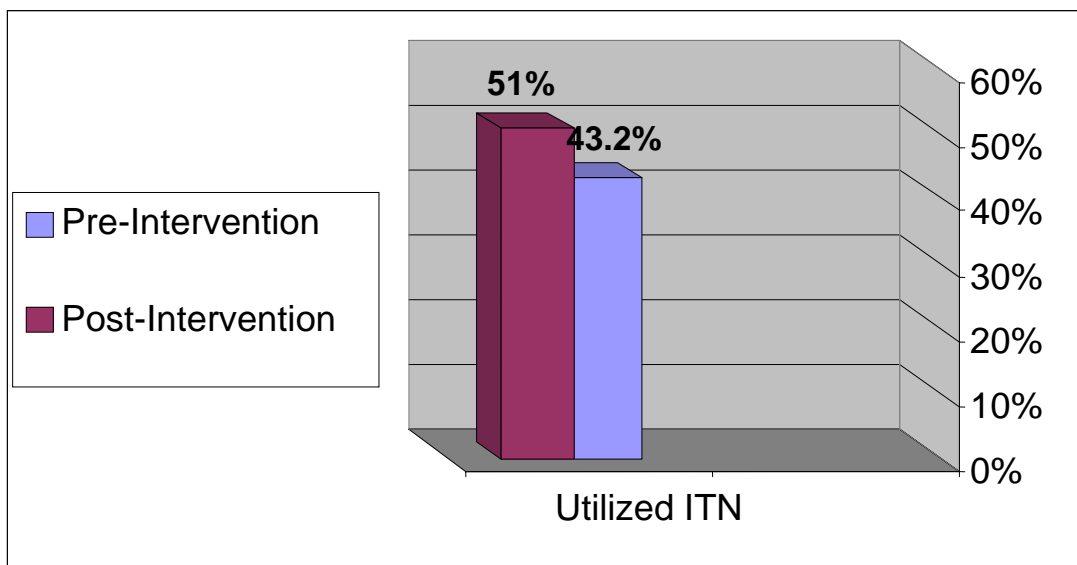
$$X^2 = 8.22$$

P<0.05 (Significant result).

Figure No (VIII)

Mothers' utilization of ITNs before and after intervention

((N=) 329)



This figure shows that (43.2%) of the pre-intervention mothers used insecticide treated nets (ITNs). Post-intervention percentage increased to (51%).

$$X^2 = 4.03$$

P>0.05 (Not significant result).

Table No. (9)

Reasons behind mothers' beliefs that utilization of ITNs has no benefit.

((N=)135)

The reason	Pre-Intervention		Post-Intervention	
	No	%	No	%
ITNs not prevent human from mosquito reach	65	48.1	44	32.5
ITNs make Allergies	30	22.2	27	20
ITNs uncomfotable	33	24.4	18	13.3
Other reasons	11	8.1	11	8.1

This table shows that (48.1%) of the pre-intervention target group believe that insecticide treated net cannot prevent from mesquite bite. Post-intervention percentage decreased to (32.5%).

$$x^2=20339$$

P>0.05 (Not significant result).

Table No. (10)

Distribution of Mothers according to method of using ITNs, before and after intervention

((N=) 229)

Method of using	Pre-Intervention		Post-Intervention	
	No	%	No	%
Use ITNs daily	139	61	164	72
Use about 3-4 times weekly	55	24	65	28

This table shows that (61%) of the pre-intervention target group used insecticide treated nets (ITNs) daily. Post-intervention percentage increased to (72%).

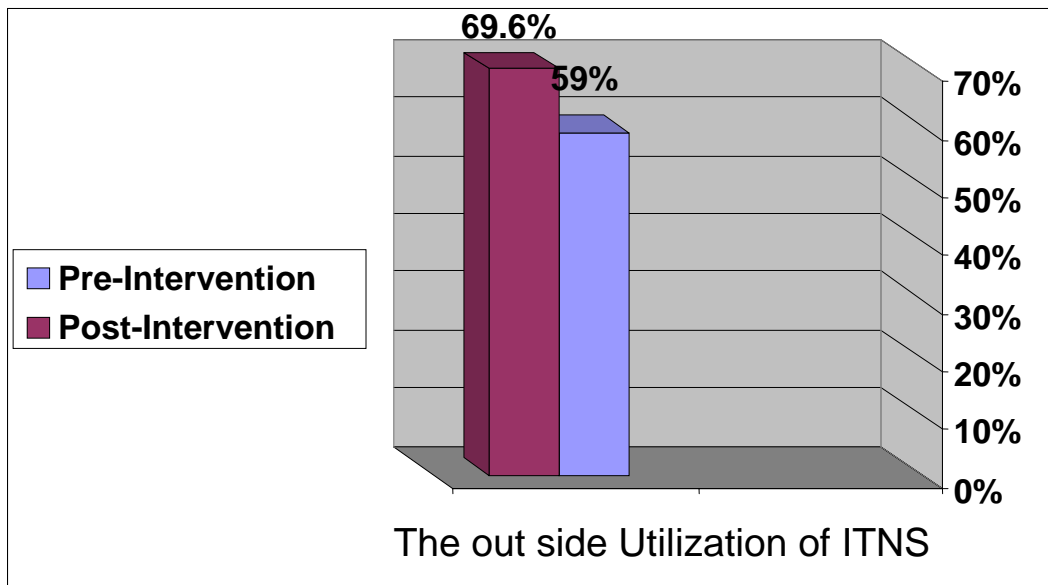
$$X^2 = 14.03$$

P<0.05 (Significant result).

Figure No (IX)

Distribution of mothers according to utilizing of ITNs out sides of the rooms, before and after intervention

((N=) 229)



This figure shows that(59%) of the pre-intervention samples used insecticide treated nets(ITNs) outside the room .Post-intervention percentage raised to (69.6%).

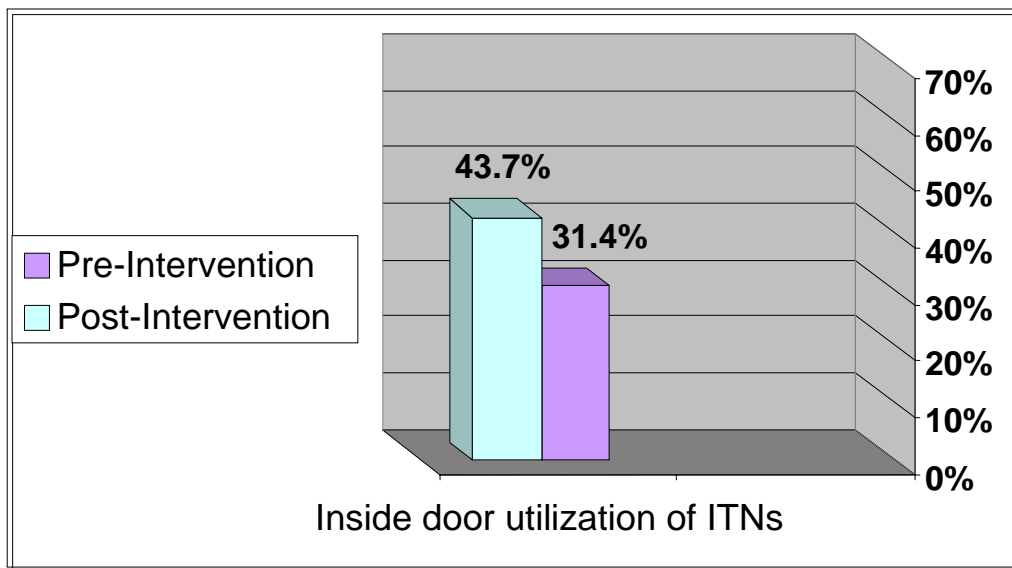
$$X^2 = 8.3$$

P<0.05 (Significant result).

Figure No (X)

Distribution of mothers according to the utilization of Insecticide Treated nets inside the room, before and after interventions

((N=) 229)



This figure shows that (31.4%) of the pre-intervention study population used insecticide treated (ITNs) inside the room. Post-intervention percentage increased to (43.7%).

$$x^2 = 7.449$$

$P < 0.05$ (Significant result).

Table No. (11)

Reasons behind not using Insecticide treated nets in side the room among mothers, before and after interventions

((N=) 229)

The Reasons	Pre-Intervention		Post-Intervention	
	No	%	No	%
Difficult to erect	111	48.4	66	28.8
There is no need to erect	25	10.9	18	7.9
No enough space in the room	21	9.2	16	6.9

This table shows that (48.4%) of the pre-intervention mothers who do not use insecticide treated (ITNs) in side the room because they believe it is difficult to erect. Post-intervention percentage decreased to (28.8%).

$$x^2 = 0.62$$

P>0.05 (Not significant result).

Table No. (12)

Distribution of mothers according to their knowledge about the suitable time of erection of ITNs during the day, before and after interventions

((N=) 329)

The time	Pre-Intervention		Post-Intervention	
	No	%	No	%
Instantly at sun set	133	3	10	3
Before mid night	174	53	217	66
When I feel mosquito bites	145	44	102	31
Total	329	100	329	100

This table shows that (53%) of the pre-intervention target group knew the suitable time to erect the ITNs, post-intervention percentage increase to (66%)

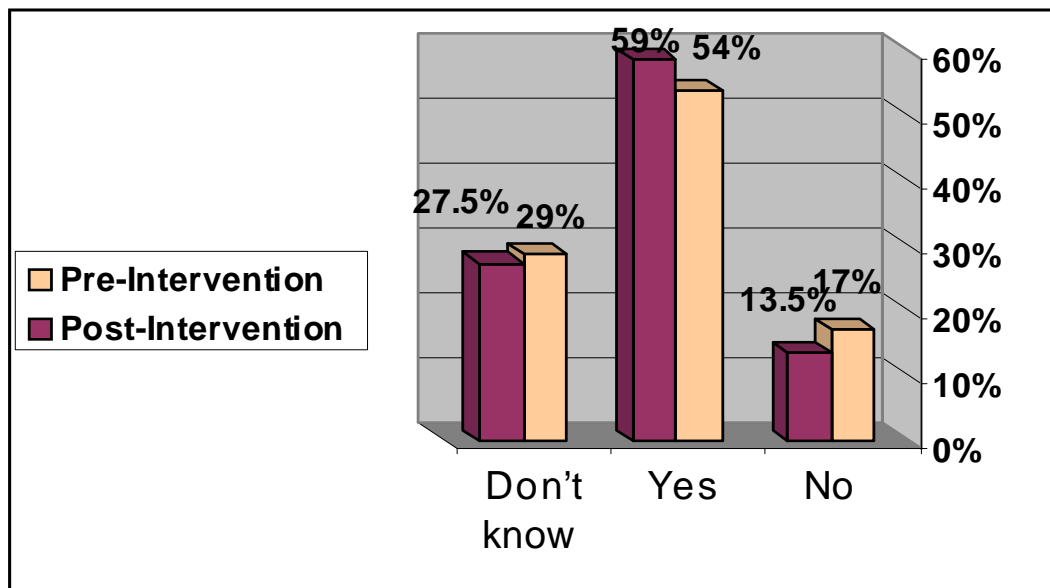
$$X^2 = 12.49$$

P<0.05 (Significant result).

Figure No (XI)

Distribution of mothers according to their knowledge that the wash of ITNs affects its effectiveness, before and after interventions

((N=) 329)



This figure shows that (54%) of the pre-intervention samples knew that washing affects the effectiveness of insecticide treated nets post-intervention percentage increased to (59%).

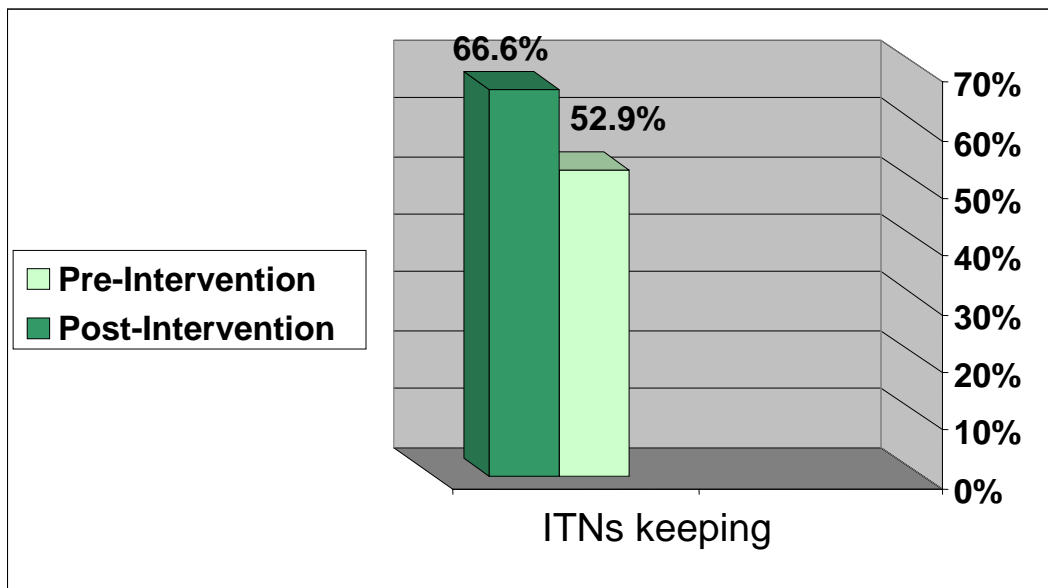
$$X^2 = 3.34$$

P>0.05 (Not significant result).

Figure No (XII)

Distribution of mothers according to keep of ITNs, before and after interventions

((N=) 229)



This figure shows that (56.9%) of the pre-intervention mothers save (keep) their insecticide treated nets (ITNs). Post-intervention percentage arise to (66.6%).

$$x^2 = 13.07$$

P < 0.05 (Significant result).

Table No. (13)

Distribution of mothers according to the place of keeping their ITNs during the day, before and after intervention

((N=) 229)

Method of Keeping	Pre-Intervention		Post-Intervention	
	No	%	No	%
Inside the room	159	69.4	214	93.4
Out side the room	95	41.14	15	6.6

This table shows that (69.4%) of the pre-intervention samples keep their insecticide treated nets (ITNs) inside the room .Post-intervention the percentage increase to (93.4%).

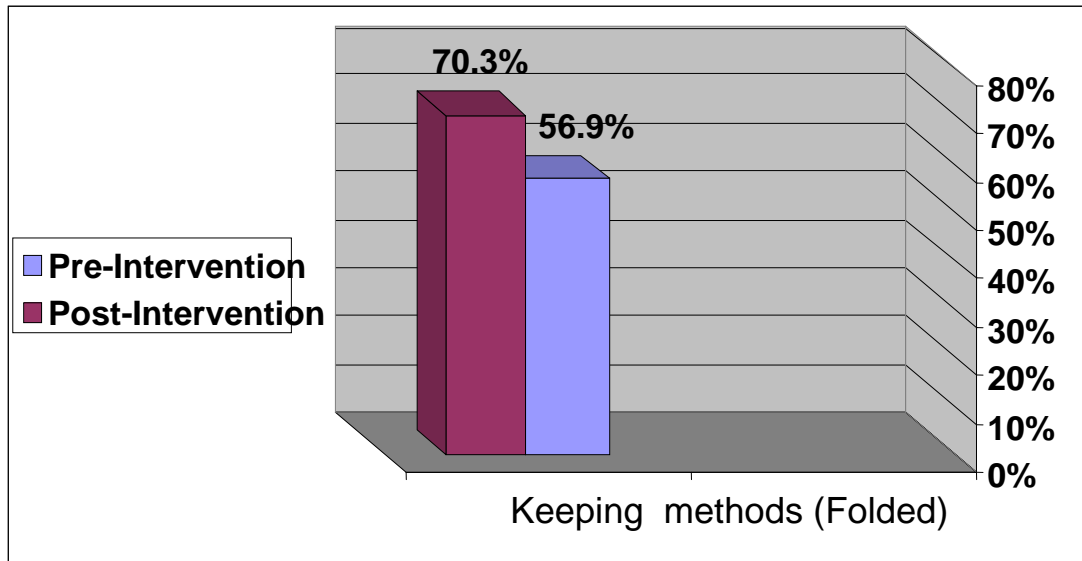
$$x^2 = 15.47$$

P<0.05 (Significant result).

Figure No (XIII)

Distribution of mothers according to the Method of Keeping their ITNs during the day, before and after interventions

((N=)229)



This figure shows that (56.9%) of the pre- intervention study population fold their insecticide treated nets (ITNs) and save (keep) it .Post intervention percentage arises to (70.3%).

$$x^2 = 7.65$$

P<0.05 (Significant result).

Table No. (14)

Distribution of mothers according to the way of net erecting, before and after interventions

((N) =229)

The way of erection	Pre-Intervention		Post-Intervention	
	No	%	No	%
Erect by sticks	184	80.3	224	97.9
Cover body with net	10	4.37	5	2.1

This table shows that (80.3%) of the pre-intervention sample erect insecticide treated nets (ITNs) by sticks. Post intervention percentage arises to (97.9%).

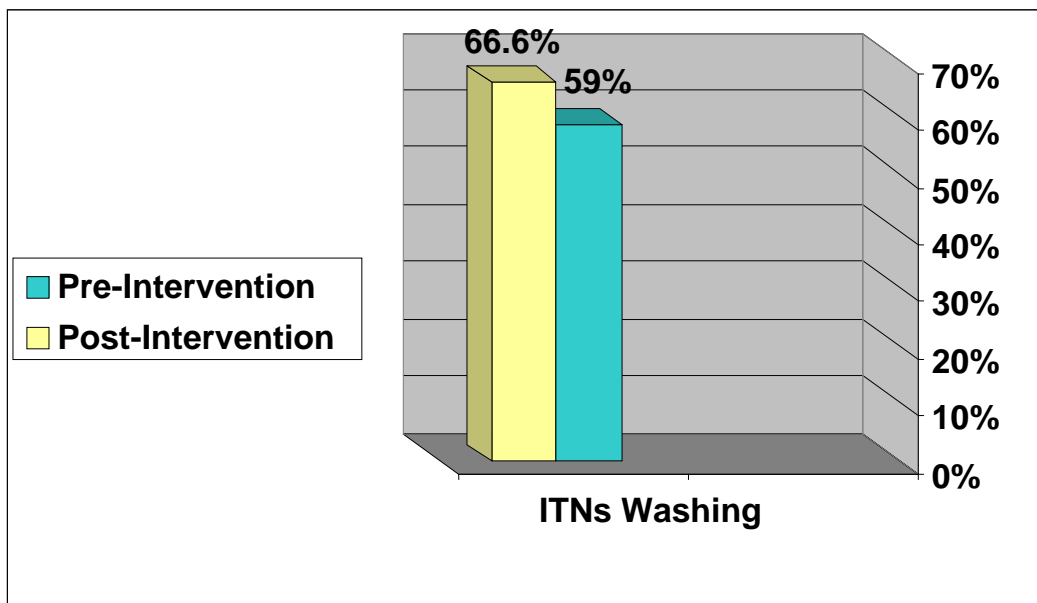
$$X^2 = 3.01$$

P<0.05 (Significant result).

Figure No (XIV)

Distribution of mothers according to the washing of Insecticide Treated nets, before and after interventions

((N=) 229)



This figure shows that (59%) of the pre-intervention target group washed their insecticide treated nets (ITNs). Post-intervention percentage became (66.6%).

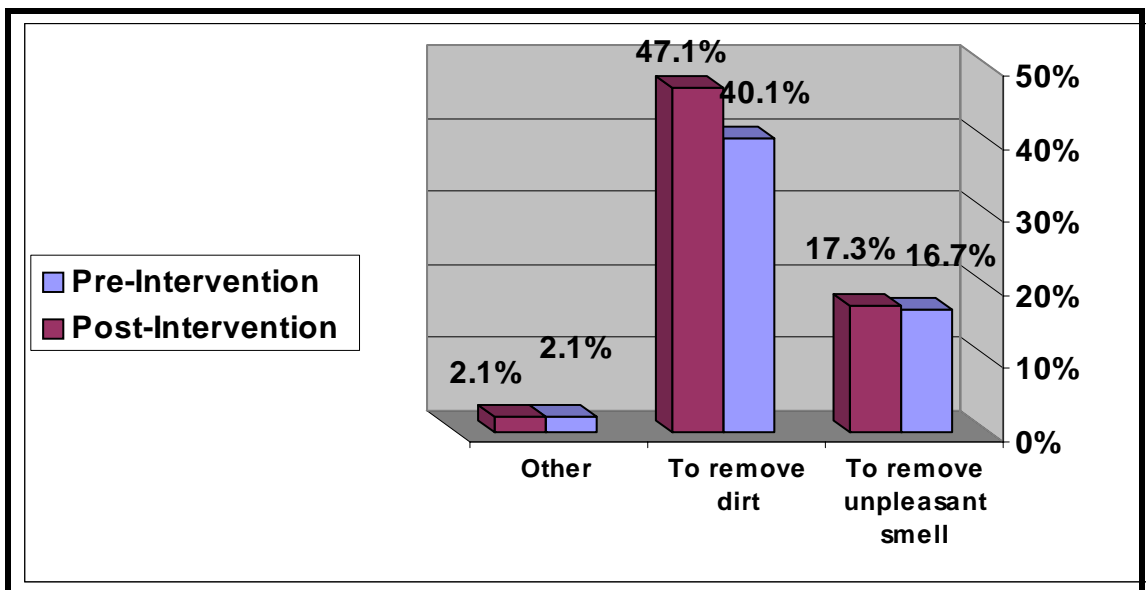
$$x^2 = 17.35$$

P<0.05 (Significant result).

Figure No (XV)

Reasons behind washing of insecticide treated nets among mothers, before and after interventions

((N=)153)



This figure shows that (47%) of the pre-intervention mothers washed their insecticide treated nets (ITNs) to remove dirt. Post-intervention percentage increase to (56%) (Number of users was increasing).

$$x^2 = 3.33$$

P>0.05 (Not significant result).

Table No. (15)

Distribution of mothers according to No of washing to ITNs before and after interventions

((N=)153)

Number of washing	Pre-Intervention		Post-Intervention	
	No	%	No	%
Once	32	14	44	19
Twice	62	27	75	33
More than twice	100	44	100	48

This table shows that (27%) of the pre-intervention mothers washed their insecticide treated twice wash. Post-intervention percentage increased to (33%).

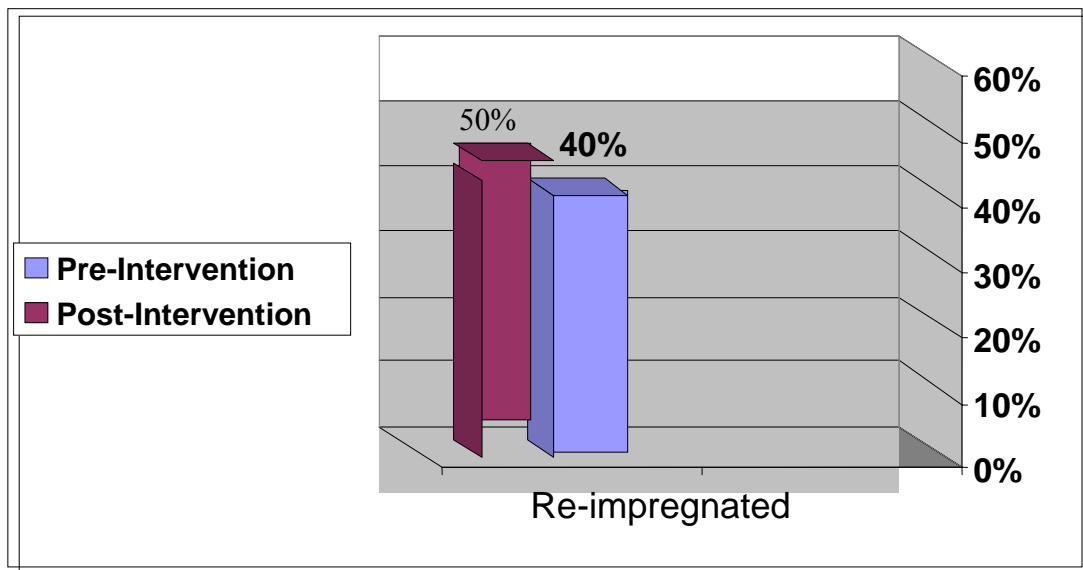
$$x^2 = 9.78$$

P<0.05 (Significant result).

Figure No (XVI)

Distribution of mothers according to their attitude towards re-impregnating the net with insecticide after washing, before and after interventions

((N=) 153)



This figure shows that (60%) of the pre-intervention study population wasn't re treated (re-impregnated) their insecticide treated nets after they wash it more than once. post intervention percentage decreased to (50%).

$$X^2 = 108.88$$

$P < 0.05$ (Significant result).

Table No. (16)

Distribution of mothers according to their beliefs about Insecticide Treated Nets size, before and after interventions

((N=) 229)

ITNs size	Pre-Intervention		Post-Intervention	
	No	%	No	%
Very suitable	133	66	34	15
Suitable	61	30	103	45
Unsuitable	104	45	92	40

This table shows that (45%) of the pre- intervention study population believe that the size of insecticide treated nets is unsuitable. post-intervention percentage decreased to (40%).

$$X^2 = 58.57$$

P<0.05 (Significant result).

Table No. (17)

Distribution of mothers according to their believe that their ITNs provide suitable ventilation for them, before and after interventions

((N=) 229)

Bring better air	Pre-Intervention		Post-Intervention	
	No	%	No	%
Yes	90	39	137	60
No	104	45	92	40

$$x^2 = 7.73$$

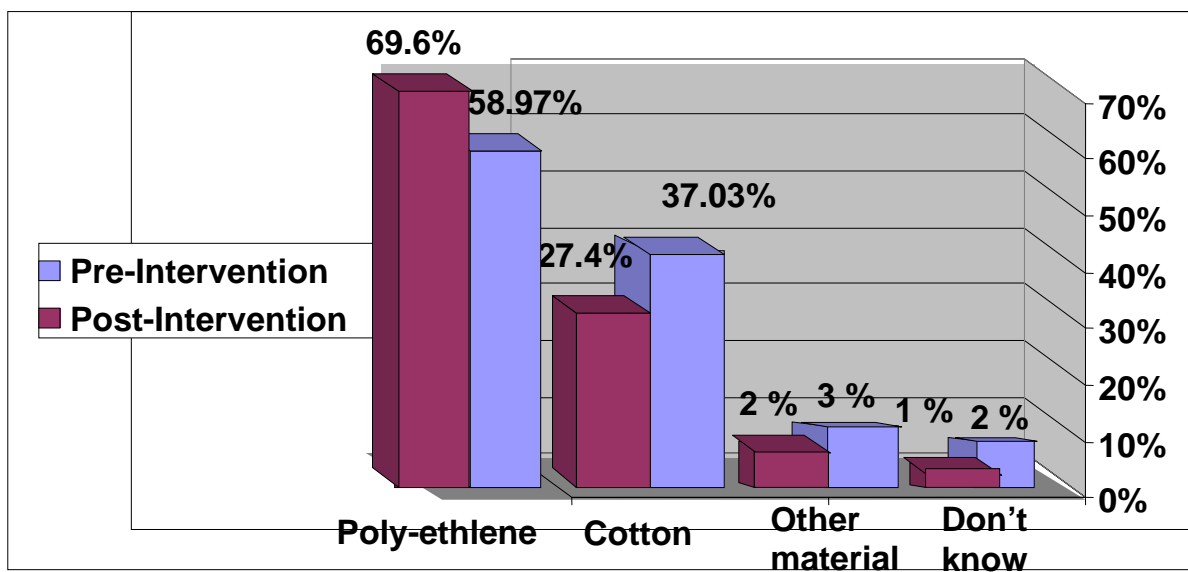
$$P < 0.05$$

This table shows that (39%) of the pre- intervention study population believe that insecticide treated nets (ITNs) provide suitable ventilation for them. Post-intervention percent arise to (60%). (Significant result).

Figure No (XVII)

Distribution of mothers according to ITNs' material preference, before and after interventions

((N=) 229)



This figure shows that (58.9%) of the pre-intervention target group prefer to use polyethylene insecticide treated nets. post-intervention percentage rose to (69.6%

$$\chi^2 = 8.22$$

P < 0.05 (Significant result).

5. DISCUSSION

In pre-intervention more than half of the study groups (69 %) happened to know the anopheles-the Malaria vector, as written in literature by (WHO, UNDP, UNICEF and World Bank, 1998) "Most malaria-carrying mosquitoes bite at night". Post-intervention the majority of them (85%) have knowledge. This reflects the role of health education in raising the level of knowledge for Mothers and also it's expected to raise their personal protection styles from vector by using ITNs for instance. This result is significance.

About less than half (43.2%) in pre-intervention phase of study group use ITNs and in post-intervention phase the ratio became more than half (51%) and this reflects the role of health education in increasing the rate of using ITNs as a means of fighting Malaria. And this match (agree) with Gaffer (2003), he concluded that "from the study area, the majority of people complain that bed nets hot, expensive and complicated although they used them.

& Balogun (1998), he concluded that "concerning mothers practices they adapt methods likes mosquito bed net (25%) and sanitation (19%) to stamp out malaria in their homes".

This result is significant.

In Pre-intervention phase more than half (59%) of Mothers use insecticide treated nets (ITNs) outside rooms. In post-intervention the majority of Mothers (69.6%) do the same process. This reflects the role of health education in increasing the rate of usage. And this does not match with Osman(1998),he concluded that “most of people are not using the appropriate protective measure against mosquitoes, which is an indication of a poor health education". This result is not significant.

In Pre-intervention phase (60%) of the study sample weren't re treated their ITNs with insecticide in post-intervention the ratio decrease to (50%) as written in literature by (National Center for Zoonotic, Vector-Borne & Enteric Disease, 2008)" Previously, nets had to be retreated at intervals of 6-12 months, more frequently if the nets were washed. "Therefore we expect this would increase the improvement of using ITNs. This result is not significant.

In Pre-intervention phase more than half of Mothers(58.9 %) prefer polyethylene ITNs, as written in literature by (National Center for Zoonotic, Vector-Borne & Enteric Disease, 2008) " Most nets are made of polyester but nets are also available in cotton, polyethylene, or polypropylene " , in post-intervention phase the majority of mothers (69.6%) have the same prefer (anew raw material and ITNs have been

brought by UNICEF). which help in improving the of ITNs utility among Mothers but there are few mothers complain that polyethylene ITNs are very hot .

CONCLUSION &RECOMMENDATION

6.1: Conclusion:

This study had been carried out in El-hosh and concluded the following:-

Knowledge of Mothers about ITNs benefit was (77.3%) in pre-intervention .In post intervention stage became (80%) (significant) ,about the suitable time for erecting ITNs was (53%) before intervention, It became (66%) in post intervention phase(significant), about the effect of washing to nets effectiveness was (54%) before intervention and in post intervention phase increased to (59% (not significant) .

Mothers' attitude towards keeping ITNs inside room was (69.4%), and in post intervention stage became (93.4%). (significant)

The rate of attitude of Mothers who think that the size of ITNs is unsuitable was (45%) before intervention, and became (40%) in post intervention stage. (significant)

Mothers' practice towards folding ITNs when keeping it was (56.9%) before intervention, It became (70.3%) in post intervention phase. (significant)

Mothers' practice towards erecting ITNs on sticks when using it was (80.3%) before intervention, It increased in post intervention phase to (97.9%). (significant)

The rate of Mothers who don't re- treat their nets after they washed it multiple washings was (60%), before intervention, it became (50%). (significant)

The rate of using ITNs had increased from (43.2%) before intervention process to (51%) after intervention process. (not significant)

2.6: Recommendations:

This study was conducted in El-shosh and recommended the following :-

- 1- To establish and continue health educations programme to increase& promote the knowledge and awareness of the mothers towards ITNs utilization.

- 2- To teach the utilizers about how to re-treat the net after multiple washings.

- 3- To provided ITNs sizes to fit the users.

- 4- To continue Provision of ITNs freely to the community.

7.1 References:

- 1- National science dictionary, (1997-2007) Published at the Center of Cancer Education, University of Newcastle upon Tyne.
- 2.WHO, 2005. Communicable disease control in emergencies. field manual . Edited by M.A.connolly.who/cds/2005.27.p155.
- 3.)Minja.H&,Schellanberg.J.A, 2001. Introduction insecticide – treated nets in the Kilombero Vally, Tanzania: the relevance of local knowledge and practice for an Information, Education and Communication (IEC) campaign. Tropical Medicine and International Health .v 6.NO 8.p 614. August 2001.
- 4.الجهود المبذولة لمكافحة الملاريا بالسودان (2006), طارق عبد القادر محمد.د. العدد الثالث يوليو. المجلد الأول. المجلة السودانية للصحة العامة. وتحديات المستقبل 2006.
- 5.National Malaria Control Program Team. (2003) Paper on Sudanese experience in distribution of long lasting Insecticide Nets: Poor approach.
- 6.Green, L.W. and Kreuter.M. (1991) Health Promotion Planning: an educational and environmental approach. Mountain View. CA USA.
7. Abd el Hameed, O.M.(2004).The role of health education in improving the knowledge, attitude and practice of mothers toward

different aspect of malaria control Khartoum state , a qualified thesis for (M.P.E.H) university of Khartoum. Khartoum

8. WHO / IDRC,1996. Anew method for preventing malaria deaths. Editors Lengeler et al.1996

9. Balogun, S.F.(2001). Knowledge, Attitude and Practices of mothers in prevention and control of malaria in Omdurman and Bahri Children Hospital in Year 2001, M.B.B.S Research. Ahfad University for Women. Khartoum.

10. Gaffer, N.A. (2003). Knowledge and Community Participation in Mosquito Control efforts at ElHaj Yousif Locality, U a qualified thesis for (M.P.E.H) University of Khartoum. Khartoum.

11. Osman , W.H.(1998). Knowledge, Attitudes and practices of Malaria among Housewives in Mayo (Khartoum) during the period 1996-1998. M.B.B.S Research, Ahfad University for women. Khartoum.

12. National Center for Zoonotic, Vector-Borne & Enteric Disease (ZVEN) .January (2008), Division of Parasitic Disease Cntent.

13. **Han W. Choi, Joel G. Breman, Steven M. Teutsch, Simin Liu, Allen W. Hightower and John D. Sexton,** THE Effectiveness of Insecticide-Impregnated Bed Nets in Reducing Cases of Malaria Infection: A Meta-Analysis of Published Results

14. Y.E. Himeidan ,2004. Annals of Tropical Medicine and Parasitology, 2004;98(6):631-633 .
15. Mobark, E.M.(1997).Knowledge, Attitudes and Practices toward Malaria Transmission & Control. a qualified thesis for (M.P.E.H). University of Khartoum. Khartoum
16. Schlein, L. (2007) Global Fund Says Insecticide-Treated Bed Nets Reduce Malaria in Africa, 27 November 2007. Geneva.
17. WHO, UNDP, UNICEF and the World Bank. (1998).
18. WHO, (1998). fact sheet No.94. Geneva.
- 19.Sachs J. & Malaney P. (2002) The economic and social burden of malaria

7.2 Message

بسم الله الرحمن الرحيم

جامعة الخرطوم

شعبة التثقيف الصحي - كلية الصحة العامة وصحة البيئة

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In The Name of Allah
University of Khartoum
Faculty of Public & Environmental Health
Department of Health education

Malaria is a severe (dangerous) disease and a threat to life. It is caused by a parasite which lives in red blood cells and liver. It is transmitted from a sick person to a healthy one by the Anopheles (female) which bites the human to feed on his blood.

Man has to protect himself from Mosquitoes bites by using saturated nets; where as having at least a saturated net is easier, less expensive, remains for a long time and it is the best means in protection the man.

The person who uses the saturated net should erect it on sticks on the bed where he sleeps.

He should also erect it before mid night (the time where Mosquitoes are in full activities)

The person should also fold his saturated net in the morning and keep it in the room less it should be affected by the direct sun beam. If he washes the saturated net more than once, he has to re saturate it with the suitable insecticide in provided place - This will increase the effectiveness of it and would help the person to protect himself from Mosquitoes bites and other insect.

In this way, the man would protect himself and would be enjoying a healthy and peaceful life. (Better protection than remedy).

7.3 Questionnaire

بسم الله الرحمن الرحيم

جامعة الخرطوم

استبيان عن دور التنقيف الصحي في تحسين استخدام الناموسيات المشبعة في مكافحة
2007-2008 الملا ريا وسط الأمهات بمدينة الحوش ولاية الجزيرة

1. اسم ربة المنزل

2. القبيلة

3. العمر : 1. 15-25 2. 26-35 3. 36-45 4. اكثر من 45 سنة

4. المستوى التعليمي 1. أمي 2. خلوة 3. أساس 4. متوسط
5. ثانوي 6. جامعي 7. فوق الجامعي
5. الحالة الاجتماعية:

1. متزوجة 2. غير متزوجة 3. ارملة 4. مطلقة
6. المهنة 1. عاملة 2. موظفة 3. بدون عمل 4. ربة منزل

5. (أخرى) حدد.....

6. عدد أفراد الأسرة 1. (1-3) 2. (4-5) 3. (6-10) 4. (اكثر من 10)

7. عدد الأطفال اقل من خمس سنوات ا. عدد () ذكر . 2 عدد () أنثى

-مستوى دخل الأسرة الشهري بالجنيه -1. اقل من 250 2. 250-300

3. 350- 500 4. أكثر من 500

1- هل تعرفي مرض الملايا 1. نعم 2. لا

2- هل أصبت بمرض الملاريا 1. نعم 2. لا

3- ما هي أعراض مرض الملاريا.....

4. ما هي طرق انتقال الملاريا 1. الذباب 2. البعوض 3. الحشرات
4. لا اعرف

5. أين يتوالد البعوض الناقل للملاريا

ا - يتوالد البعوض الناقل للملاريا داخل المنازل في :-

1. (اوانى تخزين المياه المكشوفة) الازيار 2. المكيفات 3. كل ما ذكر
4. أخرى حدد 5. لا اعرف

2. يتوالد البعوض الناقل للملاريا خارج المنازل في :-

1. المزارع 2. كسورات المياه 3. البرك وتجمعات مياه الأمطار
4. كل ما ذكر 5. أخرى 6. لا اعرف

6 ما هي أكثر فصول السنة التي يتوالد فيها البعوض ؟

1. الشتاء 2. الصيف 3. الخريف

7. ما هي آثار الملاريا على المرأة الحامل ؟

1. الإجهاض 2. تشوه الجنين 3. تؤثر على صحة المرأة الحامل
والجنين معا . 4 كل ما ذكر 5. لا اعرف

8. هل سمعت بالناموسيات المشبعة بالمبيد؟

1. نعم 2. لا

10. ما هي فوائد الناموسية المشبعة :

1. تقتل البعوض 2. تمنع وصول البعوض و الحشرات للإنسان 3. الوقاية من
مرض الملاريا 4. لا أعرف

11. متى تستخدم الناموسية

1. الخريف 2. الصيف 3. طول العام 4. الشتاء 5. لا استخدم

13. متى تنصب الناموسية؟

1. مباشرة بعد مغيب الشمس 2. منذ الصباح الباكر 3. عند منتصف النهار
4. في العصر 5. عند منتصف الليل 6. عندما أشعر بلسعات البعوض

14. هل يؤثر غسيل الناموسية المشبعة في فعاليتها؟
 1. نعم 2. لا 3. لا أعرف
15. هل تعتقد أن استخدام الناموسية المشبعة مفيد؟
 1. مفيد جدا 2. مفيد 3. غير مفيدة
16. إذا كانت الإجابة بغير مفيد لماذا .
1. لأنها لاتمنع وصول البعوض للإنسان 2. لأنها تسبب حساسية 3. غير مريحة
4. أخري حدد.....
18. ماذا تعتقد بخصوص حجم الناموسية ؟
 1. مناسب جداً 2. مناسب 3. غير مناسب
20. أي الخامات تفضلين أن تكون ناموسيتك مصنوعة منها؟
 1. النايلون 2. القطن 3. أخرى 4. لا اعرف
21. هل تعتقدين أن ناموسيتك توفر لك تهوية مناسبة ؟
 1. نعم 2. لا
24. هل تعتقد أن امتلاك الناموسية المشبعة أولوية مهمة ؟
 1. نعم 2. لا
25. هل تحفظي الناموسية المشبعة ؟
 1. نعم 2. لا
26. أين تحفظي الناموسية المشبعة بالنهار ؟
 1. في داخل الغرفة 2. خارج الغرفة 3. أخرى حدي
27. باى طريقة تحفظي الناموسية المشبعة ؟
 1. مطبقة 2. غير مطبقة
28. هل الحوامل والأطفال يستخدمون الناموسية المشبعة بانتظام؟
 1. تستخدمينها يوميا 2. ثلاثة-أربعة مرات في الأسبوع 3. عدد من الأيام في الشهر 4. لا ينطبق ذلك
29. هل تستخدمينها خارج الغرف ؟
 1. نعم 2. لا

30. هل تستخدمونها داخل الغرف ؟

1. نعم
2. لا

31. إذا كانت الإجابة بلا فلماذا ؟

1. لصعوبة نصبها . 2. لا توجد حوجة لنصبها . 3. لا توجد مساحة في الغرفة

4. أخرى حدد.....

32. كيف تتصب الناموسية ؟

1. بالتعليق في سقف الغرفة . 2. انصبها على عصى . 3. أتغطي بها

4. أخرى
33. هل تقومين بغسل الناموسية المشبعة؟

1. نعم
2. لا

34. إذا كانت الإجابة بنعم فلماذا ؟

1. لنظافة الأوساخ . 2. لإزالة الرائحة الكريه منها

3. أخرى حدي

35. كم غسله من الغسلات تمت للناموسية التي لديك؟

1. مرة . 2. مرتان . 3. أكثر من مرتين . 4. لم اغسلها بعد

36. هل تعيدي التشبع للناموسية بالمبيد بعد غسلها . 1. نعم . 2. لا

In The Name of Allah

University of Khartoum

Faculty of Public & Environmental Health

A questionnaire about the role of health education in improving utilization of ITNs in controlling Malaria among Mothers in Elhosh city-Gazira state 2007-2008

1. House keeper name

2. Tribe

3.Age:

1.(15- less than 25 Years) 2.(26- less than 35) 3.(36-less than 45)

4. (More than 45)

4. Qualification:

1.Illiterate 2. 3. Khalwa 4.Basic education 5.

Medium 6. Secondary 7. University 8.

Post graduate

5. Social status:

1. Married 2. Unmarried (single) 3. Widow 4. Divorced

5. Profession:

1.Labour 2. employee 3. Housekeeper 4. Others

6.Family members: 1.(1-3) 2. (4-5) 3. (6-10) 4. (More than10)

7. Children less than five years:

1. Number () male 2. Number () female
8. Family income per month in Sudanese pound:
 1. Less than 250sp 2. 250-300 3. 350-500 4. More than 500 sp
9. Do you know Malaria?
 1. Yes 2. No
10. Have you contacted Malaria?
 1. Yes 2. No
11. What is Malaria symptoms?
12. How Malaria transmitted?
 1. Flies 2. Mosquitoes 3. Insect 4. Others 5. Dont know
13. Where do Malaria transmitted mosquitoes breeding ?
 - 13.1. Malaria transmitted mosquitoes breeding at home in:
 1. Uncover water utensil (zeer) 2. Air conditioners 3. All mention above 4. Others (specify) 5. I don't know
 - 13.2. Malaria transmitted mosquitoes breed outside home in:
 1. Farms 2. Water broken nets 3. Pools and rainy water
 4. All mention above 5. Others 6. I don't know
14. Which season of year in which Mosquitoes breed in abundance?
 1. Winter 2. Summer 3. Autumn (rainy season)
15. What is the effect of Malaria on Pregnant Woman?
 1. Abortion 2. Congenital anomalies 3. Affect both pregnant woman & her child health 4. Don't know
16. Have you ever heard of Insecticide treated nets ?
 1. Yes 2. No .

17. What are benefit of ITNs ?

1. Kill insects
2. Prevent Mosquitoes & insects to reach human body
3. Protection ageist Malaria
4. All mention above
5. Idont know

19. When Mosquitoes nets are used ?

1. Autumn (rainy season)
2. Summer
3. Winter
4. All the year
5. Never used

20. When Mosquitoes nets erect ?

1. Instantly at sun set
2. Early morning
3. At noon
4. At after noon
5. Mid night
6. When I feel Mosquitoes bites

21. Des washing affect the effectiveness of ITNs ?

1. Yes
2. No
3. I don't know

23. Do you think using ITNS is useful ?

1. Useful
2. Very useful
3. useless

24. If the answer was useless.....Why ?

1. because it does not prevent Mosquito bites
2. case Allergies
3. Uncomfortable
4. Other(specify)

25. What do you think about Mosquitoes nets siz ?

1. Suitable
2. very suitable
3. Unsuitable

26. Which material do you prefer your ITNs to be made of?

- 1 polyethlene
2. Cotton
3. Others
4. Don't know

27. Do you think Mosquitoes nets provides a suitable ventilation ?

1. Yes
2. No

30. Do you think having ITNs am important priority ?

1. Yes 2. No

32. Do you keep your ITNs ?

1. Yes 2. No

33. Where do you store (keep) your ITNs during the day ?

1. Inside the room 2. out side the room 3. Others (specify)

34. How do you store (keep) ITNS ?

1. Folded 2. Unfolded

35. Do pregnant woman and children use ITNs regularly ?

1. They use it daily 2. Three to four times 3. None of the
above

36. Do you use ITNs out side rooms ?

1. Yes 2. No

37. Do you use ITNs in side rooms ?

1. Yes 2. No

38. If the answer was No.....Why ?

1. Difficult to erect 2. No need for erection 3. No enough space in
the room 4. Others (specify)

39. How Mosquitoes net is erected ?

1. By suspended it on the ceiling 2. by sticks 3. cover self by it
4. Others(specify)

40. Do you wash ITNs ?

1. Yes 2. No

41. If the answer was Yes.....Why ?

1. To remove dirt 2. To remove unpleasant smell

3. Others (specify)

42. How many times do you wash your ITNs ?

1. Once 2. twice 3. More than twice 4. Never wash

43. Do you re-saturate your net after washing ?

1. Yes 2. No

7.4 Map showing the study area:-

