Evaluation of Mothers’ Perception of the Symptoms and Signs of Acute Respiratory Infections, their Practice and Health Seeking Behaviour: A Survey in ELSururab Area (Karari Locality.)

BY
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A thesis submitted in Partial Fulfillment of the requirements for the clinical MD degree in Pediatrics and child health

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 Allaah, مِنْ يُقْرُرُ بَيْنَ عَلَهِ وَرَبِّي}}
Dedication

To my lovely family, it has started with my parents, now shared by my husband and two kids.
ACKNOWLEDGMENT

This work has come to fruition through the dedication of my supervisor Prof. Alzein A. Karar; I want to acknowledge him for the continuous guidance and supervision. Also great thanks to Prof. Salah. A. Ibrahim who helped me in formulating the proposal of this study.

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<tr>
<td>ARI</td>
<td>Acute Respiratory Infections</td>
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<tr>
<td>BRAC</td>
<td>Bangladesh Rural Advancement Committee</td>
</tr>
<tr>
<td>DALYs</td>
<td>Disability- Adjusted Life Years.</td>
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<td>GPC</td>
<td>Government Pneumonia Campaign</td>
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<td>HFS-2003</td>
<td>Health Facility Survey-2003</td>
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<td>ICCARI</td>
<td>International Consultation on Control of Acute Respiratory Infection</td>
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<tr>
<td>IMCI</td>
<td>Integrated Management of Childhood Illnesses</td>
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<tr>
<td>KAP</td>
<td>Knowledge, Attitude and Practice</td>
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<tr>
<td>LRTI</td>
<td>Lower Respiratory Tract Infections</td>
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<tr>
<td>MICS</td>
<td>Multiple Indicator Cluster Survey</td>
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<tr>
<td>NGOs</td>
<td>Non-governmental Organizations</td>
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<tr>
<td>UNICEF</td>
<td>United Nations Children’s’ Fund</td>
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<tr>
<td>UNDP</td>
<td>The United Nations Development Program</td>
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<tr>
<td>URTI</td>
<td>Upper Respiratory Tract Infections</td>
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<td>WHO</td>
<td>World Health Organization</td>
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ABSTRACT

This is a cross-sectional community-based intervention study conducted in Elsururab village-Karari Locality, Sudan, during the period February - May 2005 in order to assess knowledge, attitude and practice (KAP) of mothers of under 5 children with acute respiratory infections (ARI), identify causes of delayed or no care seeking for a child with ARI and to evaluate the impact of health education on mothers' and or caretakers' (KAP) on ARI. Research tools has included questionnaire, mother's card, flip calendars and focus group discussions.

After assessing mothers and/or caretakers' (KAP) on ARI in Feb. 2005, the author has conducted health education sessions on appropriate KAP regarding ARI in under 5 children. Three months later, the same 400 mothers were re-interviewed to evaluate the impact of health education on their KAP on ARI.

Before intervention risk factors for ARI were exposure to cold (50.8%), malnutrition (0.3%) exposure to smoke (0.8%), lack of immunization (0.3%) and transmission from an infected person (0.3%). After intervention all these percentage, had significantly increased except that of transmission from infected persons.

More than 42% of the study population before intervention reported viruses as causative agent for cough and clods, bacteria mentioned by only one mother (0.3%). After intervention viruses were mentioned by 55.2% and bacteria by 0.8%.

More than two thirds of the study population identified respiratory droplets as a way of transmission of ARI, 36.0% ascribed it to sharing cups for drinking. After intervention this knowledge had significantly improved.
Eighty-five percent of the study population would take the child with cough to a government health facility, traditional healer (5.3%) and 7.8% of them would treat him at home by themselves. After intervention 93.8% would treat the child with cough at home.

Home fluids used for cough and colds were Karkadi (16.3%), lemon juice (72.8%), and any warm drink at home (6.0%). After intervention all these percentages had significantly increased.

Twenty-six percent of the study population reported difficult breathing as the most alarming sign that warrant taking the child with cough to health facility, 18.5% mentioned fast breathing, no improvement in the child’s condition or getting worse was indicated by 38.3%. After intervention all these percentages had significantly increased.

More than 35.8% of the study population would manage the child with blocked nose by instillation of sesame oil drops in his nose, 7.0% use nasal drops. After intervention 96.8% of the mothers instilled saline drops in the blocked nose.

Cough syrups were prescribed for 31.3% of the children with cough in the two-weeks prior to this study, this percentage has dropped to 9.9% after intervention.

Causes of delayed or no care seeking for a child with cough included poverty (37.8%), long-distance to health facility (8.5%), failure to perceive severity of illness (15%), and illness of the mother (0.3%).

Three quarters (74.8%) of the mother and/or caretakers kept medicines at home and types of medicines included: cough syrups (26.8%), antibiotics (38.8%). After intervention only 9.3% would keep medicines at home.
כניסה לפעילות

sarabim בקרית

 Yii

(50.8 % )

(0.3 %)

(36 %)

(0.3 %)

(72.8 %)

(3.8 %)

(16.3 %)

(85 %)

(5.3 %)

(1.05 %)

(0.85 %)

(93.8 %)

(3.8 %)
ذكرت الدراسة عينة من الماء في وعشرة سبع، وكانت الصحة الواحدة إلى البالغة الطفل أخذ نتيجة علامة كاذبة اقامة صعوبة كالأخرى العلامات: الإفراز السريع (18.5%) حالته تدحر أو الطفل حالته تسخن وعند الطفل أتفرع في المنام زيتة دراسة عينة ثلاثة من أكثر وكال السكينة على الصحة) 37.8% (حالته تحسن وعند الطفل المصلحة) 37.8% (حالته تحسن وعند الطفل المصلحة). تحسين حالة الدراسة عينة من الأطفالية (96.8%) وحالته إدراكه 7% (حالته إدراك الام والمرض) 0.3% (حالته إدراك الام) 0.3%. أربعة ثالثة حوالى 74.8% (حالته توضع في الأدوية المنزلية) 26.8% (حالته توضع في الأدوية المنزلية) 9.3% (حالته في الأدوية المنزلية) 9.3% (حالته في الأدوية المنزلية) 9.3% (حالته في الأدوية المنزلية).
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INTRODUCTION AND LITERATURE REVIEW

1.1. INTRODUCTION:

Acute respiratory infections (ARI) can be caused by bacteria or viruses.\(^{(1)}\)

1.1.1. Epidemiological impact of acute respiratory tract infections in the developing world:

ARI are deadly, especially pneumonia. Nearly 13 million under five children die each year in the developing countries. ARI alone or linked to other illnesses cause 4.3 million of these deaths. ARI are the leading cause of death among young children. Nearly 12,000 children die from them each day. The average child in a developing country has a cough, cold or other acute respiratory infection 4-8 times a year. Most of these episodes are mild and short-lived, but one in every 30-50 turns into life threatening pneumonia. Without proper treatment, 10-20% of young children who get pneumonia die. For infants under one year and particularly for those under two months of age, the fatality rates are higher. Pneumonia, primarily bacterial pneumonia is responsible for 90% of all ARI deaths in developing countries. It cuts short the lives of 4 million young children every year. Studies of fatal
pneumonia cases in young children show that death comes quickly, usually within three to five days after the first signs of pneumonia appear.\(^{(2)}\)

1.1.2. Epidemiological impact of acute respiratory infections in Sudan:

The population of Sudan, comprising some 19 major ethnic groups, was estimated at over 31 million in 2001, with 63% living in rural areas. Children below 5 years of age are estimated to be 16.4% of the total population.\(^{(3)}\)

ARI is one of the five conditions that represents 70% of the outpatient case load among under five children. Annual health statistics report of the Federal Ministry of Health (1998) showed that ARI is responsible of 22.1% of the causes of the outpatient visits among under five children.\(^{(3)}\)

The Multiple Indicator Cluster Survey (MICS) 2000 indicate that acute respiratory infections (ARI) prevalence among under five was 16.7%. The preliminary results of the Health Facility Survey conducted in 2003 revealed a result similar to that reported by Annual Health Statistics report (1998).\(^{(3)}\)
1.1.3. WHO protocol for ARI case management:

Bacterial pneumonia is often encountered in developing countries. The most common bacteria in developing countries include *S. pneumoniae* and *H. influenzae*. Bacterial pneumonia can lead to death from hypoxia or sepsis. Many of the cases with cough or difficult breathing have only mild ARI for which they are brought to the health worker. This group of children does not need treatment with antibiotics. Their mothers and/or caretakers can treat them at home. On the assumption that early treatment with antibiotics that are effective against *S. pneumoniae* and *H. influenzae* can prevent death from pneumonia in children, WHO has sponsored an effective standard case management strategy implemented through the primary health care system, including community health workers.\(^4\)

Early treatment with antibiotics is important because pneumonia can lead to death within 3-5 days of the onset of symptoms, therefore, an easy quick access to antibiotics therapy is the cornerstone in the reduction of mortality from pneumonia.\(^5,6,7\) Because of the diagnostic problems encountered in establishing bacterial etiology of pneumonia in children\(^8,9,10\) and because almost all of the cases of pneumonia can be detected by simple clinical signs, without
radiography or laboratory data, the WHO protocol for case management of ARI in first level health facilities depends on these clinical signs and for simplicity and ease, the least number of criteria that is adequate for diagnosis and classification of cases of ARI is used. The WHO protocol puts forward two signs as the entry criteria for examining a child below 5 years of age for possible pneumonia; cough or difficult breathing. The guidelines emphasize the fact that most children with a cough do not need an antibiotic. ARI control programmes require that mothers and/or caretaker know when to seek care outside the home because many deaths from pneumonia occurs because children are brought to a health facility too late, or not at all. It has been found that it is feasible to transmit to mothers and caretakers of children under 5 years old the knowledge and skills required to manage the child with cough. It is important that the mothers and/or caretakers are taught to provide especial home care for children with simple cough and colds and to watch for the appearance of signs of pneumonia or other life-threatening conditions.

1.1.4. Mothers and/or caretakers’ role in ARI control:

Mothers and/or caretakers have a major role in preventing death from pneumonia. They need to be able to identify the early signs
and get the sick child to a health worker as quickly as possible. There are three signs that tell mothers when a child with cough may have pneumonia:(11)

- Fast or difficult breathing.
- Child unable to drink.
- Child becoming sicker.

Fast breathing was found to be a better predictor of pneumonia than auscultatory findings.(5) In infants aged 2-11 months, fast breathing is defined as a respiratory rate of 50 breaths per minute or above. In children aged 1-4 years it is defined as a respiratory rate of 40 per minute or above. In infants less than 2 months of age it is defined as a respiratory rate of 60 per minute or above.(11)

Since the qualitative impression of fast breathing has been found to be predictive of the presence of pneumonia,(5,6,7) mothers and/or caretakers have to know that fast breathing is an important sign of possible pneumonia.

Also mothers and/or caretakers have to know the key elements of home care which are fluid and nutritional support. The child can also be helped by reducing high fever, cleaning the nose, and avoiding overheating or chilling. Even in tropical climates, hypothermia (<
35.5°C) is a major cause of sickness and death in young infants.\textsuperscript{(12)} Mothers and/or caretakers must know the importance of keeping young infants warm at all times.

Mothers and/or caretakers also need to know that cough syrups are generally harmful and that home-made cough remedies and any warm fluid with a soothing effect on the throat can be used safely for children with coughs and colds. They should know that those remedies are safe inexpensive and can help moisten and soothe the throat.\textsuperscript{(13)}

1.1.5. Environmental risk factors of ARI in children under five years:

Mothers and/or caretakers need to know the factors that make children under 5 years old more susceptible to ARI; so as to avoid many attacks of ARI. There is a strong link between environmental risk factors and acute respiratory infections. Smoke has been found to be a threat in many forms. The most widely studied forms of smoke in relation to ARIs include; outdoor air pollution, indoor air pollution and cigarette smoke (passive smoking). Exposure to sulphur dioxide and other particulate predispose children to respiratory infections. In a study in Utah, USA, it has been found that children's ARI admissions to hospital were 2-3 times higher when a local steel was operating than
when it was idle, with the number of admissions directly related to the level of particulates in the air.\(^2\)

Wood, dried dung and agricultural wastes are the main sources of energy for cooking and heating in developing countries. These polluting solid fuels are considered the second biggest risk factor behind unsafe water and sanitation. Fifty-six percent of deaths and more than 80% of Disability-Adjusted life years (DALYS) lost because of the use of solid fuel as a basic energy source fall on children less than five years old and 2.7% of the global burden of the disease (in DALYS).\(^{14}\) Since they are often burned in smoky stoves and poorly ventilated rooms for along time ($\geq$ 4 hours); Children living in such conditions had significantly more and more severe ARI episodes. A study of young Native American children exposed to wood-burning stoves suggests that they are 4-5 times more likely to get pneumonia than those in homes without such stoves.\(^2\)

There is strong correlation between passive smoking and respiratory illness, when both parents are smokers the incidence of hospitalization for pneumonia was 50% greater than among children of non-smokers. The association was stronger for infants than for older children and also when the mother was smoker than when the father
was the smoker.\textsuperscript{(2)} Because most infections can be transmitted through respiratory droplets, overcrowding can increase the incidence of ARI. It has been found that there was a strong relationship between overcrowding and death from ARI. A study in Brazil found that where there were three or more children under five in a household this was associated with $2^{1/2}$ times greater pneumonia mortality.\textsuperscript{(2)}

1.1.6. **Fetal risk factors of ARI in under five children:**

There are risk factors within the child himself that put him at an increased risk of developing pneumonia. Of these is low birth weight. In Brazil and India low birth weight babies were found to have a 3-8 times greater risk of dying from pneumonia. Malnutrition increases the risk of developing pneumonia to about two times. Measles can be complicated by measles pneumonia, which frequently leads to death and children who recovered from measles had a six-fold increase in pneumonia during the six months that follows. Children who are not breast fed had a five times greater incidence of pneumonia during their first six months of live (in Peru) and they are 3 -6 times more likely to die from pneumonia in infancy (in Brazil). On a step wise logistic analysis of a study conducted by Broor, et al; it was found that lack of breast feeding, upper respiratory infections in mother, inappropriate
immunization for age and history of Acute Lower Respiratory Tract Infection (ALRTI) in the family were the significant contributors of ALRTI in children under 5 years old. Sex of the child, age of the parents, education of the parents, number of the children at home, anemia, inadequate caloric intake, type of housing were not found to have strong relation to ALRTI in children under five years old.\(^{(15)}\)

Recently it has been found that vitamin A deficiency has an influence on the incidence of pneumonia.\(^{(2)}\) All of the above mentioned risk factors of pneumonia are modifiable and since their identification may help in reducing the burden of ALRTI this knowledge should be transmitted to the mothers and/or caretakers at the household level.\(^{(15)}\)

Since control of ARI related morbidity and mortality is a major public health problem in developing countries; success in doing so needs not only the correct implementation of the WHO case management strategy, but also needs the participation of the community and families.

1.1.7. Role of the government and NGOs in ARI controls:

Mothers and/or caretakers must obtain the necessary knowledge for appropriate care seeking and home management of a child with cough. Also they have to know the predisposing factors to
ARI in order to avoid them. This is particularly true for mothers from poor communities that is because they have limited resources. Correct use of the standard case management strategy can prevent pneumonia related mortality.\(^{(16,17)}\) This is only true if families seek health care in a timely fashion from an appropriate provider.

To be effective health education programs should be designed to take into account the current KAP of mothers and/or caretakers on ARI in their children. Current health education interventions aimed at motivating mothers to appropriately manage the child with cough and other life threatening illnesses seem to be very effective in reducing pneumonia in their children.\(^{(18,19-27)}\) This has been supported by the results obtained by UNICEF in 1995 when they found that 40% of Peruvian mothers reported the correct signs of pneumonia\(^{(27)}\) and a study done in 2000 in Peru showed that over 80% of the mothers know about the signs of pneumonia. This large improvement has been attributed to the actions taken by Government Pneumonia Campaign (GPC) and other activities performed to motivate mothers to seek medical advice.\(^{(28)}\) The Peruvians government has used many programs to prevent pneumonia related deaths in under five years, of these programms are the winter pneumonia campaigns. Deaths from
pneumonia are usually higher during winter months and the period between 1999 - 2000 has witnessed a great deal of work during the winter months (regardless of when it was promoted, the central message of the government campaign was the same: rapidly breathing, rapidly to the health center".\(^{(29)}\)

In a pilot project carried out by the Danish-Vietnamese Study Group in Southern Vietnam, mothers KAP on ARI management was assessed before and two months after intervening by case management intervention modules. The mothers' KAP has improved by 25% two months after participating in the seminars. Also it has been shown that KAP has spread among the untrained mother (5-10%) rise in their KAP.\(^{(30)}\) It has been found that KAP of the mothers working in the health sector was significantly higher than that of the mothers interviewed in the secondary health care center. This has emphasized that education has a fundamental and a positive influence on the preventive and curative care that mothers provide to their children with cough.\(^{(31)}\)
1.2. LITERATURE REVIEW

Three hundred and four mothers from two villages of Block Beri of district Rohtak, Haryana were asked about their knowledge and practices regarding pneumonia. About 23% mother recognized pneumonia by fast breathing and 11.2% identified severe pneumonia by chest indrawing. Only 1.3% of the sample knew infective origin of ARI. More than two thirds (70%) of the study population were advising food restriction. Traditional medicine was preferred by most of the mothers especially herbal tea. Primary Health Centre was the most favorite place for treatment of ARI and mother-in-law was the most important health provider for the child.\(^{(32)}\)

In a study done in Karachi squatter settlements and rural Punjab-Pakistan, 35 mothers and four self-trained allopathic practitioners were interviewed about their beliefs and knowledge about pneumonia. The results showed maternal recognition of the cause of pneumonia is very different from the biomedical concepts. Mothers relate fast breathing to fever alone. Most of them relate chest indrawing to pneumonia. Government health facilities were visited only by mothers lacking other options. Private (frequently unlicensed)
practitioners were the most frequented health providers for treatment of ARI. They are unable to diagnose pneumonia with irrational use of antibiotics.\(^{(33)}\)

The KAP on ARI of 300 mothers in both rural and urban areas (Yangon, Myanmar) were compared. The results showed almost the same KAP on ARI of mothers in both categories. There is difference in their health care seeking practice. Most of them do not know the causes of pneumonia. Most of the mothers had not experienced the fatal danger sign, chest indrawing. Private general practitioners were preferred health providers in urban areas. Government health facilities were the most frequented place attended by rural mothers. Self-medication was widely spread among mothers in both categories.\(^{(34)}\)

In rural Kwazulu/Natal, South Africa, KAP of mothers around ARI was assessed in a descriptive study. (15 knowledgeable mothers were shown a video of 10 children with respiratory distress and four normal children. Mothers were asked to describe perceived types, signs, symptoms, cause of and actions taken for each child). Results showed that maternal knowledge of respiratory distress was good (sensitivity 91.3%, 95% cl: 86-8958%; specificity 95%, 95 cl: 89.5100%
with little variations between mothers (kappa = 0.704). Mothers described 12 local types of respiratory illness, which were classifiable into five causative categories: supernatural, natural, tuberculosis, cold weather and unknown. This means that their knowledge about causation is poor. When supernatural causation was perceived for the illness, mothers do not seek medical advice and they preferred traditional remedies.\(^{(35)}\)

In an urban Ghanaian population; one hundred and forty-three women traders were asked about their KAP on ARI in their children under 5 years old. Results showed poor maternal knowledge regarding the etiology of ARI. They were able to differentiate between mild and severe ARI, but still they delay medical care seeking in the presence of the following symptoms dyspnoea (11.2%); tachypnoea (18.9%); chest indrawing (21.7%); cough, fever and anorexia (30.0%); and cough, fever and lethargy 57.3%.\(^{(36)}\)

In an urban community in Addis Ababa, 222 mothers who brought their children to hospital with cough or difficult breathing were asked about their perceptions and interpretations of ARI signs and symptoms. Their answers were compared with those of a physician.
The results showed poor maternal knowledge regarding symptoms and signs of ARI including the key signs of pneumonia—rapid breathing and chest indrawing. A small percentage of these mothers have identified these signs but still did not interpret them as serious.\(^{(37)}\)

A total of 25,046 mothers from three villages and four hamlets in a rural Gambian population were interviewed over a period of 1 year. Interviews were about mothers’ perception of ARI in children 5 years of age. Mothers indicated that fast and difficult breathing can differentiate between upper and lower respiratory infections (sensitivity 73% specificity 73%) and chest pain (70%) was the sign that motivate them to seek medical care.\(^{(39)}\)

A rapid focused, ethnographic study was carried out in a rural area of west Java, Indonesia to identify local beliefs, perceptions and practices surrounding ARI in infants and young children. The mothers said that ARI is caused by air entering the body through some type of chill, exposure to draft or breeze, or change of weather. Mothers used increased number and diverse types of medicines when fever or difficult breathing was present. Mothers prescribed both difficult and rapid breathing as difficult breathing. They do not seek timely care for infants who are less likely to receive appropriate antibiotic therapy.
because mothers take the drugs in order to deliver them to the infant through breast milk.\(^{(40)}\)

In two communities in Ismailia, Egypt, a video was used to assess mothers’ recognition and interpretation of clinical signs of serious illness. The results showed that mothers have a good knowledge about rapid and difficult breathing but they do not use this knowledge to seek appropriate care.\(^{(41)}\)

In Matlab, Bangladesh, community perception of signs and symptoms of ARI, constrains to service utilization and case management behavior were assessed. Mothers attributed pneumonia to exposure to clod. Also attack by evil influences was some times claimed. This resulted in delaying or avoiding allopathic treatment.\(^{(42)}\)

In rural Bangladesh 63 older and younger mothers were interviewed about their KAP on ARI in children under 5 years old. Almost all of them recognized pneumonia and can differentiate between mild and severe ARI. They believed that ARIs were due to humeral imbalances, super natural causes and “negligent” mothers. They treat children at home by giving specially prepared juices, massaging child with oil and avoiding cooling foods. The Bangladesh Rural Advancement Committee (BRAC) health volunteers has a clear
influence on health care practices and rural mothers were satisfied to be able to quickly access low-cost medicines from this committee.\(^\text{(43)}\)

One hundred and thirty two mothers in a rural area (Gondar) in Ethiopia were interviewed to determine how they recognize pneumonia and what type of treatment they propose for pneumonia and mild ARI. The majority of study group identified pneumonia by rapid breathing, grunting and high fever but only 35.6% would seek appropriate health care outside home. Traditional practices were so frequently utilized.\(^\text{(44)}\)

In a baseline study for training purposes, two indicators of ARI (the respiratory rate (RR) and chest indrawing) were assessed by Ministry of Health, physicians in Egypt using a WHO video tape. Current health personnel showed poor recognition of chest in drawing. RR counted over a complete minute were more accurate than those counted over half a minute using timers with audible cues for counting RR was comparable to using watches with a second hands.\(^\text{(45)}\)

One hundred and thirty two mothers with at least one child younger than 5 years of age living in the villages of Dembosge, Koladuba and Gondar, Ethiopia, were interviewed by medical students to assess their KAP on ARI in their children. More than 77% of the study group mentioned respiratory rate, high fever (76.5%) and
decreased feeding (62.8%) as important signs of pneumonia. Only about one third (35.6%) would timely access medical care for a child with those symptoms. The majority of them (64.4%) would take the child to a traditional healer and apply butter and herb to the chest via massage at home (95.5%). Tonsil extraction by a traditional healer was the preferred treatment for a child with sore throat by 85.6% of the study population. (46)

In a health facility-based study in Enugu, Eastern Nigeria, 400 women were interviewed to assess their KAP on ARI in their pre-school children. More than half (61%) the study groups recognize pneumonia by difficult breathing, 42% by fast breathing, and 26.5% by severe cough. Only 8.5% mentioned signs suggestive of chest in drawing and central cyanosis (1%). Most of the study group (87.5%) were unsure of the late signs such as chest in drawing and central cyanosis suggested severe disease. (47)

Five hundred and one Peruvian mothers were surveyed and their knowledge and recognition of pneumonia in children under 5 years of age was assessed. About 17% of the study population said that they either did not know what pneumonia is or they had never heard about pneumonia. Only 28.9% blamed a virus or a germ as a
cause of pneumonia. A majority (80%) know the key signs of pneumonia—rapid breathing and chest in drawing. Most of the mothers would seek medical advice from an appropriate health provider. Approximately 15% of mothers would talk to a pharmacist, treat her child with medicinal herbs or with an herbal bath.\(^{(48)}\)

In Harare, Zimbabwe 413 children under 5 years of age attending a health facility for cough were studied. Aim of the study was to assess the ability of caregivers to recognize signs of pneumonia in children aged less than 5 years, to identify home remedies used for cough and to determine the number of caregivers who possess a watch and are able to use it for counting the respiratory rate. Results showed that most of the caregivers can recognize pneumonia. Two-thirds (66%) of the interviewed caregivers had used some remedy to treat the cough at home. Only a few caregivers possessed a watch and were able to use it. Pneumonia can be recognized by caregivers without a watch.\(^{(49)}\)

Mothers in Oriental Mindoro, Philippines are interviewed in clinics and focus groups in order to assess their knowledge on ARI symptoms and signs, home care, perception of severity and health care seeking behavior. Mothers tended to delay health care seeking for
up to 7 days after the appearance of symptoms of the disease. Traditional healers are the most frequent consulted health providers, they can differentiate between a wheeze and grunting, they rarely indicated fast breathing and chest indrawing as symptoms. Fever was mentioned as a sign of severity.\(^{(50)}\)

In a longitudinal study conducted in Maple, a coastal village of Udupi District it was found that most (91.3\%) of ARI cases were mild cough and cold. Age and sex has no influence on ARI incidence. However, pneumonia incidence is significantly higher among infants. Poor housing and exposure to smoke have an effect on the incidence.\(^{(51)}\)

In a community based cross-sectional survey in Baringo district, Kenya, the KAP of mothers regarding ARI in their children under 5 years old was assessed. Three hundred and nine mothers were studied. Less than one-fifth of mothers described pneumonia satisfactorily. More than three-quarters of the study population would seek health centre services for severe ARI.\(^{(52)}\)

Kapoor has interviewed 106 mother in a rural area in India in order to assess their knowledge about pneumonia, to know the types of therapy practiced by them for mild ARI and to know feeding
practices, which they follow when a child under five years old develop cough. A majority of the study population knew pneumonia by rapid breathing and difficult breathing. More than 50% of the mothers do not give any treatment or use only home remedies, while in cases of pneumonia their favourite health provider is a qualified doctor. If the disease was severe, about 33% of the mothers would take the child to a hospital. Regarding feeding practices, most of the mothers said that they would continue feeding, fluids, and breast-feeds. Tendency to stop feeding was observed among 10% of the study population; which 15% would decrease the amounts.\textsuperscript{(53)}

In Rwalpindi Hospital, Pakistan, Mull et al has interviewed 320 mother in order to know how they differentiated between pneumonia and common cold. A related objectives was to determine whether they could correctly judge the actual presence or absence of two major pneumonia signs, fast breathing and chest indrawing. Results showed that mothers' perception that a child had fast breathing and/or chest indrawing was highly correlated with pneumonia (sensitivity 64%, specificity 90%). They recognized fast breathing better than chest indrawing and accurate diagnosis of both signs was better when
interviewed mothers had prior experience with childhood pneumonia.(54)

Harison, et al has evaluated maternal reporting of symptoms and signs of pneumonia two and four weeks after diagnosis among 271 Egyptian children less than 5 years old, selected from a prospective study of the signs and symptoms of pneumonia in Ismailia and Assiut. (children with ARI were evaluated by physical examination, chest radiography, and pulse oximetry and were alternately assigned for a maternal interview about the episode 14 or 28 days later. The most frequently mentioned terms were Nahagan “deep or rapid breathing” "49%", Yenet "Grunting" mentioned by 28% and Karshet nafas "difficult or rapid breathing" reported by 31% of the mothers. The study concluded that maternal reporting of ARI symptoms is non-specific two and four weeks after diagnosis, but may be useful for monitoring trends in the proportion of children with pneumonia who receive medical care.(55)

The two-weekly ARI incidence in Alwar District (Rajasthan) at 33 episodes per 100 under-fives. Seventy-six percent of ARI cases were mild episodes. Private practitioners were the mostly consulted source of health care.(56)
In an ethnographic study of ARI in four local Government areas in Nigeria; one hundred and four focus group discussions with 53 mothers, 21 grandmothers and 30 fathers were arranged. Results showed that they believed that cold water, heredity, poor hygiene, exposure to smoke and dust and the super-natural forces are the major causes of ARI. They reported preventive measures related to the perceived causes of ARI. Regarding home remedies for the treatment of ARI, 39% of groups mentioned herbal teas, honey with lemon was mentioned by 19.5% of the study population; 8.4% reported that eating certain vegetables will relieve cough, while 21.7% used to use remedies containing palm oil.\(^{(57)}\)

In a cross-sectional community-based study conducted in the Lagos Island local Government area of Lagos State, 495 children of 450 mothers were identified by cluster-sampling technique, they were enrolled in a study to determine mothers’ action when their children are ill. More than 86% of these children had symptoms suggestive of malaria, ARI, diarrhoea and measles, 280 (65.7%) sought care outside the home at the onset of illness, while 146 (34.3%) were treated at home, 23 (8.2%) of the 280 who were taken for care outside the home were taken for care at the beginning of the illness, while the remainder
were taken after attempting home care (68.6%), use of traditional remedies (12.5%) and adoption of traditional home care (10.7%), 23.2% of the children were taken for care within 24 hours of perceived onset of the illness.\(^{(58)}\)

In the Sembabule district of central Uganda, a study conducted to assess the prevalence of childhood illnesses and care seeking practices for children with upper respiratory tract infections (URTIs), fever and diarrhoeas. Majority (82.7%) regarded fever as the most serious health problem to their children. Smaller percentage of the 300 interviewed mothers perceived URTI, diarrhoea and measles as serious. This study showed a wide gap between knowledge on ARI and practice indicating the presence of constrains to seeking health care outside home, Only 35.0% of the interviewed mothers sought care when children had URTI, while the majority of children with fever, diarrhoea and URTI were treated at home and taken to health units too late in the course of the disease. Causes that act as barriers to accessing health care included high costs of care, long distances to health units, poor attitude of health workers, lack of drug at health units and limited involvement of fathers in care of the children.\(^{(59)}\)
Khan AZ, et al has conducted a study in Aligarh, India in order to relate the KAP of mothers on ARI to their literacy status, 75% of the 140 interviewed mothers had complete knowledge regarding management of ARI. Mass media and health personnel were the major sources of information on ARI for those mothers because most mothers (89.3%) received their information from them. ARI episodes were the most alarming health problems for those mothers and most of women (87.2%) were concerned because they afraid that their children or contacts could be adversely affected. About three-quarters of mothers seek health care early during an episode of ARI. All of the medical practitioners prescribed allopathic medicine and the majority of them practiced non allopathic medicine. More than two-thirds of the study population were ready to take their children to the desired health centers when needed.\(^{(60)}\)

In a study conducted in Negri Sembilan - Malaysia in order to compare the KAP of 100 Malay mothers on ARI with that of a similar number of Chinese mothers, the following results were obtained: the mothers reported germs, food and change in climate as causes of ARIs in children. More than two thirds (70%) of Malays worried when their children had a mild ARI and the majority (85%) would seek health care.
More than half of the Chinese mothers were worried when their child had a mild ARI and 70% would seek care as soon as possible. In case of severe ARI no mother would delay care seeking. Both Chinese and Malay were afraid that their children would become weak, that is why they were worried. The Malays mothers mentioned another reason for being worry that is fear of death, while the Chinese mentioned that the ill child could infect others. Sixty eight percent of the Malays and 57% of the Chinese would not give fruits and vegetables to their sick child. Food taboos were not believed by 20% of the Malays and 36% of the Chinese. The suitable diet during an ARI was known by most mothers. Health services were utilized by 93% of the Malays, however, only 69% of the Chinese would utilize it. (24% of the Chinese would purchase medicine to treat their child). Causes that would prevent Chinese mothers from seeking care include: far distance and lack of time. Eighty nine percent Malays and 92% Chinese were interested in knowing much about ARIs and most of them preferred health personnel as sources of information. (21% of the Chinese could obtain information from reading).(61)

In Bagamoyo District, Tanzania, a population based case control study was conducted in order to evaluate factors that act as
constrains to utilization of government health care system, and factors associated with death among children under 5 years old. The results showed that about one quarter of deaths were attributed to pneumonia based on "verbal autopsy". More than one third of ARI deaths occurred in children less than 6 months old. Only 45% of the interviewed mothers utilized government health services, this is because traditional medicine is preferred by 41% of the mothers and because of shortage of drugs (38%). Independent associations were found with mothers as sole decision maker for treatment (OR: 0.13; 95 CL: 0.07; 0.22) and the child sleeping in the cooking room (OR: 2.78; 95%, CL: 1.79, 4.33).\(^{(62)}\)

Local concepts regarding ARI were studied by interviewing 315 mothers of young children in their homes in Punjab villages. Mothers were able to differentiate between pneumonia, cough and colds, only a few mothers correctly mentioned fast breathing as a sign of pneumonia, they ascribed both illnesses to "coldness" and initially treat them with heat producing home remedies and feeding was continued in both. They did not believe in spiritual healers for cough and cold or pneumonia and almost all of them reported that allopathic drugs were necessary for both illnesses. Sixty six percent of the interviewed
mothers would change the medicine and/or the doctor if her child used it for two days without improvement.\(^{(63)}\)

Data were collected from 250 mothers attending 5 primary health care centers in Riyadh during a one month period. The prevalence of ARI in children was 24%. The children mostly affected are those with lighter weight, not immunized and their mothers were working women. Most of the study population (75%) has consulted some body about ARI mostly at government health facilities. Tachypnoea was one of the mostly alarming signs for mothers to seek health care.\(^{(64)}\)

In Tlaxcala State, Mexico (80%) of the children died from ARI or diarrhoea were managed medically before death and more than 70% of those children were cared for by a private physician. For ARI case management, the decision on antibiotic and symptomatic drug use has improved in both groups.\(^{(65)}\)

National Drug Policy Programmes have been developed in many countries in order to minimize the environmental antibiotic pressure and thereby hopefully limit increasing bacteria resistance. In a study conducted in two rural communities in Vietnam, in which rural mothers’ perceptions and use of antibiotics in the treatment of ARI in
children ≤ 5 years were studied. Mothers’ perceptions and use of antibiotics reflects indignation of antibiotic into traditional Vietnamese thinking and medical practice. This resulted in self-medication and a respect for antibiotics from the mothers’ point of view.\textsuperscript{(66)}

A case control study in urban and suburban areas of Mexico city has found that ARI deaths mostly occur in the poorest communities. Seventy eight percent of them were infants <6 months old and 68% of deaths has occurred at home. Failure to receive antibiotics was found to be associated with death. This has supported the fact that antibiotics are essential and has a great role early in the disease than later on.\textsuperscript{(67)}

Fast breathing has been confirmed to be most useful predictor of pneumonia. Auscultatory findings (namely crackles) have good relation to the presence of radiological pneumonia. Cyanosis and chest indrawing were found to be highly specific signs of pneumonia.\textsuperscript{(68)}

In a community-based longitudinal study conducted in Matlab-Bangladesh, the overall incidence of ARI was 5.5 episodes per child -year observed, the prevalence was 35.4 per 100 day observed 96% of the episodes were URTI. Incidence of ALRI was 0.23 child per year. The incidence rates of URI were higher during the monsoon and during the pre-winter period.\textsuperscript{(69)}
In Burkina Faso - West Africa (44%) of children were found to be ill during the rainy season and 59% of these had ARI. Those rates has risen to 48% and 73% respectively during the dry reason. They develop 6.2 attacks of ARI during the six months of the rainy season compared with 7.0 during the six months of the dry season. Predisposing factors to pneumonia has included malnutrition and a high birth rank.\(^{(70)}\)

Hadi A has assessed impact of implementing case management strategy in improving the competency of community health volunteers in diagnosing and treating ARI. He has assessed the experience of the Bangladesh Rural Advancement Committee (BRAC) and has concluded that diagnosis and treatment of ARIs are possible at the household level in developing countries if intensive basic training and the close supervision of service provider are ensured.\(^{(71)}\)

Sixty two percent of rural Bangladeshi women would seek medical care for their children within 24 hours of the onset of illness, while 23.2% of them would not intervene at all. Not seeking care was attributed to failure to perceive severity followed by work loss.\(^{(72)}\)

The impact of health care provision on acute lower respiratory tract infection (ALRI) mortality in young children in rural Bangladesh
was assessed. The result showed that ALRI mortality was 54% lower in the community based ALRI control program area than in an area without intervention.\(^{(73)}\)

In 1988 a program was designed to treat children with ALRI in a Primary Health Care Project in rural Bangladesh. ALRI specific mortality in the program was compared with a control area. The results suggested that specific and non-specific intervention can reduce ALRTI mortality by as much as 50% and the overall mortality among under 5-years old by as much as 30\%.\(^{(74)}\)

De Fransisco, et al has conducted a case-control study in a rural area of the Gambia to evaluate risk factors for death from ALRI, they found that exposure to smoke during cooking, parental smoking and exclusive prolonged breast-feeding have a significant impact on the rate of death from ALRTI. Exposure to smoke during cooking was the most significant factor identified.\(^{(75)}\)

In the Teknaf area of Southern Bangladesh, ALRI rates were highest in the age group \(\leq 5\) month. Significant risk factors for fatal ALRI were malnutrition (18\%) and measles (8\%).\(^{(76)}\)

In Tari-Southern high lands province; acute lower respiratory tract infection (ALRI) was found to be the commonest cause of severe
morbidity. In their first year of life children developed two to three episodes of ALRI, about one fifth of which was moderate or severe illness. Health services utilization has depended on the age of the child. The majority of the children who died from ALRI has received some form of medical care, but less than half of them has received inpatient treatment.\(^{(77)}\)

Mothers from San-Juan-Comalapa, in Guatemala were able to recognize rapid breathing but not chest indrawing; Usually they sought care from physician or other providers at health center, but not in a timely fashion because health services were difficult to access and they were not able to perceive the severity of symptoms.\(^{(78)}\)

Faulty beliefs about medicines and unwanted attitudes towards medication were widely spread among Vietnamese women, 40 -60% of people in Vietnam depend on self-medication. More than 27% of 505 mothers kept drugs for expected illness in the future. Ninety-six different antibiotics were stocked at 76 house-holds mainly for cough and diarrhoea. Self-medication practice was more prevalent when a mother kept medicines in the house.\(^{(79)}\)

Data were collected from 13 primary care pediatric clinics on parents' expectations of and knowledge about the role of antibiotics in
childhood URTI. Eighty one percent attributed their visit to avoidance of complications and to be examined mentioned by 78%. Expected treatment was cough syrups (64%), decongestants (57%), paracetamol (56%), natural remedies (53%) and antibiotics (25%). Only 37% reported that antibiotics are useless in URTI and 27% knew that URTI is a self-limiting disease. Sixty one percent mentioned viruses as etiological agents of URTI.\(^{(80)}\)

In Ethiopia, Butajira district, a social anthropologist, 15 mothers were interviewed to assess their practices in the care of children with acute respiratory infections (ARIs). The results showed that only two mothers knew about pneumonia even after intervention still there were ten mothers did not recognize pneumonia as an illness entity. Fast breathing and chest indrawing were not known by the Ethiopian mothers, and few of them would seek care outside home. They would use traditional treatments e.g. massaging the chest with butter.\(^{(81)}\)
1.3. JUSTIFICATIONS AND OBJECTIVES

1.3.1. JUSTIFICATIONS:

This study has been conducted because ARIs are still a major killer of children under 5 years and because early treatment of ARI can significantly reduce ARI related mortality and morbidity.

1.3.2. OBJECTIVES:

The study aims to:

1- Assess mother’s and/or caretakers knowledge, attitude and practice about appropriate care seeking for a child with an ARI.

2- Identify the reasons for delayed or no care seeking for a child with an ARI.

3- Evaluate the impact of health education on mothers' and/or caretakers' knowledge, attitude and practice towards the child with ARI.
2. METHODOLOGY

2.1. Study design:
   A cross sectional community-based intervention study.

2.2. Study area:

   *El Sururab area (Karari Locality)* is a village that is about 48 km to the north of Omdurman city. It came into being 600-700 years ago. It is located from the North by Sheikh Eltyeb village, from the south by El nuba village, from the East by the river Nile and from the West by El Ruhal.

   Administratively it belongs to Karari locality. The total population was estimated to be 5,719 (2004). Individuals of whom 70-80% are farmers. The remaining 20-30% are employee in the capital of country (Khartoum). It has been divided into 7 sectors:

   1- Sururab Northern sector.
   2- Sururab Middle sector.
   3- Sururab Southern sector.
   4- Sururab Jemeab sector.
   5- Sururab Jemoeia sector.
   6- Sururab Danagla sector.
   7- Sururab Shaigea sector.
Electricity and water supply facilities were introduced in 1968.

In ElSururab village there are 37 water reservoirs.

El Sururab village is connected by the civil transportation with Omdurman district only. Type of available transportation are:

1- Microbuses.
2- Lorries.
3- Cars.

**Educational and social services:** education has started there in 1914 and now there are seven basic schools, two higher secondary schools, three Kindergartens, nine mosques and two khalwas.

**Health services:** the first dressing station was built there in 1918, it has developed to a dispensary, then a health centre and finally a hospital in 1984. Now there is one rural hospital (Amir Abdel Gadir's Hospital), one health centre, one PHC centre and one private clinic.

The habitants of Elsururab village include: Elsururab who belonged to Jemoeia tribe, Gaalia, Nourab, Hasania, Gabrab, Kababeesh and Hawaweer (Appendix 2).

**2.3. Study duration:**

This community-based intervention trial had been conducted in Elsururab area from February to May 2005 (Appendix 3).
• A baseline questionnaire administered to mothers and/or caretakers in 7th -11th of February 2005.

• Health education conducted in the period 12th -22nd of February 2005.

• After-intervention questionnaire administered in the period 13th -16th of May 2005.

2.4. Study population:

Mothers and/or caretakers of children under 5 years of age who agreed to participate in the study.

2.4.1. Inclusion criteria:

All mothers and/or caretakers of children under 5 years of age who agreed to participate in the study.

2.4.2. Exclusion criteria:

1- Mothers and/or caretakers of children ≥ 5 years of age.

2- Mothers and/or caretakers of children under 5 years of age who refused to participate in the study.

3- Mothers with children having chronic respiratory symptoms and signs due to problems other than ARI e.g. tuberculosis or asthma.
2.4.3. Sample size and sampling technique:-

The sample size for this study was calculated from the equation:-

\[ n = \frac{pz^2q}{d^2} \]

Where: \( n \equiv \text{sample size} \)

\( p \equiv \text{prevalence of ARI (63\%)}^* \)

\( Z \equiv \text{statistical certainty (= 1.96 at 95 confidence interval)}. \)

\( q = 1-p (= 0.37). \)

\( d \equiv \text{desired margin of error (0.05)}. \)

\[ n = \frac{0.63 \times (1.96)^2 \times 0.37}{0.0025} = 372 \]

\[ n \approx 400 \]


2.4.4. Sampling technique:

A stratified cluster sampling technique was used. In ELSururab area the community size is 5,719 persons (2004) and there is a map of
the community, then the community was divided into six subsections which were estimated to be slightly larger than the required cluster size. Each subsection was surveyed. When no enough mothers were found, the nearest subsection was surveyed.

The required number of children under 5 per cluster was 67 children.

2.5. Research tools:

2.5.1. Questionnaire:

Structured standardized questioner adapted from the standard care questionnaire included in the CDD, ARI household survey manual translated into Arabic and further adapted using local language. Sections of the core questionnaire selected including information about health care seeking behavior when the child develops cough or difficult breathing, and when to seek medical advice in case of an ARI episode. Some questions were added including causes of delayed or no care seeking, the benefit of antibiotics for ARI symptoms, does the mother keep medicines at home and whether she shares it for two children.

2.5.2. Health education aids:
Pictures and cards provided by the IMCI (mother card) were used for the health education of the mothers and/or caretakers about appropriated health care seeking for an ARI episode.

2.6. Study technique:

The author has arranged a two days training session during which the surveyors were showed how to fill in the questionnaire. The surveyors were divided in to teams. Each team was composed of two persons who were showed the starting point in their cluster. During the same two days the author showed the supervisors their responsibilities.

After the surveyors has completed the sample size of 400. The author arranged for health education of mothers about appropriate care seeking in the case of an ARI episode. This was performed by leading focus group discussion. A group of 6-10 mothers were collected in a central household or a club and they were given health messages about appropriate care seeking for ARI. Sessions were conducted until the 400 mothers were enrolled. The author has used interviews and pictures projected by IMCI.
2.7. Research team and responsibilities:

2.7.1. Research team:

1- The author.

2- 10 surveyors.

3- 2 supervisors.

2.7.2. Research personnel:

Two categories of personnel were selected to participate in date collection: surveyors and supervisors.

- Surveyors were selected according to the following criteria.
- Preference for females, other than males, in order to gain easy access to households.
- Ability to speak the local language, previous experience in conducting interviews using a standard questionnaire.
- Complete availability for 6 days to participate in the 2 days training period and 4 days data collection period.

Number of surveyors was calculated from the following equation.

\[
\text{No. of surveyors needed} = \frac{\text{sample size}}{\text{No. of days to be spent interviewing} \times \text{No of mothers expected to be interviewed by a surveyor per day of interviewing}}
\]

\[
\frac{400}{4 \times 10} = 10 \text{ surveyors}
\]
• The supervisors were selected in each cluster to:
  
a. Monitor surveyors performance, provide guidance and feedback and solve possible problems encountered during the field work.
  
b. Identify the clusters selected for the survey.
  
c. Correctly complete survey questionnaires back to the author.

Two supervisors were needed.

2.8. Administrative arrangements:

The author has used Amir Abdel Gadir’s Hospital in Elsarurab area as the center for training of supervisors and surveyors and from there they were distributed into teams of two surveyors each surveyor interviewed 20 mothers per day. The surveyors were transported to their subsections and again back to the hospital at 7: 00 p.m. when the completed questionnaires were collected from them and reviewed by the author. When she found incomplete answers, she visited the household with the incomplete questionnaire and completed it in a proper way. Per Diem was 2000 SD for the surveyors and 4000 SD for the supervisor.

Supplies for the study such as:
- Waterproof bags and pencils.
- 2 staplers
- Papers to copy the questionnaire.
- Transportation, and per diem for survey teams when they were in the field.

2.9. Ethical issues:

- One of the supervisors also act as a local guide and he has informed the families through the mosque about the survey and its objectives and was given a verbal consent to interview their wives at home.
- A verbal consent was taken from the mothers and/or caretakers of children to participate in the study.
- If the surveyors find an ill child in any of the visited household, they will refer him urgently to the hospital for medical care.

2.10. Survey Analysis:

Data in each questionnaire were analyzed using an Statistical Package for Social Sciences (SPSS) computerized programme for analysis, and $X^2$ was used as a significant test with P. value of $\leq 0.05$. 
RESULTS

3.1. Socio-demographic characteristics:

Almost all of the sample were mothers except two, one was the sister of children under 5 years old and the second was the grandmother because the mother was absent.

Most of the study population (69%) were in the age group 20-35 years, three mothers were 40 years old. Most of the mothers (53%) have ended their high secondary school education, 7(1.8%) were university graduate and there is no illiterate mother among the study population, they have 565 child under 5 years old (Table 1).

3.2. Risk factors for cough and/or common cold:

Before intervention malnutrition was reported by 0.3%, lack of immunization (0.3%) and transmission from an infected person (0.3%). This knowledge had significantly improved after intervention (P= 0.0001) as shown in (Table 2).
Table 1: Sociodemographic characteristics of the study population

<table>
<thead>
<tr>
<th>Age (in years):</th>
<th>No. of mothers</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 -25</td>
<td>60</td>
<td>15</td>
</tr>
<tr>
<td>26-30</td>
<td>152</td>
<td>38</td>
</tr>
<tr>
<td>31-35</td>
<td>108</td>
<td>27</td>
</tr>
<tr>
<td>36-39</td>
<td>68</td>
<td>17</td>
</tr>
<tr>
<td>&gt; 40</td>
<td>12</td>
<td>3.0</td>
</tr>
</tbody>
</table>

Number of children under 5 year old/ per family:

| 1              | 300            | 75         |
| 2              | 12             | 3.0        |
| 3              | 14             | 3.5        |
| 4              | 1              | 0.3        |

Level of education:

| Basic school  | 181            | 45.3 |
| Secondary school | 212       | 53.0 |
| University     | 07             | 1.8  |
Table 2: Risk factors of cough and/or common cold as in children under 5 years old (n= 400)

<table>
<thead>
<tr>
<th>Risk factor</th>
<th>Group</th>
<th>Before intervention</th>
<th>After intervention</th>
<th>P. value</th>
<th>X²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure to cold</td>
<td></td>
<td>203 (50.8%)</td>
<td>25 (6.3%)</td>
<td>0.0001</td>
<td>194.357</td>
</tr>
<tr>
<td>Exposure to smoke</td>
<td></td>
<td>3 (0.8%)</td>
<td>395 (98.8%)</td>
<td>0.0001</td>
<td>768.339</td>
</tr>
<tr>
<td>Malnutrition</td>
<td></td>
<td>1 (0.3%)</td>
<td>383 (95.8%)</td>
<td>0.0001</td>
<td>730.789</td>
</tr>
<tr>
<td>Lack of immunization</td>
<td></td>
<td>1 (0.3%)</td>
<td>284 (71%)</td>
<td>0.0001</td>
<td>436.527</td>
</tr>
<tr>
<td>Transmission from infected person</td>
<td></td>
<td>1 (0.3%)</td>
<td>3 (0.8%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do not know</td>
<td></td>
<td>2 (0.5%)</td>
<td>0 (0.0%)</td>
<td>0.0001</td>
<td>2.005</td>
</tr>
<tr>
<td>Others</td>
<td></td>
<td>197 (49.3%)</td>
<td>0 (0.0%)</td>
<td>0.0001</td>
<td>54.473</td>
</tr>
</tbody>
</table>
3.3. Causative agent(s) of cough and/or common cold:

Mothers' knowledge regarding causative agent(s) of cough and/or common cold was evaluated. Only 171 (42.8%) mentioned viruses, 0.3% reported bacteria and 1.8% indicated transmission from an infected person. This knowledge has greatly improved in the study group after intervention where viruses were mentioned by 396 (99%) (P = 0.993) as shown in (Table 3).

3.4. Causative agent(s) of pneumonia:

Mothers' knowledge regarding causative agent(s) of pneumonia was found to be poor in the sample before intervention. Bacteria was mentioned only by 3 mothers (0.8%), this knowledge did not improve in the sample after intervention where viruses were mentioned by 397 mothers (99.3%). Transmission from an infected person was indicated by 0.5% of the sample before intervention and none mentioned it after intervention. Weather changes was claimed by 7.8% before intervention and no mother mentioned it after intervention (P = 0.989) as shown in (Table 4).
Table 3: Causative agent(s) of cough and/or common cold (n = 400)

<table>
<thead>
<tr>
<th>Causative agent(s)</th>
<th>Group</th>
<th>Before intervention</th>
<th>After intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacteria</td>
<td>1 (0.3%)</td>
<td>3 (0.8%)</td>
<td></td>
</tr>
<tr>
<td>Viruses</td>
<td>171 (42.8%)</td>
<td>396 (99%)</td>
<td></td>
</tr>
<tr>
<td>Spiritual</td>
<td>1 (0.3%)</td>
<td>1 (0.3%)</td>
<td></td>
</tr>
<tr>
<td>Exposure to air</td>
<td>4 (1%)</td>
<td>0 (0.0%)</td>
<td></td>
</tr>
<tr>
<td>Exposure to cold</td>
<td>77 (19.3%)</td>
<td>0 (0.0%)</td>
<td></td>
</tr>
<tr>
<td>Exposure to water</td>
<td>62 (15.5%)</td>
<td>0 (0.0%)</td>
<td></td>
</tr>
<tr>
<td>Weather changes</td>
<td>25 (6.3%)</td>
<td>0 (0.0%)</td>
<td></td>
</tr>
<tr>
<td>Transmission from infected person</td>
<td>7 (1.8%)</td>
<td>0 (0.0%)</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>100 (25%)</td>
<td>0 (0.0%)</td>
<td></td>
</tr>
<tr>
<td>Do not know</td>
<td>226 (56.5%)</td>
<td>28 (7.0%)</td>
<td></td>
</tr>
</tbody>
</table>

P = 0.993  \quad X^2 = 1.480
<table>
<thead>
<tr>
<th>Causative agent(s)</th>
<th>Group</th>
<th>Before intervention</th>
<th>After intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacteria</td>
<td></td>
<td>3 (0.8%)</td>
<td>2 (0.5%)</td>
</tr>
<tr>
<td>Viruses</td>
<td></td>
<td>177 (44.3%)</td>
<td>397 (99.3%)</td>
</tr>
<tr>
<td>Spiritual</td>
<td></td>
<td>2 (0.5%)</td>
<td>1 (0.3%)</td>
</tr>
<tr>
<td>Transmission from infected person</td>
<td></td>
<td>2 (0.5%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Malnutrition</td>
<td></td>
<td>1 (0.3%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Exposure to water</td>
<td></td>
<td>62 (15.5%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Changes of the weather</td>
<td></td>
<td>31 (7.8%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Others</td>
<td></td>
<td>33 (7.5%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Do not know</td>
<td></td>
<td>215 (53.8%)</td>
<td>35 (8.8%)</td>
</tr>
</tbody>
</table>

\[ P = 0.989 \quad \chi^2 = 0.893 \]
3.5. Mode of transmission of cough and/or common cold:

Respiratory droplets as a way of transmission of cough were correctly mentioned by more than two-thirds of the group before intervention and by more than 3 quarters of the sample after intervention. Before intervention 36.8% ascribed transmission to sharing cups, 0.3% to heredity and 0.3% to compatible blood groups. After intervention sharing cups was mentioned by 91.0% of the sample (P = 0.0001) as indicated in (Table 5).

3.6. Seeking medical care:

The health care seeking behaviour of mothers towards a child with cough was assessed, 340 (85.0%) would take their child to a government health facility in the group pre-interventionally. After intervention, 375 (93.8%) would treat them at home by themselves (P = 0.551), this indicated in (Fig. 1).

3.7. Recommended home fluids for cough:

Table 6 indicates that, 65 (16.3%) of the study group before intervention recommended karkadi as a home remedy for cough, bee honey (3.8%), lemon juice (72.8%). After intervention, 81% recommended karkadi, bee honey (58.8%) and lemon juice (88.5%) (P = 0.0001)
Table 5: Mode of transmission of cough and/or common cold

(n= 400)

<table>
<thead>
<tr>
<th>Mode of transmission</th>
<th>Group</th>
<th>Before intervention</th>
<th>After intervention</th>
<th>P. value</th>
<th>X²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sharing cups</td>
<td>147 (36.8%)</td>
<td>364 (91.0%)</td>
<td>0.0001</td>
<td>261.029</td>
<td></td>
</tr>
<tr>
<td>Respiratory droplets</td>
<td>266 (66.5%)</td>
<td>385 (96.3%)</td>
<td>0.0001</td>
<td>116.793</td>
<td></td>
</tr>
<tr>
<td>Sleeping in and using the same indwelling of affected person</td>
<td>19 (4.8%)</td>
<td>212 (53.0%)</td>
<td>0.0001</td>
<td>226.715</td>
<td></td>
</tr>
<tr>
<td>Poor hygiene</td>
<td>2 (0.5%)</td>
<td>2 (0.5%)</td>
<td>1.000</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>8 (2.1%)</td>
<td>0 (0.0%)</td>
<td>0.143</td>
<td>12.183</td>
<td></td>
</tr>
<tr>
<td>Home fluids</td>
<td>Group Before intervention</td>
<td>Group After intervention</td>
<td>P. value</td>
<td>X²</td>
<td></td>
</tr>
<tr>
<td>-----------------------------</td>
<td>---------------------------</td>
<td>--------------------------</td>
<td>----------</td>
<td>-------</td>
<td></td>
</tr>
<tr>
<td>Karkadi</td>
<td>65 (16.3%)</td>
<td>324 (81.0%)</td>
<td>0.0001</td>
<td>335.659</td>
<td></td>
</tr>
<tr>
<td>Bee honey</td>
<td>15 (3.8%)</td>
<td>235 (58.8%)</td>
<td>0.0001</td>
<td>281.600</td>
<td></td>
</tr>
<tr>
<td>Lemon juice</td>
<td>291 (72.8%)</td>
<td>354 (88.5%)</td>
<td>0.0001</td>
<td>31.760</td>
<td></td>
</tr>
<tr>
<td>Any warm drink at home</td>
<td>27 (6.9%)</td>
<td>206 (51.5%)</td>
<td>0.0001</td>
<td>194.025</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>51 (12.8%)</td>
<td>2 (0.5%)</td>
<td>0.0001</td>
<td>48.583</td>
<td></td>
</tr>
</tbody>
</table>
3.8. Knowledge about amount of fluids during illness:

About three-quarters of the study group before intervention tended to let the amount of fluid the same as before illness. Thirty (7.5%) before intervention increased amount of fluids, while only two (0.5%) in the group after intervention increased the amount of fluids. Still there was one mother (0.3%) in the group after intervention who did not know what to do ($P = 0.027$) as shown in (Fig. 2).

3.9. Knowledge about amount of food during illness:

About three quarters of the study group tended to let the amount of food the same as before illness in the study group before intervention. Thirty (7.5%) in the group before intervention increased amount of the food, while only two (0.5%) in the group after intervention increased the amount of food. Still there was one mother (0.3%) in the group after intervention who did not know what to do ($P = 0.027$) as shown in (Table 7).
Table 7: Mothers and/or caretakers' knowledge regarding the food given to child with cough and/or common cold (n= 400)

<table>
<thead>
<tr>
<th>Amount of food</th>
<th>Group</th>
<th>Before intervention</th>
<th>After intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase</td>
<td></td>
<td>30 (7.5%)</td>
<td>2 (0.5%)</td>
</tr>
<tr>
<td>Decrease</td>
<td></td>
<td>73 (18.3%)</td>
<td>7 (1.8%)</td>
</tr>
<tr>
<td>Same as before illness</td>
<td></td>
<td>292 (73%)</td>
<td>390 (97.5%)</td>
</tr>
<tr>
<td>Do not know</td>
<td></td>
<td>5 (1.3%)</td>
<td>1 (0.3%)</td>
</tr>
</tbody>
</table>

P = 0.027  \quad \chi^2 = 18.771
3.10. Recognition of pneumonia:

Regarding recognition of pneumonia, no improvement in child's condition or getting worse were the mostly alarming signs mentioned by 153 (38.3%) mothers in the study population before intervention, difficult breathing mentioned by 104 (26.0%) and less than one fifth mentioned fast breathing. After intervention 215 (53.8%) mentioned fast breathing; 284 (71.0%) mentioned difficult breathing (P = 0.0001) and no improvement in the child's condition or getting worse was mentioned by 62.5% of the study population (P = 0.0001) this presented in (Table 8).

3.11. Usefulness of antibiotics:

In the study group before intervention, 353 (88.3%) thought "it is useful for cough", 214 (53.5%) said "it is useful for cold and runny nose", 371 (92.8%) indicated that it is useful for pneumonia. After intervention 399 (99.8%) mothers said that "antibiotics are useful for pneumonia". Significant change in this knowledge occurred after intervention, where 393 (98.3%) indicated that they are useless for cough and colds (P = 0.0001) as shown in (Table 9).
Table 8: Symptoms and signs that warrant seeking health care for a child with cough (n= 400)

<table>
<thead>
<tr>
<th>Symptoms and signs</th>
<th>Group</th>
<th>P. value</th>
<th>X²</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Before intervention</td>
<td>After intervention</td>
<td></td>
</tr>
<tr>
<td>Fast breathing</td>
<td>74 (18.5%)</td>
<td>215 (53.8%)</td>
<td>0.0001</td>
</tr>
<tr>
<td>Difficult breathing</td>
<td>104 (26.0%)</td>
<td>284 (71.0%)</td>
<td>0.0001</td>
</tr>
<tr>
<td>Inability to drink</td>
<td>12 (3.0%)</td>
<td>84 (21.0%)</td>
<td>0.0001</td>
</tr>
<tr>
<td>No improvement child's condition or getting worse</td>
<td>153 (38.3%)</td>
<td>250 (62.5%)</td>
<td>0.0001</td>
</tr>
<tr>
<td>Others</td>
<td>42 (1.5%)</td>
<td>1 (0.3%)</td>
<td>0.0001</td>
</tr>
</tbody>
</table>
Table 9: Mothers and/or caretakers knowledge about usefulness of antibiotics for under 5 children when they develop ARI (n= 400)

<table>
<thead>
<tr>
<th>Usefulness of antibiotics</th>
<th>Group</th>
<th>Before intervention</th>
<th>After intervention</th>
<th>P. value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Useful</td>
<td>Useless</td>
<td>Useful</td>
</tr>
<tr>
<td>For cough</td>
<td>353 (88.3%)</td>
<td>47 (11.8%)</td>
<td>3 (0.8%)</td>
<td>397 (99.3%)</td>
</tr>
<tr>
<td>For runny nose</td>
<td>214 (53.5%)</td>
<td>186(46.5%)</td>
<td>2 (0.5%)</td>
<td>393 (98.3%)</td>
</tr>
<tr>
<td>For pneumonia</td>
<td>371 (92.8%)</td>
<td>29 (7.3%)</td>
<td>399 (99.8%)</td>
<td>1 (0.3%)</td>
</tr>
</tbody>
</table>
3.12. Recognition of and management of a child with blocked nose:

Sixty-one (15.3%) of the study population cleaned the child's nose, 140 (35.0%) instilled sesame oil in the child nostril, 146 (36.5%) instilled saline drops. This practice has greatly improved in the group after intervention, where 164 (41.0%) will clean the child's nose and 387 (96.8%) will instill saline drops (P = 0.0001), as shown in (Table 10).

3.13. Number of under 5 children who developed cough and/or cold in the two weeks prior to the survey:

In this study, 341 (60.5%) child developed cough in the two weeks prior to the survey. After intervention this percentage has dropped to 41.2% (Table 11).

3.14. Health provider in the two weeks prior to the survey:

Of the study group before intervention, 301 mothers (75.3%) would take their children to governmental health facility, 25 (6.3%) treat them at home and eight (2.0%) would take them to a traditional healer. In the group after intervention, 66 mothers (16.5%) treat them at home and 163 (40.8%) would take them to government health facility (P= 0.0001) as shown in (Table 12).
Table 10: Knowledge of and Management of child with blocked nose (n= 400)

<table>
<thead>
<tr>
<th>Action taken by the mother</th>
<th>Group</th>
<th>P. value</th>
<th>X2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Before intervention</td>
<td>After intervention</td>
<td></td>
</tr>
<tr>
<td>Clean his nose</td>
<td>61 (15.3%)</td>
<td>164 (41.0%)</td>
<td>0.0001</td>
</tr>
<tr>
<td>Instill sesame oil in his nose</td>
<td>140 (35.0%)</td>
<td>5 (1.3%)</td>
<td>0.0001</td>
</tr>
<tr>
<td>Buy a nasal drops for him</td>
<td>28 (7.0%)</td>
<td>1 (0.3%)</td>
<td>0.0001</td>
</tr>
<tr>
<td>Instill saline drops in his nose</td>
<td>146 (36.5%)</td>
<td>387 (96.8%)</td>
<td>0.0001</td>
</tr>
<tr>
<td>Others</td>
<td>40 (1.0%)</td>
<td>0 (0.0%)</td>
<td>0.0001</td>
</tr>
</tbody>
</table>
Table 11: Number of children under 5 years old who developed cough and/or common in the two weeks prior to the survey (n=565)

<table>
<thead>
<tr>
<th>Children status</th>
<th>Group</th>
<th>Before intervention</th>
<th>After intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developed cough</td>
<td>341 (60.5%)</td>
<td>233 (41.2%)</td>
<td></td>
</tr>
<tr>
<td>Not developed cough</td>
<td>59 (10.4%)</td>
<td>167 (41.8%)</td>
<td></td>
</tr>
</tbody>
</table>
Table 12: Health provider for children who developed cough in the two weeks prior to the survey (n=400)

<table>
<thead>
<tr>
<th>Type of health provider</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Before intervention</td>
</tr>
<tr>
<td>Traditional healer</td>
<td>08 (2.0%)</td>
</tr>
<tr>
<td>Government health facility</td>
<td>301 (75.3%)</td>
</tr>
<tr>
<td>Treat by herself at home</td>
<td>25 (6.3%)</td>
</tr>
<tr>
<td>Private clinic</td>
<td>6 (1.5%)</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>3 (0.8%)</td>
</tr>
</tbody>
</table>

P = 0.0001  \quad X^2 = 103.638
3.14.1. Drug prescriber in the two weeks prior to survey:

In the study group before intervention, the doctor was the prescriber for 312 (78%) compared with 168 (42%) after intervention. The pharmacist was the prescriber for 2 (0.5%) in the study group before intervention and none after intervention. Twenty-five (6.3%) in the study group before intervention prescribed the drug for their children compared with 53 (13.3%) after intervention (P = 0.869) as shown in (Table 13a).

3.14.2. Drug prescribed in the two weeks prior to survey:

Cough syrup was prescribed for 125 (31.3%) in the study group before intervention compared with 23 (5.8%) after intervention. Antibiotics were prescribed for 189 (47.3%) in the study group before intervention compared with 144 (36%) after intervention. Sesame oil was used for 13 (3.3%) in study group before intervention compared with only one (0.3%) after intervention (P= 0.994) as mentioned in (Table 13b).
Table 13a: Drug prescriber for children under 5 years old who developed cough and/or common cold in the 2 week period prior to the survey (n=400)

<table>
<thead>
<tr>
<th>Drug prescriber</th>
<th>Before intervention</th>
<th>After intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doctor</td>
<td>312 (78.0%)</td>
<td>168 (42.0%)</td>
</tr>
<tr>
<td>Pharmacist</td>
<td>2 (0.5%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>By self at home</td>
<td>25 (6.3%)</td>
<td>53 (13.3%)</td>
</tr>
<tr>
<td>A relative and/or friend</td>
<td>4 (1.0%)</td>
<td>9 (2.3%)</td>
</tr>
</tbody>
</table>

P = 0.869  \( X^2 = 2.499 \)

Table 13b: Drug prescribed for children with cough and/or common cold in the 2 week period prior to the survey (n=400)

<table>
<thead>
<tr>
<th>Drug prescribed</th>
<th>Before intervention</th>
<th>After intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cough syrup</td>
<td>125 (31.3%)</td>
<td>23 (5.8%)</td>
</tr>
<tr>
<td>Antibiotics</td>
<td>189 (47.3%)</td>
<td>144 (36.0%)</td>
</tr>
<tr>
<td>Hibiscus or lemon</td>
<td>9 (2.3%)</td>
<td>62 (87.3%)</td>
</tr>
<tr>
<td>Sesame oil</td>
<td>13 (3.3%)</td>
<td>1 (0.3%)</td>
</tr>
<tr>
<td>Acacia</td>
<td>2 (0.5%)</td>
<td>1 (0.3%)</td>
</tr>
<tr>
<td>Oil and salt</td>
<td>3 (0.8%)</td>
<td>0 (0.0%)</td>
</tr>
</tbody>
</table>

P = 0.994  \( X^2 = 17.535 \)
3.15. Practice regarding amount of food given to child with cough in the two weeks prior to the survey:

Seventy seven mothers (19.3%) of the study group before intervention let the amount of food the same as before illness compared with only 3 mothers (0.8%) after intervention, 258 mothers (64.5%) of the study group before intervention stopped feeding ill child, while 229 (57.3%) after intervention. Only 6 (1.5%) in the study group before intervention increased the amount of food and no mother increased the amount of food given to the ill child after intervention (P = 0.946) as shown in (Table 14).

3.16. Practice regarding amount of fluid given to child with cough in the two weeks prior to the survey:

It was found that 309 mothers (77.3%) of the study group before intervention stopped giving fluids compared with 227 mothers (56.8%) after intervention. Only 2 mothers (0.5%) of the study group before intervention have increased the amount of the fluids compared with no one in the group after intervention. Fifty seven (14.3%) of the study group before intervention have let the amount of fluid the same as before illness compared with only 12 (3.0%) after intervention (P = 0.946) as shown in (Table 15).
Table 14: Mothers' practice regarding the amount of food given to children under 5 years old when they developed cough and/or common cold in the two weeks prior to the study (n=400)

<table>
<thead>
<tr>
<th>Amount of food</th>
<th>Group</th>
<th>Before intervention</th>
<th>After intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase</td>
<td>6 (1.5%)</td>
<td>0 (0.0%)</td>
<td></td>
</tr>
<tr>
<td>Decrease</td>
<td>35 (8.8%)</td>
<td>0 (0.0%)</td>
<td></td>
</tr>
<tr>
<td>Same as before illness</td>
<td>77 (19.3%)</td>
<td>3 (0.8%)</td>
<td></td>
</tr>
<tr>
<td>Stopped</td>
<td>258 (64.5%)</td>
<td>229 (57.3%)</td>
<td></td>
</tr>
<tr>
<td>Do not know</td>
<td>18 (4.5%)</td>
<td>0 (0.0%)</td>
<td></td>
</tr>
</tbody>
</table>

P = 0.946                \[X^2 = 0.743\]
Table 15: Mothers’ practice regarding the amount of fluid given to children with cough and/or common cold in the two weeks prior to the study (n=400)

<table>
<thead>
<tr>
<th>Amount of fluid</th>
<th>Group</th>
<th>Before intervention</th>
<th>After intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase</td>
<td>2 (0.5%)</td>
<td>0 (0.0%)</td>
<td></td>
</tr>
<tr>
<td>Decrease</td>
<td>20 (5.0%)</td>
<td>0 (0.0%)</td>
<td></td>
</tr>
<tr>
<td>Same as before illness</td>
<td>57 (14.3%)</td>
<td>12 (3.0%)</td>
<td></td>
</tr>
<tr>
<td>Stopped</td>
<td>309 (77.3%)</td>
<td>227 (56.8%)</td>
<td></td>
</tr>
<tr>
<td>Do not know</td>
<td>15 (3.8%)</td>
<td>0 (0.0%)</td>
<td></td>
</tr>
</tbody>
</table>

P = 0.946  \( X^2 = 0.743 \)
3.17. Causes of delayed or no care seeking:

In the study group before intervention, causes of delayed or no care seeking included poverty mentioned by 151 mothers (37.8%), far distance was mentioned by 34 (8.5%) of the, while 17 (4.3%) mentioned it after intervention. Sixty mothers (15.0%) of the study group before intervention believed that their children are not ill enough to be seen by a doctor compared with 137 (34.3%) after intervention. One mother (0.3%) in the study group before intervention attributed the delay in care seeking to illness of the mother (Fig. 3).
3.18. Health provider other than the doctor:

Two hundreds and fifty-three mothers (63.3%) of the study group before intervention preferred traditional healer, while no mother have mentioned traditional healer as a preferred health provider to the doctor after intervention. Ninety-six (24%) preferred traditional birth attendants study group before intervention and no mother preferred them after intervention. While 398 (99.5%) of the study group before intervention treat their children at home by themselves, only 24(6.0%) do so after intervention (P= 0.0001). Four (1.0%) of the study group before intervention let their children for Allah, one (0.3%) would treat him at home by grand mother or grand father (P = 0.0001) as shown in (Table 16).

3.19. Attitude towards keeping medicine at home:

In the study group before intervention, 299 mothers (74.8%) kept drugs at home. After intervention, 363 (78.2%) do not keep drugs at home (P= 0.0001) as shown in (Table 17).
Table 16: Type of health provider, other than the doctors (n= 400)

<table>
<thead>
<tr>
<th>Type of health provider, other than the doctor</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional healer</td>
<td>203</td>
<td>50.8</td>
</tr>
<tr>
<td>TBA</td>
<td>50</td>
<td>12.5</td>
</tr>
<tr>
<td>Trained midwife</td>
<td>59</td>
<td>14.8</td>
</tr>
<tr>
<td>By herself at home</td>
<td>88</td>
<td>22.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>400</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
Table 17: Mothers’ attitude towards keeping medicine at home  
(n= 400)

<table>
<thead>
<tr>
<th>Group</th>
<th>Before intervention</th>
<th>After intervention</th>
<th>P. value</th>
<th>X²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keep medicine</td>
<td>299 (74.8%)</td>
<td>37 (9.3%)</td>
<td>0.0001</td>
<td>352.237</td>
</tr>
<tr>
<td>Do' not keep medicine</td>
<td>101 (25.3%)</td>
<td>363 (78.2%)</td>
<td>0.0001</td>
<td>352.237</td>
</tr>
</tbody>
</table>
3.19.1. Type of medicines kept by mothers and/or caretakers at home:

Nasal drops were kept by 299 (74.8%) of the study group before intervention, while they were kept by only 37 (9.3%) of the study group after intervention (P = 0.0001). Cough syrups were kept by 107 mothers (26.8%) of the study group before intervention, while kept by only 2 (0.5%) of the study group after intervention (P = 0.0001). Antibiotics were kept by 155 (38.8%) of the study group before intervention, compared with only 18 (4.5%) of the study group after intervention (P = 0.0001). Paracetamol was kept by 57 (14.3%) of the study group before intervention. Three (0.8%) of the study group before intervention kept aspirin at home and no mother kept it at home after intervention (P = 0.0001) as indicated in (Table 18).
Table 18: Types of medicines kept at home (n= 400)

<table>
<thead>
<tr>
<th>Type of medicine</th>
<th>Group</th>
<th>P. value</th>
<th>X²</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Before intervention</td>
<td>After intervention</td>
<td></td>
</tr>
<tr>
<td>Cough syrup</td>
<td>107 (26.8%)</td>
<td>2 (0.5%)</td>
<td>0.0001</td>
</tr>
<tr>
<td>Antibiotic</td>
<td>155 (38.8%)</td>
<td>18(4.5%)</td>
<td>0.714</td>
</tr>
<tr>
<td>Nasal drops</td>
<td>299 (74.8%)</td>
<td>37 (9.3%)</td>
<td></td>
</tr>
<tr>
<td>Paracetamol</td>
<td>57 (14.3%)</td>
<td>19 (4.8%)</td>
<td>0.0001</td>
</tr>
<tr>
<td>Aspirin</td>
<td>3 (0.8%)</td>
<td>0 (0.0%)</td>
<td>0.083</td>
</tr>
</tbody>
</table>
3.19.2. Knowledge regarding the amount of antibiotic per child:

Before intervention, 374 (93.5%) of the study group before intervention used to share more than one child in one bottle of antibiotics. In the study group after intervention 374 (93.5%) use one bottle of antibiotic for one child (P= 0.0001) as presented in (Fig. 4).
CHAPTER FOUR

DISCUSSION

4.1. The results before intervention:

4.1.1. Risk factors and aetiology of ARI:

The results of this study showed poor maternal knowledge about the risk factors and causative agents of cough and pneumonia. Half of the study population do not know the causative agents of pneumonia and cough.

This result is comparable to that obtained by Galvez et al in Peru with a little difference, cold weather and sudden weather changes together with intake of cold food or drink were also mentioned as causes of pneumonia by rural Bolivian mothers and by Honduran mothers. In this study two of the mothers (0.5%) reported spiritual causes for pneumonia. This is also found in most cultural models, in which pneumonia in very young children is not generally attributed to natural causes, but it contrasts to what was found in the Peruvian mothers in 2000. and in Punjab villages where mothers did not believe in spiritual healers for cough and cold or pneumonia.
4.1.2. Mode of transmission of ARI:

Mothers knowledge about the mode of transmission of cough and/or common cold is found to be good because about two thirds attributed it to respiratory droplets. Sleeping in and using the same indwelling of affected person was mentioned by 147(36.8%) of the study group. Only one mother (0.3%) claimed incorrectly blood group compatibility as a way of transmission and 5 mothers (1.3%) do not know how cough is transmitted from person to person.

4.1.3. Appropriate health provider for ARI:

Mothers' knowledge about the appropriate health care provider for a child with cough was found to be poor where 340 (85%) mothers would take their children to a government health facility, 20 (5%) would visit a traditional healer and 1 (0.3%) would talk to a pharmacist for health advice. This result is comparable to that obtained by Saini et al in Haryana\(^{(32)}\) It is worse than the results obtained by Kapoor SK et al in India where about 33% of sample would take the child to a hospital\(^{(53)}\) and it is comparable to the study of the Peruvian mothers, 2000 in which most of the study population would visit the closet clinic and about 15% would talk to a pharmacist or use medicinal herbs.\(^{(48)}\)
4.1.4. Recognition of pneumonia and health care seeking for ARI:

Mothers' knowledge on when to seek health care for a child with cough is found to be poor. This can be attributed to their poor knowledge regarding causative agents of pneumonia and cough. Also their inability to recognize the key signs and danger signs of pneumonia resulted in delaying seeking health care. The results in this aspect of this study are less favourable than that obtained by Uwaezuoke et al from a health facility survey in Enugu-Eastern Nigeria. The knowledge of Ethiopian mothers in Gondar was also far better than in this study, however, a great deal of them delay seeking medical care outside home.

4.1.5. Feeding practices:

Regarding mothers' knowledge about feeding practices; more than two third (73%) of the study group let the amount of fluid the same as before illness, only 30(7.5%) increase the amount of fluid given to the child during illness; 5(1.3%) do not know what to do and no mother tends to stop giving fluids to the sick child. This result is comparable to that obtained by Kapoor et al in a rural area in India where most of mothers continue feeding, fluids and breast feeding and 15% would decrease the amounts. It was better than that obtained in Haryan-
India where 70% of the study population were advising food restriction.\(^{(32)}\)

4.1.6. Management of the child with blocked nose:

Mothers' knowledge about helping the child with blocked nose to breath and feed well was found to be poor because 140 (35.0%) instill sesame oil in child's nostril, 146 (36.5%) instill saline drops, one mother (0.3%) gave up and give no treatment, one (0.3%) let him inspire the vapour of water and one (0.3%) let him inspire the smoke of burned sugar. This result can be compared with that obtained by Denno, et al in Kumasi-Ghana.\(^{(36)}\)

4.1.7. Causes of delayed or no health care seeking:

Regarding the cause of delayed or no health care seeking by the mothers of children under 5 years old in El Sururab area; poverty was claimed by 151 (37.8%); 34 (8.5%) mentioned far distance as the cause, 69 (17.3%) think that it is mild illness and no need to see a doctor and one (0.3%) attributed it to illness of the mother. These causes are different from those identified in Matlab-Bangladesh,\(^{(42)}\) and in Bagamoyo Distric –Tanzania.\(^{(62)}\)
4.1.8. Health provider(s) other than the doctor:

In this study it was found that traditional healer was the most frequently consulted health provider other than the doctor because, 253 (63.3%) of the study group take their children to a traditional healer when not to the doctor; 70 (17.5%) take their children to TBA and 4 (1%) gave up and give no treatment. This result is worse than that derived from a study in Haryana, where 41% preferred traditional medicine.\(^{(32)}\)

4.1.9. Attitude towards keeping medicine at home:

An important concern is the irrational use of drugs, unneeded drugs are kept at home by 299(74.8%) of the study group. These drugs include nasal drops kept by 299(74.8%) of the interviewed mothers; cough syrups kept by 107 (26.8%); antibiotics kept by 155 (38.8%) and aspirin by 3 (7.5%) mothers. This result is opposite to that obtained by Kapoor SK, et al in India, where most of the study population preferred not to keep drugs and instead use home-made fluids,\(^{(53)}\) but was similar to that obtained in Vietnam.\(^{(79)}\)
4.1.10. Knowledge about the amount of antibiotic needed for one child:

The study group showed very poor knowledge regarding the use of one bottle of antibiotic for one child because 374 (93.5%) mothers use one bottle of antibiotic for more than one child.

4.2. The impact of health education on the KAP of mothers and/or health care takers on ARI:

After intervention; results of the study showed positive influence of health education on certain areas of mothers or caretakers KAP, although it failed improve their KAP on ARI in other areas.

4.2.1. Risk factors and aetiology of ARI:

Mothers' knowledge about risk factors and causative agent of ARI had significantly improved after intervention. These results ensured the need for supervised health education at the community level.

4.2.2. Mode of transmission of ARI:

Also health education was found to have significant effect on Mothers' knowledge about the mode of transmission of ARI from person to person. Respiratory droplets were correctly indicated by 96.3% compared with 66.5% before intervention. This positive
influence of health education was also proved by Anh, et al in Southern Vietnam.\(^{(30)}\)

4.2.3. Health provider(s) for ARI:

Mothers' knowledge and practice about seeking health care from appropriate health provider is poor where more than half of the study group take their children when they develop cough to government health facilities, also their knowledge and practice regarding home management of cases of mild ARI is found to be poor and sometimes inappropriate in the study group before intervention when only 31 (7.8\%) treated the mild cases at home sometimes incorrectly resulting in delaying appropriate management of the child with ARI. This knowledge has sharply risen after intervention where 375 (93.8\%) know that the children with mild ARI can be managed at home but still a small percentage 66 (16.5\%) of them practice it and often incorrectly.

4.2.4. Feeding practices:

Mothers and caretakers knowledge on fluid and feeding practices failed to improve after intervention. Only 0.5\% of mothers would increase amount of food and fluids for a child with cough. Also their practice did not improve after intervention. This might be because
mothers were afraid that feeding an ill child may increase the severity of the disease.

4.2.5. Recognition of pneumonia and usefulness of antibiotic for ARI:

Intervention succeeded to improve mothers and/or caretakers' ability to recognize signs of pneumonia where fast breathing was indicated by 53.8% of sample before intervention compared with less than 20% before intervention and difficult breathing (26.0% before and 71.0% after intervention). Also health education was of value in increasing mothers and caretakers' knowledge on the appropriate health provider for ARI and the effectiveness of antibiotics for ARI. Before intervention, 85% of mothers and/or caretakers would wrongly utilized health facility for treatment of children with cough. After intervention 93.8% would correctly treat them at home by themselves. This positive influence is supported by the results obtained by Fauveau, et al.\textsuperscript{(74)} and Qazi, et al who had proved that rational use of drugs in the treatment of patients with ARI can significantly reduce the ARI case fatality rate.\textsuperscript{(85)} The impact of health education on mothers and/or caretakers' practice regarding seeking medical care for children with cough in the two weeks prior to the survey was found to be weak.
The result of this study further supported the need for continuous community-based health education programmes.

4.2.6. Management of the child with blocked nose:

Effect on mothers' recognition of and management of child with blocked nose was very good, because this practice has improved by more than 50% in the study population after intervention. This result ensured the positive impact of health education on the KAP of mothers and/or caretakers of under five years.

4.2.7. Drug prescriber and drug prescribed in the two weeks prior to this survey:

Impact of health education on drug prescription practices in the two weeks prior to this study was poor because the doctor was inappropriately the drug prescriber for 42% of children with cough and still 13.3% of the study population prescribed drugs for their children with cough. This result ensured the need for an effective health education programme at the household level.

4.2.8. Causes of delayed or no health care seeking:

Health education did not exert a positive influence on barriers to seeking health care, this is may be because poverty and long-distance to health facility need not only health education, but also
logistic support at both public and government levels. Failure of mothers to perceive severity of illness might benefit from continuous health education using audiovisual training materials.

4.2.9. Health provider(s) other than the doctor:

Health education has exerted an obvious effect on mothers’ knowledge regarding health provider other than the doctor. After intervention, more than 99% would treat their children with cough at home and no mother would consult a traditional healer.

4.2.10. Attitude towards keeping medicines at home:

Attitude towards keeping medicines at home and the practice of treating more than one child with one bottle of antibiotic was positively influenced by health education on KAP of mothers and/or caretakers. This was also proved by Ali, et al, and Hadi.(71,73)

4.2.11. Types of medicines kept at home:

Cough syrups are kept at home by only 2 (0.5%) of the study group after intervention compared with 107 (26.8%) before intervention. Thirty-seven (9.3%) keep nasal drops at home after intervention compared with 299 (74.8%) before intervention. No mother keep aspirin at home after intervention compared with 3 (0.8%) before intervention.
4.2.12. The two weeks prevalence of cough:

The two-week prevalence of cough was estimated at 85.3% in the area surveyed before intervention. This prevalence has dropped significantly after intervention (58.3%) and this drop is expected because the pre-intervention study was conducted during the peak season of ARI.
CONCLUSIONS

- The mothers' and/or caretakers of children under 5 years old in ElSurarab village are middle aged educated mothers and are of moderate socioeconomic status.

- The mothers' and/or caretakers' knowledge regarding risk factors and causative agents of ARI was poor before intervention. It has improved after intervention with regard to the risk factors, but remained poor regarding the causative agents.

- Their knowledge regarding the mode of transmission of ARI was good pre-intervention and had further improved after intervening by health education.

- Mothers’ and/or caretakers’ knowledge regarding management of the child with cough and home was poor before intervention.

- Karkadi, bee honey, Lemon juice and other warm drinks at home were the recommended home fluids for a child with cough before and after intervention.

- Most of the mothers tend to stop feeding the ill child and keep the fluid the same as before illness. This knowledge did not improve after intervention.
• Causes of delayed or no care seeking for a child with cough included poverty, long distance to health center and some mothers believed that their children are not ill enough to be seen by doctors.

• The traditional healer was the second preferred source for consultation following the doctor.

• A tendency towards keeping medicines at home was observed among the study population before intervention and it has greatly regressed after intervention.

• A wide gap between knowledge and practice was observed among the study population.
RECOMMENDATIONS

Based on the results of this study, the author recommended the following planning principles as key to success:

1. Creating a link between communities and health facilities through developing a group of volunteers from the targeted community to act as community-based agents that provide health education to the mothers and/or caretakers of children under 5 years of age on a periodic basis (e.g. every 6 months interval).

2. Creating good communication between mothers and health worker who should talk with mothers and inform them about appropriate care of children with ARI. This is particularly of value because most mothers preferred health personnel as source of information.

3. Development of good communication strategies and building the skills of the community based agents through training them regularly (e.g. yearly) on the appropriate care seeking behavior and home care of the ill child under 5 years of age.

4. A suggested area for interventions is the secondary schools especially for girls. Members of the volunteers group are to provide
these girls with basic information about appropriate care seeking and home care of the child with cough.

5. The volunteers should be financially motivated to ensure sustainability.

6. Due to the gap observed between knowledge and actual performance, supervision stands out as an urgently needed mechanism to improve and sustain correct knowledge and practice.

7. Mass media should be used as a very effective way of raising parents’ awareness of the appropriate management of the child with cough.
REFERENCES


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80- Vinker S, Ronadi, Kitai E. The knowledge and expectations of parents about the role of antibiotic treatment in upper respiratory
tract infections- a survey among parents attending the primary physician with their sick child. BMC Fam Pract 2003; 4: 20.


**Survey time schedule:**

<table>
<thead>
<tr>
<th>Date</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>7th-8th February 2005</td>
<td>Training of surveyors and supervisors.</td>
</tr>
<tr>
<td>9th–11th February 2005</td>
<td>Data collection.</td>
</tr>
<tr>
<td>12th–22nd February 2005</td>
<td>Health education for the mothers who participate in the study.</td>
</tr>
<tr>
<td>12th May 2005</td>
<td>A refreshment session for the surveyors and supervisors about filling the questionnaire</td>
</tr>
<tr>
<td>13th–16th May 2005</td>
<td>Reinterviewing the same mothers interviewed in Feb 2005 to evaluate the impact of health education given during the initial survey about appropriate care seeking in the case of an ARI episode.</td>
</tr>
</tbody>
</table>