ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCES

SCHOOL OF ALLIED HEALTH SCIENCES

DEPARTMENT OF NURSING AND MIDWIFERY

ASSESSMENT OF KNOWLEDGE, PRACTICE AND FACTORS AFFECTING SUNLIGHT EXPOSURE OF INFANTS AMONG MOTHERS ATTENDING GOVERNMENTAL HEALTH FACILITIES IN DEBRE MARKOS TOWN, EAST GOJJAM, ETHIOPIA, 2014.

BY: ABEBE ABATE DESSIE (BSc Nurse)

A Research Thesis Submitted to the School of Graduate Studies of Addis Ababa University, College of Health Sciences, School of Allied Health Sciences, Department of Nursing and Midwifery for Partial Fulfillment of the Requirements of Master's Degree in Child Health Nursing.

March, 2015
Addis Ababa, Ethiopia

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This thesis by Abebe Abate is accepted in its present form by the board of examiners as satisfying thesis requirement for the degree of master in child health nursing.

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LIST OF ACRONYMS

25 (OH) D – 25 Dihydroxy vitamin D

BSc- Bachelor of Science

CI- Confidence Interval

DM- Debre Markos

ET- Ethiopia

HF- Health Facility

IU- International Unit

KM- kilometer

OR- Odds Ratio

USA- United States of America

UVB- Ultraviolet B

UVR- Ultraviolet Radiation

VDD- Vitamin D Deficiency

WHO - World Health Organization

ABSTRACT

Background- For centuries, sunlight has been used for therapeutic purposes. Parents still expose their infants to sunlight to treat neonatal jaundice, mostly to supply vitamin D for bone development as a consequence of health beliefs.

Objective- The main objective of this study was to assess knowledge, practice and factors affecting sunlight exposure of infants among mothers attending governmental health facilities in Debre Markos Town, East Gojjam, Ethiopia, 2014.

Method- Cross sectional descriptive study was conducted among mothers attending in under five and immunization clinics of all government health facilities in Debre Markos Town by taking a total sample size of 359 from December 1 to 30, 2014. Probability sampling method was used for the selection of individual respondents. Data was entered using EPI data version 3.1 and analyzed by SPSS version 16. Binary and multiple logistic regressions were done to show the association of dependent and independent variables.

Results - Out of 359 respondents identified for the study 96% (n=345) were responded for the interview. From the total respondents 60% and 55.4% of them had poor knowledge and poor practice about sunlight exposure respectively. In multivariate analysis mothers' educational status had significant association with both knowledge and practice of sunlight exposure of infants.

Conclusion and Recommendations: The findings in this study showed mothers had poor knowledge and poor practice about sunlight exposure. Therefore, mothers need to be educated about the importance of sunlight exposure.

Key words= Mothers' knowledge, Rickets, Sunlight exposure, Vitamin D, Vitamin D deficiency

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

For centuries, sunlight has been used for therapeutic purposes (heliotherapy), which dates back to ancient Rome and Greece (1). In the second half of the 19th century, it was realized that sunshine could have bactericidal effect as well as a therapeutic role in rickets (2-5).

In 1958, sunlight was first used for neonatal jaundice (2, 6, 7). Placing a child in a room where sunlight enters through window panes (not in direct sunlight) for 10 minutes twice a day was often used to help treat mild neonatal jaundice (8).

In recent years, exposure to sunlight has been a subject of epidemiological interest both due to its beneficial as well as adverse effects on human health. It is an important etiological factor in the development of skin cancers and sun-related eye problems when exposure is high (9, 10). However, the exposure to solar ultraviolet radiation (UVR) is an essential step for the production of Vitamin D, and also the main source of vitamin D in human body (11-14). Ultraviolet B (UVB) rays in the solar UVR spectrum produce vitamin D in the human body. UVB rays penetrate uncovered skin and converts cutaneous 7-dehydrocholesterol to pre-vitamin D_3, which in turn becomes vitamin D_3 (15, 16).

Studies also suggest that achieving and maintaining an adequate Vitamin D blood serum level, as determined by a 25-hydroxyvitamin D (25(OH)D) blood test, is essential to the prevention and treatment of autoimmune diseases such as multiple sclerosis and type 1 diabetes. Additionally,

Vitamin D appears to play a protective role in cardiovascular health, various types of cancer, autism, depression, schizophrenia, and respiratory conditions such as cystic fibrosis (17).

Studies worldwide identify lack of sun exposure as the main cause of rickets (18, 19). Rickets is a major public health problem in many countries of the world. In many rich industrialized countries, the prevalence of rickets in the general population diminished after the introduction of dietary supplementation. However, in such countries, vitamin-D deficiency rickets has re-emerged in recent years, particularly among groups with limited exposure to UVB-containing sunshine. Infants at risk of rickets are those whose mothers had poor vitamin D status during pregnancy and those exclusively breast-fed for a prolonged period with little skin exposure to UVB (20). Rickets is common in children in Sub-Saharan Africa. Vitamin D deficiency rickets has also common in Ethiopian children (21).

Decades have now elapsed since the pioneering studies on rickets in Ethiopia (22-25) showed that lack of exposure to sunshine was the single most important cause of rickets in Ethiopian children. Some pioneering studies as well as more recent work (26-28) suggested that daily exposure to sunshine remains the cheapest, safest and most effective method of preventing the disease (23). Indeed, health education to change maternal behavior to expose infants to sunshine was adopted as the main strategy to combat rickets in the country in the early 1960s (25). However, the implementation of the strategy has remained inconsistent and health messages lacked focus on factors that influence maternal practice excluding infants from getting adequate sunshine. This was largely because of lack of adequate information on the determinants of this particular risk behavior among Ethiopian mothers (29).

1.2 Statement of the problem

Contrary to general belief, rickets is widely prevalent in many tropical and subtropical regions despite abundant sunshine. WHO now estimates that globally one billion people have VDD (9). The incidence of rickets is particularly high in children who live in crowded houses almost devoid of sunlight (30)

Rickets is common among Ethiopian children. It contributes to infant mortality and morbidity and carries long-term consequences. Factors influencing caregiver behavior of exposing infants to sunshine, a simple preventive strategy, are not fully understood (29).

A study done in Addis Ababa, 41% of children below three years of age visiting an out-patient department had rickets and the frequency was higher in infants (23).On another study done in Jimma about 7% of under-five children were diagnosed to have rickets in paediatric admissions in Jimma Hospital (31) and there are indications that it is on the increase (26).

Another study done on children between 6 and 59 months of age for signs of rickets in Jimma Town, 25 (4%) of children were found to have rickets. The highest rate (11%) occurred in infants. It is also significantly associated with increased frequency of respiratory infections (32).

Apart from bone deformities, rickets is associated with increased rates of infections (26, 33, 34). It also contributes to increased mortality. In a retrospective case-control study done in Addis Ababa, the odds of dying in rickets patients was found to be about five times higher than that of controls (26). Mothers' have an important role in prevention of rickets; however, there is scarce study about the mothers' knowledge, practice and factors affecting practice especially in this study area. So this study was assessed knowledge, practice and factors affecting the practice of mothers' on sunlight exposure of their infants.

1.3 Significance of the Study

The purpose of this study is intended primarily to assess mothers' knowledge, practice and factors affecting their practice about sunlight exposure of their infants. Therefore, this is very important to identify areas for improvement regarding sunlight exposure and to improve the health of the community. In addition to this, in our country Ethiopia researches regarding sunlight exposure are scarce particularly in this study area. So, that the research study may provide base line information.

For policy makers, the result will hopefully give as a base line data for any child health intervention to be implemented at Ethiopian health institutions, beside this, the study can provide information about the overall situation of mother's knowledge and practice on sunlight exposure and the finding of this research makes clinical policy makers to give attention for the development of guidelines regarding sunlight exposure. Not only these, one of the millennium development goal of the Ethiopian government is reduce child mortality. So, this finding used as one input to reduce child mortality and finally to achieve this goal.

For researchers, it used as a base line data for any high scale study to be done at a health institution level.

For nursing education, it shows the gap and helps to revise the nursing curriculum based on the findings. In general it gives evidence based information for those who works in the health care system.

CHAPTER TWO

LITERATURE REVIEW

2.1 Overview

In contrast to general belief vitamin D deficiency was considered to be rare in those parts of the world that had plenty of sunshine all year round (9, 35). In developing countries where there is a high proportion of sunny weather, the occurrence of rickets in a significant proportion of children is largely attributed to social and cultural factors. Keeping children indoors because of the fear that they will catch cold, fear of evil eyes, and the tradition of wrapping children in swaddling clothes contribute to lack of adequate sunlight exposure (36).

Geographically, Ethiopia lies in a region with adequate sunlight throughout the year. However, despite its geographical location, the prevalence of VDD is reported to be high. A study on a topic rickets and knowledge and practice of exposing a child to sunshine in Jimma town shows there is a gap in the knowledge and practice of mothers regarding sunlight exposure of their babies (32).

2.2 **Knowledge of mothers about sunlight exposure of infants**

A study done in Manitoba Using a cross-sectional survey, to investigate the vitamin D status of a random sample of 80 mother-child pairs (child age 3-24 months) in a Manitoba community. The result shows knowledge of mothers about rickets was poor. In 43% of children and 76% of mothers, serum 25-hydroxyvitamin D levels were below normal range (37).

A study done in Sakarya, Turkey, to determine the extent of intentional sun exposure in infancy and the prevalence of maternal belief that potentially increases the children's harm risk from ultraviolet radiation, three hundred and ninety six Caucasian women mothering 0-12 months old infants, attending to State Hospital Healthy Infant outpatient clinic. The result shows that two hundred and thirty-five mothers (64.1%) believed that sunlight is harmful, but 296 (79.7%) named one benefit of intentional baby sunning. Sun causes cutaneous diseases was the most frequently 83(75.9%) mentioned harm and sun strengthens bones and teeth was the number one 250(84.4%) benefit according to the mothers. The leading source of knowledge for the beneficial effects of the sun was health care professionals (physician, midwife, nurse) 130(45.7%) (38).

A study done in tropical Australia to determine the prevalence of maternal beliefs about the therapeutic uses of sunlight in infancy, half of the women had a belief about the perceived benefits of sunning their baby. Thirty-six percent were in favour of using sunlight to treat neonatal jaundice, 20.2% believed it was necessary to intentionally sun their baby to prevent vitamin D deficiency and 10.5% thought sunlight was a good remedy for nappy rash. Independent predictors of one or more of these beliefs included maternal age and educational level. In most cases, advice to mothers to sun their baby had been given by a midwife/nurse (41% or a doctor/pediatrician (28%) (1).

A study conducted in Turkey on knowledge and behavior of parents concerning sunlight exposure of their babies showed, sunlight was considered beneficial for diaper rash by 7(5.9 %) of participants. One of them said her mother as the information source, the others said to be acting upon own experience. Most of the participants 102(86.4%) reported that sunlight was good for their baby’s bone development and one third of them had gathered this information from health care providers (39).

The study done in Jimma town on the topic Rickets and the knowledge and practice of exposure to sunlight shows that 617(99.68%) of mothers knew that exposing a child to sunlight was useful but 2(0.32%) of mothers said exposing a child to sunlight was harmful. About the importance of sunlight exposure 400(64.62%) of mothers said sunlight exposure strengthen bone, 90(14.54%) strengthen body, 6(0.97%) Keep child warm, 7(1.13%) do not know. All 625(100%) respondents exposed their babies early in the morning (32).

2.3 Practice of mothers on sunlight exposure of their infants

A study done in Saudi Arabia on the effect of physical activity and sun exposure on vitamin D status of Saudi children, the result shows the associations of 25 (OH) vitamin D were determined in subjects according to 3 groups based on level of exposure to sunlight. These were no exposure (0 minute), daily exposure (10–30 minutes) and weekly exposure (40–160 minutes). Around 24% of the subjects had no exposure to sun light, 39.5% had once in a week exposure and 36.5% had daily exposure and serum vitamin D levels increased with increasing sun exposure. Age was negatively and significantly associated with 25 (OH) vitamin D levels (40).

A study done in Brisbane Australia shows that approximately one third of the population reported spending 2 or more hours outside on weekends in summer and 41% in winter. Fifty-nine percent of people used sunscreen frequently in summer compared with 21% in winter. People who believed that high levels of sun exposure are required to generate vitamin D were less likely to be frequent sunscreen users. Compared with those identifying only the benefits to bone, participants identifying other benefits reported spending more than 2 hours in the sun and using less sunscreen (41).

A study done in Sakarya of all the mothers 321(87.5%) were exposed their children outside and 216(58.9%) were doing this between before 11 a.m. and after 3 p.m. From these mothers 66.2% was advised to sun their children and 86(34.3%) of mothers got this information from neighbors. Daily sunning periods was changing between 5 to 180 minutes most frequently they exposed on sunlight for 30 minutes 96(31.3%) (38). More than half of the mothers 208(56.7%) were exposed their children on sunlight behind the window (38).

The study done in Townsville, Australia, 20% of mothers believed it was necessary to intentionally expose their baby to sunlight, 50.9% disagreed and 28.9% were unsure and 22% of the women said they would use indirect sunlight. Women with an older child who had been treated for jaundice with traditional or solar phototherapy were more likely to think it was necessary in the tropics to sun babies to ensure adequate vitamin D levels. Traditional health care providers are the most respected sources of general health information with the family doctor and pharmacist regarded as the most reliable sources, followed by medical books and nurses. Three independently significant explanatory variables appeared in the final logistic regression model. The odds ratio for women $\geq$ 32 years was 4.1 (95% CI: 1.3, 12.4; P = 0.01435) compared to younger women, and 3.5 (95% CI: 1.2, 10.1; P = 0.01875) for women who had a child who had been treated for supposed neonatal jaundice, compared to 'other' mothers. Women who had been educated at a university or post-secondary college were 5.4 times (95% CI: 1.5, 19.2; P = 0.00851) as likely as women without these qualifications to believe it was necessary to sun babies to prevent vitamin D deficiency (1).

A study done in Turkey shows that most of the participants 97(82.2%) told that they expose their babies to sunlight outdoor, nearly one third (35.6%) of mothers report exposed their babies to sunlight indoor in front of a window. About half 48(49.7%) of the mothers, who exposed their

babies to sun outdoor, had gathered this information from medical staff, while one third 29(29.9%) of them said their information source to be their neighbors. Half of the participants 34(52%) who had answered the question about the timing of sun exposure, gave the correct answer before 10-11 a.m. and/or after 3 p.m. Fifty three babies (44.9%) were reported to be exposed to sun more than 15 minutes (39).

A research done in Jimma town on the topic Rickets and the knowledge and practice of exposure to sunlight shows, 576(92.16%) of mothers expose their children on sunlight daily, 47(7.52%) less frequently and 2(0.32%) of mothers never exposed. Regarding to condition of clothing during sunlight exposure 548(87.82%) exposed with unclothed/with diapers only and 76(12.18%) partly/Completely covered. Age infant start sunlight exposure in this study was 259(42.04%) between 0-15 days, 160(25.97%), between 16-30 days, 142(23.05%) of children exposed between 31-45 days, 55(8.93%) of children exposed after 46 days and above. Nearly 32% believed that a child should be taken outdoors after the first month of life (32).

2.4 **Factors influencing practice of sunlight exposure**

The study done in Saudi Arabia on knowledge, attitude and practice regarding vitamin D deficiency among female students indicates that participants were limited in their knowledge about vitamin D and vitamin D deficiency. They reported limited sunlight exposure due to intense heat, cultural reasons for covering the body and due to lack of an infrastructure that makes sunlight exposure difficult (40).

According to Tefera B, Abebe G, and Worku L. On a topic micronutrient Deficiency, in Jimma University, 2005 indicates that keeping children indoors because of the fear of cold, fear of evil

eye and the traditional clothing styles are the main contributing factors of vitamin D deficiency in developing countries (36).

A study done in Jimma town on a analysis of paediatric admissions to Jimma hosptial paediatrics ward show mothers not exposed their infants frequently enough to sunlight because of illness, unfavour-able weather conditions and/or poor living conditions (31).

A research done in Jimma Town on a topic rickets and the knowledge and practice of exposure to sunlight indicates that 582 (94.33%) of mothers had fears in exposing a child to sunlight while 9% preferred to have the child covered during exposure. Common fears of mothers' on sunlight exposure of their children were fear of cold and sick 24(3.89%) and evil eye 9(1.46%) (32).

According to a study done in Queensland on a topic behaviour of caregivers to protect their infants from exposure to the sun**,** Australia mothers not expose their infants to sunlight due to fear of skin cancer (90%) and skin wrinkles (65%). Most of these mothers would have been exposed to media campaigns and school education to limit sunlight exposure of their children as they were growing up (42).

2.5 Conceptual Frame Work

This conceptual frame work adapted from health promotion model (43). The frame work uses the independent variables socio-demographic variables; age, religion, marital status, education and occupation, source of information; physician, nurse/midwife, neighbors/elder people and mothers fear on sunlight exposure; evil eye, pneumonia, cold, sickness and the dependent variables knowledge and practice of mothers about sunlight exposure. Therefore, the conceptual frame work below shows the relationship of variables in summary.

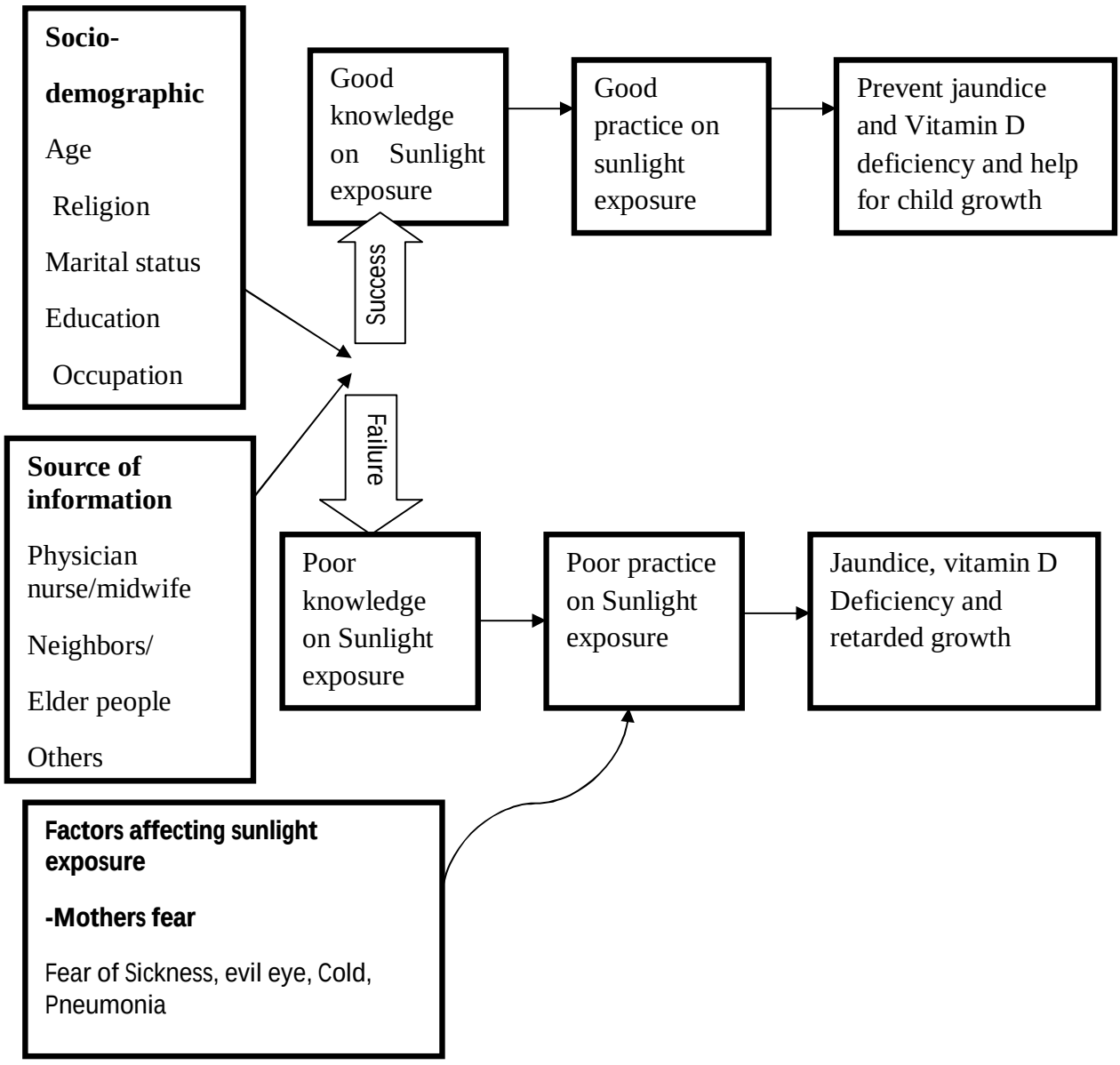


Fig.1. Conceptual frame work on mothers' knowledge and practice at governmental health facilities in Debre Markos Town, Ethiopia, 2014.

CHAPTER THREE

OBJECTIVES

3.1 General objective

- To assess knowledge, practice and factors affecting sunlight exposure of infants among mothers attending governmental health facilities in Debre Markos Town, East Gojjam, Ethiopia, 2014.

3.2 Specific objectives

- To assess level of mothers' knowledge about sunlight exposure of their infants.
- To identify practice among mothers regarding exposure of their infants to sunlight.
- To identify factors affecting practice of exposing infants to sunshine among mothers.

CHAPTER FOUR

METHODS AND MATERIALS

4.1 Study area and period

The study was conducted in all governmental health facilities in Debre Markos Town, East Gojjam, Ethiopia. Debre Markos is the capital city of East Gojjam Zone. It is 300 km far from Addis Ababa, the capital city of Ethiopia, in North West part and 265 km far from Bahir Dar, the capital city of Amhara regional state, in southern part. There are 7 Kebeles in Debre Markos Town. The total population is 101,582, from this 47,311 are males and 54,271 females and there are 3,159 infants or under one year children in the Town. There are 1 referral hospital, 4 governmental health centers, 9 private clinics and 1NGO clinic in the Town. The study was conducted from October 2013 to February 2014.

4.2 Study design

A cross-sectional institutional based study was conducted to assess mothers' knowledge, practice and factors affecting sunlight exposure of their infants at all governmental health facilities in Debre Markos Town. Data was collected from December 1to 30, 2014.

4.3 Source population

The source population was all mothers having children and attending in under five and immunization clinics of all governmental health facilities in Debre Markos Town.

4.4 Study population

The study population was mothers with infants attending in under five and immunization clinics of each governmental health facilities at the time of data collection and who fulfill the inclusion criteria.

4.4.1 **Inclusion criteria**

- Mothers with infants who was attending in under five and immunization clinics of each governmental health facilities in Debre Markos town.
- Mothers with infants who was mentally and physically capable of being responded.
- Those mothers with infants who were volunteer to participate in the study

4.4.2 **Exclusion criteria**

- Mothers with baby above 12 months of age

4.5 **Sample size determination**

Sample size was calculated using single population proportion formula with a source population of size less than 10,000. Assuming prevalence of mothers' knowledge and practice on sunlight exposure to be 50%, Z value of 1.96 and marginal error of 5%, sample size was calculated as follows:

$n = (Z_{a/2})^2 \, p \, (1-P)/d^2$

$n = (1.96)^2 \, (0.5) \, (0.5)/ \, (0.05)^2$

$n = 384$

Where: - n= sample size

Z = critical value = 1.96 for 95% CI

p = prevalence of mothers' knowledge and practice on sunlight exposure = 50%

d = precision (marginal error) = 0.05

The total number of infants in Debre Markos Town is 3,159. So since this figure is below 10,000, use the following adjustment formula for the sample size:

$n = n/ \, (1 + n/N)$

Where,

n = sample size for population of size above 10,000

N = number of infants in Debre Markos Town

Therefore,

n = 384/ (1 + 384/3,159)

n=342

Taking 5% (17) non response rate the final sample size was **359**.

4.6 Sampling procedure

All governmental health facilities were included in the study. The reason of selecting only governmental health facilities were more clients are available at governmental health facilities than private health facilities, mothers follow their infants immunization service at governmental health facilities since the service is given free of charge. Overall sample was taken proportionally from all governmental health facilities. That means proportional numbers of mothers were included in to the sample from each health facility to make up a total sample size. Each study participants was selected using systematic sampling technique in which every second client was interviewed in each health facility.

Proportional allocation of the study subjects to the five health facilities were as follows:

$$\text{n in health facility} = \frac{\text{N in a health facility} * \text{nt}}{\text{N total}}$$

Where

n in health facility= proportion of mothers with infants in a given health facility

nt = Total sample size

N in a health facility= Number of mothers with infants in a given health facility

N total = Total number of mothers with infants in all health facilities

Hidassie H/C

116/626*359 = **67** k1 = N/n = 116/67 = ~2

Debre Markos H/C

140/626*359 = **80** k2 = N/n = 140/80 = ~2

Debre Markos Referal Hospital

168/626*359 = **96** k3 = N/n = 168/96 = ~2

Gozamen H/C

112/626*359 = **64** k4 = N/n = 112/64= ~2

Weseta H/C

90/626*359 =**52** k5= N/n = 90/52 = ~2

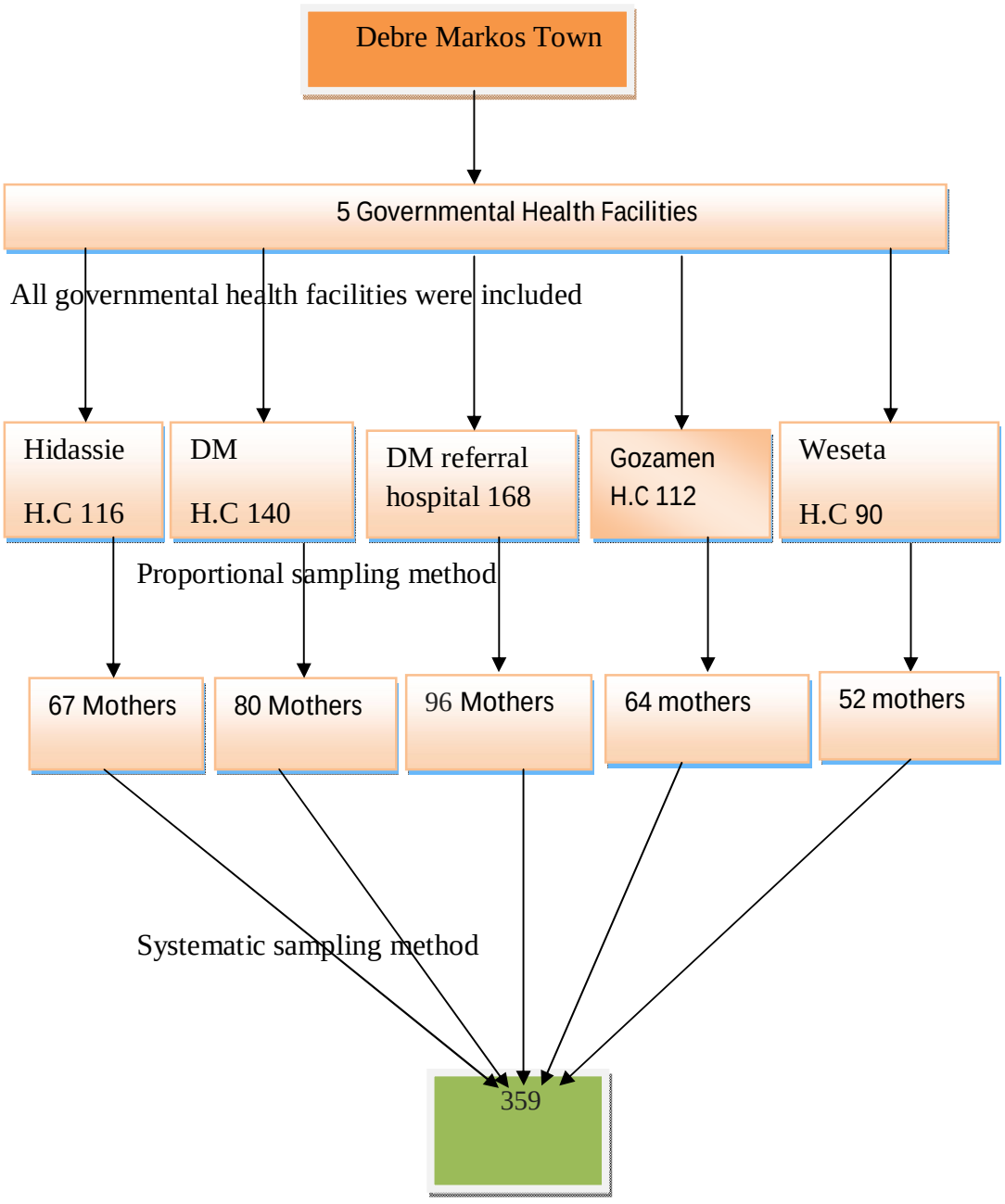


Figure 2: Schematic representation of sampling procedure on mothers' knowledge and practice at governmental health facilities in Debre Markos Town, Ethiopia, 2014.

4.7 Data collection instrument

A structured questionnaire adapted from a study done in Turkey (39) to assess mothers' knowledge, practice and factors affecting practice of sunlight exposure of infants and it was modified according to Ethiopian context. It includes all the relevant variables to meet the objectives. Part- I socio-demographic questions contain 9 questions, part-II knowledge questions contain 6 questions, part-III practice questions contain 9 questions and part- IV factors affecting practice of sunlight exposure questions contain 2 questions. An individual who had good knowledge in English language translate the English version to Amharic for better understanding of the respondents.

4.8 Data collection procedure

Before going to the data collection pretest was done on 5% (n=18) of similar mothers at Amanuel health center outside the study area. Findings and experiences from the pre-test was utilized in modifying the questionnaire. Data were collected through face to face interview method. Five diploma nurses who were worked in each health facility (one nurse for each health facility) that was not worked in that unit was recruited as data collectors, one BSc nurse was recruited as a supervisor. All data collectors and supervisor were trained for two days on their responsibilities for describing the purpose of the study, how to collect the data and telling clients the importance of honest and genuine reply on responding to questions. Mothers were interviewed after they got the services. The principal investigator and the supervisor were strictly follow the overall activities of the data collection on daily base to ensure the completeness of questionnaire and to give further clarification.

4.9 Data quality assurance

Tool was given to expertise to check content validity and accuracy. Questionnaire prepared in English version and translated in to Amharic and back to English to check its consistency. It was pre-tested on 5% (n=18) of similar mothers in Amanuel health center outside the study area. After the pretest based on the response the questionnaire was modified. Data collection was carried out by trained nurses from other units of the health facilities. The collected data were checked by the supervisor daily for completeness and finally the principal investigator was monitored the overall quality of data collection.

4.10 Study variables

4.10.1 Independent variables

- Socio-demographic factors (age, religion, ethnicity, marital status, educational status, occupation)
- source of information (physician, nurse/midwife, TV/Radio, neighbors/elder people)
- mothers fear (sickness, evil eye, cold, pneumonia)

4.10.2 Dependent variables

- Knowledge about sunlight exposure
- Practice of sunlight exposure

4.11 Data analysis procedure

Data were entered in to Epi Data version 3.1 and exported and analyzed using SPSS Software version 20. Mean, Standard deviation, frequencies, percents and odds ratio were calculated. Binary and multiple logistic regression analysis were determined to assess the association between independent and dependent variables. The strength of statistical association was

measured by odds ratio and 95% confidence intervals and statistical significance was considered at P<0.05.

4.12 **Ethical consideration**

Ethical clearance was obtained from institutional review board of department of nursing and midwifery, college of health sciences, Addis Ababa University. Letter was obtained from the department nursing and midwifery to East Gojjam Zone health bureau and from Zonal health bureau to Debre Markos woreda health office. Then letters obtained from woreda health office to all governmental health facilities for their cooperation to conduct the study in the health facilities. Each study participant was adequately informed about the purpose, method and anticipated benefit and risk of the study by their data collector. The respondents had the right to respond or refuse to the interview. Even they had the right to withdraw the interview at any time or skip any question that they do not want to respond. Oral Informed consent was obtained from study participants. All the information given by the respondents were used for research purposes only and confidentiality and privacy was maintained by omitting the name of the respondents during data collection procedure and after data collection information from the study put without participants' name and principal investigator put questionnaires locked with a key.

4.13 **Operational definitions**

Knowledge - The theoretical understanding of mothers' about sunlight exposure of infants.

Practice - Mothers' activity or behavioral experience in relation to sunlight exposure of infants.

Good knowledge -Those mothers that were responded to knowledge questions and scored above 4 median value.

Poor knowledge - Those mothers that were responded to knowledge questions and scored 4 and below 4 median value.

Good practice- Those mothers that were responded to practice questions and scored above 6 median value.

Poor practice- Those mothers that were responded to practice questions and scored 6 and below 6 median value.

4.14 **Dissemination and utilization of the result**

The thesis will be presented to Addis Ababa University, department of Nursing and midwifery as partial fulfillment of master's degree in child health nursing. The thesis will be disseminated to East Gojjam zonal health bureau, Debre Markos Woreda health bureau and for Debre Markos town governmental health facilities. The findings will be presented in different seminars, meetings and workshops and will be published in a scientific journal. Hard and soft copy will be available in the library of Addis Ababa University for graduate students as well as for other concerned readers.

CHAPTER FIVE

RESULTS

5.1 Socio-demographic Characteristics of respondents

Out of 359 mothers identified for the study, 345(96%) responded to the interview. From those respondents 156(45.2%) were between age 21 and 26 years. The mean age of the mothers were 26.9(±5.3) years and mean ages of the children were 4.7((±3.2) months. Ninety six point five percent of the participants were Orthodox in religion and 339 (98.3%) were Amhara in ethnicity. Majority 329 (95.4%) of mothers were married and 86(24.9%) of mothers had diploma and above in their educational status. Most 167(48.4%) of the respondents were housewives and 202(58.6%) of mothers had household family of 1-3 and in regard to their husbands, 126(36.5%) of husbands had diploma and above educational level (**Table 1**).

Table 1: Distribution of socio-demographic characteristics of mothers' in Debre Markos Town, Ethiopia, 2014 (n=345).

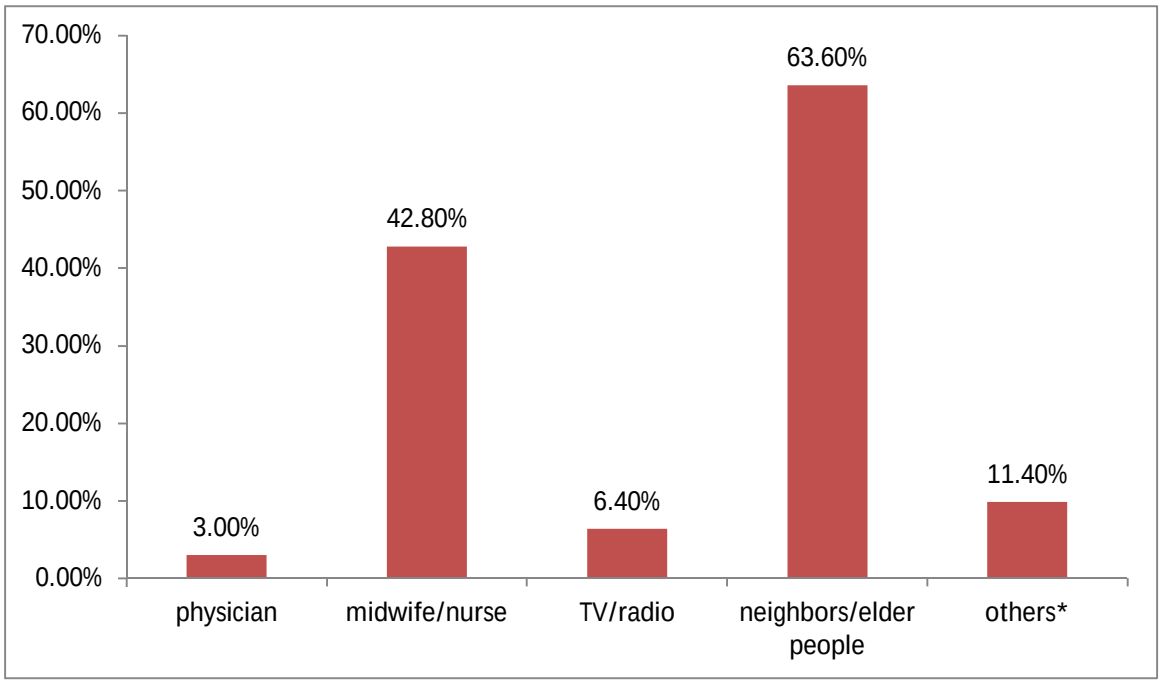
Variable Name	Frequency	Percent (%)
Mother's age		
15-20	29	8.4
21-26	156	45.2
27-32	102	29.6
33+	58	16.8
Total	**345**	**100**
Infant's age		
0-6 months	245	71
7-12 months	100	29
Total	**345**	**100**
Religion		
Orthodox	333	96.5
Muslim	9	2.6
Protestant	3	0.9
Total	**345**	**100**
Ethnicity		
Amhara	339	98.3
Oromo	3	0.9
Tigre	3	0.9
Total	**345**	**100**

Marital status		
Single	7	2
Married	329	95.4
Divorced	6	1.7
Widowed	3	0.9
Total	**345**	**100**
Mother's educational status		
unable to read and write	38	11
able to read and write	55	15.9
grade 1-6	86	24.9
grade 7-10	67	19.5
grade 11-12	13	3.8
Degree and above	86	24.9
Total	**345**	**100**
Mother's occupation		
Student	12	3.5
House wife	167	48.4
Government employee	90	26.1
Private employee	23	6.7
Daily labourer	14	4.1
Merchant	31	9
Others	8	2.3
Total	**345**	**100**
Family size		
1-3	204	59.1
4-6	135	39.1
>6	6	1.7
Total	**345**	**100**

Husband's educational status		
unable to read and write	23	6.7
able to read and write	42	12.2
grade 1-6	9	2.6
grade 7-10	66	19.1
grade 11-12	63	18.3
Degree and above	126	36.5
Missing	16	4.6
Total	**345**	**100**

5.2 Mothers' source of information about sunlight exposure of infants

Out of the total 345 respondents, 297 (86.1%) of the mothers had information (knowledge) about sunlight exposure of infants and majority 189 (63.6%) of mothers got this information from neighbors and 127(42.8%) from midwife/nurse (**figure 3**).



Others* = from health extension worker, herself, school and training.

Figure 3: Distribution of mothers by their source of information about sunlight exposure at governmental health facilities in Debre Markos Town, 2014.

5.3 Knowledge of respondents about sunlight exposure

Regarding benefit of sunlight exposure 273 (91.9%) of mothers said sunlight exposure was beneficial for infants and from these 192 (70.3%) mention sunlight exposure was useful to strength bone, 138(50.5%) mention sunlight exposure was useful to strength body and 100 (36.6%) mention sunlight exposure was useful for vitamin D production, sun strengthen teeth and sun warm a body were also indicated by the respondents as a benefit of sunlight exposure.

Regarding to harmful effect of sunlight exposure 50(14.5%) said sunlight exposure had harmful effect for the infant and most mentioned harmful effect of sunlight exposure was 39(78%) skin cancer. About time of sunlight exposure 297(100%) of mothers said good time to expose infants on sunlight was at the morning (**Table 2).**

Table 2: Knowledge of mothers' about sunlight exposure of their infants in Debre Markos Town, Ethiopia, 2014.

Variable name	Attributes	Frequency	Percent
Mentioned sunlight exposure was beneficial	Yes	273	91.9
	No	24	8.1
	Total	**297**	**100**
Mentioned strengthen bone as a benefit of sunlight exposure	Yes	192	70.3
	No	81	29.7
	Total	**273**	**100**
Mentioned strengthen teeth as a benefit of sunlight exposure	Yes	41	15
	No	232	85
	Total	**273**	**100**
Mentioned keep child warm as a benefit of sunlight exposure	Yes	36	13.2
	No	237	86.8
	Total	**273**	**100**
Mentioned vitamin D production as a benefit of sunlight exposure	Yes	100	36.6
	No	173	63.4
	Total	**273**	**100**
Mentioned strengthen body as a benefit of sunlight exposure	Yes	138	50.5
	No	135	49.5
	Total	**273**	**100**
Mentioned sunlight exposure had harmful effect	Yes	50	16.8
	No	247	83.2
	Total	**297**	**100**
Mentioned skin cancer was a harmful effect of sunlight exposure	Yes	39	78
	No	11	22
	Total	**50**	**100**
Mentioned blindness was a harmful effect of sunlight exposure	Yes	37	74
	No	13	26
	Total	**50**	**100**
Mentioned sterility was a harmful effect of sunlight Exposure	Yes	1	2
	No	49	98
	Total	**50**	**100**

5.4 Mothers' knowledge level about sunlight exposure of infants

Based on the above knowledge questions median value was calculated and it was 4, out of 345 respondents 207(60%) of respondents scored less than or equal to 4. Therefore, based the operational definition 60% of mothers had poor knowledge about sunlight exposure of infants (**Table 3**).

Table 3: Distribution of mothers by their knowledge level about sunlight exposure at governmental health facilities in Debre Markos Town, Ethiopia, 2014.

Correct answer	frequency	percent	Cumulative percent	Median value
0	48	13.9	13.9	**4**
2	24	7	20.9	
3	3	0.9	21.7	
4	132	38.3	60	
5	91	26.4	86.4	
6	7	2	88.4	
7	3	0.9	89.3	
8	1	0.3	89.6	
9	1	0.3	89.9	
10	4	1.2	91	
11	31	9	100	
Total	**345**	**100**		

5.5 Practice of mothers about sunlight exposure of infants

Out of 345 respondents, 321(93%) of mothers exposed their babies on sunlight. From these 102 (31.8%) started sunlight exposure of their infants from 16-30 days, 98(30.5%) of mothers started after 45 days and 75(23.4%) from 0-15 days. Even though, 321(93%) of mothers stated exposed their infants on sunlight, only 186(57.9%) exposed daily. Regarding place of sunlight exposure most 287 (89.4%) of mothers told they exposed infants on sunlight outdoor (outside the house). Majority 318(99.1%) of mothers exposed their infants between the time range of 8-10AM and condition of closing during exposure 133(41.4%) of mothers exposed their infants on sunlight uncovered and 121(37.7%) of mothers exposed their infants by partly covered.

Regarding to the time duration of exposure of their infants on sunlight 122(38%) were exposed from 10-15minutes followed by 82(25.5%) of mothers exposed their infants from 15-30minutes (**table 4**).

Table 4: Practice of mothers' on sunlight exposure of their infants in Debre Markos Town, Ethiopia, 2014.

Variables	Categories	Frequencies	Percent
Do you expose your baby on sunlight	Yes	321	93
	No	24	7
	Total	**345**	**100**
Age infant start sunlight exposure	0-15 days	75	23.4
	16-30 days	102	31.8
	31-45 days	46	14.3
	45 days and above	98	30.5
	Total	**321**	**100**
How frequently expose	Daily	186	57.9
	Sometimes	135	42.1
	Total	**321**	**100**
Where do you expose	Outdoor	287	89.4
	Indoor	37	10.6
	Total	**321**	**100**
Time of sunlight exposure	Morning 8-10 AM	318	99.1
	Mid day 11AM-1PM	1	0.3
	Afternoon 2-4 PM	2	0.6
	Total	**321**	**100**

Condition of closing during exposure	Unclothed	133	41.4
	With diapers and eye protection only	51	15.9
	Partly covered	121	37.7
	Completely covered	16	5
	Total	**321**	**100**
For how much minute do you expose	5-10 minute	80	24.9
	10-15 minute	122	38
	15-30 minute	82	25.5
	Above 30 minute	37	11.5
	Total	**321**	**100**

5.6 Application of lubricants on the infants body

Regarding to practice of application of lubricants almost all mothers 316(98.4%) of mothers apply lubricants on the infants body during the time of sunlight exposure and majority 223(70.6%) of mothers apply these lubricants during sunlight exposure and 51(16.1%) of mothers apply after sunlight exposure. From 316(98.4%) of mothers 138(43.7%) of mothers apply butter and 107(33.9%) of mothers apply baby Vaseline on the infants body (**figure 4**).

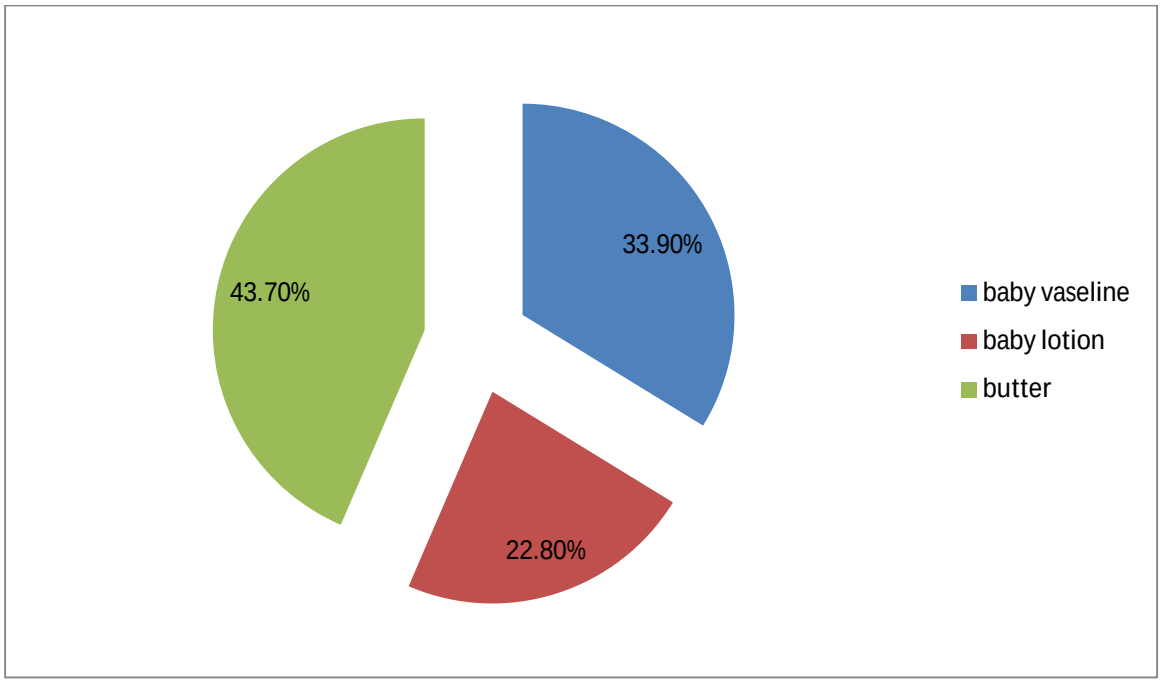


Figure 4: Application of lubricants on the infants' body at governmental health facilities in Debre Markos town, Ethiopia, 2014.

5.7 Mothers' poor practice status about sunlight exposure of infants

Therefore, based on the above practice questions median value was calculated and it was 6. Out of 345 respondents 191(55.4%) of respondents scored less than or equal to 6. Therefore, based the operational definition 55.4% of mothers had poor practice about sunlight exposure of infants. Some of the main poor practices of mothers were as follow in (**Figure 5**).

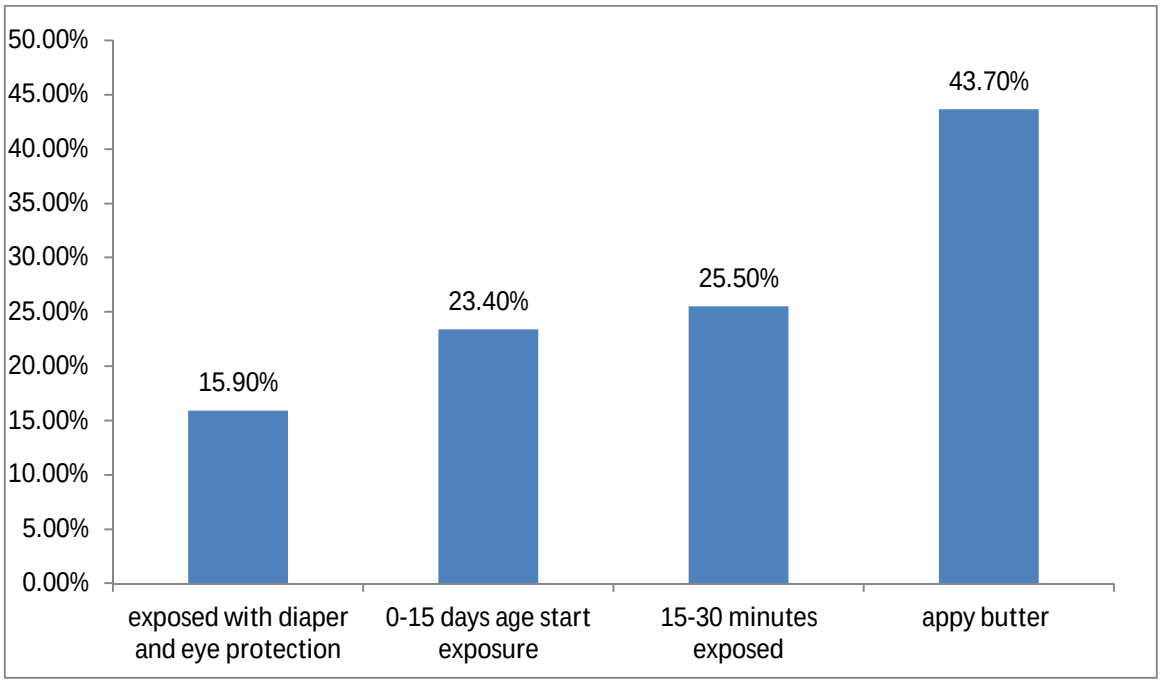


Figure 5: poor practice of mothers on sunlight exposure of infants at governmental health facilities in Debre Markos town, Ethiopia, 2014.

5.8 Factors affecting practice of sunlight exposure

Out of the total of 345 respondents, 132(38.3%) of mothers in this study area had fear to expose their infants on sunlight. The highest fear of mothers' in this study was 100(29%) fear of cold and 41(11.9%) fear of evil eye (**Figure 6**).

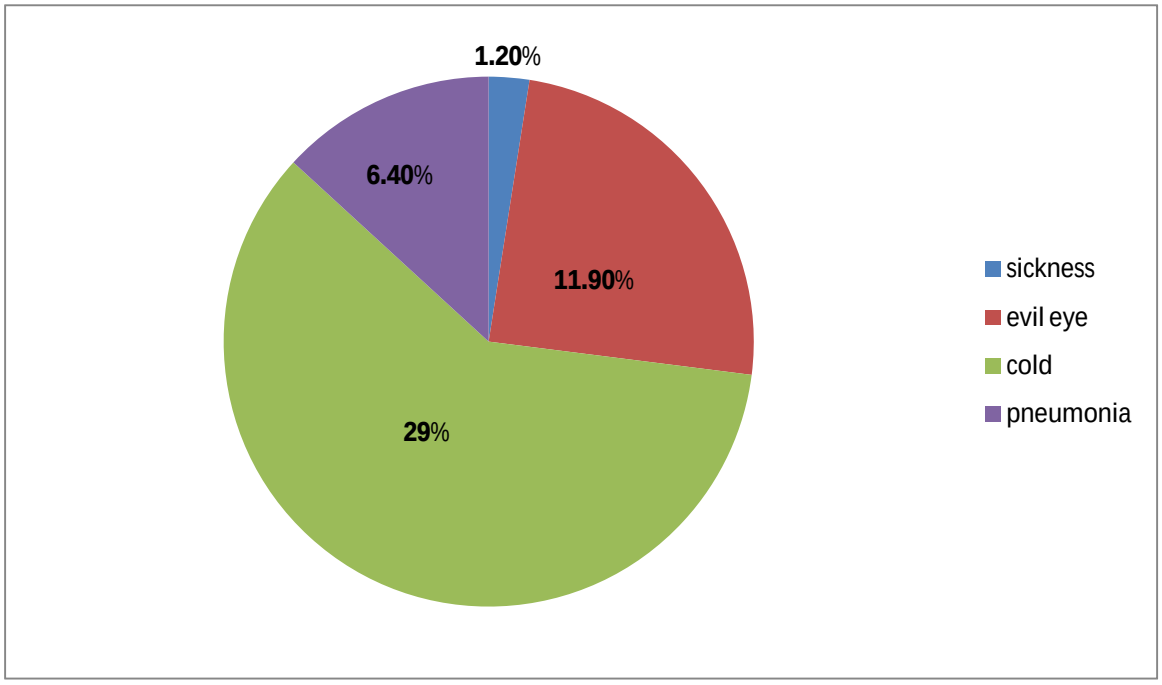


Figure 6: Factors affecting practice of mothers about sunlight exposure of infants at governmental health facilities in Debre Markos town, Ethiopia, 2014.

5.9 Association of socio-demographic factors with knowledge of mothers on sunlight exposure of infants

In the bivariate analysis significant association was observed between maternal age and knowledge of mothers, mothers with the age group of above 33 years were 8.67 times more likely knowledgeable than mothers with age group of 15-20 years(COR=8.67, 95% CI=2.36, 31.84).

The educational status of mothers also associated with knowledge, mothers who have diploma and above were 3.24 times more knowledgeable than mothers who were unable to read and write. (COR=3.24(95%CI=1.46, 7.22)). Family size of 4-6 were 3.88 times more knowledgeable than family size of 1-3 (COR=3.88 (95%CI=2.45, 6.17)).

Mothers who have diploma and above husband educational status were 2.92 times more likely to have knowledge than mothers who have husbands unable to read and write (COR=2.92(95%CI=1.08, 7.90).

Variables that had p-value less than 0.2 and variables that had significant association in the bivariate analysis taken into multivariate analysis and the significant association between maternal age, maternal education, family size, husband educational status and knowledge about sunlight exposure was retained in the multivariate analysis.

Association between marital status, occupation and knowledge about sunlight exposure was tested in the bivariate analysis and found to be no association (**Table 5**).

Table 5: Association of socio-demographic variables with knowledge of mothers on sunlight exposure of infants in Debre Markos Town, Ethiopia, 2014.

Variables	Knowledge of mothers about sunlight exposure					
	Poor	Good	p-value	COR	P-value	AOR
Mothers' age						
15-20	26(7.5%)	3(0.9%)	0.00	1	0.05	1
21-26	110(31.9%)	46(13.3%)	**0.04**	3.62(1.04,12.57)	0.11	2.93(0.77,11.15)
27-32	42(12.2%)	60(17.4%)	**0.00**	12.38(3.52,43.58)	**0.01**	5.71(1.43,22.89)
33+	29(8.4%)	29(8.4%)	**0.00**	8.67(2.36,31.84)	**0.03**	4.93(1.16,21.01)
Marital status						
Single	5(1.4%)	2(0.6%)	0.91	1		
Married	195(56.5%)	134(38.8%)	0.52	1.71(0.32,8.99)		
Divorced	4(1.2%)	2(0.6%)	0.85	1.25(1.85,1.25)		
Widowed	3(0.9)	0(0.0%)	0.99	0.00(0.00)		
Mother's educational status						
unable to read and write	25(7.2%)	13(3.8%)	0.00	1	0.05	1
able to read and write	29(8.4%)	26(7.5%)	0.21	1.73(0.73,0.4.05)	0.68	1.26(0.41,3.90)
grade 1-6	70(20.3%)	16(4.6%)	0.06	0.44(0.19,1.04)	0.65.0	0.79(0.27,2.24)
grade 7-10	45(13%)	22(6.4%)	0.89	0.94(0.41,2.18)	.26	1.83(0.63,5.32)
grade 11-12	6(1.7%)	7(2%)	0.22	2.24(0.62,8.07)	0.24	2.47(0.55,11.08)
Degree and above	32(9.3%)	54(15.7%)	**0.004**	3.24(1.46,7.22)	**0.03**	3.16(1.12,8.87)
Mother's occupation						
Student	7(2%)	5(1.4%)	0.00	1		
House wife	110(31.9%)	57(16.5%)	0.60	0.72(0.22,2.39)		
Government employee	36(10.4%)	54(15.7%)	0.23	2.10(0.62,7.13)		
Private employee	18(5.2%)	5(1.4%)	0.22	0.39(0.08,1.77)		
Daily labourer	10(2.9%)	4(1.2%)	0.49	0.56(0.11,2.86)		
Merchant	19(5.5%)	12(3.5%)	0.86	0.88(0.22,3.43)		
Others	7(2%)	1(0.3%)	0.19	0.20(0.02,2.18)		

Family size						
1-3	147(42.6%)	55(15.9%)	0.00	1	0.00	1
4-6	55(15.9%)	80(23.2)	**0.00**	3.88(2.45,6.17)	**0.00**	2.91(1.59,5.35)
>6	5(1.4%)	3(0.9%)	0.23	2.67(0.52,13.64)	0.59	1.66(0.26,10.49)
Husband's education						
unable to read and write	17(5.2%)	6(1.8%)	0.00	1	0.02	1
able to read and write	20(6.1%)	22(6.7%)	**0.04**	3.11(1.03,9.46)	**0.04**	3.89(1.01,14.93)
grade 1-6	8(2.4%)	1(0.3%)	0.37	0.35(0.04,3.45)	0.57	0.48(0.03,6.32)
grade 7-10	55(16.7%)	11(3.3%)	0.33	0.57(0.18,1.76)	0.73	0.80(0.21,2.98)
grade 11-12	33(10%)	30(9.1%)	0.78	2.58(0.90,7.39)	0.07	3.08(0.92,10.34)
Degree and above	62(18.8%)	64(19.5%)	**0.03**	2.92(1.08,7.90)	0.31	1.87(0.56,6.21)

***** Statistically significant at p-value <0.05

5.10 Association of socio-demographic and mothers' fear with practice of sunlight exposure

Regarding to sunlight exposure practice there was a statistically significant association between maternal age and practice. In bivariate analysis mothers' age between 27-32 years were 7.03 times more likely practice sunlight exposure than mothers between the age group of 15-20 years (COR=7.03(95%CI=2.62, 18.84)). Mothers with educational status of diploma and above were 8.79 times more likely practice sunlight exposure than mothers who were unable to read and write (COR=8.79(95%CI=3.70, 20.90)).

Regarding mothers occupation, daily labourer mothers 0.08 times less likely practice sunlight exposure than student mothers (COR=0.08(95%CI=0.01, 0.57)). Family size of 4-6 were 2.30 times more likely practice sunlight exposure than family size of 1-3(COR=2.30(95%CI=1.47, 3.58)).

Mothers who had diploma and above husband educational status were 6 times more likely had knowledge than mothers who had husbands unable to read and write (COR=6(95%CI=2.31, 15.53)).

Regarding mothers fear, in the bivariate analysis mothers who had no fear of evil eye were 4.55 times more likely practice sunlight exposure than mothers who had fear of evil eye (COR=4.55(95%CI=1.96, 10.58)). Mothers who had no fear of cold were 6.19 times more likely practice sunlight exposure than mothers who had fear of cold(COR=6.19(95%CI=3.46-11.06)).

Mothers who had no fear of pneumonia were 2.9 times more likely practice sunlight exposure than mothers who had fear of pneumonia(COR=2.91(95%CI=1.05, 8.08)).

Variables that had p-value less than 0.2 and variables that had significant association in the bivariate analysis taken into multivariate analysis and the significant association between maternal education, family size, fear of cold and practice about sunlight exposure was retained in the multivariate analysis but the significant association between maternal age, husband educational status, evil eye, pneumonia and practice on sunlight exposure was not retained in the multivariate analysis.

Association between marital status, fear of sick and practice on sunlight exposure was tested in the bivariate analysis and found to be no association (**Table 6**).

Table 6: Association of independent variables with practice of mothers on sunlight exposure of infants in Debre Markose Town, Ethiopia, 2014.

Variables	Practice of sunlight exposure					
	Poor	Good	p-value	COR	p-value	AOR
Mothers' age						
15-20	23(6.7%)	6(1.7%)	0.00	1	0.00	1
21-26	90(26.1%)	66(19.1%)	**0.03**	2.81(1.08,7.29)	0.07	3.50(0.88,13.96)
27-32	36(10.4%)	66(19.1%)	**0.00**	7.03(2.62,18,84)	0.26	2.30(0.54,9.82)
33+	42(12.2%)	16(4.6%)	0.49	1.46(0.50,4.24)	0.18	0.34(0.07,1.65)
Marital status						
Single	4(1.2%)	3(0.9%)	0.63	1		
Married	179(51.9%)	150(43.5%)	0.89	1.11(0.25,5.07)		
Divorced	5(1.4%)	1(0.3%)	0.32	0.27(0.02,3.65)		
Widowed	3(0.9%)	0(0.0%)	0.99	0.00		
Mothers educational status						
unable to read and write	26(7.5%)	12(3.5%)	0.00	1	0.00	1
able to read and write	33(9.6%)	22(6.4%)	0.40	1.44(0.60,3.45)	**0.04**	4.33(1.09,17.22)
grade 1-6	72(20.9%)	14(4.1%)	0.06	0.42(0.17,1.03)	0.48	0.63(0.17,2.28)
grade 7-10	36(10.4%)	31(9%)	0.14	1.87(0.81,4.30)	0.07	3.23(0.90,11.54)
grade 11-12	7(2%)	6(1.7%)	0.35	1.86(0.51,6.73)	0.13	4.07(0.67,24.52)
Degree and above	17(4.9%)	69(20%)	**0.00**	8.79(3.70,20.90)	0.14	2.91(0.70,12.00)
Mothers' occupation						
Student	4(1.2%)	8(2.3%)	0.00	1	0.02	1
House wife	119(34.5%)	48(13.9%)	**0.01**	0.20(0.06,0.70)	**0.03**	0.14(0.02,0.80)
Government employee	15(4.3%)	75(21.7%)	0.17	2.50(0.67,9.38)	0.60	0.59(0.08,4.15)
Private employee	17(4.9%)	6(1.7%)	**0.02**	0.18(0.04,0.81)	0.11	0.18(0.02,1.51)
Daily labourer	12(3.5%)	2(0.6%)	**0.01**	0.08(0.01,0.57)	**0.01**	0.02(0.00,0.44)
Merchant	18(5.2%)	13(3.8%)	0.15	0.36(0.09,1.46)	**0.02**	0.10(0.01,0.71)
Others	6(1.7%)	2(0.6%)	0.08	0.17(0.02,1.23)	0.11	0.12(0.00,1.67)

Family size						
1-3	128(37.1%)	74(21.4%)	0.00	1	0.00	1
4-6	58(16.8%)	77(22.3%)	**0.00**	2.30(1.47,3.58)	**0.00**	3.90(1.75,8.69)
>6	5(1.4%)	3(0.9%)	0.51	1.73(0.34,8.79)	0.06	7.66(0.94,62.30)
Husband's educational status						
unable to read and write	15(4.6%)	8(2.4%)	0.00	1	0.01	1
able to read and write	27(8.2%)	15(4.6%)	0.94	1.04(0.36,3.02)	0.21	0.39(0.09,1.71)
grade 1-6	8(2.4%)	1(0.3%)	0.21	0.23(0.03,2.22)	0.19	0.11(0.00,2.90)
grade 7-10	54(16.4%)	12(3,6%)	0.11	0.42(0.14,1.20)	0.12	0.32(0.08,1.33)
grade 11-12	45(13.7%)	18(5.5%)	0.58	0.75(0.27,2.07)	0.08	0.31(0.08,1.15)
Degree and above	30((9.1%)	96(29.2%)	**0.00**	6.00(2.31,15.53)	0.84	1.14(0.31,4.25)
Fear of mother Sickness						
Yes	3(0.9%)	1(0.3%)	0.34	1		
No	188(54.5%)	153(44.3%)	0.44	2.44(0.25,23,70)		
Evil eye						
Yes	34(9.9%)	7(2%)	0.00	1		1
No	15745.5%0	147(42.6%)	**0.00**	4.55(1,96,10.58)	0.25	2.04(0.61,6.88)
Cold						
Yes	83(24.1%)	17(4.9%)	0.00	1		1
No	108(31.3%)	137(39.7%)	**0.00**	6.19(3.46,11.06)	**0.00**	4.67(2.06,10.57)
Pneumonia						
Yes	17(4.9%)	5(1.4%)	0.02	1		1
No	174(50.4%)	149(43.2%)	**0.04**	2.91(1.05,8.08)	0.27	2.30(0.53,10.00)

* Statistically significant at $p<0.05$

CHAPTER SIX

DISCUSSION

The aim of this study was to assess knowledge, practice and factors affecting practice of sunlight exposure of infants among mothers attending governmental health facilities in Debre Markos town. Current approach of the Ethiopian government is decreasing child morbidity and mortality. Therefore, assessment of knowledge, practice and factors affecting practice of sunlight exposure of infants among mothers are one important aspect in maintaining children's health.

The proportion of respondents who reported that they had the information (knowledge) about sunlight exposure was 86.1%, the same study done in Jimma town showed that 100% of mothers had information about sunlight exposure (32). My finding was comparatively lower than the study done in Jimma town; the possible reason for this may be concerned bodies in Jimma town may educate the community about sunlight exposure.

Out of the total respondents responded to the question does sunlight exposure beneficial, 91.1% mentioned sunlight exposure was beneficial; it was lower than the study done in Jimma town which was 99.68% (32). The reason behind may be due to mothers in Jimma town as mentioned above had 100% information about sunlight exposure and this finding was higher compared to the study done in Sakarya which was 64.1% (38). The possible reason for this may be mothers in Sakarya educated about harmful effect of sunlight exposure rather than benefit of sunlight exposure because they live in a high temperature region and they had fear of skin cancer. Seventy percent of the respondents mentioned the most benefit of sunlight exposure was strengthening bone; this finding was similar to the same study done in Jimma town which was 64.62% (32).

When mothers asked about harmful effect of sunlight exposure 16.8% mentioned sunlight exposure had harmful effect, it was lower than the same study done in Sakarya which was 64.1% (38). The reason behind may be due to Sakarya was found in tropical region in which there was high temperature in this region and due to this mothers may learn about harmful effect of sunlight exposure. The most frequently harmful effect of sunlight exposure mentioned in this study was skin cancer 78% and it was similar to the same study done in Sakarya which showed 75.9% (38). When mothers asked about good time to sunlight exposure of infants, all mothers 100% mentioned it was in the morning that is similar to the same study done in Jimma town which was 100% (32).

Based on knowledge questions median value for knowledge score was calculated and median value was 4 and those mothers that scored median value and below the median value were classified as poor knowledge mothers which were 60% and those mothers that answered above the median value were classified as good knowledge mothers which were 40% of mothers.

Regarding practice of sunlight exposure, majority 93% of mothers exposed their infants on sunlight. It is in line with the same study done in Sakarya which was 87.5% of mothers exposed their infants on sunlight (38) and it was lower than the same study done in Jimma town which was 100% (32). The reason behind for this difference may be according to the finding 100% of mothers in Jimma town had information about sunlight exposure than mothers in Debre Markos town. It was also higher than the same study done in Townsville, Australia which was 20% (1). The possible explanation for this may be due to they were found in tropical region which was high prevalence of skin cancer, so due to fear of skin cancer mothers may not exposed their infants to sunlight.

This study showed that the ages of infants started sunlight exposure were 23.4% of mothers started sunlight exposure of their babies between 0-15 days. This number was lower than the same study done in Jimma town which was 42.04% (32). This study also showed that 93% of mothers mentioned exposed their infants on sunlight but only 57.9% of mothers exposed their infants on sunlight daily and the remaining mothers exposed their infants sometimes. This finding was lower than the same study done in Jimma town which was 92.16% of mothers exposed daily (32). The reason behind for this difference may be the community had more information and maybe there was a health education program for mothers in Jimma.

Majority 89.4% of respondents exposed their infants outside the house (outdoor). This finding was similar to the study done in Sakarya which was 87.5% (38). In this study 99.1% of mothers exposed their infants on sunlight in the range of time between 8 to 10 AM in the morning and 38% of respondents exposed their infants with time duration of 10-15 minutes. It was lower than the study done in Sakarya which was 30 minutes (38). This indicates that small number 25.5% of mothers exposed their babies for correct time recommended which was for 15-30minutes. Most 98.4% of respondents apply lubricants on the baby's body at the time of sunlight exposure and majority 70.6% of mothers apply during sunlight exposure. Among this 43.7% and 33.9% of mothers mentioned they apply butter and baby vaseline respectively. This indicates that 43.7% of respondents apply traditional malpractice; this implies low level of knowledge of mothers about sunlight exposure in this study area and no any finding related to this variable.

Based on practice questions median value for practice question was calculated and median value was 6 and those mothers that scored median value and below the median value were classified as poor practice mothers which were 55.4% and those mothers that scored above the median value were classified as good practice mothers which were 44.6% of mothers.

Out of 345 respondents, 38.3% of mothers had fear to expose their infants on sunlight. Among these 11.9% of mothers not exposed their infants on sunlight due to fear of evil eye. This study result was higher than the same study done in Jimma town which was 1.46% (32). The possible explanation for this difference may be due to cultural difference between the two populations.

In the bivariate analysis, for mothers knowledge, significant association was observed between maternal age, mothers educational status, family size, husband educational status and knowledge of mothers with odds ratio of (COR=8.7, 95% CI=2.4, 31.8), (COR=3.24, 95%CI=1.46,7.22), (COR=3.88, 95% CI=2.45, 6.17), (COR=3.11, 95% CI=1.03,9.46) respectively. These variables had also significant association with knowledge in multivariate analysis. The other variables: marital status and mothers' occupation had no statistically significant association with knowledge of mothers. But on the study done in Townsville, Australia, maternal age and maternal education had similar association with knowledge (1).

Regarding mothers' sunlight exposure practice in the bivariate analysis mothers' age, mothers educational status, mothers' occupation, family size, fathers' educational status, evil eye, cold and pneumonia had statistically significant association with sunlight exposure practice, with odds ratio of; (COR= 7.03,95%CI=2.62,18.84),(COR=8.79,95%CI=3.70,20.90),(COR=0.08(0.01,0.57) (COR=2.30(1.47,3.58),(COR=6.00(2.31,15.53),(COR=4.55(1,96,10.58), (COR=6.19(3.46,11.06) (COR=2.91(1.05,8.08) respectively. But among these variables mothers age, husband educational status, evil eye and pneumonia had no significant association with practice of sunlight exposure in multivariate analysis. Marital status and sickness were totally had no significant association with practice of sunlight exposure. Similarly maternal age and maternal education had significant association in the study done in Townsville, Australia (1).

Strength and limitation of the study

Strength of the study

- The study included all the illegible respondents in the selected health facilities.
- The questioner was pre-tested on similar settings and modified based on the findings to minimize difficulty during data collection.
- Recall bias was minimized since the questionnaire emphasizes only on mothers with infants.
- Could be a base line data for other researcher since there is scarcity of similar articles done in our country.

Limitation of the study

- Lack of similar studies especially in Ethiopia made difficult in comparing results.
- Since the study is cross –sectional it does not show cause and effect between dependent and independent variables.
- The information was self-reported and no behavior of the mother was observed.

CHAPTER SEVEN

CONCLUSION AND RECOMMENDATIONS

7.1 Conclusion

According to the result of this study more than half (60%) of the mothers had poor knowledge about sunlight exposure of infants. Similarly 55.4% of mothers had poor sunlight exposure practice. This implies information given about sunlight exposure during antenatal care, delivery and immunization follow up was not comprehensive. Common fear of mothers that affect sunlight exposure practice in this study area were cold and next to this evil eye.

Mothers age, mothers educational status, family size and husbands educational status had significant association with mothers knowledge and mothers educational status, mothers occupation, family size and fear of cold had significant association with mothers practice about sunlight exposure of infants in multivariate analysis.

In general the knowledge and practice of mothers about sunlight exposure of infants in Debre Markos town, Ethiopia was poor.

7.2 Recommendations

Based on the results of this study the following recommendations are forwarded:

- The policy makers, Ministry of health, Amhara regional health bureau, East Gojjam Zonal health bureau and Debre Markos Woreda health bureau should create awareness about benefit of sunlight exposure of infants among mothers and health workers to resolve problem of infants that results from lack of sunlight exposure by giving continuous health education program.
- Nongovernmental organizations should give training for health professionals and health science students regarding to benefit of sunlight exposure of infants.
- Health science colleges especially nursing schools should incorporate benefit of sunlight exposure for infants in the nursing curriculum and will teach students about benefit of sunlight exposure.
- Health professionals should provide appropriate information about sunlight exposure for mothers since they had a direct relationship with mothers in different circumstances e.g. during antenatal care, delivery, immunization and integrated management of newborn and childhood illness service.
- Health extension workers should give sunlight exposure education for mothers with health extension package programs during home to home visiting.
- Mass Medias should create awareness about sunlight exposure in the community by giving health education for the community.
- Finally researchers should do further study to identify knowledge, attitude and practice of mothers with qualitative data about sunlight exposure of infants at large scale.

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9. Annexes

Annex 1: Information sheet

Addis Ababa University College of Health Sciences School of Allied Health Sciences
Department of Nursing and Midwifery

A Study prepared to collect data on knowledge and practice of mothers about sunlight attending at under five and immunization clinics at governmental health facilities in Debre Markos Town.

Hello! My name is _____. I am conducting a survey on mothers' knowledge and practice regarding sunlight exposure of their infants. This is beneficial to identify areas of improvement in the mothers knowledge and practice and highlighting the need for corrective actions. By doing this we will provide sufficient information for policy makers, clinicians and researchers, as a result they could make informed decision. In order to attain this goal, you are kindly requested to provide your genuine response on the questions given below. I would like to confirm you that you have the right to with draw the interview at any time or skip any question that you do not wish to answer. Because taking part in this survey is not mandatory and your responses will be held in strict confidence. Your privacy will also be confidential and no one will know your answer. If you do not wish to participate, it will not affect the services you receive at the clinic now or in the future.

I also request you to answer it candidly because your answers are like one important piece of brick in the whole research and determine the outcome of this study.

Thank you very much for your willingness to listen to me. In case if you have any question you can ask.

Abebe abate, Phone: ***0929176180***

Are you willing to participate?

If the answer is, YES, - Please continue

NO _____ Thanks her and end

Annex II: Conset form

Hellow! My name is. ----------

I temporarily represent Addis Ababa University, College Of Allied Health Science, and Department Of Nursing And Midwifery. This study is conducted with the objective of assessing knowledge and practice of mothers regarding sun light exposure of their infants attending under five and immunization clinics. As the study is directly related to women and you are one of the women who have been selected randomly to participate in this study. Therefore, you are kindly requested to participate in this study and provide the essential information required from you. I would like to ask you a few questions, but you can refuse to answer any question I ask. You may end the interview at any time. You can also refuse to participate in the study completely. Your refusal will not restrict you from obtaining the required medical care when you need. The interview will last approximately 40 minutes. Your responses will be kept confidential and there will be no way of linking your individual responses to the final results of the study findings. I would like to inform you that the responses that you provide to the questions are very essential for the successful accomplishment of the study objectives. Are you voluntary to respond to the questions?

Yes; ----proceed with the interview

No; ---- thanks her and end.

Annex 3- Questionnaire

Questionnaire on mothers' knowledge and practice on sunlight exposure of their infants attending at Debre Markos town governmental health facilities.

Part I- Socio-demographic information

Instruction: Please, carefully read the following questions and write their age and circle the number which best describes response of the respondents

No.	Questions	Coding categories	Skip to
101	Mother's age	_____years	
102	Baby's age	_____months	
103	Religion	1. Orthodox 2. Muslim 3. protestant 4. Others	
104	Ethnicity	1. Amhara 2. Oromo 3. Tigray 4. Others	
105	Marital status	1. Single 2. Married 3. Divorced 4. Widowed	
106	Mother's educational status	1. Unable to read and write 2. Able to Read and write 3. Grade 1-6 4. Grade 7-10 5. Grade 11-12 6. Diploma and above	
107	Occupation	1. Student 2. House wife 3. Government employee 4. Private employee 5. Daily labourer 6. Merchant 7. Others	
108	Family size	1. 1-3 2. 4-6 3. >6	

110	Husband's educational status	1. Unable to read and write 2. Able to Read and write 3. Grade 1-6 4. Grade 7-10 5. Grade 11-12 6. Diploma and above	

Part II- Knowledge of mothers about sunlight exposure of their infants

No.	Questions	Coding categories	Skip to
201	Do you have knowledge about sunlight exposure	1. Yes 2. No →	301
202	Source of information about sunlight exposure	3. Physician 4. Midwife/nurse 5. Television/radio 6. Neighbors/elder people 7. Others	
203	Does sunlight exposure beneficial?	1. Yes 2. No →	205
204	Benefit of sunlight exposure	1. Strengthen bone 2. Strengthen teeth 3. Keep child warm 4. Produce vitamin D 5. Strengthen body 6. Others	
205	Does sunlight exposure harmful	1. Yes 2. No →	207
206	Harmful effect of sunlight exposure	1. Skin cancer 2. Sterility 3. Blindness 4. Others	
207	Good time to expose infants on sunlight	1. Morning 2. Afternoon 3. Evening	

Part III- Practice of mothers on sunlight exposure of their infants

301	Do you expose your baby on sunlight?	1. Yes 2. No →	401
302	Age infant start sunlight exposure	1. 0-15 days 2. 16-30 days 3. 31-45 days 4. 45 days and above	
303	How frequently do you expose?	1. Daily 2. Sometimes	
304	Where do you expose your baby on sunlight	1. Outdoor 2. Indoor	
305	At what time of the day do you expose your baby outdoors?	1. Morning 8-10 AM 2. Mid day 11AM-1 PM 3. Afternoon 2-4 PM	
306	Condition of clothing during exposure	1. Unclothed 2. With diapers and eye protection only 3. Partly covered 4. Completely covered	
307	For how much minutes you expose your baby on sunlight?	1. 5-10 minute 2. 10-15 minute 3. 15-30 minute 4. Above 30 minute	
308	Do you apply lubricants on your baby's body during sunlight exposure?	1. Yes 2. No →	401
309	If you apply, when do you apply?	1. Before exposure 2. During exposure 3. After exposure	
310	What things do you apply?	1. Baby vaseline 2. Baby lotion 3. butter 4. other	

Part IV- Factors affecting practice of mothers on sunlight exposure of their infants

No	Questions	Code categories	Skip to
401	Do you have fear to expose your baby on sunlight?	1. Yes 2. No	
402	Mother's fear on sunlight exposure	1. Sickness 2. Evil eye 3. Cold 4. Pneumonia 5. Other specify	

አዲስ አበባ ዩኒቨርስቲ የጤና ሳይንስ ኮሌጅ

የነርሲንግና የሚድዊፈሪ ትምህርት ክፍል

የጥናቱ ማብራሪያ

በአምስት የመንግስት ጤና ተቓማት የእናቶች እውቀትና ትግበራ ልጆቻቸውን የፀሀይ ብርሀን ስለማሞቅ ለማወቅ የወጣ መጠይቅ፡፡

የጥናቱ ርዕስ

የእናቶች እውቀትና ትግበራ ልጆቻቸውን የፀሀይ ብርሀን ማሞቅ በተመለከተ እንዴት ነው፡፡

የጥናቱ ኣላማ

የጥናቱ አለማ እናቶች ስለ ፀሀይ ብርሀን ያለቸው እውቀትና ትግበራ በመለየት በተጠቀሱት ችግሮች ላይ መፍትሄ ለማግኘት መሆኑ ተነግሮኛል፡፡ በዚህ ጥናት ላይም በተራዬ እንድሳተፍ ተጠይቂያለሁ፡፡

በጥናቱ ላይ መሳተፍ በፈቃደኝነት ላይ የተመረኮዘ መሆኑንና የምሰጠው መረጃም ለጥናቱ አላማ ብቻ እንደሆነ ተነግሮኛል፡፡ በጥናቱ ላይ ለመሳተፍ ፈቃደኛ አለመሆኔ ወይም መሳተፍ ጀምሬ ማቋረጥ ብፈልግ ማቆም እንደምችል እንዲሁም ደግሞ መመለስ የማልፈልጋቸውን ጥያቄዎች አለመመለስ (መተዉ) እንደምችል ተነግሮኛል፡፡ ሆኖም ግን በጥናቱ ላይ ባለመሳተፌ እኔም ሆነ ቤተሰቦቼ በምናገኘው አገልግሎት ላይ ምንም ዓይነት ተፅእኖ ወይም ጉዳት እንደሌለው ተረድቻለሁ፡፡

በተጨማሪም የምሰጣቸው መልሶች ለማንም እንደማይሰጡና በሚስጥር እንደሚጠብቁ እንዲሁም በዚህ ጥናት ሪፓርትም ውስጥ የሰጠሁት የእኔ ለመሆኑ ማንም ሊያውቀው እንደማይችል ተገንዝቢያለሁ፡፡

በዚህ ጥናት በመሳተፍ የምሰጠው መረጃ ግን የጥናቱን አላማ ለማሳካት ከፍተኛ ጠቀሜታ እንዳለው ተገንዝቢያለሁ፡፡

ይህን ጥናት በተመለከተ ጥያቄ ካልዎት በ **0929176180** ደውለው ይጠይቁ፡፡

አመሰግናለሁ!!!

አዲስ አበባ ዩኒቨርስቲ የጤና ሳይንስ ኮሌጅ

የነርሲንግና የሚድዊፈሪ ትምህርት ክፍል

የስምምነት ማስገንዘቢያ ቅጽ

ጤና ይስጥልኝ፤ ስሜ……

እኔ በአዲስ አበባ ዩኒቨርስቲ የጤና ሳይንስ ኮሌጅ የነርሲንግና የሚድዊፈሪ ትምህርት ክፍል በጊዚያዊነት ወክዬ ነው ይህን የጥያቄና መልስ ይገፎ የመጣሁት።

ይህ ጥናት የሚካሄደው እናቶች ልጆቻቸውን ሲያሞቁ ስለፀሀይ ብርሀን ያለቸውን እውቀትና ትግበራ በመለየት መፍትሄዎችን ለማምጣት ነው።

በጥናቱ እንዲሳተፉ በእጣ ከተመረጡ ሴቶች አንዷ እርስዎ ነዎት። ስለዚህ እዚህ ጥናት ላይ እንዲሳተፉና አስፈላጊውን መረጃ እንዲሰጡን በተህተና እንጠይቃለን። ይሁን እንጂ ማንኛውም ጥያቄ አለመመለስ ይችላሉ። እንዲሁም በማንኛውም ጊዜ ይያቁወን ማቋረጥና በጥናቱ አለመሳተፍ ይችላሉ።

በጥናቱ ባለመሳተፍዎ ማግኘት የሚገባዎ አገልግሎት ከማግኘት አያግድዎትም። ጥያቄና መልሱ 40 ደቂቃ ይፈጃል።

ይህ በግልዎ የሚሰጡት መልስም በሚስጥር የሚጠበቅ ስለሆነ ከጥናቱ ውጤት ጋር በምንም የሚያያዝ አይደለም።

ላረጋግጥልዎ የምንፈልገው ነገር ቢኖር ይህ የሚሰጡት መልስ በጣም አስፈላጊ የሚሆነው ጥናቱን ለማጥናት ብቻ ሳይሆን ፀሀይ ብርሀን ባለማግኘት ለተጎዱ ህጻናት አስፈላጊ የሆነ እቅድ ለማውጣትና በተግባር ለማዋል የሚጠቅም አስተያየት ለማግኘትም ነው።በጥናቱ ለመሳተፍ ፍቃደኛ ነዎት?

አዎ ከሆነ ……ቃለ መጠይቁን ይጀምሩ።

አይደለሁም ከሆነ…… አመስግነው መጠይቁን ያቁሙ።

አዲስ አበባ ዩኒቨርስቲ የጤና ሳይንስ ኮሌጅ
የነርሲንግና የሚድዊፈሪ ትምህርት ክፍል

በደብረማርቆስ ከተማ ስር ባሉ የመንግስት ጤና አገልግሎቶች የሚገለገሉ እናቶች ከአንድ ዓመት በታች ያሉ ልጆቻቸውን ፀሐይ ስለማሞቅ ያላቸውን እውቀትና ትግበራ ለማወቅ የተዘጋጀ መጠይቅ፡-

ክፍል 1 ማህበራዊ መረጃ

ተ.ቁ	ጥያቄ	መልስ	ማለፍ
101	የእናት እድሜ	_____በዓመት	
102	የልጅ እድሜ	_____በወር	
103	ሀይማኖት	1. ኦርቶዶክስ 2. እስላም 3. ፕሮቴስታንት 4. ካቶሊክ 5. ሌላ	
104	ብሔር	1. አማራ 2. ኦሮሞ 3. ትግሬ 4. ጉራጌ 5. ሌላ	
105	የጋብቻ ሁኔታ	1. ያላገባች 2. ያገባች 3. የፈታች 4. ባሏ የሞተባት	
106	የእናት የትምህርት ሁኔታ	1. ማንበብና መፃፍ የማትችል 2. ማንበብና መፃፍ የምትችል 3. ከ1-6ኛ ክፍል 4. ከ7-10ኛ ክፍል 5. ከ11-12ኛ ክፍል 6. ዲኘሎማና ከዚያ በላይ	
107	ሥራ	1. ተማሪ 2. የቤት እመቤት 3. የመንግስት ሠራተኛ 4. የቀን ሠራተኛ 5. የግል ተቀጣሪ 6. ነጋዴ 7. ሌላ	
108	የቤተሰብ ብዛት	1. 1-3 2. 4-6 3. >6	
110	የባል የትምህርት ሁኔታ	1. ማንበብና መፃፍ የማትችል 2. ማንበብና መፃፍ የምትችል 3. ከ1-6ኛ ክፍል 4. ከ7-10ኛ ክፍል 5. ከ11-12ኛክፍል 6. ዲኘሎማና ከዚያ በላይ	

ክፍል ሁለት፡- የእናቶች እውቀትን ስለፀሐይ ብርሐን በተመለከተ

ተ.ቁ	ጥያቄ	መልስ	ማለፍ
201	ልጅሽን የፀሐይ ብርሐን ማሞቅን በተመለከተ እውቀት አለሽ?	1. አዎ 2. የለኝም →	301
202	ልጅሽን የፀሐይ ብርሐን ማሞቅን በተመለከተ እውቀት ያገኘሽ ከየት ነው?	1. ዶ/ር 2. አዋላጅ/ነርስ 3. ቴሌቭዥን/ሬዲዮ 4. ጐረቤት/ሽማግሌ ሰዎች 5. ሌላ	
203	የፀሐይ ብርሐን ማሞቅ ለልጅሽ ጠቃሚ ነው ?	1. አዎ 2. አይደለም →	205
204	አዎ ከሆነ, የፀሐይ ብርሐን ማሞቅ ለልጅሽ ምን ጥቅም አለው?	1. አጥንት ለማጠንከር 2. ጥርስ ለማጠንከር 3. ህፃኑ እንዲሞቀው 4. ቫይታሚንዲ ለማምረት 5. ሰውነቱ እንዲጠነክር 6. ሌላ	
205	ልጅሽን የፀሐይ ብርሐን ማሞቅ ጉዳት አለው?	1. አዎ 2. የለውም →	207
206	አዎ ከሆነ, የፀሐይ ብርሐን ምን ጉዳት አለው?	1. የቆዳ ካንሰር 2. ዓይነ ስውርነት 3. መካንነት 4. ሌላ	
207	ህፃናትን ፀሐይ ለማሞቅ ጥሩው ሰዓት የትኛው ነው?	1. ጧት 2. ከሰዓት በኋላ 3. ማታ	

ክፍል ሶስት- እናቶች ልጆቻቸውን ፀሐይ ሲያሞቁ የሚያደርጉት ትግበራን በተመለከተ

ተ.ቁ	ጥያቄ	መልስ	ማለፍ
301	ልጅሽን የፀሐይ ብርሐን ታሞቂውአለሽ ?	1. አዎ 2. አላሞቀውም ⟶	 401
302	ፀሐይ ማሞቅ የጀመርሽው በሥንት ጊዜው/ዋ ላይ ነው?	1. ከ0-15ቀናት 2. ከ16-30 ቀናት 3. ከ31-45 ቀናት 4. ከ45 ቀናት በኋላ	
303	አዎ ከሆነ, ልጅሽን የፀሐይ ብርሐን የምታሞቂው እንዴት ነው?	1. በየቀኑ 2. አልፎ አልፎ	
304	ልጅሽን የፀሀይ ብርሀን የምታሞቂው የት ነው?	1. ከቤት ውጭ በር ላይ 2. ቤት ውስጥ ከመስኮት ጀርባ	
305	በቀን ውስጥ ልጅሽን የፀሐይ ብርሐን የምታሞቂው በየትኛው ሰዓት ነው?	1. ጥዋት ከ2፡00-4፡00 ሰዓት 2. ቀን ከ5፡00-7፡00 ሰዓት 3. ከሰዓት በኋላ ከ8፡00-10፡00ሰዓት	
306	ልጅሽን የፀሐይ ብርሐ የምታሞቂው እንዴት ነው?	1. ልብስ ሳይለብስ 2. የሽንት ልብስና የዓይን መሸፈኛ ለብሶ 3. በከፊል ለብሶ 4. ሙሉ በሙሉ ለብሶ	
307	ልጅሽን የፀሐይ ብርሐን የምታሞቂው ለስንት ደቂቃ ነው?	1. ከ5-10 ደቂቃ 2. ከ10-15 ደቂቃ 3. ከ15-30 ደቂቃ 4. ከ30 ደቂቃ በላይ	
308	ፀሐይ በምታሞቂበት ጊዜ ልጅሽ ገላ ላይ የምትቀቢው ነገር አለ?	1. አዎ 2. አልቀባም ⟶	 401
309	አዎ ከሆነ, መቸ ነው የምትቀቢው?	1. ፀሐይ ከመሞቁ በፊት 2. ፀሐይ እየሞቀ 3. ፀሐይ ከሞቀ በሓላ	
310	ልጅሽ ገላ ላይ የምትቀቢው ምንድን ነው?	1. የህፃን ባዝሊን 2. የህፃን ቅባት 3. ቅቤ 4. ሌላ	

ክፍል አራት፤ እናቶች ልጆቻቸውን የፀሐይ ብርሐን እንዳያሞቁ ተጽኖ የሚያደርጉ ነገሮች

ተ.ቁ	ጥያቄ	መልስ	እለፍ
401	የፀሐይ ብርሐን ለማሞቅ ትፈሪያለሽ?	1. አዎ 2. አልፈራም	
402	አዎ ከሆነ, የምትፈሪበት ምክንያት ምንድን ነው?	1. ያመዋል 2. ቡዳ ይበላዋል 3. ብርድ ይመታዋል 4. ምች ይመታዋል 5. ሌላ	

ይህ የመጠይቁ ማብቂያ ነው፡፡ እመሰግናለሁ!!!

የቃለ መጠይቁ መረጃ የተሰበሰበት ቀን……

መረጃውን የሰበሰበው ባለሙያ ስም ……ፊርማ…….

የተቆጣጣሪ ባለሙያ ስም……ፊርማ……

DECLARATION

I, the undersigned, declare that this proposal is my original work and has not been presented for a degree in this or another university and that all sources of materials used for this proposal have been fully acknowledged.

Name: Abebe Abate (BSc N)

Signature: _____

Place: Addis Ababa University, College of Health Sciences, School of Allied Health Sciences, Department of Nursing and Midwifery

Date of submission: _____

This proposal is submitted for examination with my approval as University advisor.

Name: Rajalakshmi Murugan ((MSc in Child Health Nursing, MA (sociology) Asst. Prof., PHD fellow)

Signature: _____