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Knowledge, Attitude and Practice of Mothers on Sun Exposure of their Infants at St. Paul's Hospital, Ethiopia

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Abstract

Background- The main cause of rickets in Ethiopia has been Vitamin D deficiency even though Ethiopia is a subtropical country. So the main objective of this study was accessing the knowledge, attitude, practice and factors affecting sunlight exposure of infants among mothers which is important to alleviate this problem. A cross-sectional institutional based study was conducted on mother attending in under five pediatrics department at St. Paul's Hospital Convenience sampling was used with pre tested questioner and data was entered using EPI and analyzed by SPSS version 22. Out of 384 respondents identified for the study 90% (n=346) responded for the Interview. From the total respondents 86.1% of them had good knowledge with 42% having good attitude towards sun exposure of their infants and 40% of them have poor practice about sunlight exposure respectively. In the analysis mothers' educational status had significant association with both knowledge and practice of sunlight exposure of infants. The findings in this study showed mothers have good knowledge but half of them have poor practice about sunlight exposure. Therefore, mothers need to be educated about the importance and proper implementation the practice of sunlight exposure.

***Key words*:** Rickets; Sunlight exposure; Vitamin D deficiency.

1. Introduction

Exposure to sunlight has been a subject of epidemiological interest both due to its beneficial as well as adverse effects on human health. The exposure to solar ultraviolet radiation is an essential step for the production of Vitamin D and also the main source of vitamin D in human body [1]. Decades have now elapsed since the pioneering studies on rickets in Ethiopia 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 suggested that daily exposure to sunshine remains the cheapest, safest and most effective method of preventing the disease [2].

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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 [3]. 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 [4]. Contrary to general belief, rickets is widely prevalent in many tropical and subtropical regions despite abundant sunshine [5]. Mothers' have an important role in prevention of rickets; however, there is scarce study about the mothers' knowledge, practice and factors affecting practice in Ethiopia. This study assessed knowledge, attitude, and practice and factors affecting the practice of mothers' on

2. Methods

2.1 Study Area and Period

The study was conducted in St. Paul's pediatrics department, In Addis Ababa, Ethiopia. There are 5 parts of pediatrics ward in SPHMMC. These are regular OPD, emergency OPD, ward, NICU, pediatrics ICU. The research was conducted in all these departments between March 1- April 20 2020 G.C.

2.2 Study Design

A cross-sectional institutional based study was conducted.

2.3 Source Population

The source populations are all mother attending in under five pediatrics department at St. Paul's hospital.

2.4 Study Population

The study population is mothers with infants attending in less than five St. Paul's Hospital.

Inclusion Criteria

- Mothers with infants who are attending in less than five years old departments at St. Paul's hospital.
- Mothers with infants who are mentally and physically capable of responding.

Exclusion Criteria

- Mothers with baby above 12 months of age.

2.5 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' practice on sunlight exposure to be 50%, Z value of 1.96 and marginal error of 5%, sample size was calculated as follows:

$n = (Z\ a/2)^2\ p\ (1-P)/d^2$

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

$n = 384$

The total number of infants in Addis Ababa is 1,250,976. When Taking 10% non-response rate the final sample size is 346**.**

2.6 Sampling Procedure

Convenience sampling technique is used and hence all mothers who come to St. Paul's pediatrics ward during the study period were taken as a whole fulfilling the inclusion criteria.

2.7 Data Collection Instrument

A structured questionnaire adapted from a study done in Turkey and it was modified according to Ethiopian context.

2.8 Data Collection Procedure

Before going to the data collection pretest was done on 5% (n=20) of similar mothers.

2.9 Study Variables

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).

2.10 Dependent Variables

- Knowledge about sunlight exposure.
- Attitude about sun exposure.
- Practice of sunlight exposure.

2.11Data Analysis Procedure

The collected data were checked for its completeness, consistency and accuracy before analysis. The data was presented by using descriptive and analytic statistics. The data was entered and analyzed by using SPSS version 22. Univariant analysis was done to screen out potentially significant independent variables and using significant dependent variables. Variables having p-value less than 0.05 is considered as significant variables.

AOR is considered to see the strength of association between dependent and independent variables.

2.12 Ethical Consideration

Ethical clearance was obtained from public health department of St. Paul's hospital. 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.

2.13 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 responded to knowledge questions and scored above 4.
- Good attitude-the mothers that scored above 4.
- Good practice- Those mothers who scored above 5.

3. Results

3.1 Socio-demographic Characteristics of Respondents

Out of 384 mothers identified for the study 346 responded to the interview. From those respondents 156(45.2%) were between age 21 and 26 years. The mean age of the mothers was 26.9(±5.3) years and mean ages of the children were 4.7(±3.2) months. Majority 295 (85.4%) of mothers were married and 86 (24.9%) of mothers had diploma and above in their educational status. 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.

3.2 Mothers' source of information about sunlight exposure of infants

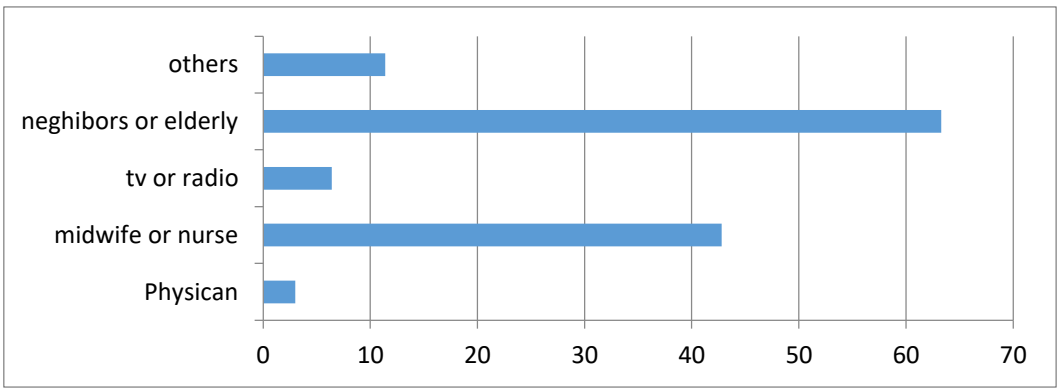

Figure 1: Distribution of mothers by their source of information about sunlight exposure at St. Paul's hospital, pediatric wards.

Out of the total 346 respondents, 298 (86.1%) of the mothers had information (knowledge) about sunlight exposure of infants and majority 220 (63.6%) of mothers got this information from neighbors and 114 (32.8%) from midwife/nurse.

3.3 Knowledge of Respondents about Sunlight Exposure

Regarding benefit of sunlight exposure 318 (91.9%) of mothers said sunlight exposure was beneficial for infants and from these 223(70.3%) mention sunlight exposure was useful to strength bone, 161 (50.5%) mention sunlight exposure was useful to strength body and 116 (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 28(8.1%) said sunlight exposure had harmful effect for the infant and most mentioned harmful effect of sunlight exposure was 21(78%) cold or flu.

Table 1: Knowledge of mothers' about sunlight exposure of their infants at St. Paul's hospital pediatrics wards.

Variable name	Attributes	Frequency	Percent
Mentioned sunlight exposure was beneficial	Yes	318	91.9
	No	28	8.1
	Total	**346**	**100**
Mentioned strengthen bone as a benefit of sunlight exposure	Yes	223	70.3
	No	94	29.7
	Total	**318**	**100**
Mentioned strengthen teeth as a benefit of sunlight exposure	Yes	48	15
	No	270	85
	Total	**318**	**100**
Mentioned keep child warm as a benefit of sunlight exposure.	Yes	42	13.2
	No	276	86.8
	Total	**318**	**100**
Mentioned vitamin D production as a benefit of sunlight exposure.	Yes	116	36.6
	No	202	63.4
	Total	**318**	**100**
Mentioned it strengthen body as a benefit of sunlight exposure.	Yes	161	50.5
	No	157	49.5
	Total	**318**	**100**
Mentioned sunlight exposure had harmful effect.	Yes	28	8.1
	No	318	91.9
	Total	**346**	**100**
Mentioned skin cancer was a harmful effect of sunlight exposure.	Yes	3	8
	No	25	92
	Total	**28**	**100**
Mentioned blindness was a harmful effect of sunlight exposure.	Yes	2	6
	No	26	94
	Total	**28**	**100**
Mentioned sterility was a harmful effect of sunlight Exposure.	Yes	1	4
	No	27	96
	Total	**28**	**100**

3.4 Mothers' Knowledge Level about Sunlight Exposure of Infants

Based on the above knowledge questions, out of 346 respondents 138 (40%) of respondents scored less than or

equal to 4. Therefore, based the operational definition 40% of mothers had poor knowledge about sunlight exposure of infants.

3.5 Practice of Mothers about Sunlight Exposure of Infants

Out of 346 respondents, 318 (91.1%) of mothers exposed their babies on sunlight. From these 101 (31.8%) started sunlight exposure of their infants from 16-30 days, (30.5%) of mothers started after 45 days and 97 (23.4%) from 0-15 days. Even though, 318 (91.9%) of mothers stated they expose their infants on sunlight, only 184 (57.9%) exposed daily. Regarding place of sunlight exposure most 284 (89.4%) of mothers told they exposed infants on sunlight outdoor.

Table 2: Practice of mothers' to sunlight exposure of their infants in St. Paul's hospital, Pediatrics wards.

Variables	**Categories**	**Frequencies**	**Percent**
Do you expose your baby to sunlight	Yes	318	91.9
	No	28	8.1
	Total	**346**	**100**
At what age did the infant start sunlight exposure	0-15 days	76	23.4
	16-30 days	101	31.8
	31-45 days	46	14.3
	45 days and above	97	30.5
	Total	**318**	**100**
How frequently do you expose your infant	Daily	184	57.9
	Sometimes	134	42.1
	Total	**318**	**100**
Where do you expose your infant	Outdoor	284	89.4
	Indoor	34	10.6
	Total	**318**	**100**
Time of sunlight exposure	Morning 8-10 AM	306	96.1
	Mid-day 11AM-1PM	8	2.9
	Afternoon 2-4 PM	4	1
	Total	**318**	**100**
Condition of clothing During exposure.	Unclothed	132	41.4
	With diapers and eye protection only	51	15.9
	Partly covered	120	37.7
	Completely covered	15	5
	Total	**318**	**100**
For how long do you expose your infants	5-10 minute	0	0
	10-15 minute	219	68.8
	15-30 minute	99	31.2
	Above 30 minute	0	0
	Total	**318**	**100**

Majority 305(96.1%) of mothers exposed their infants between the time range of 8-10AM and condition of clothing during exposure 132(41.4%) of mothers exposed their infants to sunlight uncovered and 189 (59.6%) of mothers exposed their infants partly covered.

3.6 Application of Lubricants on the Infants' Body

Regarding to practice of application of lubricants almost all mothers 313(98.4%) of mothers apply lubricants on the infants body during the time of sunlight exposure and majority 221(70.6%) of mothers apply these lubricants during sunlight exposure and 50(16.1%) of mothers apply after sunlight exposure. From 313(98.4%) of mothers 137(43.7%) of mothers apply butter and 106(33.9%) of mothers apply baby Vaseline on the infants body.

3.7 Mothers' Poor Practice Status about Sunlight Exposure of Infants

Based on the above practice questions, out of 318 respondents (45.4%) scored less than or equal to 6. Therefore, based the operational definition 45.4% of mothers had poor practice about sunlight exposure of infants.

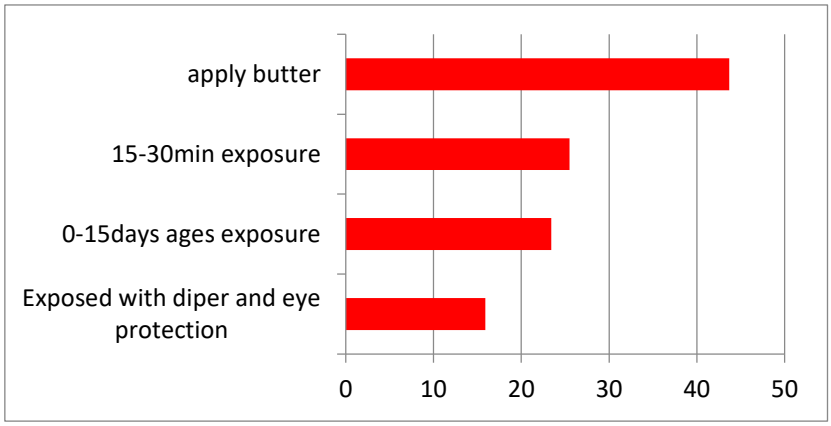

Figure 2: Poor practice of mothers on sunlight exposure of infants at SPHMMC, pediatrics wards, 2020G.C

3.8 Factors Affecting Practice of Sunlight Exposure

Out of the total of 346 respondents 8.1% of mothers in this study had fear to expose their infants on sunlight. The highest fear of mothers' in this study was 29% fear of cold and 11.9% fear of evil eye.

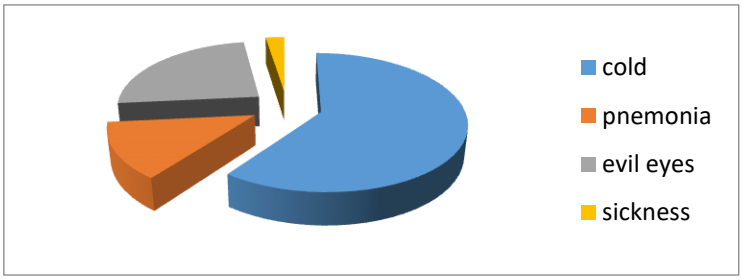

Figure 3: Factors affecting practice of mothers about sunlight exposure of infants at St. Paul's hospital, Pediatrics ward.

3.9 Factors Associated with Poor Practice of Sunlight Exposure of Infants at St. Paul's Hospital, Pediatrics Wards

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. 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. Family size of 4-6 was 3.88 times more knowledgeable than family size of 1-3. Regarding to sunlight exposure practice there was a statistically significant association between maternal age and practice. Mothers' age between 27-32 years was 7.03 times more likely practice sunlight exposure than mothers between the age group of 15-20 years. 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. Family size of 4-6 was 2 times more likely practice sunlight exposure than family size of 1-3.

4. Discussion

The proportion of respondents who reported that they had the knowledge about sunlight exposure was 86.1 %, the same study done in Jimma town showed that 100% of mothers had information about sunlight exposure [11]. This studies' 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 who responded to the question does sunlight exposure beneficial, 91.9% mentioned sunlight exposure was beneficial; it was lower than the study done in Jimma town which was 99.68%. 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% [7] . The possible reason for this may be mothers Sakarya are 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. When mothers asked about harmful effect of sunlight exposure 8.1% mentioned sunlight exposure had harmful effect, it was significantly lower than the same study done in Sakarya which was 64.1%. 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 cold 78% [9]. This study showed that the ages of infants that started sunlight exposure after the 15 days of their life were 30.4%.This number was higher than the same study done in Jimma town which was 22.04%. The reason behind for this difference may be the community had more information and maybe there was a health education program for a mother in Addis Ababa is relatively effectively done [11]. Majority 89.4% of respondents exposed their infants outdoor. This finding was similar to the study done in Sakarya which was 87.5% [7]. In this study 96.1% 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. This indicates that small number of mothers exposed their babies for correct time recommended which was for 15-30minutes [8]. Out of 346 respondents, 8.3% of mothers had fear to expose their infants to sunlight. Among these 11.9% of mothers don't not exposed their infants on sunlight due to fear of evil eye. This study result was

lower than the same study done in Jimma town which was 31.46%. This may be due to cultural difference between the two populations. For mother's knowledge, significant association was observed between maternal age, mothers educational status, family size, husband educational status and knowledge of mothers. Regarding attitude of the mothers 42% have good attitude towards adequate sunlight exposure of their infant while 58% of infants have poor attitude towards sunlight exposure [11]. Mothers' sunlight exposure practice 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.

5. Strength and Limitation of the Study

- The Strength of the study is it included all the illegible respondents at St. Paul's Hospital.
- Limitation of the study is lack of similar studies especially in Ethiopia made difficult in comparing results.

6. Conclusion and Recommendations

6.1 Conclusion

According to the result of this study 91.1% of the mothers had knowledge about sunlight exposure of infants. 40 % of mothers had poor sunlight exposure practice. This implies information given about sunlight exposure during antenatal care, delivery and immunization follow is more or less is adequate. Common fears of mothers that affect sunlight exposure practice in this study area were cold and 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 general the knowledge of mothers on sunlight exposure of infants in this study area was good but practice of mothers about sunlight exposure is poor.

6.2 Recommendations

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

- Health professionals especially primary physicians should provide appropriate information about sunlight exposure and appropriate practices for mothers since they had a direct relationship with mothers in different circumstances e.g. during ANC, delivery, integrated management of newborn and childhood illness service.
- Mass Medias should create awareness about sunlight exposure in the community by giving health education for the community.
- Since a major gab is observed on the practices the demonstration of sunlight exposure by health extension workers and professionals is necessary.
- Clearing on issues of taboos and harmful effects of sunlight exposure to the primary caregivers is needed.
- Fellow 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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7. Conflicting Interests

The author declares there is no conflict of interest.

8. Funding

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