

Knowledge, Practice, and Factors Affecting Sunlight Exposure of Infants Among Mothers at Governmental Health Facilities in Dessie Town, Ethiopia, 2021

Clinical Medicine Insights: Pediatrics
Volume 17: 1–9
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DOI: 10.1177/11795565221148329



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ABSTRACT

BACKGROUND: Human being needs sunlight for physical and mental well-being. Sunlight helps the body to produce vitamin D, an important vitamin for skeletal development, immune function, and blood cell formation. So, the community should be counseled to get sufficient sun exposure and vitamin D supplementation to uphold the serum 25 (OH) D levels. This study designed to assess the mothers' knowledge, practice, and factors affecting the sunlight exposure of their infants.

METHODS: A facility-based cross-sectional study was conducted at governmental health facilities in Dessie Town, 2021. A total of 398 mothers were interviewed using semi structured questionnaires. Data were entered into the EPI data version 3.1 and analyzed using SPSS 23. Binary and multivariate logistic regression analyses were also performed. In multivariate analysis, a significant association was considered at *P*-value of <.05.

RESULTS: Response rate was 98.9%. About 76.6% and 58.9% of the mothers had poor knowledge and poor practice regarding sunlight exposure of infants respectively. Mothers' occupation (aOR=0.124, 95% CI=0.042, 0.365), mothers' source of information (aOR= 18.604, 95% CI= 7.564, 45.75), and attitude (aOR= 2.773, 95% CI= 1.474, 5.215) had showed a significant association with mothers' knowledge. On the other hand, mothers' age (aOR=3.191, 95% CI= 1.334, 7.633), mothers occupation (aOR= 4.226, 95% CI=2.321, 7.694), and baby age (aOR= 1.989, 95% CI= 1.260, 3.140) had a significant association with their practice about sunlight exposure of infants.

CONCLUSION: Mothers' knowledge and practice of sunlight exposure of infants are poor in Dessie Town. Hence measures should be taken to increase and improve mothers' responsiveness of sunlight exposure of infants.

KEYWORDS: Sunlight, infants, Dessie, Ethiopia, 2021

RECEIVED: March 29, 2022. **ACCEPTED:** December 12, 2022.

TYPE: Original Research Article

FUNDING: The author(s) received no financial support for the research, authorship, and/or publication of this article.

COMPETING INTERESTS: The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Background

Sunlight is important for the physical and mental well-being of humans.¹ Being exposed to sunlight helps the body to make vitamin D, an essential vitamin for skeletal development, immune function, and blood cell formation. It is recommended by an expert group of Turkish pediatricians to instruct/educate mothers to sun their infants for at least 20 minutes per day outdoors.²

Insufficient sun exposure has become a major public health concern. The degree of change needed is minor but critically important. The community should be instructed to gain sufficient sun exposure and vitamin D supplementation to maintain a serum 25(OH) D level of at least 30 ng/mL.³ In all age groups, vitamin D deficiency becomes an international public health problem, predominantly those from the Middle East.⁴ In many parts of the world, clinical vitamin D deficiency (rickets and osteomalacia) becomes prevalent with a reappearance of rickets in children of ethnic minority groups in Europe and Australasia.⁵

In low- and middle-income countries (LMICs), dietary foods that are the source of vitamin D are often not readily available.⁶ A systematic review and meta-analysis conducted to assess the prevalence of vitamin D deficiency in Africa showed a high prevalence of vitamin D deficiency in African populations.⁷ Hypovitaminosis D is highly prevalent in China, Mongolia, Sub-Saharan Africa, the Middle East, and Latin America, particularly in children, the elderly, and women.⁸

In low- and middle-income countries, inadequate accessibility of population-representative 25(OH)D data hinders the efforts to assess the vitamin D status of populations mostly for those vulnerable to the skeletal and potential extra skeletal consequences of low vitamin D status, like exclusively breastfed infants, children, adolescents, pregnant and lactating women, and the elderly.⁶

In pediatric population, VDD is associated with prematurity, obesity, mal-absorption, and lifestyle characteristics, like clothing, extreme latitudes, low consumption, and little sun



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exposure.⁹ As it is recommended by the integrated management of newborn and childhood illness 2015 (IMNCI) guideline of Ethiopia sunning of neonates starting from the first 2 weeks of age is very important.¹⁰

In Ethiopia, VDD rickets becomes prevalent and increases the morbidity and mortality of children below 5 years of age.¹¹ A study in Jimma Town showed that about 25 (4%) of children were found to have rickets with an uppermost rate (11%) occurring in infants.¹² Additionally, a 3 years retrospective analysis of rickets in Jimma University Specialized Hospital showed a 10.5% prevalence of rickets with the uppermost rate 98 (57.6%) found in children aged 3 to 24 months,¹³ and another study conducted in under 5 children also showed the magnitude of rickets to be 7.8%.¹⁴

Mothers' have a significant role in exposing their infants to adequate sunlight to prevent rickets and vitamin D deficiency; however, there are few studies to assess the mothers' knowledge, practice and the factors that affect the sunlight exposure of infants in Ethiopia especially in this study area. Therefore this study is proposed to assess mothers' knowledge and practice on sunlight exposure of infants, and the factors affecting it in Dessie Town. It is very important to find areas for improvement regarding sunlight exposure and to improve the health of the community.

Methods

Study design, area, and period

A facility-based cross-sectional study was conducted to assess knowledge, practices, and factors affecting sunlight exposure of their infants among mothers at governmental health facilities in Dessie Town from November 1 to 15, 2021. The town is located 401 km from Addis Ababa; 480 km from Bahirdar. Its astronomical location is 11°38' North latitude and 37°15' East longitude. The town has a national total population of 382 912. The town has 5 sub cities and 18 kebeles. There were a total of 4 health centers, 1 referral hospital, and 4 private hospitals.

Population

The source population consisted of mothers with infants and those receiving child care services at governmental health facilities in Dessie Town. The study population consisted of mothers with infants who receive child care related service at the governmental health facilities at the time of data collection. Mothers with infants who receive child care related service at each governmental health facilities in Dessie Town were included in the study. Mothers with difficulty of communicating (hearing problem) were excluded from the study.

Sample size determination

Single population proportion formula was used to calculate the sample size by assuming the prevalence of 62.2%, from

previous study,¹⁵ Z value of 1.96 and marginal error of 5%, sample size was calculated as:

$$N = \frac{\left(\frac{Z\alpha}{2}\right)^2 \times p(1-p)}{(d)^2}$$

$$N = \frac{(1.96)^2 \times 0.62(1-0.62)}{(0.05)^2}$$

$$N = 362$$

By adding 10% for non-respondents, the total sample size to be taken was 398.

Sampling procedure

All governmental health facilities in Dessie Town were included in the study. The overall sample was proportionally taken from all governmental health facilities in the town. This means that a proportional numbers of mothers were included in the sample from each health facility to make up the total sample size. Study participants were selected using a systematic sampling technique in which every second client interviewed at each health facility. The proportional allocation of the study subjects to the 5 health facilities was shown as follows:

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

Where n in health facility = proportion of mothers with infants to be taken from a given health facility

nt = total sample size to be taken from all health facility

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.

Data collection instrument and procedure

Data were collected from mothers through face to face interviews using a semi structured pre-tested questionnaire (16). Two days training was provided for all data collectors and supervisors about their responsibilities for describing the purpose of the study, how to collect the data and telling clients the importance of honest and genuine reply toward the questions. The principal investigator and supervisors strictly follow the overall activities of the data collection on daily base to ensure the completeness of questionnaire and to give further clarification

Study variable

Dependent variables. Knowledge and practice on sunlight exposure of infant.

Independent variables

- Socio-demographic factors
- Source of information
- Attitude of mother on sunlight exposure of infant.

Operational definitions

Knowledge: Eight questions were used to assess the mothers' level of knowledge on sunlight exposure of infants. The median score for these knowledge questions were 5 and those mothers with score of above the median were considered to have adequate knowledge and those scoring below the median were considered to have inadequate knowledge about sunlight exposure of infants.

Practice: Eight questions were used to assess the mothers' level of practice on sunlight exposure of infants. The median score for these practice questions were 5 and those mothers with score of above the median were considered to have adequate practice and those scoring below the median were considered to have inadequate practice about sunlight exposure of infants.

Data quality assurance

Training was given both to data collectors and supervisors. Pretest was done at Haik Health Center by taking 5% of the total sample size to check the questionnaire for its clarity, understandability, and simplicity in collecting for what it is aimed. Then, amendments were made based on the inputs and comments generated at the pretest. Then duplication of the final questionnaires was done. The principal investigator checked every questionnaire to ensure the quality of the data collected at the evening of the date of collection.

Data analysis procedure

Epi Data version 3.1 was used for data entry and exported into SPSS version 23 for analysis. To assess the association between independent and dependent variables, binary and multiple logistic regression analysis were done. Significant association was declared at P value of $<.05$.

Result

Socio-demographic characteristics of respondents

From the sampled 398 mothers, 394 (98.99%) responded to the interview. About 188 (47.7%) were between age 21 and 26 years. And 242 (61.4%) of the infants were aged less than 6 months. About 55.3% of the participants were of Muslim religion. Majority 378 (95.9%) of mothers were married and 174 (43.7%) of mothers was grade 1 to 8 in their educational status. Most 294 (74.6%) of the respondents were housewives and 334 (84.8%) of mothers had a child of 1 to 3 and in regard to their husbands, 124 (31.5%) of husbands had diploma and above educational level (Table 1).

Table 1. Distribution of socio-demographic characteristics of mothers' in Dessie Town, Ethiopia, 2021 (n=394).

S. NO	VARIABLE	FREQUENCY	PERCENT
1.	Mother age		
	Age less than 20	26	6.6
	21-26	188	47.7
	27-32	138	35.0
	Above 33	42	10.7
2.	Infant age		
	Below 6 mo	242	61.4
	7-12 mo	152	38.6
3.	Religion		
	Orthodox	166	42.1
	Muslim	218	55.3
	Protestant	10	2.5
4.	Marital status		
	Single	10	2.5
	Married	378	95.9
	Divorced	6	1.5
5.	Mother education		
	Unable to read and write	50	12.7
	Able to read and write	24	6.1
	Grade 1-8	172	43.7
	Grade 9-12	92	23.4
	College and above	56	14.2
6.	Mother occupation		
	House wife	294	74.6
	Government employee	44	11.2
	Private employee	22	5.6
	Daily laborer	14	3.6
	Merchant	14	3.6
7.	Number of children		
	1-3	334	84.8
	4-6	54	13.7
	More than 6	6	1.5
8.	Husbands education status		
	Unable to read and write	44	11.2
	Able to read and write	32	8.1
	Grade 1-8	118	29.9
	Grade 9-12	124	31.5
	College and above	76	19.3

Source of information

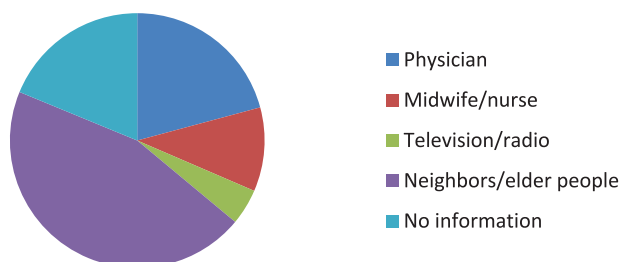


Figure 1. Distribution of mothers by their source of information about sunlight exposure of infant at governmental health facilities in Dessie Town, 2021.

Mothers' source of information about sunlight exposure of infants

Out of the total 394 participants, 332 (84.3%) of them had information about sunlight exposure of infants and the majority 178 (45.2%) of them got this information from neighbors and 82 (20.8%) from physician (Figure 1).

Knowledge of respondents about sunlight exposure

Concerning the benefit of sunlight exposure, about 374 (94.9%) of participants stated that sunlight exposure is beneficial for infants. From those, about 190 (48.2%), 126 (32%), and 50 (12.7%) of the participants stated sunlight exposure beneficence to strength body, to strength bone, and to produce vitamin D respectively. From all respondents, only 52 (13.2%) believed that sunlight exposure had harmful effect for the infant and the most commonly mentioned harmful effect of sunlight exposure was 18 (4.6%) blackness. About time of sunlight exposure, 388 (98.5%) of mothers thought the good time to expose infants on sunlight was in the morning (Table 2).

Mothers' knowledge level about sunlight exposure of infants

Based on the questions used to assess the level of knowledge, the median value was calculated as 5. About 302 (76.6%) of participant scored less than or equal to 5. Thus, based on the operational definition 76.6% of mothers had poor knowledge about sunlight exposure of infants (Figure 2).

Practice of mothers about sunlight exposure of infants

Among 394 respondents, 370 (93.9%) of them exposed their babies to sunlight. From these, 102 (25.9%) underwent sunlight exposure of their infants from 0 to 15 days, and 122 (31.0%) of mothers started after 45 days. From those mothers exposing their infant to sunlight, only 328 (83.2%) exposed daily. About 368 (93.4%) of the participants exposed their infants outdoors (outside the house), with 368 (93.4%) of the participants exposing their infants in the morning (8-10 AM).

Regarding the condition of closing during exposure, 188 (47.7%) of them expose their infants on sunlight partly covered and 94 (23.9%) of mothers exposed their infants completely covered (Table 3).

Mothers' practice level about sunlight exposure of infants

Based on the questions used to assess practice level, the median value was calculated as 5. So, out of 394 respondents, 232 (58.9%) of respondents scored less than or equal to 5. Hence, based on the operational definition 58.9% of mothers had poor practice on sunlight exposure of their infants (Figure 3).

Application of lubricants on the infant body

Concerning the use of lubricants, about 256 (65%) apply lubricant to the infants body. From these, 180 (45.7%) apply during sunning, and 48 (12.2%) of mothers apply before sunning. Regarding the material used for lubrication, 240 (93.75%) mothers apply baby Vaseline and 16 (6.25%) of mothers apply lotion on the infants' body (Table 4).

Association of independent variables with knowledge of mothers on sunlight exposure of infants

Significant association was detected between maternal occupation and knowledge of mothers, as employed mothers were less likely to have poor knowledge than housewife (aOR=0.124, 95% CI=0.042, 0.365).

Similarly, mothers with another occupation (such as merchant or student) were also less likely to have poor knowledge about sunlight exposure of infant than housewife others (aOR=0.193, 95% CI=0.038, 0.980).

Those mothers who did not have any source of information about sunlight exposure of infants were 18 times more likely to have poor knowledge than mothers who describe their physician as their source of information (aOR=18.604, 95% CI=7.564, 45.75).

Similarly mothers who have poor attitude on sunlight exposure of infants were 2.7 times more likely to have poor knowledge than about sunlight exposure of infants than mothers with good attitude on sunlight exposure of infants (aOR=2.773, 95% CI=1.474, 5.215) (Table 5).

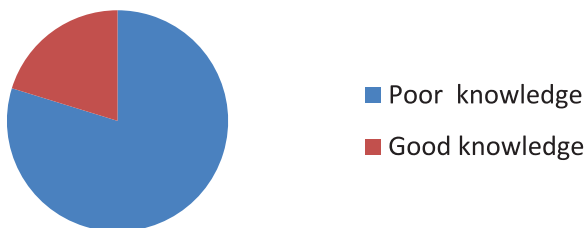
Association of independent variables with practice of mothers on sunlight exposure of infants

Significant association was detected between maternal age and practice of mothers, as mothers aged 22 to 27 years were 3.1 times more likely to have poor practice on sunlight exposure of infant than mothers aged 34 and above years (aOR=3.191, 95% CI=1.334, 7.633). And, mothers aged 28 to 33 years were also 4 times more likely to have poor practice on sunlight

Table 2. Knowledge of mothers' on sunlight exposure of their infants in Dessie Town, Ethiopia, 2021.

	ATTRIBUTE	FREQUENCY	PERCENT
Mentioned as sunlight was beneficial	Yes	374	94.9
	No	20	5.1
Mentioned benefits of sunlight	Strengthen bone	126	32.0
	Strengthen teeth	4	1.0
	Produce vitamin D	50	12.7
	Strengthen body	190	48.2
Mentioned sunlight has harmful effect	Yes	52	13.2
	No	334	84.8
Mentioned harmful effects of sunlight	Skin cancer	8	2.0
	Sterility	10	2.5
	Sun burn	8	2.0
	Blackness	18	4.6
	I don't know	8	2.0
Good time to expose infants on sunlight	Morning	388	98.5
	Evening	2	0.5
Aware about the effect of inadequate or absence of sunlight exposure	Yes	322	81.7
	No	70	17.8

Level of knowledge

**Figure 2.** Distribution of mothers by their knowledge level about sunlight exposure of infants at governmental health facilities in Dessie Town, Ethiopia, 2021.

exposure of infant than mothers aged 34 and above years (aOR = 4.000, 95% CI = 1.610, 9.935).

Mothers having infant age of less than 6 month were 1.9 times more likely to have poor practice on sunlight exposure than those having infants of age 7 and above months (aOR = 1.989, 95% CI = 1.260, 3.140). Employed mothers were also 4.2 times more likely to have poor practice on sunlight exposure of infants than housewife mothers (aOR = 4.226, 95% CI = 2.321, 7.694) (Table 6).

Discussion

This study was aimed at assessing mothers' knowledge and practice on sunlight exposure of infant and associated factors that affect their knowledge and practice.

The study finding shows that 302 (76.6%) of mothers have poor knowledge on sunlight exposure of infant. This result is higher than the studies conducted in Farta district, Debre Markos, Jimma and Aleta Wondo Health Center, in which only 49.9%, 60%, 24%, and 38.8% mothers have poor knowledge about sunlight exposure respectively.^{12,15-17} This variation may be due to socio-cultural difference between the study sites.

Regarding practice of mothers, the finding shows 232 (58.9%) of mothers have poor practice on sunlight exposure of infants. These findings were lower than the study done in Aleta Wondo Health Center, SNNPR that shows about 68.4% of mothers have poor practice on sunlight exposure of infants.¹⁵ This discrepancy may be due to the socio-cultural differences between the 2 regions.

But these results were higher than the study conducted in Farta district, St. Paul's Hospital and Yirgalem hospital, Sidama regional state, which shows about 45.5%, 40%, and 45.7% of mothers have poor practice on sunlight exposure of infants.^{16,18,19} This discrepancy may be due to geographical difference between the study sites.

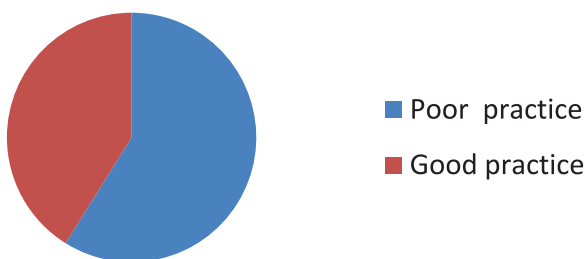
The percentage of respondents who reported that they had the information (knowledge) about sunlight exposure was 332 (84.3%). These findings were in line with the study done in Debre Markos town, that showed that 86.1% of mothers had information about sunlight exposure.¹⁷

Significant association was observed between mothers occupation and knowledge of mothers, employed mothers

Table 3. Practice of mothers' on sunlight exposure of their infants in Dessie Town, Ethiopia, 2021.

VARIABLE	ATTRIBUTE	FREQUENCY	PERCENT
Expose infant for sunlight	Yes	370	93.9
	No	24	6.1
Age infant start sunlight exposure	0-15 d	102	25.9
	16-30 d	76	19.3
	31-45 d	72	18.3
	45 d and above	122	31.0
Frequency of sunlight exposure	Daily	328	83.2
	Sometimes	44	11.2
Place of exposure	Outdoor	368	93.4
	Indoor	4	1.0
Time of sunlight exposure	Morning 8-10 AM	368	93.4
	Mid day 11 AM-1 PM	2	0.5
	Afternoon 2-4 PM	2	0.5
Condition of clothing during exposure	Unclothed	70	17.8
	With diapers and eye protection	16	4.1
	Partly covered	188	47.7
	Completely covered	94	23.9
Duration of exposure	5-10 min	56	14.2
	10-15 min	64	16.2
	15-30 min	158	40.1
	Above 30 min	94	23.9

Level of practice

**Figure 3.** Distribution of mothers by their practice level about sunlight exposure of infant at governmental health facilities in Dessie Town, Ethiopia, 2021.

were less likely to have poor knowledge than housewives (aOR=0.124, 95% CI=0.042, 0.365). This may be because employed mothers may have an opportunity to update themselves more than housewife mothers.

Similarly, mothers with another occupation (such as merchant or student) were also less likely to have poor knowledge about sunlight exposure of infant than housewives (aOR=0.193,

Table 4. Application of lubricants on the infants' body at governmental health facilities in Dessie Town, Ethiopia, 2021.

	ATTRIBUTES	FREQUENCY	PERCENT
Use of lubricant	Yes	256	65.0
	No	116	29.4
Time of application	Before exposure	48	12.2
	During exposure	180	45.7
	After exposure	32	8.1
Types of lubricant	Baby Vaseline	240	60.9
	Baby lotion	16	4.1
	Butter	2	0.5

95% CI=0.038, 0.980). This may be because these groups of mothers may have an opportunity to update themselves more than housewife mothers.

Those mothers who have no any source of information about sunlight exposure of infants were 18 times more likely to

Table 5. Association of independent variables with knowledge of mothers on sunlight exposure of infants at governmental health facilities in Dessie Town, Ethiopia, 2021.

VARIABLES	LEVEL OF KNOWLEDGE		ODDS RATIO, AT 95% CI			
	POOR	GOOD	CRUDE	P-VALUE	ADJUSTED	P-VALUE
Mother age						
Age less than 21	36	10	0.417 (0.162-1.071)	.069	0.516 (0.128-2.084)	.353
22-27y	148	44	0.446 (0.218-0.913)	.027	0.580 (0.193-1.743)	.332
28-33y	94	22	0.351 (0.160-0.769)	.009	0.363 (0.125-1.055)	.063
34 and above years	24	16	1		1	
Mother occupation						
Housewife	212	82	1			
Employee	58	8	0.357 (0.163-0.779)	.010	0.124 (0.042-0.365)	.000
Other	32	2	0.162 (0.038-0.690)	.014	0.193 (0.038-0.980)	.047
Number of children						
less than 3 child	262	72	1		1	
4 and more child	40	20	1.819 (1.002-3.305)	.049	1.862 (0.724-4.792)	.197
Source of information						
Physician	68	14	1		1	
Midwife/nurse	36	6	0.810 (0.287-2.286)	.690	0.862 (0.283-2.629)	.794
Radio/media	18	0	0.000	.998	0.00	.998
Neighbors	158	20	0.615 (0.293-1.288)	.198	0.716 (0.318-1.615)	.421
No any source	22	52	11.481 (5.363-24.577)	.000	18.604 (7.564-45.75)	.000
Practice						
Poor practice	168	64	1.823 (1.107-3.002)	.018	1.160 (0.598-2.251)	.661
Good practice	134	28	1		1	
Attitude						
Poor attitude	76	44	2.726 (1.679-4.426)	.00	2.773 (1.474-5.215)	.002
Good attitude	226	48	1		1	

The bold is to shows variables having significant association with dependent variable.

have poor knowledge than mothers who describe physician as their source of information (aOR=18.604, 95% CI=7.564, 45.75). This may be because having no information makes an individual to have poor knowledge.

Similarly mothers who have poor attitude on sunlight exposure of infant were 2.7 times more likely to have poor knowledge than about sunlight exposure of infants than mothers with good attitude on sunlight exposure of infants (aOR=2.773, 95% CI=1.474, 5.215). This might be due to having a poor attitude toward sunlight exposure of infants and may reduce an individual's interest to update themselves and to gain knowledge about sunlight exposure.

A significant association was also observed between maternal age and practice of mothers, as mothers with age of 22 to

27years were 3.1 times more likely to have poor practice on sunlight exposure of infant than mothers with age group of 34 and above years (aOR=3.191, 95% CI=1.334, 7.633). And, mothers with age of 28 to 33 years were 4 times more likely to have poor practice on sunlight exposure of infant than mothers with age group of 34 and above years (aOR=4.000, 95% CI=1.610, 9.935). This may be due to as being young in age may make an individual to be careless.

Mothers having baby age of less than 6 month were 1.9 times more likely to have poor practice on sunlight exposure of infants than mothers infant having of 7 and above months (aOR = 1.989, 95% CI=1.260, 3.140). This may be because mother having infant with age less than 6 month may fear to expose the infant for sunlight because of the infants immaturity.

Table 6. Association of independent variables with practice of mothers on sunlight exposure of infants at governmental health facilities in Dessie Town, Ethiopia, 2021.

VARIABLES	LEVEL OF PRACTICE		ODDS RATIO, AT 95% CI			
	POOR	GOOD	CRUDE	P-VALUE	ADJUSTED	P-VALUE
Mother age						
Age less than 21	32	14	1.750 (0.646-4.744)	.271	1.683 (0.588-4.818)	.332
22-27y	108	84	3.111 (1.363-7.103)	.007	3.191 (1.334-7.633)	.009
28-33y	60	56	3.733 (1.586-8.788)	.003	4.000 (1.610-9.935)	.003
34 and above years	32	8	1		1	
Baby age						
Less than 6 mo	132	110	1.603 (1.053-2.439)	.028	1.989 (1.260-3.140)	.003
7 and more months	100	52	1		1	
Mother occupation						
Housewife	192	102	1		1	
Employee	22	44	3.765 (2.139-6.626)	.000	4.226 (2.321-7.694)	.000
Other	18	16	1.673 (0.819-3.420)	.158	1.755 (0.821-3.751)	.147
Knowledge						
Poor	168	134	1.823 (1.107-3.002)		1.457 (0.855-2.481)	.166
Good	64	28	1		1	

The bold is to shows variables having significant association with dependent variable.

Employed mothers were 4.2 times more likely to have poor practice on sunlight exposure of infants than housewife mothers (aOR = 4.226, 95% CI = 2.321, 7.694). This might be attributed to employed women have no sufficient time to expose their infants to sunlight when compared to that of housewife women.

Conclusion

According to the result of this study, 76.6% of the mothers had poor knowledge about sunlight exposure of infants, and 58.9% of mothers had poor sunlight exposure practice. This infers the information provided about sunlight exposure of infants at antenatal, natal, postnatal period, and immunization follow up is inadequate. Mother's occupation, mother's source of information, and mother's attitude had showed a significant association with mothers' knowledge and mothers' age, mothers' occupation, and baby age had showed significant association with mothers practice about sunlight exposure of infants. In general both the knowledge and practice of mothers on sunlight exposure of infants in this study area was poor. So, this result shows mothers knowledge and practice of exposing an infant to sun light in Dessie Town needs improvement. All possible opportunities, that is, the mass media, antenatal visits, natal visits, post natal visits, and immunization or sick baby visits, should consider to explore about mothers awareness and skill on sunlight exposure of infants.

Declarations

Ethics Approval and Consent to Participate

Ethical clearance was gained from research and ethical review committee of college of medicine and health science, Wollo University. The ethical clearance letter reference number is CMHS-905/13/13. Communications with administrators of the selected kebeles in the town were held through a formal letter (reference number: CMHS-025/13/13). The data collector elaborates on the importance of the study for the participants. Written consent was signed by each participant for their voluntariness to participate in the study before data collection. Confidentiality of the collected data was maintained.

Consent for Publication

Informed consent has been obtained from all participants.

Author Contributions

Debrnesh Goshiye: Conceptualization; Data curation; Formal analysis; Funding acquisition; Investigation; Methodology; Project administration; Resources; Software; Supervision; Validation; Visualization; Writing—original draft; Writing—review & editing. Gebeyaw Biset: Formal analysis; Investigation; Methodology; Writing—original draft; Writing—review & editing. Zinet Abegaz: Formal analysis; Methodology; Writing—original draft; Writing—review & editing. Endalk

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Acknowledgements

We are thankful to the Dessie Town community, particularly those mothers who participated in this study. We also acknowledge our data collectors and supervisors for their involvement in the study. We are appreciative to Wollo University for supporting us to research.

Availability of Data and Materials

not applicable

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