





# Determinants of traditional eye practices amongst rural dwellers in the Asikuma Odoben Brakwa District, Ghana



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**Background:** In Ghana and other developing countries, people resort to other means of eye care apart from the orthodox treatment given by eye care practitioners.

**Aim:** This study aimed to examine the determinants of traditional eye practices amongst a sample in the Central Region of Ghana.

**Setting:** The study employed a mixed-method convergent parallel study design and adapted the Expanded Programme on Immunization Survey Technique to enrol 191 residents.

**Methods:** A questionnaire and an interview were used to obtain data from the participants. Descriptive statistics were computed along with univariate and multivariable logistic regression analysis to determine associated factors for the use of traditional eye medication (TEM), ophthalmic self-medication and its combination.

**Results:** The study included 191 participants with an age range of 18–79 years. The odds of TEM use were 2.3 times higher in male than female participants (adjusted odds ratio [AOR]: 2.307, 95% confidence interval [CI]: 1.219, 4.364,  $p = 0.01$ ). Other socio-demographic characteristics (age, marital status, occupation and educational status) were not associated with traditional eye practices. The  $p$ -value in all these was  $p > 0.05$  during the univariate analysis, but age was independently significant during the multivariate statistic ( $p = 0.041$ ).

**Conclusion:** Gender and age were significantly associated with TEM use. Public education on TEM and ophthalmic self-medication and its consequences should be organised, targeting the natives in the rural communities, by the Ghana Health Service.

**Keywords:** determinants; self-medication; traditional eye medication; traditional medical practitioners; traditional therapies; eye care.

## Introduction

In this article, the phrase ‘traditional eye practices’ is used to describe the use of traditional eye medicine (TEM), sacred rituals and prayers, or ophthalmic self-medication to treat eye disorders. Traditional healers provide treatment based on cultural beliefs and practices relating to eye diseases and deliver eye care at the community level, especially when patients are reluctant to get treatment from professional eye care service providers.<sup>1</sup> Topical substances used in ocular treatment included seawater, extracts of roots, leaves of trees, herbs, powdered charcoal, human urine and saliva.<sup>2</sup> In Ghana, Asiedu et al. reported that the incidence rate of self-medication was 25.2% for over-the-counter topical ophthalmic drugs.<sup>3</sup>

Munaw et al., through a community-based cross-sectional study in Ethiopia, reported that being unmarried, illiterate, living within the area of traditional healers, having poorer access to modern eye care services and positive family history of TEM use were significantly associated with TEM practice.<sup>4</sup> Bifari et al. reported a strong association between the participants education status and medication use without consulting a physician.<sup>5</sup> Other studies have reported no significant association with age, sex, education, occupation and TEM use.<sup>6</sup> However, in a mixed-method prospective cohort study by Arunga et al., distance from the eye clinic and late presentation to the eye clinic were associated with TEM use.<sup>7</sup>

A study by Ntim-Amponsah et al. showed that traditional eye practices are common in Ghana, but their associated determinants have not yet been explored.<sup>8</sup> This study was carried out to ascertain the determinants of TEM use, ophthalmic self-medication and a combination of TEM and ophthalmic self-medication use. This study’s findings would provide a robust basis to plan and regulate traditional eye practice in Ghana.

## Methods

### Study design, setting, sampling and method

The study employed a mixed-method descriptive and cross-sectional design with an Expanded Programme on Immunisation (EPI) survey sampling method<sup>7</sup> to sample 1283 natives from Asikuma Odoben Brakwa District between 05 January 2020, and 27 March 2020. Based on the geographical location, the 30 towns in the district were considered clusters.<sup>9</sup> The community park in each cluster was selected as our starting point to undertake the house-to-house survey, and we visited the third randomly selected household as per the pen's spin direction. If no household member was selected, the nearest household (door to door) to the one determined in the previous stage was selected and tested for conformity with the inclusion criterion. The processes were repeated until seven participants were surveyed in each cluster. At most, the first two participants encountered were selected from each household. The sample size used for the study was statistically determined using the Cochran formula because of the large population size, with the design effect of 3.1% attrition rate for cluster sampling factored in. Data collection included the administration of a questionnaire (consisting of both closed- and open-ended questions). The participants demographic information such as gender, age, marital status, occupation and educational status were recorded. The use of TEM or ophthalmic self-medication and the reason for engaging in its use were investigated.

### Statistical analysis

Data analysis was performed with the Statistical Package for Social Sciences (SPSS) version 25 (IBM Corp., Armonk, New York, United States). Both descriptive and analytical methods were employed for analysis. Summary statistics, frequencies and cross-tabulations were performed for the descriptive analysis. Chi-square test and logistic regression were used to explore determinants (socio-demographic factors) associated with TEM use only and ophthalmic self-medication only. The determinant associated with the use of a combination of TEM and ophthalmic self-medication was also assessed. The level of significance of the study was considered at  $p < 0.05$ .

### Ethical considerations

Ethical clearance to conduct this study was obtained from the the University of KwaZulu-Natal Biomedical Research Ethics Committee (No. BE342/19 on 05 June 2019) and the Ghana Health Service Ethical Board (No. GHS-ERC 004/05/19). Only consented participants 18 years and above who had used TEM or ophthalmic self-medication or a combination of the two for at most two months before the study were included in the study. A written informed consent was obtained from all participants prior to participation.

## Results

### Socio-demographic characteristics of the study participants

A total of 191 participants with a response rate of 91.8% were recruited for the study with the mean age of  $44.32 \pm 16.27$  years. Female participants accounted for most of the respondents (52.9%,  $n = 101$ ). Approximately 42% of participants were aged from 18 to 39 years. A total of 66 participants (34.6%) were farmers followed by 33 traders (Table 1). The majority of participants (42.9%) were married, and the educational status of the majority of participants was primary (basic education) (42.4%). Other descriptive statistics of participants are presented in Table 1.

### Determinants of traditional eye medicine use only by socio-demographic characteristics

Female participants (66.30%,  $n = 67$ ) reported to have used TEM more than males (50.00%,  $n = 45$ ) (Table 2). Univariate statistics showed a statistical association between gender and TEM use only ( $\chi^2 [1] = 5.183$ ,  $p = 0.023$ ). Although the univariate analysis was performed, and multivariable logistic regression was performed to compute the adjusted odds ratio (AOR). The model explained 3.7% (Nagelkerke  $R^2$ ) of the variance in TEM use and correctly classified 58.6% of cases. The model was independently associated with gender and age category with  $p < 0.05$ . Traditional eye medicine use odds were 2.3 times higher in male than female participants (AOR: 2.30, 95% confidence interval [CI]: 1.10, 3.53,  $p = 0.010$ ). Old adults (72.50%,  $n = 29$ ) used TEM the most followed by young adults (57.50%,  $n = 46$ ).

**TABLE 1:** Demographic characteristics of participants ( $n = 191$ ).

Characteristics	<i>n</i>	%
<b>Gender</b>		
Male	90	47.1
Female	101	52.9
<b>Age category (years)</b>		
18–39	80	41.9
40–59	71	37.2
60 and above	40	20.9
<b>Marital status</b>		
Single	50	26.2
Married	82	42.9
Divorced	12	6.3
Separated	33	17.3
Widowed	14	7.3
<b>Occupation</b>		
Civil servant	15	7.9
Trading	33	17.3
Fishing	25	13.1
Farming	66	34.6
Artisan	10	5.2
Unemployed	34	17.7
Retiree	8	4.2
<b>Educational status</b>		
Primary	81	42.4
Secondary	30	15.7
Tertiary	18	9.4
None	62	32.5

**TABLE 2:** Traditional eye medicine use only by demographic characteristics of the participants.

Characteristics	N	%	TEM use only				s.e.	OR	95% CI	p	
			Yes		No						
			n	%	n	%					
<b>Gender</b>											0.010*
Male	90	47.1	45	50.0	45	50.0	0.325	2.30	1.10–3.53		
Female	101	52.9	67	66.3	34	33.7	-	REF	-		
<b>Age category (years)</b>											0.041*
18–39	80	41.9	46	57.5	34	42.5	0.614	3.55	1.07–11.84		
40–59	71	37.2	37	52.1	34	47.9	0.522	3.64	1.31–10.13		
60 and above	40	20.9	29	72.5	11	27.5	-	REF	-		
<b>Marital status</b>											0.982
Single	50	26.2	30	60.0	20	40.0	0.804	0.83	0.17–4.05		
Married	82	42.9	46	56.1	36	43.9	0.656	0.88	0.24–3.21		
Divorced	12	6.3	8	66.7	4	33.3	0.875	0.62	0.11–3.46		
Separated	33	17.3	20	60.6	13	39.4	0.697	0.97	0.25–3.83		
Widowed	14	7.3	8	57.1	6	42.9	-	REF	-		
<b>Occupation</b>											0.732
Civil servant	15	7.9	6	40.0	9	60.0	1.139	1.33	0.14–12.47		
Trading	33	17.3	16	48.5	17	51.5	0.948	0.72	0.11–4.67		
Fishing	25	13.1	14	56.0	11	44.0	1.052	0.55	0.07–4.32		
Farming	66	34.6	43	65.2	23	34.8	1.018	0.35	0.05–2.59		
Artisan	10	5.2	7	70.0	3	30.0	1.246	0.31	0.03–3.54		
Unemployed	34	17.7	21	61.8	13	38.2	1.104	0.39	0.40–3.40		
Retiree	8	4.2	5	62.5	3	37.5	-	REF	-		
<b>Educational status</b>											0.716
Primary	81	42.4	51	63.0	30	37.0	0.418	0.72	0.32–1.64		
Secondary	30	15.7	16	53.3	14	46.7	0.589	1.09	0.35–3.48		
Tertiary	18	9.4	9	50.0	9	50.0	0.872	0.55	0.10–3.07		
None	62	32.5	36	58.1	26	41.9	-	REF	-		

TEM, traditional eye medicine; REF, reference group; OR, odds ratio; 95%CI, 95% confidence interval; s.e., standard error.

\*, Suggestive significance ( $p: 0.05 = p < 0.05$ ).

and middle-aged adults (52.10%,  $n = 37$ ) but this was not significant ( $p > 0.05$ ) during the univariate analysis and was statistically significant after the confounders were controlled ( $p = 0.041$ ) during the logistic regression. Under the marital status category, more than 50% of the respondents in each subcategory used TEM but no statistically significant association was found. More than half of the artisan, farmers, retirees, unemployed and fisherfolks participants used TEM only. Less than 50% of the traders and civil servants used TEM only (Table 2).

### Determinants of ophthalmic self-medication by socio-demographic characteristics

Female participants (45.5%,  $n = 46$ ) reported to have used ophthalmic self-medication more than the males (42.2%,  $n = 38$ ) with level of significance at  $p = 0.644$  (Table 3). In all, 45.0% of the young adults ( $n = 36$  from the ages of 18 years to 39 years) were engaged in ophthalmic self-medication followed by the middle-aged adults (40–59 years) (45.1%,  $n = 32$ ) then old adults (60 years and above) (40.0%,  $n = 16$ ) at  $p = 0.829$ . There was no association between use of ophthalmic self-medication and marital status, occupation and educational status at  $p > 0.05$  (Table 3). More than 50.0% of the participants had tertiary educational status self-medicated, whilst less than half of the participants who had primary school education and no educational status engaged in ophthalmic self-medication (Table 3). Amongst

the occupation, civil servants had the highest use of ophthalmic self-medication practice, followed by farmers, traders and those who were unemployed (Table 3).

### Determinants of combination of traditional eye medicine and ophthalmic self-medication by socio-demographic characteristics

Male participants (23.3%,  $n = 21$ ) engaged in the use of a combination of TEM and ophthalmic self-medication more than female participants (17.8%,  $n = 18$ ) at  $p = 0.346$  (Table 4). Twenty-five percent of the middle-aged adults (40–59 years) ( $n = 18$ ) engaged in the use of a combination of TEM and ophthalmic self-medication followed by the young adults (18–39 years) [17.5%,  $n = 14$ ] and old adults ( $\geq 60$  years) (17.5%,  $n = 7$ ) with  $p > 0.499$ . Similar results were found regarding statistical findings for marital status, occupation and educational status at  $p > 0.05$ .

## Discussion

### Demographic characteristic

This is the first study to assess traditional eye practices amongst people in the Asikuma Odoben Brakwa district, Ghana. The sample consisted of more females than male participants. This finding is consistent with similar studies conducted in Ghana,<sup>10</sup> India<sup>11</sup> and Nigeria.<sup>12</sup> This research study coincides with population-based eye health surveys in Africa, Asia and

developed countries, which reveal that approximately two-thirds of women in the world bear the financial burden of vision-related problems.<sup>13</sup> This financial burden can influence women's need to seek alternative medicine and herbal concoctions to solve their visual needs more than men. Also, there is gender disparity in Ghana, with women outnumbering men in the last reported national census.<sup>14</sup>

### Determinants of traditional eye medicine use by socio-demographic characteristics

Females used TEM more than males (Table 2), with a statistically significant association between gender and TEM use. This trend can be attributed to females being more attentive to their health than males, and therefore resorting to any form of practice to relieve their ailment.<sup>15</sup> The logistic regression model was independently statistically significant for gender and age (Table 2) but not for the other factors, such as marital status, occupation and educational status. It can be inferred that males are 2.3 times more likely to use TEM than females. Whilst Nwosu and Obidior found no statistical gender difference,<sup>12</sup> Kayoma et al. reported that males were more likely to use TEM than females.<sup>16</sup> The finding that age is associated with TEM use in this study correlates with the study by Bifari et al., who reported a strong relationship between age and TEM use amongst the populace of Taif city, Saudi Arabia.<sup>5</sup>

Amongst the various age groups, the elderly adults ( $\geq 60$  years) were more likely to use TEM only, compared with middle-aged and young adults (Table 2). Aghaji et al.

revealed that the elderly individuals used TEMs predominantly because they were not as financially capable as when they were young.<sup>17</sup> Furthermore, Al-Akily et al. suggested that knowledge related to medicinal plants amongst older individuals influenced their use of TEM.<sup>18</sup>

The other socio-demographic factors (marital status, occupation and educational status) were not associated with TEM use. Similar findings were reported in studies carried out in Zimbabwe<sup>19</sup> and Brazil,<sup>20</sup> with traditional eye practices not dependent on the participant's level of education, religion or marital status. However, Eze et al. revealed that a prior marital family unit might influence TEM use.<sup>21</sup>

Some herbal medicine practitioners have been found to misinform unskilled workers regarding their drug of choice.<sup>22</sup> They present their drugs as a 'wonder drug' that can cure almost every form of a medical condition, of which the eye is not an exception. The proximity of the unskilled workers' workplace and exposure to advertisements and information centres to herbal medicine practitioners may cause them to fall prey to this management form.<sup>22</sup> Herbal practitioners sometimes inform their clients that the various symptoms experienced are attributable to haemorrhoids, which is locally known as 'koko' in Ghana. Farmers have some folk herbal medicinal knowledge passed down from their fathers, and thus they use the TEM.<sup>22</sup> Most of the participants had primary or no education, which may have contributed to an economic barrier to seeking professional eye care services

**TABLE 3:** Ophthalmic self-medication by demographic characteristics of the participants.

Characteristics	N	%	Ophthalmic self-medication				s.e.	OR	95% CI	p	
			Yes		No						
			n	%	n	%					
Gender											0.551
Male	90	47.1	38	42.2	52	57.8	0.313	1.20	0.65–2.22		
Female	101	52.9	46	45.5	55	54.5	-	REF	-		
Age category (years)											0.829
18–39	80	41.9	36	45.0	44	55.0	0.554	0.75	0.25–2.22		
40–59	71	37.2	32	45.1	39	54.9	0.466	0.97	0.39–2.41		
60 and above	40	20.9	16	40.0	24	60.0	-	REF	-		
Marital status											0.559
Single	50	26.2	22	44.0	28	56.0	0.798	0.71	0.15–3.38		
Married	82	42.9	38	46.3	44	53.7	0.648	0.87	0.25–3.10		
Divorced	12	6.3	7	58.3	5	41.7	0.821	0.54	0.11–2.72		
Separated	33	17.3	11	33.3	22	66.7	0.694	1.56	0.40–6.10		
Widowed	14	7.3	6	42.9	8	57.1	-	REF	-		
Occupation											0.828
Civil servant	15	7.9	9	60.0	6	40.0	1.091	0.51	0.06–4.38		
Trading	33	17.3	15	45.5	18	54.5	0.920	0.92	0.15–5.62		
Fishing	25	13.1	9	36.0	16	64.0	1.034	1.33	0.18–10.14		
Farming	66	34.6	32	48.5	34	51.5	0.981	0.86	0.12–5.86		
Artisan	10	5.2	3	30.0	6	70.0	1.214	1.77	0.16–19.16		
Unemployed	34	17.7	13	38.2	21	61.8	1.080	1.64	0.20–13.61		
Retiree	8	4.2	3	37.5	5	62.5	-	REF	-		
Educational status											0.842
Primary	81	42.4	32	39.5	49	60.5	0.402	1.44	0.65–3.17		
Secondary	30	15.7	13	43.3	17	56.7	0.566	1.25	0.41–3.79		
Tertiary	18	9.4	10	55.6	8	44.4	0.833	1.17	0.23–5.99		
None	62	32.5	29	46.8	33	53.2	-	REF	-		

REF, reference group; OR, odds ratio; 95% CI, 95% confidence interval; s.e., standard error.

whenever they had any ocular ailment.<sup>21</sup> Economic barriers to professional eye care services leave the natives with no other alternative but to seek the services of traditional medical practitioners who reside within their communities.

### Determinants of ophthalmic self-medication by socio-demographic characteristics

Female participants engaged in ophthalmic self-medication more than their male counterparts (Table 3). This finding is comparable with the trend seen in the use of TEM, aligning with the fact that female participants resort to any form of practice to relieve themselves of their ailment.<sup>15</sup> This gender difference, however, was not statistically significant. Participants between 18 years and 39 years resorted to more self-medication use than those 40 years old and above. This use of ophthalmic medicines without consultation of eye-care providers could be attributed to visual stress and eye injuries being more common in participants less than 40 years old.<sup>23</sup> It was also observed that the educated participants were more likely to self-medicate when compared with those with little or no education. With their broad knowledge base, educated participants may have a propensity to link the former symptoms with current diseases and self-medicate, making this trend more prevalent.<sup>24</sup>

The proportion of ophthalmic self-medication use amongst the occupations correlates with the trend seen with the educated participants engaging in self-medication. No significant association was found between the various demographic

characteristic and ophthalmic self-medication use in the study. In contrast, Adimassu et al. reported that amongst age groups 29–42 years, eye drug bottle or tube availability at home, distance commuting to get eye care facilities, and low awareness of self-medication were essential factors associated with the practice of ophthalmic self-medication.<sup>25</sup> Also, Esan et al. stated that self-medication amongst undergraduates of a private university in Nigeria was significantly correlated with age, sex, college and year of study.<sup>26</sup>

It could be observed that participants who used TEM the most were the ones who engaged in ophthalmic self-medication the least and vice versa, except for gender. Under occupation, skilled workers such as civil servants and traders used TEM the least but used ophthalmic self-medication the most. Unskilled workers such as farmers, fisherfolks, artisans and the unemployed used TEM the most but engaged in ophthalmic self-medication the least. A similar finding was found in the educational category where participants who had tertiary education used TEM the least but used ophthalmic self-medication the most. Participants with no education and primary education used TEM the most but used ophthalmic self-medication the least.

### Determinants of combination of traditional eye medicine and ophthalmic self-medication by socio-demographic characteristics

Male participants using the combination practice (TEM and ophthalmic self-medication) more than female participants

**TABLE 4:** Combination of traditional eye medicine and ophthalmic self-medication by socio-demographic characteristics.

Characteristics	N	%	TEM and ophthalmic self-medication				s.e.	OR	95% CI	p
			Yes		No					
			n	%	n	%				
<b>Gender</b>										0.177
Male	90	47.1	21	23.3	69	76.7	0.388	0.59	0.28–1.27	
Female	101	52.9	18	17.8	83	82.2	-	REF	-	
<b>Age category (years)</b>										0.499
18–39	80	41.9	14	17.5	66	82.5	0.731	1.17	0.28–4.89	
40–59	71	37.2	18	25.4	53	74.6	0.579	0.65	0.21–2.01	
60 and above	40	20.9	7	17.5	33	82.5	-	REF	-	
<b>Marital status</b>										0.989
Single	50	26.2	9	18.0	41	82.0	0.945	1.10	0.17–7.03	
Married	82	42.9	17	20.7	65	79.3	0.731	1.20	0.29–5.02	
Divorced	12	6.3	2	16.7	10	83.3	1.025	1.73	0.23–12.88	
Separated	33	17.3	7	21.2	26	78.8	0.776	1.25	0.27–5.74	
Widowed	14	7.3	4	28.6	10	71.4	-	REF	-	
<b>Occupation</b>										0.418
Civil servant	15	7.9	6	40.0	9	60.0	1.451	0.14	0.01–2.45	
Trading	33	17.3	9	27.3	24	72.7	1.252	0.50	0.04–5.82	
Fishing	25	13.1	5	20.0	20	80.0	1.373	0.82	0.06–12.03	
Farming	66	34.6	9	13.6	57	86.4	1.337	1.16	0.08–15.90	
Artisan	10	5.2	3	30.0	7	70.0	1.512	0.31	0.02–6.00	
Unemployed	34	17.7	6	17.6	28	82.4	1.439	0.62	0.04–10.38	
Retiree	8	4.2	1	12.5	7	87.5	-	REF	-	
<b>Educational status</b>										0.807
Primary	81	42.4	14	17.3	67	82.7	0.515	1.32	0.48–3.62	
Secondary	30	15.7	7	23.3	23	76.7	0.682	1.06	0.28–4.04	
Tertiary	18	9.4	5	27.8	13	72.2	1.047	2.40	0.31–18.68	
None	62	32.5	13	21.0	49	79.0	-	REF	-	

TEM, traditional eye medicine; REF, reference group; OR, odds ratio; 95% CI, 95% confidence interval; s.e., standard error.



could be associated with the need for speedy healing in males to enable performance of daily activities, particularly for those in rural settlements.<sup>27</sup> Furthermore, it has been observed that male participants appear to be more knowledgeable in medicinal plants than female participants.<sup>27</sup> It was observed that less than 50% of the participants within each sub-category of age, marital status, occupation and educational status engaged in the use of traditional eye practices that are a combination of TEM and ophthalmic self-medication. This finding contrasts with the study by Gupta et al., who reported that more than 50% used TEM and ophthalmic self-medication.<sup>11</sup> This contrast can be attributed to the higher sample size used and their study setting as it has been reported that Indians use TEM more compared with Ghanaians. The association between gender, age, marital status, occupation and educational level was statistically insignificant when assessed against traditional eye practices.

## Conclusion

This study provides an insight into the determinants of traditional eye practices in Asikuma Odoben Brakwa by natives. The practice of TEM, which poses questions about the safety of drugs used by the participants, was also observed. Healthcare professionals, however, should be more aware of the use of TEM and advise patients on the combination of the prescription treatment regimen and herbal medicines and the potential for herb–drug interactions. The government should institutionalise policies to ban the buying of eye drops from the drug stores without prescriptions and enforce the removal of uncertified herbal medications from the market to avert the use of ophthalmic self-medication.

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## Competing interests

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

## Authors' contributions

E.B.E., U.N., S.B.B.-K. and M.N. contributed equally to the design and implementation of the research, to the analysis of the results and to the writing of the manuscript.

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## Data availability

The authors confirm that data supporting the findings of this study are available within this article.

## Disclaimer

The views and opinions expressed in this article are those of the authors and do not necessarily reflect the official policy or position of any affiliated agency of the authors.

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