

**FREQUENCY OF DEWORMING, PARENTAL PERCEPTION AND FACTORS
ASSOCIATED WITH THE PRACTICE OF DEWORMING SCHOOL-AGE
CHILDREN IN NORTH-EAST NIGERIA.**

ABSTRACT:

Aims: To assess the frequency of deworming among school children, assess parental perception of the practice and the factors influencing school child deworming practices among the parents/guardians in Bauchi State.

Study Design: It was a descriptive cross-sectional study carried out in Bauchi State North-East Nigeria in March 2016 among parents/guardians of primary school pupils. A multi-stage sampling technique was used to select 12 out of 36 primary schools for the study.

Methods: There were 598 participants. A semi-structured questionnaire was used to elicit variables such as frequency of de-worming, parental perception and predictors of parents/guardian deworming practices.

Results: Nearly half 272 (45.5%) of the guardians were aware of deworming, while only 119 (19.9%) of their school children had been dewormed but 572 (95.7%) guardians saw deworming as an important practice and 560 (93.6%) wanted their children dewormed. Binary logistic regression showed that being a male child and having a previously dewormed child were positive predictors for the practice of school children's deworming.

Conclusion: The frequency of de-worming practice is low in North-East Nigeria, this was majorly due to lack of awareness. This underscores the need for scaling-up of deworming exercises alongside sensitization and health education of parents/guardian of primary school pupils.

Keywords: frequency, parental perception, deworming, school-age children

Introduction

Infections with parasitic helminths are among the most common and widespread infections of humans in the world today especially among school-age children in developing countries [1]. They are transmitted by ingestion of eggs present in human faeces which contaminates soil in areas where sanitation is poor, hence they affect the poorest and most deprived communities [2].

The World Health Organization (WHO) estimates that over two billion people are infected with one or more soil-transmitted helminths and common species identified are the roundworm (*Ascaris lumbricoides*), the whipworm (*Trichuris trichiura*) and the

hookworms (*Necator americanus* and *Ancylostoma duodenale*) [3]. WHO puts the latest estimates of children in need of treatment for these parasites at more than 880 million while over 610 million children of school age stand the risk of morbidity occasioned by soil transmitted helminthiasis and schistosomiasis [4]. The organisation recommends annual treatment in areas where prevalence rate of soil-transmitted helminthiasis is between 20% and 50%, and a twice a year treatment in areas with prevalence rates of over 50% [5]. Despite these recommendations and scaling-up of deworming exercises targeted at increasing coverage of deworming among school-aged children, soil helminthiasis is still a major public health issue [6].

Studies in Nigeria have reported a high prevalence of worm infestation among school-aged children. In riverine communities of Warri North Local Government Area of Delta State, Nigeria, 77% of the school children studied were infected with intestinal helminths [7]. Another study reported the prevalence of intestinal parasitism among pupils in the rural schools (the Almajiris) in Borno state of Northern Nigeria as 80.9% [8]. A study done in Turkey in which parents were interviewed on de-worming revealed that 84.7% of parents were aware of the school health program. It also identified among others; community knowledge and perceptions of deworming, benefits of the treatment, and willingness of the community to pay as factors contributing to issues of sustainability of deworming programs [9]. Another study on community perception of school-based de-worming program in Ghana highlighted the need to educate illiterate mothers, increase involvement of families in the mass treatment process, reach children that are absent from school and make efforts to change the perception of the community about de-worming [10]. In the study carried out in Turkey, it was reported that the interviewed community members saw deworming with anthelmintics as an experiment by foreigners with the aim of inducing sexual sterility among the local population. Others believed that the drugs would introduce infection in their children. Most parents in the study did not perceive worm infection as a major health problem for children [9].

Worm infection has been known to have several health and developmental consequences on the child especially the school age child. The most disadvantaged groups such as the poor and the female children often suffer most from ill health and malnutrition occasioned by worm infestation. These disadvantaged groups would gain the most from deworming [11].

72 Chronic parasitaemia could cause disruption of both physical and mental
73 development of the child, give rise to anaemia, malabsorption, protein-energy
74 malnutrition, growth stunting, reduced physical fitness, decreased school
75 attendance, reduced cognitive development and decreased grade attainment [12].

76 The most cost-effective way to deliver deworming drugs regularly to school-age
77 children is through school based deworming programmes. This is because, a school
78 offers a readily available, extensive and sustained infrastructure with a skilled
79 workforce that is in close contact with the community.

80 Regular deworming is very important because it contributes to good health and
81 nutrition for children of school age. In addition, it will improve their physical and
82 mental health and development with the benefit of increase in school enrolment,
83 attendance, cognition and reduced class repetition [11]. Deworming of school
84 children also protects other children indirectly. This happens because the dewormed
85 child does not shed the ova of the parasites that could in turn affect other non-
86 infected children [13]. Therefore, this study seeks to determine the frequency of the
87 practice of deworming, parental perception of deworming and factors associated with
88 deworming School-age children in North-East Nigeria.

89

90 **Materials and methods**

91 **Study Area:** The study was conducted in March 2016 in Bauchi Local Government
92 Area (LGA) of Bauchi State, one of the States in North Eastern region of Nigeria. The
93 State was created in 1976 and is made up of 18 Local Government Areas (LGA) with
94 Bauchi LGA as its capital city. Bauchi is demarcated on latitude $9^{\circ}30''$ North and
95 $12^{\circ}30''$ North respectively. The western and eastern boundaries are demarcated
96 by longitude $8^{\circ}45''$ and $11^{\circ} 0''$. The State covers a land mass of $49,259\text{km}^2$
97 [14]. People of Bauchi State are predominantly Hausa/Fulani by tribe. There are 36
98 public primary schools in Bauchi LGA [14].

99 **Study Population:** The study was carried out among parents/guardians of pupils
100 attending 12 randomly selected public primary schools. All consenting parents of the
101 school children were eligible for the study.

102 **Study design:** This was a descriptive cross-sectional study conducted in March 2016
103 amongst parents of primary school pupils attending the 12 selected schools in Bauchi
104 LGA.

105 **Sample size determination:** The minimum sample size was calculated using the
106 Cochran formula for study population greater than 10,000 [15].

107

108
$$N = Z^2 \frac{pq}{d^2}$$

109 When N = minimum sample size, Z = Standard normal deviate corresponding to the
110 probability of type I error is 1.96, p = prevalence of deworming (50%) [6]. q = 1-p, d =
111 tolerable error of margin set at 0.05. The minimum sample size calculated was 502
112 but the researchers increased the sample size to 598 participants to accommodate
113 non-response.

114 **Sampling Technique:** A multi-stage sampling technique was used to select parents
115 of children attending 12 selected primary schools used for the survey. The first stage
116 was a simple random sampling to select 12 schools from a list of 36 primary schools
117 in Bauchi Local Government area. The second stage was a systematic sampling
118 method to select 10 pupils from each class for the respective levels in the selected
119 schools with an average of 50 pupils per school (Primary 2 to 6). The parents of the
120 selected children were invited for questionnaire administration through the principals
121 of the respective schools. Those who gave their consent were interviewed for the
122 study.

123 **Data collection:** The study instrument was a pre-tested semi-structured (with
124 reliability coefficient of 8.0), self-administered questionnaire. The questionnaire was
125 self-developed and comprised of three sections on socio-demographic
126 characteristics, perception/practice and factors influencing up-take of deworming.
127 The age and sex of the school child whose parent was interviewed were also
128 recorded.

129 **Statistical Analysis:** The data was analysed using Statistical Software Packages for
130 Social Sciences (IBM - SPSS version 21), for Windows. Frequencies and proportions
131 were calculated for categorical variables, while the means and standard deviations

132 were calculated for numeric/quantitative variables. Comparison between categorical
 133 variables was done using a chi-square test. Fishers Exact Test was done for outputs
 134 where one or two of the cells had numbers less than 5. A 'P' value less than 0.05 was
 135 considered statistically significant, using a two-tailed distribution. Bivariate analysis
 136 was done to assess the relationship between socio-demographic characteristics,
 137 awareness, perception of deworming and deworming status of school children.
 138 Variables that were significant on bivariate analysis were fed into a multivariate
 139 binary logistic regression model to assess the association and interactions among
 140 factors influencing guardians deworming practice.

141 **ETHICAL CONSIDERATIONS:**

142 The study was approved by National Research and Ethics Committee (NREC)
 143 Bauchi State. The approval ID was NREC/12/05/2013/16/03 and written informed
 144 consent was obtained from each parent or guardian.
 145

146 **RESULTS**

147 Parents/guardians of 598 primary school children from 12 selected schools in Bauchi
 148 State were interviewed mainly on the deworming status of their wards in primary
 149 school. They were also interviewed on their historical practices of deworming and
 150 some socio-economic features of the guardians that may affect the practice of school
 151 child deworming. Also evaluated was their perception of child deworming practices.

152 **Socio – demographic characteristics of school children and the guardians**

153 Table 1 shows that 598 school children included 302 (50.5%) males and 296
 154 (49.5%), females whose combined average age was 10.6 years, ranging between 5
 155 and 20 years with those aged 10 – 14 years being greatest in proportion 410
 156 (68.6%). Their interviewed guardians were between the ages of 18 and 82 years
 157 with an average age of 44.3 ± 10.7 years. Those aged 40 – 49 years constituted the
 158 greatest proportion 211 (35.3%). The proportion of males 511 (86.5%) was more
 159 than that of the females.

160 **Table 1: Socio – demographic characteristics of school children and the**
 161 **guardians**

Variables	Description/Frequency (%)	
	School children	Guardians N = 598
Mean age	10.6 $\pm$ 2.3 (C.I = 10.4 –	44.3 $\pm$ 10.7 (C. I = 43.4 – 45.1)

(years)	10.8)		
Age group	N = 595		
5 – 9	183 (30.6)	< 19	1 (0.2)
10 – 14	410 (68.6)	19 – 29	46 (7.7)
15 – 20	2 (0.3)	30 – 39	132 (22.1)
		40 – 49	211 (35.3)
		50 – 59	153 (25.6)
		≥ 60	55 (9.2)
GenderN = 598			
School children		Guardians	
Male	302 (50.5)	Male	511 (85.5)
Females	296 (49.5)	Females	87 (14.5)

Less than half 272 (45.5%) of the guardians were aware of deworming while **119 (19.9%) of the school children had ever been dewormed by these guardians**. Out of this number, 29 (24.4%) were dewormed 6 months prior to the study and 90 (75.6%), dewormed over 6 months before the commencement of the study. One hundred and seventy (28.4%), guardians had ever dewormed their other children apart from those in school. The commonest reason why minority of the school children were dewormed was because majority of the guardian 326 (54.5%) never knew about deworming. One hundred and eighteen (19.7%) said that they had never given deworming a thought while the cultural practices and religious belief of one guardians respectively, did not permit deworming of children. However, 572 (95.7%) guardians saw deworming as a worthwhile practice and 560 (93.6%) would want their children dewormed (Table 2).

Table 2. Child's deworming status/guardians awareness and perception of deworming practices

Variables	Frequencies (N = 598)	Percentage (%)
Guardians who were aware of deworming	272	45.5
School children who were dewormed	118	19.7
Last time school child was dewormed		

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≤ 6 months ago	28	4.7
7months – 1 year ago	29	4.8
> 1 year ago	61	10.2
Guardians who have dewormed other children	170	28.4
Reasons why child was not dewormed		
My culture does not encourage it	1	0.2
My religion does not permit it	1	0.2
No money	11	1.8
It is not necessary	22	3.7
I never thought about it	118	19.7
I do not know about it	326	54.5
Guardians who feel that deworming is good	572	95.7
Guardian who want child dewormed	560	93.6

178

179 Table 3 revealed that the proportion of dewormed school children was greatest
180 among those aged 5 – 9 years 44 (24.0%), compared to other age groups. Males
181 were also favoured 71 (23.5%) in terms of deworming compared to their female
182 counterpart 48 (16.2%). Guardians aged 30 – 39 years practiced deworming of the
183 school child 34 (25.8%), more than other age groups. However, the females
184 marginally practiced child deworming for the school child, 18 (20.7%) more than the
185 males 101 (19.8%). Statistical significant relationships existed only between the sex
186 of the school child and child's deworming status ($P= .02$), but not with child's age nor
187 with guardians' sex and age group.

188

189 **Table 3: Association between age and gender of child/guardian and**
190 **deworming practices**

Variables	Deworming status of school children $\chi^2(P\text{-value})$		
	N (%)		
	Yes	No	Total
Age group of school			

child				
5 – 9 yrs	44 (24.0)	139 (76.0)	183	3.1 (.12)
10 – 14 yrs	75 (18.5)	335 (81.7)	410	
15 – 20yrs	0 (0.0)	2 (100)	2	
Child's gender				
Male	71 (23.5)	211 (78.5)	302	4.9 (.02)
Female	48 (16.2)	248 (83.8)	248	
Age group of guardian				
< 19 yrs	0 (0.0)	1 (100)	1	7.1 (.23)
19 – 29 yrs	4 (8.7)	42 (9.3)	46	
30 – 39 yrs	34 (25.8)	98 (74.2)	132	
40 – 49 yrs	43 (20.4)	168 (79.6)	211	
50 – 59 yrs	28 (18.3)	125 (81.7)	153	
≥ 60 yrs	10 (18.2)	45 (81.8)	55	
Sex of guardian				
Male	101 (19.8)	410 (80.2)	511	0.04 (.89)
Female	18 (20.7)	69 (79.3)	87	

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192

193 Findings in table 4 revealed that higher proportion of guardian who had heard about
 194 deworming, practiced it on the selected primary school children 119 (43.9%),
 195 compared to those who were not aware ($P < .001$). Out of 170 guardians who
 196 dewormed their other children, 117 (68.8%), dewormed their wards in primary school
 197 as against 53 (31.2%), who did not. Similarly, 117 (20.5%), guardian who saw
 198 deworming as a worthwhile practice dewormed their primary school children, in
 199 contrast to 2 (7.7%) among those who had negative perception about deworming.
 200 Guardians who had more than 20 children 6 (23.1%), dewormed greater proportion
 201 of wards in primary school that those who had less number. Significant statistical
 202 relationship was seen between awareness/deworming of other children and
 203 deworming practices ($P < .001$).

204 Also, shown in table 4 is that the proportion of guardians who practiced deworming
 205 was greatest among those who completed tertiary education 75 (26.6%) whereas,
 206 those who had vocational education never dewormed their wards attending primary
 207 school. Among the occupational groups, the proportion of guardians in the

208 manufacturing industry who dewormed their children in school 5 (33.3%), was more
 209 than those dewormed by persons engaged in other occupations, followed by the civil
 210 servants 39 (30.0%). Guardians who were students and those in the agricultural
 211 sector never dewormed their children who were in primary school. Occupation and
 212 educational status had highly statistical significant relationship with deworming
 213 practices for school children ($P<.001$).

214 **Table 4: Association between other guardians' factors and deworming**
 215 **practices**

Variables	Deworming status of school children			$\chi^2(P\text{-value})$
	N (%)			
	Yes	No	Total	
Guardians who were aware of deworming	119 (43.9)	153 (56.2)	272	111.1 (< .001)
Guardian had ever dewormed other children	117 (68.8)	53 (31.2)	170	356.7 ((<.001)
Guardian who see deworming as good practice	117 (20.5)	455 (79.5)	572	2.5 (.08)
Number of guardian's children				
< 6 children	46 (19.8)	186 (80.2)	232	2.1 (.56)
5 – 10 children	48 (21.9)	171 (78.1)	219	
11 – 20 children	19 (15.7)	102 (84.3)	121	
>20 children	6 (23.1)	20 (76.9)	26	
Educational status of guardian				
Vocational education	0 (0.0)	10 (100.0)	10	20.4 (.001)
Primary school	5 (6.9)	67 (93.1)	72	
No formal education	6 (12.0)	44 (88.0)	50	
Secondary school	33 (18.6)	151 ((82/1)	184	
Tertiary education	75 (26.6)	207 (73.4)	282	
Occupation of guardian				
Manufacturing	5 (33.3)	10 (66.7)	15	18.9 (< .001)
Civil servant	39 (30.0)	91 (70.0)	130	
Public servant/defence	11 (27.5)	29 (72.5)	40	

Professional	24 (24.2)	75 (75.8)	99
Retired	12 (24.0)	38 (76.0)	50
Artisan/non-professional	12 (14.6)	70 (85.4)	82
Business	16 (10.81)	132 (89.2)	148
Student	0 (0.0)	13 (100.0)	13
Farming	0 (0.0)	21 (100)	21

216

217

UNDER PEER REVIEW

A multi - variate analysis of the factors driving guardians to deworm their primary school wards using binary logistic regression, showed that the sex of the school child mattered to them. The guardians are about 3 times more likely to deworm their male primary school children than the females. Similarly, having practiced deworming on other sibling of the school child was a very strong factor for the school children's deworming. A guardian who had dewormed any of his/her other children was 530 times more likely to deworm the one in primary school.

Table 5: Predictors of parents/guardians deworming practice

Variable	Wald (χ^2)	P-value	Exp(B) (Odds Ratio)	95% C. I of Exp (B)
Gender of school child (Male)	7.8	.01	2.5	1.3 – 4.8
Ever dewormed any child (Yes)	72.9	<.001	530.2	125.5 – 2238.9

DISCUSSION

Generally, findings from this study revealed that nearly half (45.5%) of the parents/guardians of the school children were aware of deworming with a consequent very low frequency of child - deworming practices in the study population. This level of awareness was much lower than that of parents in a study conducted in another State of Northern Nigeria where 70.9% had heard about deworming [16]. A study in Turkey revealed much less level of awareness (15.3%) [10]. However, in this study out of the 598 school children, only 119 (19.9%), were ever dewormed by the parents/guardians. Of this number, 28 (23.7%), received antihelminthics 6 months before the study, while 61 (51.7%) children who were ever dewormed received the medication more than a year prior to the survey. A study of deworming status of children population in River State of Nigeria was more encouraging as 50% of the children were periodically dewormed [17]. The finding of this present study was also at variance with that of a study conducted in Brazil in which as much as 51.0% of

242 children were dewormed 6 months prior to involving them in the study. In this present
243 study, there was a highly statistical significant association between
244 parents' deworming awareness and deworming of their school children
245 ($P < .001$) (Table 3). In contrast, a study in Rivers State Nigeria reported that beyond
246 awareness, knowledge of deworming did not connote practice [17].

247 A combination of poor awareness of deworming and high intestinal parasitic burden
248 of over 50% prevalence reported in several studies in some states of northern
249 Nigeria and other parts of the country complicated by poor parental deworming
250 practices of school children is a cause for concern. For instance, in Borno and
251 Kaduna states in the north and Delta states in southern Nigeria, prevalence of
252 helminthiasis among primary school children were 80.9%, 67.1% and 77%
253 respectively [7,8,18]. Going by the WHO recommendation for control of
254 helminthiasis, therefore, twice yearly mass deworming of the school children is
255 needed in order to effectively combat intestinal parasitic infestation in states of the
256 region [18,19].

257 It is evident in this study that a very low proportion of parents practiced child
258 deworming in general as only 28.4%, ever dewormed other children apart from those
259 in primary school. Various reasons for the abysmal deworming practices were
260 advanced by the parents. More than half of them (54.5%), did not deworm because
261 they never heard about the intervention. Among those who were aware (19.7%),
262 said they never gave it thought and 3.7%, never considered deworming their children
263 a necessary venture.

264 It may be extrapolated that parents/guardians who had ever dewormed their other
265 children may be more likely to administer prophylactic antihelminthics on their

266 children in primary school. This calls for more awareness creation in the form of
267 health education and social marketing on the importance of deworming. Such an
268 exercise would emphasize the benefits of deworming in the physical and mental
269 development as well as academic progress of the school child and the spillover
270 benefit to their peers [14,20]. A study in Bangladesh revealed that socio cultural
271 factors could influence parents' (women's), tendencies to seek treatment of child's
272 intestinal parasite as well as their knowledge of helminths and exposure to health
273 education [21]. Same could apply to school child deworming practices. Therefore,
274 there is a need to involve stakeholders in religious and cultural milieu in re-orientating
275 the parents and the community on the importance of school child deworming.

276 Despite the low level of awareness, a high proportion (95.7%), of the
277 parents/guardians had a good perception of deworming to the extent that 93.6% of
278 them subscribed to the deworming of their children. Such acceptance and
279 willingness to deworm children were seen in studies carried out jointly in Ghana and
280 Tanzania and another in Brazil [9,22]. In the Ghana/Tanzania studies, 90% of the
281 parents were even willing to pay for the sustenance of a school based deworming
282 program. This was contrary to the finding in Jos Plateau State, a neighbouring state
283 to the study population, in which there was poor attitude towards deworming [16]. The
284 findings of this study show an encouraging level of acceptance and readiness to
285 deworm among the parents/guardians, therefore, it's likely that what was really
286 lacking in the schools and the communities was a program designed for periodic
287 deworming of the school children. These underscores the need for a school health
288 and community based program that incorporates periodic mass deworming of
289 school-age children both in and out of school in the region. The study in Kaduna
290 State also had similar recommendation [18]. School based deworming exercise has

291 been shown to minimize cost of delivery of the medications per child while
292 maximizing the reach of the exercise [13].

293 Though studies have identified child's age as a significant risk factor for helminthic
294 infestation [23-25]. However, there was no significant statistical relationship between
295 the age of neither the school children nor the parents and deworming practices in the
296 present study. Two of these studies conducted in Nigeria revealed variously that the
297 age group 8 – 12 and 12 -17 years were most at risk [24-25]. The studies attributed
298 the relationship to the fact that increasing age increases the risk of exposure to worm
299 infestation such as contact with soil contaminated with faeces especially as the
300 school child starts developing the capacity to personal care with less assistance from
301 parents in addition to increased outdoor activities. From the foregoing, it is obvious
302 that the age bracket at which worm infestation is commonest, falls within the school
303 age, hence necessitating the need for an efficient and effective implementation of
304 periodic deworming of the group as well as integration of the practice into school
305 health program in the region.

306 Being a male school child, favours the probability of receiving deworming therapy (P
307 $=.01$). This practice of preferentially deworming the male child, though may be
308 inadvertent, is justified by the finding of some studies [22,24]. A multivariate analysis
309 of factors predicting helminthic infestation in a study conducted in Brazil identified
310 being a male child as a highly significant risk factor ($P < .001$) [22]. The study in Jos
311 report the contrary whereby more females ran a greater risk than males ($P < .95$) [16].
312

313 Though family size had no significant statistical association with parents/guardians'
314 child-deworming practices in this study ($P = .56$), there was inverse relationship

315 between the practice and the number of children in the family. As shown on table 3
316 parents/guardian with more children dewormed smaller proportions of them. This
317 may be the explanation to the finding in a study conducted in the western region of
318 Nigeria in which the prevalence of worms increased with increasing family size
319 [26]. Similar finding was reported by a study carried out in Rural China [18]. These
320 poor deworming practices may be attributable to the reduced capacity of the
321 parent/guardian to meet up with family needs including deworming, considering the
322 large size of the family.

323 Socioeconomic characteristics of the parents/guardians such as their occupation and
324 educational attainment revealed a highly statistically significant relationship ($P <$
325 .001), with child deworming practices. The proportion of parents with higher level of
326 (formal) education who practiced child deworming was more than that of their
327 counterparts with lower levels to the extent that parents with vocational education
328 never dewormed any of their school children. Several studies identified low level of
329 parental/caregiver education as a risk factor for worm infestation to which non-
330 deworming of children may be a one of the reasons [19,27,28]. For instance, the
331 study which involved mothers in rural setting in China and Mexico highlighted the
332 fact that the likelihood of intestinal parasitic infestation was less in mothers with more
333 education than the less educated one [19,27].

334 Parents/guardians whose occupation entailed some sort of professionalism
335 dewormed their children in school more their counterparts who are non-
336 professionals. This finding may be explained by what was seen among the more
337 educated ones. Thus, professionals are probably more educated than the artisans,
338 farmers and students and by extension, as seen above, are more likely disposed to
339 deworming their children compared to the non-professionals.

340 The result of the multivariate analysis (table 5), showed that the likelihood of a
341 parent/guardian deworming a school child is higher when the child is a male. The
342 likelihood is even greater if the parent/guardian is used to deworming other sibling of
343 the school child. In the first instance, the male school children are preferentially
344 dewormed because they are more infested by the worms in the region. As a result,
345 there is the tendency for parents to deworm the male children who always come
346 down with worm infestation. Such perceptions may be common among the less
347 educated and non-professional which explains their less likelihood to deworm their
348 school children. It is also understandable that once a parent practiced child
349 deworming and experienced the benefits therein for the child, such a parent is
350 encouraged to deworm other children.

351 **Conclusion**

352 Deworming practices is low among parents of the school children studied. This study
353 has shown that there was lack of awareness of deworming of school children and the
354 benefit thereof among the parents/guardians. Also revealed was that parental
355 preference of male child deworming affected the overall deworming profile of the
356 study population. Educational status and occupation of guardians played prominent
357 part singly in determining their child-deworming practices. There was high
358 acceptability of school child deworming among the study population. However,
359 opportunity to engage in mass deworming of the children was lacking. Therefore,
360 education of parents, planning and implementation of school health programmes that
361 would incorporate deworming and community based deworming program are all very
362 vital in enhancing deworming status of school children and the control of helminthic
363 infestation among the children in school and those not in schools.

365 **Recommendations:**

- 366 1. Periodic deworming exercise should be carried out among school children in
 367 the state.
- 368 2. Health education and community sensitization of all parents should be
 369 embarked upon to create more awareness on deworming of all children
 370 irrespective of gender.

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