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Barriers and Facilitators to the use of Motorcycle Helmet in Tamale

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ABSTRACT: while road traffic crashes involving motorcycles cannot be completely prevented, the probability and severity of head injuries following a crash can surely be mitigated through helmet use. In northern Ghana where motorcycles are popular means of transport, prevalence of motorcycle helmet use is low. This study identifies the barriers and facilitators to the use of motorcycle helmet in Tamale, Ghana. A questionnaire survey was administered to 300 motorcyclists at three different locations in the city. Data were edited, coded and entries made into SPSS version 20, and descriptive statistical analysis was extensively carried out. The study found that about 33% of motor cycle riders were using helmet of any type. The strongest facilitating factor for helmet use is the feeling for protection (62.2%) followed by respondent's awareness that helmet use is mandatory (19.7%), and the presence of police on the street (15%). The evidence also suggests that the leading discouraging factor for non-use of crash helmet is the perception that helmet use disturbs head and hearing ability (63%). While the influence of short travelling distance is imprecise, long distance trip slightly appears to be a negative determinant with about 54% of participants reporting long distance as factor in their non-use of helmet. Public health interventions on helmet use should be tailored to surmount the perceived barriers to the use of helmet. That is, concerns for helmet use as being associated with headache and discomfort would need urgent attention if public educations on helmets are to be successful. Helmets that offer good ventilation may be convenient and less troubling to users. Road safety education campaigns can promote the facilitators to motorcycle helmet use by highlighting the benefits and protective efficacy of helmet. Increased presence of road traffic police and strong enforcement of helmet use legislations would also be germane to improving road safety behaviours of motorcyclists.

Keywords: Barriers, facilitators, Ghana, helmet use, motorcycle

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I. INTRODUCTION

An estimated 1.2 million people are killed annually and about 50 million more injured in road traffic accidents across the world [1]. The majority of these deaths occur in the developing world. Road traffic crashes have been predicted to emerge as the sixth leading cause of mortality and morbidity by the year 2020 and as high as 80% of the deaths are expected to occur in low-income and middle-income countries whereas fatalities in high-income countries will decline by almost 30% [2].

In Ghana, vulnerable road users (pedestrians, cyclists and motorcyclists) have increasingly accounted for a high proportion of road traffic fatalities. Crash fatalities involving motorcyclist have for instance, increased from just 44 in 2001 to 210 in 2010, an increase of 377% in contrast with 13% for pedestrians [3]. High incidence of non-reporting (62.2%) and under-reporting (27%) of motorcycle crashes means that, the real burden of injuries and mortalities could be much higher than estimated [4]. Two wheel motorcycle vehicles are popular and inexpensive means of transport for many in northern Ghana. Compared to automobiles, however, motorcycle represents a risky form of transport and riders are 21 times more likely to die in accident than those in vehicles [5, 6].

The high risk of motorcycle associated injuries and fatalities, is mainly due to non-use of crash helmet. Studies have shown that non-users of helmet have a 40% likelihood of death in an accident than users of helmet [7]. Non-use of helmet is also a major risk factor for severe injuries to head following motorcycle crash [8, 9, 10]. On the contrary, Keng [9] in Taiwan showed that helmet use reduces the likelihood of head and neck injuries from motorcycle crash by 53%; leading, to an overall reduction in the probability of deaths from these injuries by 71%. Because of this protective value, the government of Ghana in 2004 made the use of helmet

mandatory under the Road Traffic Act (Act 683). Even so, helmet use among motorcycle users is low. A recent study in Tamale, the largest city in northern Ghana showed that a little over one-third (34.2%) of motorcycle riders and 1.9%pillion riders use helmet [4]. The principal motivators and barriers that influence people's decision to use helmet have been widely reported in previous studies [11, 12, 13]. Due to variations in spatial, economic, socio-cultural norms and several other contextual influences however, it is difficult to generalize earlier findings from different countries to the context in Ghana, where evidence regarding the determinants of helmet usage is lacking. Many studies on motorcycles in Ghana have mainly examined the socio-economic effects of growth in motorcycle use [14] and the economic burden of motorcycle crashes [15]. The recent study by Ackaah and Afukaar [4] is perhaps the closest in studying the use of helmet by motorcyclists. Although Ackaah and Afukaar's observational study has been extremely beneficial in estimating the prevalence of helmet use, the main factors that encourage or hinder the use of helmet in Ghana have largely remained understudied. This study aims to identify the barriers and facilitators to motorcycle helmet use in Tamale, Ghana.

II. MATERIALS AND METHODS

The study was conducted in Tamale, the administrative capital of Northern Region, and largest city in northern Ghana with an estimated population of 371,351 [16]. Road transport is the predominant mode of travel and the city has a total of 125.60 km of roads. About half of the city's road network is fairly in good condition [17] and many daily trips are undertaken by means of motorcycle, bicycle, tricycles, cars, and on foot [17]. A survey involving questionnaires as instrument was undertaken in the month of November, 2016. Data collection was made at three different locations in the city: the Central Business District (about 1km radius from the Central Market), Tamale College of Education and Tamale Central Hospital. Questionnaires (N=300) were randomly distributed to motor bike riders, to be completed and returned individually at each location's motor bike park. Illiterate respondents were assisted by trained field officers to complete the questionnaire, which lasted for about 6 – 8 minutes. Each respondent's consent was sought and participation was entirely voluntary. Data were edited, coded and entries made into SPSS version 20, and descriptive statistical analysis was extensively carried out.

III. RESULTS

The study sampled 300 motorcycle users at three different locations in the city. Data from 60 respondents were, however, excluded for the following reason(s): 1) invalid completion of questionnaire; or 2) failure to return questionnaires. Of the 240 respondents that were analyzed, majority of participants were generally young people aged 18-25 years (23.8%); 26 -30 years (39.6%) followed by those older than 30 years old (36.7%). Compared with females (26.7%), males (73.3%) were almost three times associated with the use of motorcycle as means of transport. On the whole, participants were predominantly literates with more than two-thirds (72%) having tertiary education. only 4% had no formal education while 16% and 7.9% had secondary/vocational education and primary/JHS education respectively.

Table 1: motor cycle usage and demographic characteristics

Variable	Category	Frequency	(%)
Sex	Male	176	(73.3)
	Female	64	(26.7)
Age	18-25	57	(23.8)
	26-30	95	(39.6)
	Above 30	88	(36.7)
Education	Primary/ JHS	19	(7.9)
	SHS/Vocational	39	(16.2)
	Tertiary	172	(71.7)
	No education	10	(4.2)
Profession	Student	73	(30.4)
	Government worker	129	(53.3)
	Self employed	39	(16.2)
Helmet use	Yes	80	(33.3)
	No	160	(66.7)
Own a motorcycle	Yes	202	(84.2)
	No	38	(15.8)
Valid license	Yes	65	(27.1)
	No	175	(72.9)
Regularity of use	Daily	177	(73.8)
	Weekly	21	(8.8)
	Occasionally	42	(17.5)

Table 2: factors that encourage helmet usage

Respondents' reason(s)	Frequency	(%)	Percent of Cases
For protection	79	62.2%	98.8%
Because it's mandatory	25	19.7%	31.2%
Because of police presence	19	15.0%	23.8%
Because of Peer Pressure	4	3.1%	5.0%
Total	**127**	**100%**	**158%**

To assess the factors that facilitate helmet use among motorcyclists, respondents were allowed to pick one or more from a multiple set of reasons for wearing protective helmet. Respondents identified three main factors that encourage the use of motorcycle helmet. The strongest predictor or facilitating factor was the wish for protection (62.2%). This was followed by respondent's awareness that helmet use is mandatory. The presence of police was also on a smaller note, likely to encourage the use of helmet.

Table 3: descriptive analysis of factors associated with non-use of helmet

Reason for non-use of helmet	Response		Total
	N (%)	N (%)	N (%)
Cost of helmet is high	Yes	No	
	63 (39.4)	97 (60.6)	160 (100)
Use of helmet disturbs my head & hearing	Yes	No	160 (100)
	101 (63.1)	59 (36.9)	
Use of helmet disturbs my hair style	Yes	No	160 (100)
	47 (29.4)	113 (70.6)	
I don't use helmet because of peer influence	Yes	No	160 (100)
	31 (63.1)	129 (80.6)	
I don't use helmet when the distance is short	Yes	No	160 (100)
	80 (50.0)	80 (50.0)	
I don't use helmet when the distance is long	Yes	No	160 (100)
	86 (53.8)	74 (46.2)	
I don't use helmet during day time	Yes	No	160 (100)
	85 (53.1)	75 (46.9)	
I don't use helmet during night time	Yes	No	160 (100)
	40 (25.0)	129 (75.0)	

From the analysis of data as showed in table 3, it is evident that factors that are commonly assumed to influence non-use of helmet have different impact on non-usage of helmet. Of these factors, the feeling that helmet disturbs head and hearing ability emerged as the most discouraging factor (63%) for non-use of crash helmet. Others such as the cost of helmet and sentiments that helmet use disturbs hair style are less likely to discourage helmet use among majority of respondents. The data also showed that influences of friends are least likely to influence decisions not to wear helmet. A striking difference was particularly observed in this regard; where about 81% of respondents believed that their non-use of helmet is not occasioned by any perceived or actual influences of friends.

Unlike other factors, the influence of short travelling distance remains unclear, with equal number of respondents (Yes 50.0%; No %50.0%) differing on the use of helmet for short distance trips. Long distance trips, however, slightly appears to be a negative determinant with about 54% of participants reporting long distance as factor in their non-use of helmet. Similar findings were reported in respect of the influence of riding time; where the period was divided as daytime and night-time. As showed in table 2, more than half (53%) of respondents considered daytime as factor in the non-use of helmet; whereas three-quarters (75%) of respondents also regard night-time as a negative determinant of helmet use.

IV. DISCUSSION

While road traffic crashes involving motorcycles cannot be entirely prevented, the probability and severity of head injuries following a crash can surely be mitigated through helmet use. This study investigates the barriers and facilitators to the use of helmet in Tamale. Our study builds on observations that prevalence of helmet use among motorized two-wheel vehicle users is generally low in Ghana [4] and in many low/middle income countries including Nigeria [18], Iran [19] and India [20]. This study found that about 33% of motor cycle riders were using helmet of any type, which is similar to an earlier prevalence rate of 34% reported by

Ackaah & Afukaar [4] in a roadside observational study. It is however, considerably different from a questionnaire survey in Ghana [21] on motorcycle taxi riders where an appreciable use (85%) of helmet was found. This departure might be due to the fact that commercial use of motorcycle as 'taxi' is prohibited by Ghana's Road Traffic Act (Act 683) and hence not seen in Tamale. In cities such as Accra where its existence is nascent, operators and passengers appear to have accepted to the regular use of helmet perhaps as a decoy and to avoid committing double crimes.

We also found that as high as 74% of respondents use motorcycles for daily travels, which confirms previous reports that motorcycle is a major means of transport in northern Ghana [4, 15]. It is significant to mention that motorcycle use is overwhelmingly dominated by males in the economically active age group. The high proportion of males in the use of motorcycle as found in this study is in keeping with a previous study [13], and may be explained by several factors. Compared to females, males tend to engage in more risky behaviours. Males are also more likely to perceive themselves as less susceptible to traffic crashes and may even be more optimistic of their injury protection and escape skills.

The results of this study revealed a number of facilitating factors that are likely to motivate the use of helmet. The belief that helmet use promotes safety and reduces the severity of motorcycle crash injuries was found to be the strongest motivating factor for more than half (62.2%) of all participants who reported wearing helmet when riding motorcycle. This is consistent with recent findings by [13], [21] and [12]. The presence of road traffic police and respondents' knowledge that helmet use is mandatory under the law were also more likely to encourage helmet use. It is plausible that an exposure to traffic police officers may have had a dual effect of informing and fostering a positive attitude which then could have translated into action and adoption of proper road behaviour. It is also suggestive that increased visibility of police presence and education on helmet use would for instance, motivate individuals to wear helmet and potentially prevent an encounter with traffic police and thereby avoid the imposition of serious sanctions as prescribed by the Road Traffic Act (Act 683). Road safety education campaigns can help to build and reinforce such positive attitudes, and subsequently improve the road safety behaviours of motorcyclists.

The results of this study again highlight a number of factors that are likely to impede the use of helmet. The biggest barrier for non-use of helmet is riders' feeling that helmet use obstructs one's ability to hear and more importantly, creates discomfort for the head and in some cases reduces vision. This claim has been substantially reported in previous studies [11, 12]. The findings by Skalkidou and colleagues [11] in Greece, specifically found perceptions of discomfort and reduced vision resulting from use of helmet among 19% of respondents studied. In tropical areas such as Tamale where the average annual day sunshine is about 7.5 hours with temperatures ranging from 33º C to 39º C [22], concerns for heat, headache and discomfort resulting from helmet use would need urgent attention if public educations on helmet use are to be successful. Helmets that offer good ventilation may be convenient and less troubling to users. Our finding that long distance trips negatively influence decisions to wear helmet highlights important problems that require public education because long distance journeys might involve higher probability of a crash resulting from fatigue and perhaps high speed riding.

V. CONCLUSION

This study explored the factors that explain individuals' decision to use or not to use motorcycle crash helmet. The results show that helmet use is mainly influenced by individuals' need for protection, knowledge that helmet use is mandatory and presence of road traffic police. On the other hand, participants' perception that helmet use disturbs head and hearing ability emerged as the leading discouraging factor (63%) for non-use of crash helmet. Public health interventions on helmet use should be tailored to surmount the perceived barriers to the use of helmet. That is, concerns for heat, headache and discomfort resulting from helmet use would need urgent attention if public educations on helmet use are to be successful. Road safety education campaigns can promote the facilitators to motorcycle helmet use by highlighting the benefits and protective efficacy of helmet. Increased presence of road traffic police and strong enforcement of helmet use legislations would also be germane to improving road safety behaviours of motorcyclists.

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