

Youths' Perceptions of Road Safety Risk Behaviours in the Roadway Environment: A Study of College Students in The Gambia and Tanzania

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Abstract

Road traffic injury is the seventh leading cause of death in low-income countries, the tenth leading cause of death in resource-limited countries for all ages, and the leading cause of death for adolescents and youths worldwide. In this study, we seek to provide information on youths' perceptions of risky road traffic safety behaviours. A self-administered survey on youths' risk perceptions of road traffic crashes in The Gambia and Tanzania was distributed to students at universities in The Gambia and at the Muhimbili University of Health and Allied Sciences in Tanzania. Risky behaviours and distractions were identified as the primary risk of crashes involving youths. Texting while driving (The

Gambia 56.6%, Tanzania 83.7%, AOR = 1.72, 95% CI = 0.5, 5.88) or riding in cars whose drivers had been drinking alcohol (The Gambia 20.2%, Tanzania 59.7%, AOR = 3.12, 95% CI = 1.17, 8.36) were major concerns. These results indicate that the implementation of interventions to reduce driver distractions and impairment are needed in both countries. Prevention efforts should focus on not only roadway designs and vehicle factors, but also on the traffic safety culture and education of road users, especially the youth and young adults. These results fill a knowledge gap that will be beneficial to developing effective interventions to promote a traffic safety culture among youths.

Keywords: youths; road safety; risky behaviours; LMICs; Gambia; Tanzania

Introduction

Road traffic injuries are the seventh leading cause of death in low-income countries and the tenth leading cause of death in lower-middle-income and upper-middle-income countries. About 1.35 million people die from road traffic crashes globally each year, and between 20 and 50 million sustain non-fatal injuries. Road traffic injuries and death affect all ages and are the leading cause of death for those between five and 29 years of age (World Health Organization, 2018, 2022). Globally, more than 1 000 individuals under the age of 25 years are killed in road traffic crashes daily (World Health Organization, 2007). Adolescents and young adults (15 to 44 years) continue to be the most vulnerable populations to road traffic crashes in low-income and lower-middle-income countries (LI/LMICs). Most youths killed in traffic crashes die as pedestrians, bicyclists, motorcyclists or passengers of public transport (World Health Organization, 2020b, 2022).

Risk factors for road traffic crashes include vehicle factors, road conditions, driving speed, driving under the influence of alcohol or other substances, and driver distractions. Beyond these key determinants, post-crash care, which includes trauma response, prehospital management of admitted trauma patients and inpatient management, is a critical element that needs concerted efforts to curb this important public health problem (Nguyen, Ivers, Jan, Martiniuk, Li, & Pham, 2013; Wesson, Boikhutso, Bachani, Hofman & Hyder, 2014).

As in other LMICs, there is limited information on road traffic-related morbidity and mortality for The Gambia (West Africa) and Tanzania (East Africa). Part of the valuable information in the literature that documents the nature and mechanism of injuries as presented in emergency rooms are data from the trauma registries initiated in The Gambia and Tanzania (Sanyang, Peek-Asa, Bass, Young, Jagne, et al., 2017; Sawe Reynolds, Weber, Mfinanga, Coats & Wallis, 2020). Sanyang, Peek-Asa, Bass, Young, Jagne, et al. (2017) found that one in every three admitted patients were road traffic injury (RTI) victims in The Gambia. More than one-third of admitted road traffic victims are students, with a mean age of 14 years, who are mostly pedestrians. The study identified that 50% of all admitted RTI patients were pedestrians or motorcycle users

and 51% of RTI crashes involved commercial vehicles. Speeding was found to be a significant cause of RTI, with nearly 80% of admitted patients indicating speed as a contributing factor to their injury (Sanyang, Peek-Asa, Bass, Young, Daffeh, et al., 2017). A similar profile is evident in Tanzania; Sawe et al. (2020) found that road traffic crashes were the most common cause of injuries (60.3%), and most of the victims (76.6%) were riders or occupants of motorised two- or three-wheeled vehicles.

The Gambia and Tanzania have seen major road improvements recently. However, the overall quality of roads in these countries is still considered poor. In 2019, the World Economic Forum ranked the quality of roads in The Gambia and Tanzania as 3.70 and 4.10 respectively, based on a scale of 1 (low) to 7 (high) (Global Economy, 2021). These are mostly roads that connect major cities and towns, whereas those in the neighbourhoods or those that connect smaller towns and villages remain underdeveloped.

Existing research has focused on RTIs, mostly on trauma care systems and roadway exposure assessment, which tend to focus on understanding the effectiveness of secondary- or tertiary-level interventions in reducing injuries related to road traffic crashes (Higashi, Barendregt, Kassebaum, Weiser, Bickler & Vos, 2015; Juillard et al., 2014; Sanyang, Peek-Asa, Bass, Young, Daffeh, et al., 2017). To our knowledge, this study is the first report in sub-Saharan Africa to examine youths' perceptions of risks in the roadway environment. This is essential in determining appropriate primary interventions associated with youth mortality and disability related to road traffic crashes. We believed that there is a fundamental need to understand the risk-taking behaviours of young people, such that public safety and health interventions can be designed to resonate with the target age group and to reduce crash and injury rates.

Before this study, there was incomplete documentation of youths' risk perceptions of road traffic crashes in The Gambia and Tanzania, and the determinants of injuries were largely unknown. The need for these data may be better understood with some information on the national health and development indicators and trauma situation in the two countries. Both The Gambia and Tanzania are LMICs whose development and health profiles resemble many other developing countries in Africa (Table 1). In both countries, more than half of the population are between the ages of 15 and 65 years. According to the World Health Organization (WHO), 62% of the population in The Gambia live in the urban region, compared to 35% in Tanzania (World Health Organization, 2020a). Government and household expenditure on health is low in both countries. The ratio of healthcare workers to the population is between 0.1 and 15.4 per 10 000 population. Given all these challenges, the burden of road traffic crashes remains high. Recent data indicate that road traffic-related mortality rates for The Gambia (29.7 per 100 000) and Tanzania (29.2 per 100 000) continue to be high (World Health Organization, 2020a).

Table 1: Selected health indicators for The Gambia, Tanzania and the WHO African region

Characteristics	The Gambia	Tanzania	WHO African Region
Total population (000, 2020) ^a	2 417	59 734	1 340 598
Population density (per sq. km) ^a	238.8	67.4	45.2
Life expectancy at birth, both sexes (2020) ^b	63	65	61.2
Population between 15 and 65 years (in millions) ^b	1.3	31.1	34.1
Urban population (%) ^b	61.9	34.5	34.1
Quality of roads ^c (1 = low; 7 = high)	3.70	4.10	N/A ^d
Total expenditure on health as a percentage of GDP (2014) ^b	7.34	5.58	N/A
Domestic general health expenditure as a percentage of general government expenditure (%) (2017) ^b	3.1	9.5	7.2
Total net official development assistance to medical research and basic health sectors per capita (US\$) by recipient country (2018) ^b	20.92	4.24	4.42
Density of medical doctors (per 10 000) (2010–2018) ^b	1.0	0.1	3.0
Density of nursing and midwifery personnel (per 10 000 population) (2010–2018) ^b	15.4	5.8	10.1
Total alcohol per capita ($\geq$ 15 yrs of age) consumption (litres of pure alcohol) (2018) ^b	3.6	11.3	N/A
Road traffic mortality rate (per 100 000; 2016) ^b	29.7	29.2	N/A

^a Source: United Nations, 2020.^b Source: World Health Organization, 2020b.^c Source: World Economic Forum, 2019.^d N/A: This indicates either data are not available to us or data are not relevant for the variable.

The purpose of this study was to provide information on youths' perceptions about risky road traffic safety behaviours. Specifically, the study was designed to identify predictors of road traffic risk-taking behaviour and the types and level of concern of risks to drivers and passengers, and to examine prior road traffic safety knowledge among college and university students. The study further assessed the attitudes and behaviours of youths in a roadway environment.

Methods

The survey about youths' risk perception of road traffic crashes in The Gambia and Tanzania was developed to identify the ways in which youths in the study countries perceived risks in the roadway environment. Using the extended parallel process model, we identified the ways in which youths perceived these risks, and the control strategies they use. Personal visits by the principal investigator were conducted preceding the survey to establish contact with and train data collectors in both countries.

Students less than 18 years or older than 35 years in tertiary education institutions in The Gambia and Tanzania were excluded from the study. The study participants were between 18 and 35 years; according to the African Union's Youth Charter that regards individuals between 18 and 35 years as youths (African Union, 2006). In The Gambia, the survey was distributed to students at the University of The Gambia, the Gambia College, the International Islamic University, the School for Enrolled Nurses, the School for Community Health Nurses, and the Rural Development Institute. In Tanzania, the same survey was administered to students in the Schools of Medicine, Pharmacy, Public Health, Environmental Health Science, and Allied Health Sciences at the Muhimbili University of Health and Allied Sciences (MUHAS). The institutions in The Gambia are located throughout the country, including both rural and urban towns, whereas the MUHAS is located entirely in the urban area of Tanzania. The self-administered survey was developed in English and responded to by students between the ages of 18 and 35 (youths).

The survey included a broad range of questions on issues ranging from campus road safety, driver and motorcycle rider distractions to traffic safety culture. The respondents were asked to rank risks based on the ways in which they perceive the corresponding associated severity and frequency they engage in the risky behaviours.

Information on risky driving/riding behaviour was collected from the participants and categorised as having used (or used before driving) a motorised vehicle, drove/rode in an overloaded vehicle, refused a ride because of safety concerns, use a device (for example, Bluetooth) while driving, use marijuana, alcohol and other drugs while driving/riding, use a cellphone while driving a car or riding a motorcycle.

Information on roadway risk perceptions was collected from the participants and categorised as seating position, importance of following safety laws, texting while driving/riding, and speeding. We also collected information on safety perceptions. Safety perceptions were measured by the use (or non-use) of vehicles owing to safety concerns, safety features in the vehicle (for example, seat belts, helmets) and safety features in the roadway environment (for example, zebra crossings).

The dependent variable in this study is the occurrence or involvement of the respondent in a road traffic crash and is dichotomised as "yes" or "no". The independent variables are the behavioural risk factors and risk perceptions that can increase the chances of the

occurrence of road traffic crashes. Risky behaviours and risk perceptions were categorised as “no risky behaviour” (never), and “some risky behaviours” (sometimes, frequently, all the time). Bivariate analysis was done to assess the association between several risk factors with road traffic crashes. The command-driven software package SAS 9.4 was used for the analysis.

This study was reviewed and approved by the institutional review board of the Western Kentucky University (reference number 19-399), the joint Gambian Government and MRC ethics committee (reference number 17440), and the institutional review board of the MUHAS (reference number 19-241).

Results

The majority of students did not own/drive vehicles in both countries (The Gambia 90.8%; Tanzania 85.3%), own/drive a motorcycle (The Gambia 90.2%; Tanzania 87.2%) or own/drive a bicycle (The Gambia 71%; Tanzania 75.3%). They were primarily pedestrians, riding as a passenger or using public transport. The respondents who operate a motorcycle did not often engage in risky behaviours while riding, such as making cellphone calls (The Gambia 70.8%; Tanzania 94%), riding after smoking marijuana (The Gambia 93.7%; Tanzania 94%), or riding after using any illegal drugs (The Gambia 93.6; Tanzania 95.9%).

Most cyclists practice safety behaviours such as wearing a helmet (The Gambia 78.1%; Tanzania 76.7%) and not riding a bicycle after smoking marijuana (The Gambia 92.6%; Tanzania 96.1%). A little over one-half of the cyclists reported making phone calls while riding their bicycles (The Gambia 56.5%; Tanzania 56.3%).

Differences were observed between the two countries regarding safety behaviours and alcohol use. Although the majority of the respondents from The Gambia reported they will not ride in a car whose driver had been using alcohol (79.8%), more than half of the respondents from Tanzania would (59.7%). The respondents from both countries reported not wearing their seat belts when riding in another person’s car (The Gambia 86%; Tanzania 89.4%). More respondents in Tanzania reported riding in a car whose driver texts while driving (The Gambia 56.6%; Tanzania 83.7%) or makes a phone call while driving (The Gambia 85.5%; Tanzania 91.9%). Most respondents will not ride in a car whose driver emails while driving (The Gambia 76.5%; Tanzania 50.5%) or had been smoking marijuana (The Gambia 69.5%; Tanzania 65%).

Similarly, the majority of the respondents from both countries indicated that they would not ride a motorcycle whose driver had been drinking alcohol (The Gambia 95.6%; Tanzania 57.6%), been smoking marijuana (The Gambia 94.4%; Tanzania 73.7%), or using any illegal drug (The Gambia 94.4%, Tanzania 75.7%). The respondents in The Gambia, however, reported higher rates of avoiding such risky behaviours in comparison to those in Tanzania.

The trend was not different from bicycle use. The majority of the respondents will not ride a bicycle whose driver had been drinking alcohol (The Gambia 97.2%; Tanzania 76.2%), makes phone calls (The Gambia 79.2%; Tanzania 58.7%), had been smoking marijuana (The Gambia 94.2%; Tanzania 84.2%) or cocaine (The Gambia 97.6%; Tanzania 88.4%); these avoidance behaviours were also higher in The Gambia than in Tanzania.

Table 2: Risky driving/riding behaviour of students in The Gambia and Tanzania

Risky Behaviour	The Gambia		Tanzania	
	Never <i>n</i> (%)	Sometimes <i>n</i> (%)	Never <i>n</i> (%)	Sometimes <i>n</i> (%)
Make phone calls while driving a motorcycle	126 (70.8)	52 (29.2)	27 (52.9)	24 (47.1)
Drive a motorcycle after smoking marijuana	164 (93.7)	11 (6.3)	47 (94)	3 (6)
Drive a motorcycle after using any illegal drug	160 (93.6)	11 (6.4)	47 (95.9)	2 (4.1)
Wear a helmet when riding a bicycle	339 (78.1)	95 (21.9)	79 (76.1)	24 (23.3)
Make phone calls while riding a bicycle	188 (43.5)	244 (56.5)	45 (43.7)	58 (56.3)
Ride a bicycle after smoking marijuana	398 (92.6)	32 (7.4)	98 (96.1)	4 (3.9)
Ride in a car whose driver had been drinking alcohol	1109 (79.8)	280 (20.2)	189 (40.3)	280 (59.7)
Wear a seat belt when riding in a car driven by someone else	195 (14)	1199 (86)	50 (10.6)	420 (89.4)
Ride in a car whose driver texts while driving	603 (43.4)	786 (56.6)	63 (13.3)	410 (83.7)
Ride in a car whose driver emails while driving	1060 (76.5)	326 (23.5)	237 (50.5)	234 (49.7)
Ride in a car whose driver makes a phone call while driving	203 (14.5)	1195 (85.5)	42 (8.9)	430 (91.9)
Ride in a car whose driver had been smoking marijuana	967 (69.5)	424 (30.5)	307 (65)	165 (35)
Ride on a motorcycle whose driver had been drinking alcohol	1255 (95.6)	58 (4.4)	260 (57.5)	192 (42.5)
Ride on a motorcycle whose driver had been smoking marijuana	1240 (94.4)	73 (5.6)	333 (73.7)	119 (26.3)

Risky Behaviour	The Gambia		Tanzania	
	Never n (%)	Sometimes n (%)	Never n (%)	Sometimes n (%)
Ride on a motorcycle whose driver had been using any illegal drug	1240 (94.4)	73 (5.6)	340 (75.7)	109 (24.3)
Ride on a bicycle whose driver had been drinking alcohol	1274 (97.2)	37 (2.8)	324 (76.2)	101 (23.8)
Ride on a bicycle whose driver makes a phone call while driving	1033 (79.2)	272 (20.8)	249 (58.7)	175 (41.3)
Ride on a bicycle whose driver had been smoking marijuana	1231 (94.2)	76 (5.8)	357 (84.2)	67 (15.8)
Ride on a bicycle whose driver had been smoking cocaine	1274 (97.6)	31 (2.4)	375 (88.4)	49 (11.6)

The researchers assessed the students' perceptions of their traffic safety practices. Over one-half of respondents from The Gambia (54.9%) had never driven an overloaded car within the past month. However, the majority of their counterparts (54.4%) in Tanzania sometimes drive overloaded vehicles. Most respondents had never ridden a motorcycle with more than two people in both countries, though this was higher in The Gambia (72.4%) than in Tanzania (53.3%). Similarly, the majority of the respondents indicated that they had never ridden a bicycle with more than one person (The Gambia 63.2%, Tanzania 67%). The majority of respondents indicated that they refused a ride for safety reasons (The Gambia 74.7%, Tanzania 75.2%).

Disparities were observed about the respondents' seating preferences in a vehicle. Although the respondents from The Gambia preferred the front seat (38.6%), 40% of the respondents from Tanzania preferred a window seat. The respondents were not concerned about driver age or previous experience in both groups (The Gambia 59.4%; 57.6%, Tanzania 72.7%; 55.2%). The minority of the respondents reported using Bluetooth devices when driving motorised vehicles (The Gambia 18.5%, Tanzania 22.1%), do not see the importance of obeying traffic laws (The Gambia 3.5%, Tanzania 2.5%), find it acceptable to text while driving (The Gambia 5.3%, Tanzania 4.9%), and find it acceptable to speed while driving (The Gambia 15.8%, Tanzania 9%).

Most students reported that it was important to obey all traffic regulations (The Gambia 93.1%, Tanzania 85.5%). The respondents reported that it was equally important for pedestrians to cross streets at pedestrian crossings or traffic lights (The Gambia 76.8%, Tanzania 76.4%).

Table 3: Safety behaviours and perceptions of students in The Gambia and Tanzania

Variable		The Gambia N (%)	Tanzania N (%)
Safety behaviours	Drove an overloaded vehicle in the past 30 days		
	Never	846 (54.9)	211 (45.7)
	Sometimes	614 (45.9)	251 (54.3)
	Rode with more than two people on a motorcycle in the past 30 days		
	Never	968 (72.4)	247 (53.3)
	Sometimes	369 (27.6)	216 (46.7)
	Rode with more than one person on a bicycle in the past 30 days		
	Never	844 (63.2)	300 (67)
	Sometimes	492 (36.8)	148 (33)
	Refused a ride because of safety concerns		
	Yes	1034 (74.7)	351 (75.2)
	No	350 (25.3)	116 (24.8)
Safety perceptions	Refused a ride because of concerned with age of the driver		
	Yes	569 (40.6)	131 (27.3)
	No	832 (59.4)	349 (72.7)
	Refused a ride because of a past experience with a driver		
	Yes	592 (42.4)	214 (44.8)
	No	803 (57.6)	264 (55.2)
	Use Bluetooth while driving a motorised vehicle		
	Yes	233 (18.5)	101 (22.1)
	No	1029 (81.5)	356 (77.9)
	Best seating position in a car		
	Front seat	537 (38.6)	79 (17)
	Back seat	437 (31.4)	170 (36.6)
	Middle seat	131 (9.4)	28 (6)
	Window seat	287 (20.6)	187 (40.3)

Variable		The Gambia N (%)	Tanzania N (%)
	Important to obey traffic safety laws		
	Not important	49 (3.5)	12 (2.5)
	Important	1347 (96.5)	464 (97.5)
	Acceptable to text while driving		
	Yes	75 (5.3)	24 (4.9)
	No	1336 (94.7)	464 (95.1)
	Acceptable to speed while driving		
	Yes	225 (15.8)	44 (9)
	No	1201 (84.2)	444 (91)
	Important to obey all traffic signals		
	Yes	1332 (93.1)	467 (95.5)
	No	99 (6.9)	22 (4.5)
	Important to cross only at traffic lights or pedestrian crossings		
	Yes	1044 (76.8)	373 (76.4)
	No	316 (26.2)	115 (23.6)

Results from the logistic regression present the predictors of risk perceptions and behaviours associated with being involved in a crash (Table 4). The combined data generated from the two countries, The Gambia and Tanzania, indicated that the odds of perceiving making cellphone calls while driving a motorcycle (AOR, 2.33, CI = 0.92–5.93) or riding on a bicycle (AOR, 2.34, CI = 0.83–6.69) as a safety risk were more than twice as high as not using a cellphone. On the other hand, the participants' perceptions on driver/rider risky behaviours were mostly low. The participants perceived crossing roads at traffic lights or pedestrian crossings (AOR = 3.21; CI = 1.32–7.79) to be a high contributor to crashes. With regard to the experience and/or past crash records of the drivers, the participants' decision to ride with a driver is not influenced by young age. Moreover, they will be 33% less likely to refuse a ride because of a past experience with a driver.

Table 4: Multivariate logistic regression to assess the relationship between risk factors and the occurrence of road traffic crashes in The Gambia and Tanzania

Risk Factors	Adjusted Odds Ratio (AOR)	95%	P-value
Make phone calls while driving a motorcycle			0.074
No risky behaviour	Ref.		
Some risky behaviour	2.33	0.92, 5.93	
Driving a motorcycle after smoking marijuana			0.937
No risky behaviour	Ref.		
Some risky behaviour	0.93	0.14, 6.13	
Ride in a car whose driver had been drinking alcohol			0.023
No risky behaviour	Ref.		
Some risky behaviour	3.12	1.17, 8.36	
Wear a seat belt when riding in a car driven by someone else			0.473
No risky behaviour	Ref.		
Some risky behaviour	0.67	0.16, 2.35	
Ride in a car whose driver texts while driving			0.390
No risky behaviour	Ref.		
Some risky behaviour	1.72	0.50, 5.88	
Ride in a car whose driver emails while driving			0.119
No risky behaviour	Ref.		
Some risky behaviour	0.41	0.13, 1.26	
Ride in a car whose driver had been using an illegal drug			0.166
No risky behaviour	Ref.		
Some risky behaviour	1.91	0.77, 4.76	
Ride on a motorcycle whose driver makes a phone call while driving			0.156
No risky behaviour	Ref.		
Some risky behaviour	0.42	0.13, 1.39	
Ride on a bicycle whose driver makes a phone call while riding			0.114
No risky behaviour	Ref.		
Some risky behaviour	2.34	0.82, 6.69	

Risk Factors	Adjusted Odds Ratio (AOR)	95%	P-value
Have more than two people ride on a motorcycle in the past 30 days			0.68
No risky behaviour	Ref.		
Some risky behaviour	1.22	0.47, 3.15	
Have more than one person ride on a bicycle in the past 30 days			0.568
No risky behaviour	Ref.		
Some risky behaviour	1.33	0.50, 3.52	
Refused a ride because of concern with the age of the driver			0.994
Yes	Ref.		
No	1.00	0.39, 2.57	
Refused a ride because of a past experience with the driver			0.389
Yes	Ref.		
No	0.67	0.27, 1.67	
Important to cross only at traffic lights or pedestrian crossings			0.010
Yes	Ref.		
No	3.24	1.32, 7.79	

Discussion

In this study, we used the experiences of college students in health-related fields in two sub-Saharan African countries, The Gambia and Tanzania. In the study, we assessed risky behaviours and the perceptions of road safety risks among youths and young adults. The results indicated varying perceptions of road safety risk behaviours that could occur both before and during vehicle operations. A multi-country approach was used in this study to generate information since the challenges faced by youths and young adults in road traffic crashes may be marked by differences in geographical, cultural and structural settings. However, the fact remains that this population requires well-defined global approaches and strategies for injury prevention and safety promotion because they are disproportionately affected as victims of road traffic crashes. Modification of attitudes to increase positive behaviours and innovations to incorporate age-specific considerations should be prioritised to effectively deal with the problem.

The study results indicated two major areas of concern about road safety risk behaviours among youths and young adults in the two countries: driver distraction and impairment. Overall, rider distraction was perceived to be a problem among motorcycle and bicycle drivers. The majority of youths in the study from both countries reported making phone calls while riding a bicycle as a major distraction.

This risky behaviour was again perceived in drivers of cars. Most study participants reported riding in cars whose drivers were texting and/or making a phone call while driving. Driver distraction through cellphone use is supported by Seo and Torabi (2004) in their study on cellphone use and road traffic crashes among college students. These researchers found an association between in-vehicle cellphone use in road traffic crashes and near-missed crashes. A study by Cook and Jones (2011) supports the increased risk of young drivers and their riders with cellphone distraction. Drivers who text while driving have an increased risk of road traffic crashes compared to those who do not text.

The perception of driver impairment as a risky behaviour was found to be a major concern among youths in Tanzania. These results are supported by those of the study by Rolison, Regev, Moutari and Feeney (2018) on the factors that contribute to road crashes. Risk taking was identified as a factor associated with the youth with regard to road safety. Youths are more likely to be engaging in contributing factors to road traffic crashes such as alcohol and drug use and driver distraction compared to other age groups (Rolison et al., 2018). Poulsen, Moar and Pirie's (2014) finding support the association between driver alcohol use and road traffic crashes. These authors found positive associations between driver responsibility for traffic crash-related deaths and their alcohol use, and combined alcohol and cannabis use.

Alcohol use was found to be significantly associated with road traffic crashes and fatalities in a study conducted by Schumann et al. (2021). Drivers of passenger vehicles who use any alcohol and those using $> 0.05\text{g}/100\text{ ml}$ of alcohol were at a significantly greater risk of road traffic fatalities. These same researchers found significant associations between alcohol use and the number of road traffic fatalities among all road users. Our finding of youths' perceptions of alcohol use and increased risk of road traffic crash is again supported by Lu, Contrand, Gadegbeku, Salmi and Lagarde's (2020) study on road traffic crashes and drivers who take prescription medication. These researchers found that drivers who use alcohol were significantly responsible for road traffic crashes.

Developing countries such as The Gambia and Tanzania that are dealing with the high burden of road traffic crashes among youths and young adults, which are as a result of driver or rider distractions and impairments, need not only deal with the determinants of such challenges but also establish adequate emergency response system. Good post-crash care reduces death, disability and suffering for road crash survivors. In The Gambia, there is no national emergency response system, which means that there is neither a national ambulance system nor an emergency number to call to respond to road

traffic crash emergencies or other related emergencies. The severity and impact of injuries arising from road traffic crashes can be significantly reduced by the response time and capability (material and human) of the response team, and post-crash management of the crash victims. For example, at the time of developing this article, The Gambia had only one neurosurgeon with variable limitations, including facilities and resources to treat patients (Sanyang, Peek-Asa, Bass, Young, Daffeh, et al., 2017). Strategies that can be implemented include those which have worked well towards reducing the burden of road traffic crashes in other countries, such as promoting better first-aid services for victims of road crashes through the support of volunteer groups in the community, introducing a single emergency phone number and dispatch system, supporting prompt transport to health facilities including a strengthened ambulance system, improving professional capacity and equipment at definitive and lower-level healthcare facilities and hospitals, and establishing injury rehabilitation services (Ntakiyiruta et al., 2016; Tanigawa & Tanaka, 2006; Young, Moon, & Wilkinson, 2021).

Our results indicate a clear distinction of the perceptions of road safety risks between passive and active behaviours occurring during the operation of a vehicle. Passive behaviours are explained by the exposure of the driver to harmful substances before driving but with the potential of impairing functioning and judgement during driving. The consumption of alcohol, marijuana and other illicit drugs by drivers increase the likelihood of injury and loss of life if the driver's condition is not recognised and vehicle operation is not terminated. The driver education curriculum and licencing age should be reviewed regionally for nations to learn from each other about their effectiveness in preparing responsible vehicle drivers. On the other hand, and where necessary, laws should be modified to the extent that they are constructed to adequately deal with vehicle driver behaviours that endanger self, passengers and the public.

Active risky behaviours occur during vehicle operations and can be identified at the point of occurrence by the driver, passengers or non-passenger observers. For any type of vehicle, including cars, motorcycles and bicycles, the driver's hands play the primary role of controlling the vehicle. We found that drivers exercise the risky behaviour of using their hand-held devices for texting or making phone calls while driving. These behaviours force the driver's hands to execute numerous tasks leading to distractions which subsequently results in risk of injury or loss of life. Traffic rules and regulations should be strict and enforced among drivers; they should include clear restrictions on the use of hand-held devices during vehicle operations. Our study determined that the degree of risk perceived from active behaviours was lower when the driver uses built-in devices such as the audio system in the vehicle.

The mitigation of the impact of active and passive risky behaviours is a function of both safety laws and social engagement. Although laws could be effective and rightly enforced, they may come after the losses from the road traffic events have occurred. Social movements targeting youths and young adults and applying innovations that

draw the attention of these age groups, such as hands-free devices and voice-activated texts, could be important in the prevention of injuries and their impact on society. A demonstration of the impact of injuries on the quality of life and loss in productivity should be included as part of driver education programmes. Countries should make appropriate determinations on the way in which to include injury prevention and safety promotion content at different levels of education to maximise the reach of the information among the youth and young adults.

A limitation of this study is that the two countries included are very different with regard to population size and study population characteristics. The study participants in The Gambia comprised health and non-health students across the country; on the other hand, the Tanzania participants consisted of students only at the MUHAS. Our study is therefore not population-based, at least for Tanzania, and the results may not be generalisable beyond these specific populations. In addition, the risks perceived by the respondents are self-reported, which can have variable validity. For example, some respondents may fear negative consequences of reporting illegal drug or substance use while on the road for fear of related penalties. Despite these limitations, in this article, we provide essential information that governments in The Gambia and Tanzania and their collaborators can use to accommodate the needs of youths and young adults to improve safety on the roads.

Prevention Implications

In the Gambia and Tanzania, as in other LMICs, the road safety of youths and young adults continue to be a primary concern owing to the high rates of injuries and deaths. There are educational and policy implications from this study. The results suggest that national initiatives to review and revamp the driver education content standards to critically deal with roadway safety risk behaviours among new drivers and ongoing interventions for existing drivers are needed. In addition, the study results suggest that the idea of community-level interventions, focusing on behaviour modification through a combination of the factors of law enforcement and technology, may be useful for reducing RTIs among the youth and young adults. Governments should take into consideration country-specific circumstances for policies to be developed at different levels to have the potential to utilise these factors for meaningful changes in behaviours and their consequences.

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Author Contributions

Edrisa Sanyang, William N. Mkanta, Grace K. Larney, Ritchie D. Taylor, Paul Bass, and Candida Moshiri facilitated the data-collection process. Edrisa Sanyang, William N. Mkanta, Grace K. Larney and Manjally Ndow edited and analysed the data. Edrisa Sanyang, William N. Mkanta, Grace K. Larney contributed to the introduction and discussion sections of the article. All the authors reviewed and improved on the final manuscript.

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