Original Article

Risk Factors of Road Traffic Accidents in Rural and Urban Areas of Indonesia Based on the National Survey of Year 2018

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Abstract

Context: Indonesia has a large population with a large number of motorised vehicles, so it cannot be separated from traffic accidents. **Aims:** This study aimed to determine and analyse the advanced level risk factors for road traffic accidents (RTA) in rural and urban areas based on data from the Basic Health Research 2018 (Riskesdas). **Methods:** This study used Riskesdas data sourced from the National Institute of Health Research and Development, Ministry of Health, Indonesia, which was collected from 34 provinces in Indonesia using a cross-sectional method. The statistical data consisted of 59,423 respondents aged over 15 years old, who had experienced a road traffic injury and lived in rural or urban areas. The data variables analysis was socio-demographic, lifestyle, smoking status, alcohol consumption, mental disorders, nutritional status and use of helmets on motorcycle riders and passengers. **Statistical Analysis:** Multivariate logistic regression was used to analyse the most dominant risk factors related to RTA in rural and urban areas. **Results:** The prevalence of RTA in urban areas was 34.1%, while in rural areas was 28.2%. The factors related to traffic accidents in respondents from urban areas ($P < 0.005$) were sex (1.342 [1.217–1.480]), age (1.111 [1.067–1.156]) and use of helmets on motorcycle riders and passengers (0.662 [0.566–0.771]). Meanwhile, risk factors for respondents from rural areas ($P < 0.005$) were mental disorders (0.842 [0.743–0.955]), age (1.095 [1.040–1.154]) and use of helmets on motorcycle riders and passengers (0.682 [0.585–0.796]). **Conclusions:** We found that the prevalence of RTA in urban areas was higher than in rural areas. The dominant risk factors related to RTA in Indonesia were age, sex, mental disorders and the use of helmets on motorcycle riders and passengers. This finding supports the importance of road safety education and the prevention of RTA needs to be done both in urban and rural areas.

Keywords: Indonesia, motor vehicles, road injury, road traffic accident, urban-rural

Introduction

The Global Burden of Disease Study (GBD) was an assessment study of diseases, injuries and risk factors that cause mortality and disability in people around the world. GBD 2019 found that road traffic injuries (RTIs) were the first cause of death due to injury compared to other causes.[1] The global status report on road safety also showed that road traffic accidents (RTA) cause more than 1.3 million deaths annually.[1,2] Half of all road traffic deaths in the world occur in the Western Pacific region (RTA death rate per capita 26.6/100,000 population) and the South-East Asia region (RTA death rate per capita 20.7/100,000 population) most of which belong to low-middle income countries.[3,4]

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The death due to RTI was a leading cause of injury-related disability-adjusted life years (DALYs).[5] Globally, around 20–50 million people suffer from accidental injuries in all age groups.[2] RTIs became the first rank of DALYs among 10–24 years of age.[1] The highest RTI was experienced by countries in the South-East Asia region.[1,6] Indonesia became the country with the highest number of RTIs in Southeast Asia since 2010.[3,7] RTA was a top-rank leading cause of death in Indonesia for 10–24 years of age.[8] RTA was the eighth-leading cause of death in Indonesia and accounted for 2.46% of deaths RTA from the total population death.[3]

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RTA occurred due to human factors, 34% due to operational deficiencies, and 12% due to vehicle breakdowns.[9] A cross-sectional study in India showed that RTA occurred more among males (77.5%) who came from rural areas (67%).[10] The same thing was found in Korea that males were 1.5 times more likely to be injured in accidents than females.[11] Various studies have reported that the influence of drugs and alcohol consumption significantly increases the likelihood of RTA at 16–20 years of age. A person under the influence of alcohol tends to drive at higher speeds.[12]

Another study stated that obesity was reported as RTA risk factors.[13] A study reported that a person obese have low agility and speed of activity,[14] and at high risk for obstructive sleep apnoea.[15] In addition, obese people were reported to rarely use seat belts, this may cause more serious injuries in RTA.[16] The other risk factors in the occurrence of traffic accidents were mental disorders of drivers (odds ratio [OR] = 2.4), especially female drivers, lack of knowledge of driving safety and unsafe behaviour from drivers such as not wearing a helmet, operating a mobile phone while driving, speeding and violating traffic.[9,17]

A study in China distinguished risk factors for traffic accidents in urban and rural areas and reported that the prevalence of traffic accidents among urban residents was 13.2% higher than that of rural areas, which was positively related to minority status, income and mental disorder scores at the individual level.[18] In contrast to previous research reports that states rural areas were more at risk of RTA.[19,20] Most studies identified and compared locations hazardous roads often originate in the US, Europe or Australia and were not always applicable in a Southeast Asian context Most studies originating from the US, Europe or Australia identify and compare the location of hazardous roads between rural and urban areas, but these results are not applicable in the context of countries in Southeast Asia.[18] This study contributed to mapping the factors of RTA in urban and rural areas of Indonesia based on Basic Health Research (Riskesdas) 2018. Therefore, this study contributes to mapping RTA factors in urban and rural areas in one of the Southeast Asian countries, namely Indonesia, based on the results of the 2018 Basic Health Research (Riskesdas).

Methods

Data sources and subjects

This research used secondary data from the 2018 basic health research survey which was sourced from the National Institute of Health Research and Development (NIHRD), Indonesian Ministry of Health. The research was a national-scale survey with a cross-sectional and non-interventional design conducted every 5 years. Briefly, participant selection was made through a two-stage hierarchical clustering sample drawn from nationwide, including 34 provinces and 514 municipalities/districts in Indonesia. The data were collected by using interviews, measurements and examinations. The interviews used two instruments, namely: household instruments and individual instruments. The details of sampling techniques, survey design, survey instruments, measurement systems and quality control have been described in several publications.[21] We used information collected from 59,423 respondents over the age of 15 who had experienced on injury.

Variables

Dependent variable

Traffic accident data were taken from individual questionnaires with code E-06 that were differentiated by urban and rural areas. The classification of urban and rural areas based on Riskesdas refers to the Regulation of the Head of Central Statistics Agency Number 37-year 2010. It was about the status of an administrative area at the district level based on certain classification criteria in terms of population density; percentage of agricultural households and availability/access to public facilities owned by a village/district to determine the urban or rural status of a village/district.

Independent variables

In this study, the independent variables were selected based on previous research, there were 11 independent variables that we analyzed; sex, age, marital status, occupation, education level, smoking status, alcohol consumption, mental disorders (mental disorder status was determined by a WHO Self-Reporting Questionnaire-20,[21,22] nutritional status and use of helmets on motorcycle riders and passengers.

Statistical analysis

The data were presented in frequency and percentage based on a history of RTA. Chi-square analysis was performed to determine the relationship between the independent variable and the dependent variable. $P < 0.05$ was considered statistically significant. The independent variable which has a P value lower than 0.25 is included in the multivariable analysis. We analysed the final model using Binary Regression Logistic. All analyses were performed by SPSS 22.0 (IBM Corporation, NY, USA).

Ethical clearance

The Research Ethics Committee of NIHRD, Indonesian MoH reviewed and approved the survey protocol, design, data and questionnaire (Number: LB.02.01/2/KE.024/2018). There was no further ethical clearance required for the analysis of the secondary data. All participants were asked for consent and signed its form in the survey.

Results

General characteristics of the study subjects

The general characteristics of the population studied are presented in Table 1, the majority of respondents from urban areas were male (57.6%), aged 15–34 years (48.3%), married (64.4%), employed (74.0%), had a low level of education (53.8%), everyday smokers (29.3%), did not consume alcohol (92.4%), had mental disorders (58.2%), normal nutritional status (50.5%), had experienced an injury because of an accident (34.1%), wearing a helmet (85.1%). While most respondents from rural areas were male (59.0%), aged

15–34 years (45.4%), married (70.9%), employed (77.3%), have a low level of education (75.9%), everyday smokers (33.6%), did not consume alcohol (90.3%), has mental disorders (59.1%), has an underweight status (59.4%), has experienced an injury due to an accident (28.2%) and wear helmet (69.2%). Overall, respondents from urban and rural areas have the same individual characteristics tendencies.

Based on Table 2, injured limbs, it was known that the tendency of the location of the injury between respondents from urban and rural areas was similar, they tend to never have a head injury (89.5% of urban respondents and 89.0% of rural respondents), never have a chest injury (97.0% of urban respondents and 96.0% of rural respondents), never had a back injury (92.4% of urban respondents and 90.2% of rural respondents), never had an abdominal injury (97.8% of urban respondents and 97.1% of rural respondents), never experienced injuries to the upper limbs (64.4% of urban respondents and 64.5% of rural respondents) and had experienced injuries to the lower limbs (66.0% of urban respondents and 64.2% of rural respondents). Based on the type of injury, it was known that most respondents from urban areas suffered from bruising (59.3%), superficial injuries (20.2%) and sprains (37.5%), while most respondents from rural areas experienced this type of injury, bruising (58.2%), superficial injuries (25.4%) and sprains (34.6%).

Table 1: Characteristics of respondents based on region

Variable	Region	
	Urban (*n*=25,554), *n* (%)	Rural (*n*=33,869), *n* (%)
Sex		
Male	14,718 (57.6)	19,970 (59.0)
Female	10,836 (42.4)	13,899 (41.0)
Age (years)		
15-34	12,354 (48.3)	15,369 (45.4)
35-44	4564 (17.9)	6656 (19.7)
45-54	3998 (15.6)	5499 (16.2)
55-64	2767 (10.8)	3751 (11.1)
65-74	1305 (5.1)	1738 (5.1)
≥75	566 (2.2)	856 (2.5)
Marital status		
Single	9088 (35.6)	9856 (29.1)
Married	16,466 (64.4)	24,013 (70.9)
Occupation status		
Unemployed	6653 (26.0)	7703 (22.7)
Employed	18,901 (74.0)	26,166 (77.3)
Education level		
Low	13,758 (53.8)	25,712 (75.9)
High	11,796 (46.2)	8157 (24.1)
Smoking status		
Former smokers	2149 (8.4)	1886 (5.6)
Someday smokers	1676 (6.6)	2307 (6.8)
Everyday smokers	7497 (29.3)	11,396 (33.6)
Missing	14,232 (55.7)	18,280 (54.0)
Alcohol consumption		
Yes	1947 (7.6)	3288 (9.7)
No	23,607 (92.4)	30,581 (90.3)
Mental disorders		
Yes	14,879 (58.2)	20,011 (59.1)
No	10,675 (41.8)	13,858 (40.9)
Nutritional status (BMI)		
Underweight	12,893 (50.5)	20,127 (59.4)
Normal	3128 (12.2)	4244 (12.5)
Overweight	6092 (23.8)	6308 (18.6)
Obesity	2450 (9.6)	2007 (5.9)
Class 3 obesity	163 (0.6)	128 (0.4)
Use of helmets on motorcycle riders and passengers		
No	3809 (14.9)	10,435 (30.8)
Yes	21,745 (85.1)	23,434 (69.2)

BMI: Body mass index

Figure 1 shows that respondents were injured due to accidents. The majority of respondents experienced an injury while using a motorcycle either as a rider (76.81% of urban respondents and 74.12% of rural respondents) and as passengers (15.44% of urban respondents and 19.51% of rural respondents). This shows that both in urban and rural areas, motorcycles are a vehicle that is often used.

Based on Table 3, it showed that respondents who come from urban areas have significant relationship with the incidence of traffic accidents with marital status ($P = 0.001$), employment status ($P = 0.001$), age ($P = 0.001$), wear helmet ($P = 0.001$), alcohol consumption ($P = 0.016$), mental disorders ($P = 0.042$), education level ($P = 0.002$), sex ($P = 0.001$) and nutritional status ($P = 0.042$). While the respondents in rural areas, the variables that were significantly related to the incidence of traffic accidents were marital status ($P = 0.001$), employment status ($P = 0.001$), age ($P = 0.001$), use of helmets on motorcycle riders and passengers ($P = 0.001$), alcohol consumption ($P = 0.001$), ($P = 0.002$), mental disorders ($P = 0.001$), education level ($P = 0.001$) and sex ($P = 0.001$).

Based on Table 4, it was known that the multivariate analysis using logistic regression tests was carried out with 7 models with the last model showing that the factors associated with traffic accidents in respondents from urban areas ($P < 0.005$)

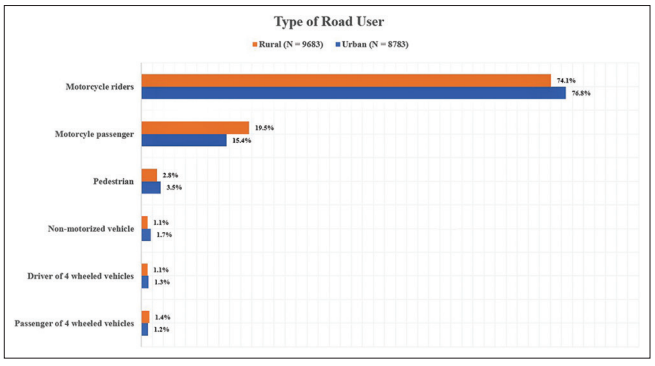

Figure 1: Distribution of injuries by road user type

Table 2: Characteristic of traffic injuries

Variable	Region	
	Urban (*n*=25,554), *n* (%)	Rural (*n*=33,869), *n* (%)
Injury due to RTA		
Yes	8709 (34.1)	9537 (28.2)
No	2109 (8.3)	2831 (8.4)
Missing	14,736 (57.7)	21,501 (63.5)
Body region injury		
Head injury		
Yes	2675 (10.5)	3734 (11.0)
No	22,879 (89.5)	30,135 (89.0)
Chest injury		
Yes	777 (3.0)	1353 (4.0)
No	24,777 (97.0)	32,516 (96.0)
Back injury		
Yes	1931 (7.6)	3322 (9.8)
No	23,623 (92.4)	30,547 (90.2)
Abdominal injury		
Yes	573 (2.2)	986 (2.9)
No	24,981 (97.8)	32,883 (97.1)
Upper limb injuries		
Yes	9096 (35.6)	12,018 (35.5)
No	16,458 (64.4)	21,851 (64.5)
Lower limb injuries		
Yes	16,873 (66.0)	21,759 (64.2)
No	8681 (34.0)	12,110 (35.8)
Type of injuries		
Bruising		
Yes	15,148 (59.3)	19,698 (58.2)
No	10,406 (40.7)	14,171 (41.8)
Superficial injuries		
Yes	5159 (20.2)	8588 (25.4)
No	20,395 (79.8)	25,281 (74.6)
Sprains		
Yes	9580 (37.5)	11,716 (34.6)
No	15,974 (62.5)	22,153 (65.4)
Fractures and broken bones		
Yes	1787 (7.0)	2138 (6.3)
No	23,767 (93.0)	31,731 (93.7)
Limb loss		
Yes	131 (0.5)	225 (0.7)
No	25,423 (99.5)	33,644 (99.3)
Eye injuries		
Yes	174 (0.7)	276 (0.8)
No	25,380 (99.3)	33,593 (99.2)
Brain injuries		
Yes	69 (0.3)	86 (0.3)
No	25,485 (99.7)	33,783 (99.7)
Internal injuries		
Yes	402 (1.6)	619 (1.8)
No	25,152 (98.4)	33,250 (98.2)
Burns		
Yes	349 (1.4)	439 (1.3)
No	25,205 (98.6)	33,430 (98.7)
Others		
Yes	885 (3.5)	797 (2.4)
No	24,669 (96.5)	33,072 (97.6)

RTA: Road traffic accidents

were sex (1.342 [1.217–1.480]), age (1.111 [1.067–1.156]), and use of helmets on motorcycle riders and passengers (0.662 [0.566–0.771]). Meanwhile, respondents from rural areas ($P < 0.005$) were mental disorders (0.842 [0.743–0.955]), age (1.095 [1.040–1.154]) and use of helmets on motorcycle riders and passengers (0.682 [0.585–0.796]).

Discussion

RTA is a major burden of disease in the world, including in Indonesia. The reason was the high number of registered vehicles and the relatively good road access that passes through urban and rural. Preliminary analysis found that the high prevalence of traffic accidents in Indonesia occurred more in urban areas (34.1%) than in rural areas (28.2%). This was consistent with previous studies in several developing countries, such as studies in Malaysia,[23] and Kosovo.[24] The level of population density in urban areas with various activities on the edge and along city roads, traffic jam, undirected traffic flow systems, as well as high-speed driving behaviour, reckless overtaking and not complying with traffic regulations can cause increase the frequency of traffic accidents in urban areas.[25]

Accidents on urban highways only caused minor injuries to the victims and were classified as non-fatal accidents. Accidents on urban highways caused more victims of minor injuries that require a quick recovery time than victims who lose their lives. The results of data analysis showed that most city residents who had been involved in a traffic accident only suffered minor injuries, such as abrasions/bruising (59.3%), cuts/tearing/stab wounds (20.2%) and sprains (37.5%). When compared with the data on the severity of traffic accident injuries in rural areas, the victims of accidents with minor injuries were more in urban areas. The same phenomenon also occurs in Thailand,[16] and England[26] Factors such as driver's characteristics and actions, road characteristics, environmental characteristics and speed of first aid play an important role in determining the severity of RTA, in both urban and rural areas. In addition, highways in urban areas tend to be divided into several segments and covered with concrete; thus, it is allowing accident victims to suffer only minor injuries.[27,28]

Motorcycle drivers were considered vulnerable road users because motorcycle accidents were a major cause of traffic injuries.[27] It was because motorcycles are the main choice of transportation for the Indonesian people because of their relatively low cost and practical use according to road conditions. Similar results were also found in Columbia, where 77.4% of traffic accident victims were motorcycle drivers so that motorcycles were identified as the vehicle with the highest probability of an urban accident.[27] Another finding in Singapore, most of the victims of traffic accidents also involve motorcycle passengers (60.1%) because 51.1% of them were passengers who were children and their behaviour is not controlled.[29] Thus, variations in traffic accident victims were caused by road conditions and the level of knowledge of driving safety in these countries.

Table 3: Bivariate analysis of determinants of road traffic accident

Variable	Urban				Rural			
	RTA		*P*	OR	RTA		*P*	OR
	Yes (*n*=8709), *n* (%)	No (*n*=2109), *n* (%)			Yes (*n*=9537), *n* (%)	No (*n*=2831), *n* (%)		
Sex								
Male	5407 (82.4)	1153 (17.6)	0.001	1.36	6235 (79.2)	1636 (20.8)	0.001	1.38
Female	3302 (77.5)	956 (22.5)			3302 (73.4)	1195 (26.6)		
Age (years)								
≥75	44 (56.4)	34 (43.6)	0.001	1	50 (63.3)	29 (36.7)	0.001	1
65-74	228 (78.9)	61 (21.1)		2.88	213 (70.5)	89 (29.5)		1.38
55-64	672 (76.7)	204 (23.3)		2.54	656 (73.9)	232 (26.1)		1.64
45-54	1223 (78.4)	336 (21.6)		2.81	1255 (75.6)	405 (24.4)		1.79
35-44	1539 (80.6)	371 (19.4)		3.2	1696 (75.6)	547 (24.4)		1.79
15-34	5003 (81.9)	1103 (18.1)		3.5	5667 (78.8)	1529 (21.2)		2.15
Marital status								
Married	4888 (79.4)	1269 (20.6)	0.001	0.85	5502 (75.5)	1789 (24.5)	0.001	0.79
Single	3821 (82)	840 (18)			4035 (79.5)	1042 (20.5)		
Occupation status								
Employed	6828 (81.3)	1567 (18.7)	0.001	1.26	7572 (77.8)	2165 (22.2)	0.001	1.18
Unemployed	1881 (77.6)	542 (22.4)			1965 (74.7)	666 (25.3)		
Education level								
Low education	4312 (79.4)	1122 (20.6)	0.002	0.86	6470 (75.9)	2057 (24.1)	0.001	0.79
High education	4397 (81.7)	987 (18.3)			3067 (79.8)	774 (20.2)		
Smoking status								
Former smokers	701 (81.2)	162 (18.8)	0.574	1	534 (77.1)	159 (22.9)	0.244	1
Someday smokers	640 (82.7)	134 (17.3)		1.1	718 (78)	203 (22)		1.05
Everyday smokers	2851 (82.7)	595 (17.3)		1.1	3523 (79.5)	909 (20.5)		1.15
Alcohol consumption								
Yes	873 (83.3)	175 (16.7)	0.016	1.23	1248 (80.3)	307 (19.7)	0.002	1.23
No	7836 (80.2)	1934 (19.8)			8289 (76.7)	2524 (23.3)		
Mental disorders								
Yes	4800 (79.8)	1214 (20.2)	0.042	0.9	5076 (75.5)	1646 (24.5)	0.001	0.82
No	3909 (81.4)	895 (18.6)			4461 (79)	1185 (21)		
Nutritional status (BMI)								
Normal	4471 (80.6)	1077 (19.4)	0.042	1	5717 (77.4)	1672 (22.6)	0.281	1
Underweight	1218 (82.1)	266 (17.9)		1.1	1328 (77.5)	385 (22.5)		1.01
Overweight	2002 (79.8)	508 (20.2)		0.94	1651 (76.4)	509 (23.6)		0.94
Obesity	745 (79.6)	191 (20.4)		0.94	545 (74.3)	189 (25.7)		0.84
Class 3 obesity	34 (66.7)	17 (33.3)		0.48	41 (82)	9 (18)		1.33
Use of helmets on motorcycle riders and passengers								
No	701 (72.6)	265 (27.4)	0.001	0.61	1792 (69.5)	787 (30.5)	0.001	0.6
Yes	8008 (81.3)	1844 (18.7)			7745 (79.1)	2044 (20.9)		

RTA: Road traffic accidents, OR: Odds ratio, BMI: Body mass index

Table 4: Multivariate analysis of determinants of road traffic accident

Variable	Region			
	Urban		Rural	
	P	Adjusted OR (95%CI)	*P*	Adjusted OR (95%CI)
Male sex	0.000	1.342 (1.217-1.480)	-	-
≥75 years	0.000	1.111 (1.067-1.156)	0.001	1.095 (1.040-1.154)
Mental disorders	-	-	0.000	0.842 (0.743-0.955)
Not wear helmet	0.000	0.662 (0.566-0.771)	0.000	0.682 (0.585-0.796)

OR: Odds ratio, CI: Confidence interval

Generally, RTA in rural areas includes demographic factors, such as sex, age, occupation, education level, smoking status, alcohol consumption, mental disorders and nutritional status; and driving behaviour (i. e. use of helmets on motorcycle riders and passengers).

The factors influencing road traffic accident in urban areas

The role of differences in age and sex in traffic accidents attracts attention. Related to sex, we found that traffic accidents were shown to increase by 1.342 times when the drivers were male. Sex is a strong predictor of risky driving behaviour, with men being more prone to risky driving behaviour than women.[16] In general, female drivers are considered safer than males. That was due to men who tend to be more impulsive, drive at high speeds, and are given relatively greater freedom to explore their environment, as well as the fact that more men have driver's licenses than women.[30]

The difference of age group that causes traffic accidents in urban areas was mostly dominated by the 18–30 year age group which is associated with a lack of experience and aggressive driving behaviour.[30,31] That was in contrast to our findings which show that the age group over 75 years old is more prone (OR = 1.111) to have traffic accidents. The increasing age of drivers in line with driving experience is refuted by the findings of this study and is consistent with research in Australia, where experienced drivers tend to be the main contributors to accidents.[32] Another study found that the highest injury index due to traffic accidents occurred in men in the elderly group (>65 years). This is associated with disproportionately elderly drivers riding motorcycles, plus road conditions, decreased physical endurance, decreased concentration power while driving and decreased ability of elderly drivers to avoid fatal accident situations.[33]

Another variable that contributes to traffic accidents in urban areas in Indonesia is the use of helmets on motorcycle riders and passengers. Our findings the same with studies in Malaysia,[23] Thailand,[34] and Iran,[35] where helmet-wearing drivers experienced were less crashes. Research in Benin found that riders who did not wear helmets had a higher risk of head injury (OR = 3.8) than those who wore helmets.[36]

The factors influencing road traffic accident in rural areas

We found three of the 10 factors identified as the main factors influencing accidents in rural areas. These three factors are age, mental disorders and use of helmets on motorcycle riders and passengers. The risk factors for traffic accidents in rural areas of Indonesia related to the dominant age are from the age group >75 years. This finding is like the findings of other studies which found that elderly people are more prone to being involved in accidents.[16] Decreased physical and mental abilities with increasing age led to be the risky behaviour in elderly drivers and pedestrians.[33] The other causes include decreased visual and cognitive function, mental health and decreased mobility.[20] The magnitude of these risk factors is accompanied by a greater risk of fatal injury due to the intensification of fragility by age-related degeneration of physical and mental conditions.[37,38]

We found that helmetless drivers in urban areas of Indonesia are also at risk in rural areas because they can increase the severity of injury to accident victims. Table 4 shows that motorcycle drivers without helmets are 0.682 times more likely to be involved in traffic accidents in rural areas. Motorcyclists without helmets in rural areas have been found to increase the likelihood of fatal injuries due to bumpy and sloping road contours,[16] In addition, the reluctance of rural communities to wear helmets is caused by the notion that helmets are not necessary for short distances, discomfort, hearing difficulties, dishevel hair, interest in wearing traditional head coverings, the possibility of helmets being stolen, expensive helmet prices,[39] and lack of police control.[40] In the elderly group, wearing a helmet is considered an obstacle to greeting neighbour or colleagues.[40]

Recently, mental health also has been identified as a risk factor for accidents, especially in the elderly. We found that the driver's responsibility when driving in the countryside was influenced by emotional status. In short, the emotional dysregulation is a potential source of internal disturbances that can influence risky driving behaviour. In general, current psychological conditions, such as stress, depression, anxiety and dementia can have an impact on driving behaviour.[25] In addition, attention deficit hyperactivity disorder is also considered as a predictor of risk behaviour and accidents among motorcycle drivers in rural areas.[41] Analysis of mental and emotional disorders of motorcycle drivers in rural areas that are at risk of causing traffic accidents is influenced by the proportion of travel time on hiking trails, variations in instantaneous speed and poor road conditions.[41]

Conclusions

We conclude that the factors associated with traffic accidents in respondents from urban areas were sex, age and helmet use. Besides, the respondents from rural areas are mental disorders, age and use of helmets. The limitation of this study was that information is limited on Riskesdas data regarding the demographics of the name of the area that only obtains information on urban or rural groups. Hence that it cannot be known for sure how the contours of the road and the level of population density in each group are. In addition, unknown whether respondents experienced mental disorders before or after RTA. We believe that the research findings be able to describe the risk factors for RTA between urban and rural areas in Indonesia because the respondents are people in every region in Indonesia. In the future, we recommend to study further the impact of traffic accidents in urban and rural areas on mental disorders due to accidents experienced.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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