

Alcohol and Injury in Emergency Room: A Comparison of Songkran Festival and Normal Period in Thailand

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ABSTRACT

Background: Alcohol-related injury is considered as the most harmful effect to public health. In Thailand, the alcohol-related injury is more prevalent during long weekend. The study aimed to examine the relationship between alcohol consumption and traffic accidents of injuries treated in emergency rooms, comparing between long weekend and normal period.

Methods: This study used probability samples of all injured patients that were representative of the patients who delivered to the Emergency Room (ER). The data were collected among 12,164 patients from 32 ER hospitals. Study undertook in two periods, including one official long weekend period which was Songkran festival (Thai New Year) 2016 and normal period which was 3-4 weeks before the long weekend. Logistic regression was employed to investigate the association between alcohol consumption and accident injuries.

Finding: A total of 12,164 patients were studied and 4,586 were classified into accident injuries. Most of the patients were drivers, and motorcycles were the most common transportation among patients. Moreover, the accidents were mainly occurred in local or community road. Half of alcohol-related injuries was related with vehicle use. The study demonstrated that drinkers had double risk to experience alcohol-related injuries than non-drinkers (OR, 2.04; 95% CI, 1.84-2.26). The study also revealed that patients were more likely to experience alcohol-related injury during long weekend than normal period (OR=1.11; 95% CI, 1.02-1.20). Furthermore, patients who aged 20-29 years, had 2.42 times more likely to undergone alcohol-related injuries than those who aged below 20 (OR, 2.42; 95% CI, 2.10-2.80).

Conclusion: The alcohol consumption is related to injury in emergency room as the study showed evidence of association between alcohol use and road traffic injuries, especially during long weekend period. Therefore, law enforcement should effectively implement in order to reduce alcohol-related problems during serious harmful period.

Keyword: Alcohol, Emergency room, injury, Thailand

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Introduction

Global status report on road safety (2015) shows that 68 countries have seen a rise in the number of road traffic deaths since 2010, of which 84% are in low- or middle-income countries. For Thailand, the WHO estimates the number of road traffic deaths in 2013 at 24,237 persons, or 36.2 people per 100,000. According to this estimate, in 2013, Thailand ranks the second in the world (WHO, 2015). The Royal Thai Police reported the number of road traffic was decreased since 2004, but the numbers of road traffic deaths were increase from 19% in 1998 to 30% in 2011. This situation shows that the road accidents tend to intensify (Thammarangsi, et al, 2013). It is an unfortunate fact that traffic accidents in Thailand happen the most during festive and holiday seasons such as, traditional Thai New Year festival (locally known as Songkran festival falling between the periods of 12-15 April every year), which usually have extremely high casualties and several thousand injured accident victims throughout the country (Tanaboriboon, 2004).

Thailand Development Research Institute (TDRI) (1994) reported that the traffic injuries and deaths cost the nation over 213 million USD in the lost economic productivity, hospitals and property costs. Additionally, the total economic losses on Songkran Holidays 2003 and New Year Holidays 2004 were estimated to be 5,959 and 7,487 million Baht, respectively (Tanaboriboon, 2005). According to the report from Central Information Technology Center, the Royal Thai Police, traffic accidents from motor vehicles had claimed over 9,205 lives, 21,916 injuries, and cost approximately 62.2 million Baht in 2011 (Permpoonwiwat, 2012). Furthermore, the economic costs of motorcycle accidents are huge in terms of productivity losses due to mortality and disabilities (Sarawasee, 2015).

The National Injury Surveillance reported that motorcycles were a major vehicle of accidents in proportion of injuries and deaths, and one in three deaths from motorcycle use was associated with alcohol use (Department of Disease Control, 2012). In particular during Songkran Festival, the injured were drinkers. According to road accident data from the Road Safety Thailand Center reported that motorcycle is the most accidental vehicle and more than 80% of the accidents were caused by drink driving. One of the major risk factors for accidents were high speed. Moreover, the most accidents happened more on the side roads than the main ones. (Department of Disaster Prevention and Mitigation, 2012). In addition to several studies showed that alcohol consumption increases the risk of traffic accidents and direct medical health costs (Gomez-Restrepo C. et al, 2016)

A number of study in the emergency rooms indicated that alcohol consumption was strongly associated with injuries (Cherpitel et al., 2005; Cherpitel et al., 2006). For example, the emergency room studies in the U.S., Australia, England, Germany, South Africa, Mexico, India, Taiwan and China founded that alcohol drinking was associated with road traffic accidents (García G et al., 1991, Watt K. et al., 2004, Baune BT. et al., 2005, Li YM et al., 2006, Xiang X. et al., 2014, Turner et al., 2010,

Herbert et al., 2015 and Esser M. et al, 2016). For the studies in Thailand, patients with road traffic accidents in the emergency rooms mostly had drinking behaviors (Suriyawongpaisal, 2002; Ta-in, 2002; Chomdech, 2005; Toongdong, 2008). Moreover, the road accident injured happened the most during the holiday season, both Songkran festival and New Year, which was about two times higher than the normal period (Thammarangsi et al, 2012). It was found that the proportion of alcohol drinking within 24 hours before the emergency room was 11-18 % in the normal period and was 26-37% during the holiday period (Witworapong et al., 2014).

Therefore, the alcohol-related injury is more prevalent during long weekend. The study aimed to examine the relationship between alcohol consumption and traffic accidents of injuries treated in the emergency rooms, comparing long weekend and normal period.

Methods

Population and samples

A cross-sectional study was conducted in order to study alcohol consumption and accident traffic injuries. A total of 12,164 patients were included and 4,586 were classified into accident injuries for treatment at the emergency rooms in 32 hospitals (12 Center Hospitals and 20 community hospitals) from four regions and Bangkok, Thailand.

Tools

The questionnaires were used in this study, which consisted of 11 questions. The questions started with the demographic information (gender, age, address, etc.). Types of hospital and time of admit were collected. The questions concerning types of vehicles, position of patients in the vehicles, type of roads and experienced from accidents were asked. Patients were also asked about alcohol drinking behaviors (such as consumption 24 hours prior to injuries).

Data collection

Data were collected from 14 day of 2 periods including 1) normal period was 3-4 weeks before the holidays (14-20 March 2016) and 2) Songkran festival (11-17 April 2016), using the questionnaires which was collected by nurses or healthcare providers. The patients were asked for informed consents before the interviewed. Almost all the interviewed was done at the emergency rooms or in-patient department. Patients who were not in severe condition answered the questions by themselves. However, there were some patients who required the relatives to provide the information.

Data analysis

There were three main analysis approaches to address the aim of this study. The first was to explore the proportion of alcohol drinkers and describe the characteristics of patients from the road accident injuries. The second approach was to describe the patients who drank alcohol prior to the injuries compared between the normal period and holiday period. The last one was to examine the associated factors with the road accident injuries. Multiple logistic regression models were applied to determine the significant factors. All analyses were performed using STATA (version 11) program with the statistical significant at $p < 0.005$.

Ethics considerations

Ethics approval was obtained from the Ethical Committee of the Institute for the Development of Human Research Protections, Ministry of Public Health. (Protocol November 9, 2015). Informed written consent was obtained all participants.

Results

Characteristics of the road accident injuries

A total of 12,164 patients were studied and 4,586 were classified into accident injuries. Table 1 describes the proportions of alcohol use within 24 hours prior to the road accident injuries across the characteristics of patients. The majority of the 4,401 patients included in the study sample were male (64.2%), with 31.6% were under 20 years, mostly injuries were patients at center hospital (77.7%) in the North and North-eastern were 59.1%. Moreover, the road accident injuries in Songkran festival were 56% higher than the normal period .The rates of alcohol drinking within 24 hours prior to the road accident injuries was reported at 27.9%, mostly in male patients (38.1%), aged 30-39 (37%) and lived in the North of Thailand (40.1%). Furthermore, all of the demographic factors were significantly associated with alcohol use within 24 hours prior to the road accident injuries.

Table 1 The characteristics of the road traffic injuries and alcohol consumption status

Variable	Total (%)	Alcohol consumed 24 hr prior to in juries				P-value
		Yes		No		
		n	(%)	n	(%)	
Type of injuries						< 0.001
Road traffic injuries	4,401 (37.0)	1,227	(27.9)	3,174	(72.1)	
Other	7,485 (63.0)	1,200	(16.0)	6,285	(84.0)	
Period time						< 0.001
Normal	1,916 (43.5)	424	(22.1)	1,492	(77.9)	
Songkran festival	2,485 (56.0)	803	(32.3)	1,682	(67.7)	
Gender						< 0.001
Female	1,567 (35.8)	149	(9.5)	1,418	(90.5)	
Male	2,813 (64.2)	1,071	(38.1)	1,742	(61.9)	
Age group						< 0.001
below20	1,367 (31.6)	206	(15.1)	1,161	(84.9)	
20-29	1,223 (28.1)	429	(35.1)	794	(64.9)	
30-39	554 (12.7)	216	(39.0)	338	(61.0)	
40-59	498 (11.4)	169	(34.0)	329	(66.0)	
59-60	401 (9.2)	124	(30.9)	277	(81.1)	
60 up	317 (7.3)	60	(18.9)	257	(81.1)	
Type of hospital						< 0.001
Center Hospital	3,419 (77.7)	891	(26.1)	2,528	(73.9)	
Community Hospital	982 (22.3)	336	(34.2)	646	(65.8)	
Region						< 0.001
Bangkok	286 (6.5)	59	(20.6)	227	(79.4)	
Central	900 (20.4)	159	(17.7)	741	(82.3)	
North	987 (22.4)	396	(40.1)	591	(59.9)	
North-eastern	1,614 (36.7)	528	(32.7)	1,086	(67.3)	
South	614 (13.9)	85	(13.8)	529	(86.2)	

Comparison of alcohol consumption related the road accident injuries between normal period and Songkran Festival (holiday period)

Table 2 shows the comparison of alcohol consumption behaviors related the road accident injuries between the normal period and Songkran Festival. The patients who drank alcohol prior to injuries compared normal period and festival period, 65% of patient road accident injuries in Songkran festival higher normal period. The highest percentage of male drinker was 87% and among patients age 20-29 years old were 37.4%. Although patients who were drivers (82.1%) and motorcycles (84.0%) were the most common means of transportation, but the percentage of passenger behind of the pickup (2.7%) and pedestrian (3.0%) in Songkran festival higher than normal period. In addition, 31.8% of patients were accident injuries on community or sub-district road, three-fourth of time crashes involve alcohol at 3.00 pm – 3.00 am and one-fourth of people were injured from drink drive. However, time of injuries factor was significantly associated with period time

Table 2 The comparison of alcohol consumption behaviors related the road accident injuries between the normal period and Songkran Festival.

Variable	Total (%)	Alcohol consumed 24 hr prior to injuries (Only drinker)				
		Normal Period		Festival Period		P-value
		n	%	n	%	
Road accident injuries	4,401 (63.0)	424	(34.6)	803	(65.4)	
Gender						0.625
Female	149 (12.2)	49	(11.6)	100	(12.6)	
Male	1,071 (87.8)	374	(88.4)	697	(87.4)	
Age group						0.093
below20	206 (17.1)	61	(14.6)	145	(18.4)	
20-29	429 (35.6)	135	(32.4)	294	(37.4)	
30-39	216 (17.9)	85	(20.4)	131	(16.6)	
40-59	169 (14.0)	63	(15.1)	106	(13.5)	
59-60	124 (10.3)	47	(11.3)	77	(9.8)	
60 up	60 (5.0)	26	(6.2)	34	(4.3)	
Status of patients						0.269
Driver	991 (83.4)	356	(85.8)	635	(82.1)	
Passenger (within car/sit behind the motorcycle)	138 (11.6)	46	(11.1)	92	(11.9)	
Passenger behind of the pickup	26 (2.2)	5	(1.2)	21	(2.7)	
Pedestrian	30 (2.5)	7	(1.7)	23	(3.0)	
Other	3 (0.3)	1	(0.2)	2	(0.3)	
Type of vehicle						0.104
motorcycle	1,010 (84.6)	360	(85.7)	650	(84.0)	
Car	40 (3.4)	16	(3.8)	24	(3.1)	
Pickup truck	98 (8.2)	25	(6.0)	73	(9.4)	
Public transport	3 (0.3)	0	(0.0)	3	(0.4)	
Other	43 (3.6)	19	(4.5)	24	(3.1)	
Type of road						0.513
Highways	191 (18.3)	66	(16.8)	125	(19.1)	
Rural Road	270 (25.8)	100	(25.5)	170	(26.0)	
Intownroad	249 (23.8)	104	(26.5)	145	(22.2)	
Village/community road	325 (31.1)	117	(29.8)	208	(31.8)	
Other	11 (1.1)	5	(1.3)	6	(0.9)	
Time of injuries						0.001
00.00-02.59	203 (17.0)	78	(19.1)	125	(15.9)	
03.00-05.59	68 (5.7)	37	(9.0)	31	(4.0)	
06.00-08.59	41 (3.4)	15	(3.7)	26	(3.3)	
09.00-11.59	49 (4.1)	13	(3.2)	36	(4.6)	
12.00-14.59	98 (8.2)	27	(6.6)	71	(9.1)	

15.00-17.59	195 (16.3)	54	(13.2)	141	(18.0)	
18.00-20.59	329 (27.6)	102	(24.9)	227	(29.0)	
21.00-23.59	210 (17.3)	83	(20.3)	127	(16.2)	
People were injured from road accident						0.952
Yes	222 (18.6)	76	(18.2)	146	(18.8)	
No	943 (78.9)	331	(79.2)	612	(78.8)	
No answer	30 (2.5)	11	(2.6)	19	(2.4)	

Risk estimate

Crude and adjusted relative estimate (in term of odds ratios) showed in Table 3. The variables of the characteristics patients (controlling period, alcohol consumption, gender, age groups, type of hospital and region) were entered in univariate analysis and the multivariate analysis and they were associated with road accident injuries. The analyses showed that the risk of alcohol related to road accident injuries during holiday period was 1.106 times higher than normal period (95%CI: 1.023 to 1.196). Moreover, patients who drank alcohol had 2.043 times higher risk of road accident injuries than those who did not (95%CI: 1.842 to 2.265). Furthermore, gender was significantly associated with road accident injuries, which men had a higher risk than women (95%CI: 0.831 to 0.980). Patients who were below 20 and aged 20-29 had higher risks of road accident injuries than the other age groups. When compared between the types of hospital, one can see that patients in the center hospitals had 1.541 times greater risk than patients in the community hospital (95%CI: 1.406 to 1.688). Additionally, the higher risk of road accident injuries was seen in the regional parts of Thailand.

Table 3 Crude and adjusted odds ratio of accident road injuries

Variable	Total	Road Accident Injuries (%)		Univariate analysis				Multivariate analysis			
		Yes	No	Crude OR	p-value	Lower limit	Upper limit	Adjusted OR	p-value	Lower limit	Upper limit
Period											
Normal	6,538	39.6	64.8	1.205	<0.001	1.119	1.297	1.106	0.011	1.023	1.196
Songkran festival	5,626	35.2	64.8	1				1			
Alcohol consumption											
Yes	2,292	51.5	48.5	2.027	<0.001	1.850	2.223	2.043	<0.001	1.842	2.265
No	9,838	34.4	65.6	1				1			
Gender											
Male	7,623	38.5	61.5	1.117	0.005	1.034	1.205	0.902	0.015	0.831	0.980
Female	4,474	36.0	64.0	1				1			
Age groups											
below20	3,385	41.9	58.1	2.477	<0.001	2.151	2.853	2.427	<0.001	2.101	2.805
20-29	2,710	46.7	53.3	3.005	<0.001	2.599	3.473	2.588	<0.001	2.229	3.005
30-39	1,634	35.5	64.5	1.889	<0.001	1.609	2.216	1.625	<0.001	1.378	1.916
40-49	1,491	34.5	65.5	1.811	<0.001	1.538	2.133	1.595	<0.001	1.349	1.886
50-59	1,344	31.1	68.9	1.549	<0.001	1.308	1.835	1.461	<0.001	1.229	1.737
60 up	1,436	22.6	77.4	1				1			
Type of hospital											
Center Hospital	9,032	39.2	60.8	1.327	<0.001	1.218	1.446	1.541	<0.001	1.406	1.688
Community Hospital	3,132	32.7	67.5	1				1			
Region											
Bangkok	1,271	22.7	77.3	1				1			
Central	2,300	40.4	59.6	2.302	<0.001	1.971	2.689	2.687	<0.001	2.283	3.164
North	3,115	33.1	66.9	1.679	<0.001	1.443	1.952	1.758	<0.001	1.501	2.059

Variable	Total	Road Accident Injuries (%)		Univariate analysis				Multivariate analysis			
		Yes	No	Crude OR	p-value	Lower limit	Upper limit	Adjusted OR	p-value	Lower limit	Upper limit
North-eastern	3,933	42.8	57.2	2.542	<0.001	2.197	2.940	2.637	<0.001	2.263	3.071
South	1,545	41.2	58.8	2.384	<0.001	2.020	2.813	2.648	<0.001	2.231	3.143

Discussion

The results showed that alcohol consumption behavior was associated with road accident injuries. Of the 4,401 patients from the road accident injuries, there were 1,227 who drank alcohol 24 hours prior to the injuries. Moreover, alcohol consumption during the Songkran festival was higher than normal period. This study also found that alcohol-related road accident injuries were mostly seen among males and adults aged 20-29. This finding corresponds with the previous Thai studies (Sriwattanapong, 2012; Department of Disease Control, 2012; National Statistical Office, 2015) and supported this result from Rustic B. et al, (2013), the Global status report on road safety (WHO, 2015), Alcohol and Drug use Among Fatally Injured Drivers in Urban Area of Kuala Lumpur (Mohamed et al, 2012), and Reported Road Casualties Great Britain in Annual Report 2011 (Department for Transport, 2012).

This study reported that 80% of drivers in the road accident injuries were alcohol drinkers, and most of the accidents were caused by motorcycles. This is similar to the findings in many studies (Wittayarungruengsri N. (2003); Tanaboriboon and Satiennam, 2004; Kasantikul V. et al (2005); James V. et al (2006); Piyapromdee U. et al (2015)). Moreover, the Thai Cohort Study (Berecki-Gisolf et al, 2015), showed that 74% of the road traffic injuries was from motorcycles.. Furthermore, the Epidemiological Surveillance Report (Department of Disease Control, 2016) confirmed that three in four serious injuries were caused by motorcycles, with no helmet-wearing, no driver's license, and alcohol drink riders.

Although motorcycles are the main cause of road accident injuries, the most popular vehicles in Thailand is pick-up trucks, which have been used in the agricultural transportation and other small logistics. During the long holidays, people who work in the big cities usually take pick-up trucks to go back to hometown or travelling to other places. In Songkran Festival, people also use pick-up trucks to travel around the city and play water on the main and community road. This study founded that using of pick-up trucks was increased during Songkran festival (9.4%) than the normal period (6.0%). The Department of Disaster Prevention and Mitigation (2016) also reported that out of the vehicles involved in accidents in Songkran festival 2016, 80.67% were motorcycles and 8.85% were pick-up trucks. This reflects that a lot of people use more pick-up tracks during the holiday period, and it is a risk to involve in road accident injuries caused by drink driving. Thus, on 8th August 2012, Thailand has adopted the law to ban drinking of alcohol in any kind of vehicles; however, this law is not effectively enforced (Verrasco L. and Arayawongchai K., 2015).

In addition, this study showed that 80.9% of the accidents were mainly occurred in minor road (rural road, in-town road and Village/community road) rather than on highways during Songkran festival. According to Royal Thai Police Statistic Report (2012) and Road Safety Thailand Center (2014) reported that more than 80 % of accidents injuries were on municipal and local road.

Also found that road accidents in village road related to alcohol consumption and this study reflected that Thai people have used transportation in the minor roads more during long holidays.

This study founded that one-fourth of people drinker were injured from drink drive. This finding corresponds with Alcohol Situation and Policy Survey in 2016 (Chiyasong et al, 2017) showed that 10.8% of road accident injuries and 5.2% involved in road accidents from other drinker (Waleewong et al, 2015). Although Thailand has been launched legal and polices, including social measurement for prevention and control alcohol consumption, the road accident injuries and harm to other problem are still remain. The weakness of law enforcement and lack of policies implementation are barrier of alcohol policy effectiveness. (Thammarangsi, 2006; Chaiyasong and Thammarangsi, 2016).

The limitation of this research is that the data collected from patients injuries, also some data not complete and discrepancy for alcohol consumption.

Conclusion

The alcohol consumption is related with injury in emergency room as the study showed evidence of association between alcohol use and road traffic injuries, especially during long weekend period. Therefore, law enforcement should effectively implement in order to reduce alcohol-related problems during serious harmful period.

Acknowledgements

The authors would like to thank the Center for Alcohol Studies for its financial support to carry out this study as well as our colleagues who support and assist the study.

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