The Status of Preventive Behaviors in Traffic Accidents in Junior High School Students in Isfahan

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ABSTRACT

Background: Population growth and use of the car in daily life entails new incidents and accidents everyday. Adolescents' entering the new world of adults, their insufficient knowledge of rules, and high-risk behaviors expose them to more risks. Accordingly, a study was conducted with the aim to evaluate the status of preventive behaviors in traffic accidents in boy and girl junior high school students in Isfahan regarding vehicle use.

Methods: A descriptive-analytical cross-sectional study was conducted on 7000 junior high school boy and girl students from 20 towns in Isfahan Province using multi-stage cluster sampling method in 2009–2010. A researcher-made questionnaire was used as data collection tool, which evaluated students' practice and preventive behaviors with 21 questions, each examining students' practice in accidents and incidents that may occur in school and on the way to school. Data were analyzed with Epi 6 and SPSS software using t-test and Chi-square test.

Results: Girls comprised 49.9% of students and 50.1% were boys, 84% lived in urban areas and 15.5% in rural areas. The frequency of an accident location was school in 53.9% with 3739 cases and on the way to school in 10.6% with 732 cases. Mean practice score of preventive behaviors in traffic accidents involving cars, taxi, and school bus (72.6 ± 17.52 girls, 72.7 ± 18.31 boys, $P = 0.88$), motorbike (79.1 ± 14.048 girls, 74.1 ± 19.73 boys, $P < 0.001$), bicycle (71.4 ± 16.56 girls, 68.5 ± 14.69 boys, $P = 0.152$), bus and minibus (91.8 ± 13.16 girls, 87 ± 18.65 boys, $P < 0.001$), crossing the street (30.5 ± 26.67 girls, 32.7 ± 28.03 boys, $P = 0.003$), and skating (60.6 ± 29.103 girls, 61.2 ± 26.84 boys, $P = 0.927$). Results indicate that girls have better preventive practices than boys in use of motorbikes, buses, and minibuses.

Conclusions: According to the results obtained, the majority of students walk to school and have the lowest practice score in this respect. It is recommended that as the first step, students be given necessary road traffic rules training, particularly how to cross the street.

Keywords: Isfahan Province, Junior high School, school, students, traffic accidents

INTRODUCTION

Population growth and use of the car in daily life entails new accidents in everyday life of everybody. Adolescents are more exposed to accidents because they are entering adulthood, separating from family, with higher presence in society, have insufficient knowledge of rules and have risk-taking spirits. Amid, developing and low-income countries have a higher share of these injuries and associated costs incurred, and accident-related mortality rate of 8.5 million worldwide is a witness to this claim.[1] Road traffic accidents worldwide are the second leading cause of mortality in 5-14 years old children and 15- to 29-year-old adolescents.[2] In 2005, an overwhelming 30,000 people with mean age of 30 years, equivalent to 1,200,000 years of life, lost their lives on the country's roads, imposing a cost of nearly 2000 b$ (more than 5% of Gross National Product) on the country, while all traffic accidents are preventable.[2] In a study conducted in 2008 in Charmahal-Bakhtiari Province, status of inadvertent accidents in this province was as follows: 19% of deaths in this province were caused by road accidents, making it the second leading cause of death. Accidents resulting in death are slightly more prevalent in rural areas than urban areas. In 2007, total registered number of injuries was 5131 people, of whom traffic accidents comprised 41.2%, burns comprised 2.8%, and falling comprised 14.9%. Men are twice as likely to fall as women, and burns mostly occur in homes during the cold winter months.[3]

In a survey of causes of death in the population covered by Birjand University of Medical Sciences in 2003, of 2148 registered deaths, cardiovascular diseases ranked the first cause of mortality with 517 cases (24.1%). In this group, stroke and myocardial infarction were the most common causes. The mean age of those who died of heart diseases was 97.9 years and heart diseases comprised 14.5% of lost life. Furthermore, unintentional accidents and incidents comprised 18.7% (267) of deaths, which was mostly due to traffic accidents. Mean age of the dead was 35.4 years and most of the lost years of life belonged to this group (18.7%). Cancers and tumors were the third cause of mortality with 146 cases (5.7%) with liver and gall bladder cancer (11.6%), lung cancer (11.6%) and stomach cancer (10.3%) as the most common causes in this group. Their mean age was 58.2 years.[4]

A study aimed to investigate epidemiological causes of inner-city traffic accidents in Lenjan town (Isfahan Province) in 2007, of the 1193 accidents, 72.5% caused damage, 27% involved injuries, and 0.5% involved deaths. In terms of causes of accidents, the highest cause related to ignoring the "right of way" rule with 30%. In this study, given the inner-city speed limit and consistent presence of the police, it was found that the most frequent accident was the damage type, and that private cars were most frequently to blame for these accidents. Noncompliance with "right of way" rule caused the most accidents.[5]

According to the survey in 2007, 1823 inner-city traffic accidents occurred, which were reduced by 557 cases through implementation of Safer Community Program in Lenjan. This program also reduced the number of injuries from 2145 to 1317 people, and in terms of types of traffic accidents, injuries and deaths were reduced, but damage accidents increased.[6]

However, the most vulnerable group in relation to accidents are children and adolescents, and disability of this group causes profound stagnation in social activities, with wide-ranging harms, which involve psychological, physical and economic impacts that advance as a huge wave throughout the community.[7]

So far, students' preventive behaviors have not been investigated. For activities and preventive programs to have more reducing impact on quantity and intensity of accidents, they should be so designed to focus on the accident (traffic and nontraffic incidents). Thus, a study was designed and conducted with the aim to evaluate the status of preventive behaviors in use of vehicles and dangerous vehicles among junior high school male and female students across Isfahan Province.

METHODS

A descriptive-analytical cross-sectional study was conducted during 2009–2010 in Isfahan provincial towns. Junior high school students totaled 188562, of whom, 7000 students of both sexes were selected using multi-stage cluster sampling method from schools in 20 provincial towns. Data were collected using a researcher-made questionnaire that consisted of 21 items, assessing students' practice and preventive behaviors in

relation to incidents and accidents that may occur in school and on the way to school through use of transportation, including: Car, bus, minibus, bikes, bicycles, and skate, as well as behaviors that may lead to accidents on the way to school, as yes/no answers and also in Likert scale format.

Data collection method
- Selection of skilled interviewers
- Interviewers were given the same training for homogeneity of data collection and control of confounding factors.

Method of completing questionnaire
First, interviewers briefed the students for answering the questions, then questionnaires were completed by students over 20–30 min, and handed to the program official after collection.

Data collection with coordination of supervisor
Questionnaires were first checked by a supervisor, and then handed to project executive. Completion of questionnaires was monitored by executives, and after collection and quality control by supervisors from different towns, questionnaires were handed to project executives. Questionnaires were then coded and handed to trained operators for software input.

Practice score for use of car and school commuting service
Scoring for answers to questions was 0 and 1. The highest practice score was 17, and the lowest was 0.

Practice score for use of motorcycle
Scoring was in the form of Likert scale with 1–5 points. The highest practice scored 30 points, and the lowest scored 6.

Practice score for use of bicycle
Scoring was in the form of Likert scale with 1–5 points. The highest score was 55 points and the lowest 11.

Practice score for use of public transport and skate
Scoring was in the form of Likert scale with 1–5 points. The highest score was 30 points and the lowest 5.

Practice score for crossing the road
Answers to questions in the correct order were from 0 to 5. The highest score was 5 and the lowest 0 points.

Practice score for in-school accidents
Scoring was from 0 to 1, with the highest score 10 and lowest 0 points.

Practice score for accidents on the way to school
Scoring was from 0 to 1, with the highest score 10 and lowest 0 points.

Data were entered into Epi6 and were analyzed with SPSS-11.5 (Epi6 software. Centre of disease control and prevention, Version 11.5, SPSS Inc., Chicago, IL) using *t*-test and Chi-square at 95% confidence level.

RESULTS
- Overall sample size was 7000, but a number of questionnaires were eliminated due to being incomplete (67 questionnaires), reducing the total to 6933 cases [Table 1]
- Frequency distribution of an accident site: In-school, 3739 cases (53.9%), and on the way to school, 732 cases (10.6%)
- Regarding the frequency of mode of transport to school, most students walked to school, and then use of public transport (bus and minibus), school bus (mostly used in cities), private car, bicycle, and lastly motorcycle, respectively [Figure 1, Tables 2 and 3]
- Based on the data obtained, the relationship between gender and students' practice in traffic accidents (car, school bus, and…) was insignificant ($P = 0.88$). However, there was a significant relationship with place of residence,
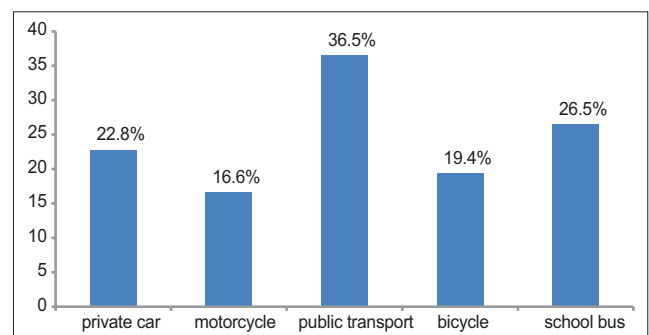

Figure 1: Frequency of mode of transport used by students

Table 1: Frequency distribution of some demographic characteristics of students and their parents

	Quantity	Percentage
Area		
Urban	5860	84.5
Rural	1073	15.5
Gender		
Girls	3462	49.9
Boys	3471	50.1
Age		
<13 years	2286	33.1
13 years	2360	34.1
14 years and older	2268	32.8
Mother's education		
Illiterate	764	11.1
Junior high school	3722	53.8
Diploma and under	1678	24.2
Higher diploma and higher	744	10.8
Deceased	6	0.01
Father's education		
Illiterate	568	8.2
Junior high school	3350	48.5
Diploma and under	1736	25.2
Higher diploma and higher	1151	16.7
Deceased	96	1.4
Mother's occupation		
Employee	480	6.9
Self-employed	300	4.4
Retired	38	0.5
Housewife	6093	88
Deceased	12	0.2
Father's occupation		
Employee	1815	26.4
Self-employed	4159	60.4
Unemployed	334	4.9
Retired	422	6.1
Deceased	153	2.2

Table 2: Mean score of student's preventive behaviors according to the mode of transport

	Quantity	Mean
Car, taxi,…	3157	72.7±17.887
Motorcycle	1102	76.3±17.643
Bicycle	1303	68.6±14.783
Bus, minibus	2343	89.5±16.577
Crossing the road	5433	31.5±27.3458
Skate	111	61.0±27.2562

and students in rural areas had a better practice score. There was a significant relationship

Table 3: Mean practice score of junior high school student's preventive behaviors in traffic accidents, with distinction of place of residence and gender-Isfahan 2009

Area	Quantity	Mean±SD	P
Car and taxi			
Town	2785	72.1±18.028	<0.001
Village	372	76.9±16.219	
Girl	1709	72.6±17.524	0.880
Boy	1448	72.7±18.312	
Total	3157	72.7±17.887	
Motorcycle			
Town	917	75.7±17.49	0.010
Village	185	79.3±16.286	
Girl	482	79.1±14.048	<0.001
Boy	620	74.1±19.739	
Total	1102	76.3±17.643	
Bicycle			
Town	1128	68.6±14.655	0.829
Village	175	68.8±15.627	
Girl	54	71.4±16.564	
Boy	1249	68.5±14.697	0.152
Total	1303	68.6±14.783	
Bus and minibus			
Town	2134	89.5±16.695	
Village	209	89.6±15.373	0.920
Girl	1033	91.8±13.166	
Boy	1310	87.7±18.653	
Total	2343	89.5±16.577	
Walking			
Town	4489	32.5±27.787	<0.001
Village	944	27.1±24.678	
Girl	2867	30.5±26.674	
Boy	2566	32.7±28.036	
Total	5433	31.5±27.3458	
Skate			
Town	100	59.6±27.570	
Village	11	74.2±20.889	0.052
Girl	26	60.6±29.103	
Boy	85	61.2±26.846	0.924
Total	111	61.0±27.2562	

SD=Standard deviation

between gender and students' practice in traffic accidents (motorcycle) ($P < 0.01$), and girls practice scored higher than boys. However, the relationship with place of residence was insignificant. The relationship between students' practice in traffic accidents (bicycle) and gender, and place of residence was insignificant. There was a significant relationship between students'

practice in traffic accidents (bus and minibus) and gender ($P < 0.01$), and girls performed better. However, the relationship with place of residence was insignificant. The relationship between students' practice in traffic accidents (obeying pedestrian rules) and gender and place of residence was significant ($P < 0.01$), and boys performed better than girls, and urban students better than rural ones. There was an insignificant relationship between students' practice in traffic accidents (skate) and gender or place of residence.

DISCUSSION

In the present study, status of incidents and also students' practice score in relation to transport they used for commuting to school were examined. According to the results, of the 6933 samples questioned, 3739 (53.9%) had accidents in school and 732 (10.6%) had accidents on the way to school. These figures indicate many students were involved in accidents in schools, and according to students' reports, more than half had been due to childhood and adolescence misadventures. Such a high percentage is totally preventable. These in-school accidents more frequently occur among boys.

In a study in Mazandaran Province on the pattern of accidents involving children younger than 15 years of age in 1999–2000: Falling (30.1%) and accident (26.6%) were the most common incidents while, in the present study in school falling involved 1.7% of students.[8]

According to a study by Shiraz University of Medical Sciences on rates and causes of accidents involving junior high school students in Shiraz, accidents involving 5–17 years old children were the most important cause of mortality. According to this study, an accident rate was 1.2%, among girls 0.6%, and boys 1.49%, and hands and arms received the most injuries of all body parts. Data from this study indicate that 1st year junior high school students were most involved in accidents.[9]

In this study, students were required to disclose mode of transport used to school, and 1580 (22.8%) used cars, with urban girls having the highest percentage. 4460 (64.3%) declared they walked to school, with rural girls having the highest percentage.

In this study, 1153 (16.6%) revealed they used motorcycles to go to school, and boys had the highest percentage. According to the results obtained, mean students' practice score in traffic accidents of the province (Motorcycle) was 76.3 ± 17.643, and girls scored higher than boys.

Totally, 2531 (36.5%) of students used public transport to go to school, and urban boys had the highest percentage of use. According to results obtained, students' mean practice score in traffic accidents (bus and minibus) was 89.5 ± 16.577, and urban girls had better practice than boys.

346 (19.4%) of students declared they cycled to school, with boys having the highest percentage. No significant relationship was found between gender and place of residence in this questioning.

Moreover, of the 6933 subjects questioned, 1838 (26.5%) cases used school service and urban students had the highest use than other students. 114 (1.6%) subjects skated to school, and boys had the highest score. According to the results, mean practice score of students in traffic accidents (skate) was 61 ± 27.2562, and only 111 used skates to school. No other mode of transport was declared by students.

CONCLUSIONS

According to data obtained, the majority of students walked to school, and had the lowest practice scores. This group was most vulnerable and most exposed to accidents and incidents.

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