Original Article

Assessment of road traffic behavior using Youth Risk Behavior Survey questionnaire among school-going adolescents of Jaipur city, Rajasthan: An observational analysis

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Abstract

Background: Adolescents are a relatively healthy group, but their developmental stage makes them vulnerable to many risk-taking behaviors. One such major issue is road safety practices and their risk on roads. **Objective:** To determine road safety risk behavior among school-going adolescents of Jaipur city and factors associated with it. **Materials and Methods:** An observational, cross-sectional study was conducted from July 2015 to February 2016. A total of 900 school-going adolescents were enrolled from eight schools of Jaipur city and the Youth Risk Behavior Survey (YRBS) questionnaire was administered. **Results:** Most of the participants (67.56%) were in the age group of 13–16 years. A total of 682 (75%) adolescents were driving one or other type of vehicle to commute. Out of the 682 vehicle-using adolescents, 603 (88%) had risky behavior on roads. Driving under the influence was found more among those using four-wheelers (10%) than two-wheelers (5%). Almost half of drivers used mobile phones while driving a car or two-wheeler. There was statistically significant association between risk on roads with respect to rising education and occupation of parents. A majority (88.41%) of the school-going students were found to be at risk on roads while driving. Safety-belt was not used by 28% of the students while half did not use a helmet. More than 70% of the car drivers and two-wheeler drivers drove without license. **Conclusion:** Majority of the adolescent drivers are at risk on roads. Driving without license and/or helmet and using mobile phone are the main risk factors.

Keywords: Adolescent, mobile use, road safety, YRBS questionnaire

Introduction

Healthy adolescents are assets to the economic growth and productivity of any nation. Although they are relatively healthy group, their developmental stage makes them vulnerable for many risk-taking behaviors. One of the important risks is their susceptibility to accidents, especially road traffic accidents (RTAs). Currently, accidents are the most important reason of death and the leading cause of large number of hospitalizations and hospital care.[1] Adolescents are at double the risk of life-threatening accidents in comparison with general population. This is mainly because they are less likely to appreciate danger, more likely to drive fast and be involved in sudden maneuvers (stunts).[2-6] Distractions like music, mobile phones, and use of alcohol are also related to risky driving.[4,7-9] Hence, this study was conducted with an objective to determine the proportion of school-going adolescents of Jaipur city with road traffic risk behavior and its

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associated variables using the Indian version of the Youth Risk Behavior Survey (YRBS) questionnaire.

Methods

An observational, descriptive type of cross-sectional study was conducted from July 2015 to February 2016 in Jaipur city. Schools and students that met the following eligibility criteria were considered for the study.

Inclusion criteria for schools and students were as follows:

1. Schools having coeducation facility and having all the three streams, i.e. science, commerce, and arts
2. School students studying in the 11th and 12th class
3. Students present on the day of study.

Exclusion criteria for schools and students:

1. School with a strength less than 100 in class 11th and 12th were excluded to make study cost-effective
2. Students who did not give consent.

Sample size: The prevalence of mobile phone users during driving was 17%.[10] At 95% confidence level and 3% absolute error, the sample size came to be 627. The sample was enhanced to 900, adjusting for nondriving students, nonresponders, and absentees.

Sampling technique

A complete list of all government and private senior secondary schools was procured from the Department of Education, Jaipur. One government and one private school from each zone (east, west, north, and south) were selected by a simple random sampling technique. A list of students of 11th and 12th class was procured from all the eight selected schools. Equal proportions of students were selected randomly from each of the three streams (science, commerce, and arts). All selected students were interviewed using the YRBS tool, after explaining to them the purpose of study, taking consent, and assuring for anonymity. The study variables included age, sex, height, weight, body mass index (BMI), religion, stream of study, family type, number of family members, family income, with whom children were living, parent's education, parent's occupation, road safety, use of alcohol during driving, and drugs abuse.

Study tool

The latest version of the YRBS questionnaire (2015) was used. It is a standard pro forma used in many studies in India and internationally and is modified every two years. The YRBS collects data about the basic information of the study subject and road safety behavior.

Parent's occupation and education score

Parental guidance is very important in constructing healthy behaviors in adolescents. Education and occupation of parents, especially of mothers, has a great impact; hence, it was decided, in consultation with three senior experts, to give more weight to mother's occupation and education and a score was developed as follows:-

1. Occupation: A professional degree, including a doctor and engineer, and Ph.D. professor/lecturers were scored at 6; teachers were scored 5; big businessmen were scored 4; petty businessmen and clerical staff were given 3; farmers were given 2; laborers were given 1; and unemployed were given 0 scores. Twice the value was assigned to mother as compared with the father in the same category. For example, if the father was a petty businessman (score 3) and mother was a Ph.D. (score 6) lecturer then the total score would be $3 \times 1 + 6 \times 2 = 15$. The minimum score was 0 and maximum score was 18. Hence, the composite score of parent's occupation was categorized as 0–6, 7–12, and 13–18, indicating low influence, moderate influence, and high influence in child-rearing, respectively. The median score was calculated to divide the group into two categories having good or poor parental influence.
2. Education: A professional degree, including a doctor and engineer, and Ph.D. professor/lecturers were scored at 3, undergraduates were scored 2, up to senior secondary education was scored 1, and illiterates were given 0 scores. Twice the value was assigned to mother as compared with the father in the same category. For example, if the father was a professional (score 3) and mother had up to senior secondary education (score 1), then the total score would be $3 \times 1 + 1 \times 2 = 5$. The minimum score was 0 and maximum score was 9. Hence, the composite impact of parent's education was categorized as 0–3, 4–6, and 7–9, indicating low influence, moderate influence, and high influence in child-rearing, respectively. The median score was calculated to divide the group into two categories having good or poor parental influence.

Road safety behavior

It was decided that all those who drove vehicles without a license, drove without safety measures, used mobile phone while driving, or drove under the influence were considered at risk. The overall score ranged from 0–30 and was divided as low- and high-risk behavior using three as the median value.

Data analysis

All data collected were entered into a Microsoft Excel spreadsheet in the form of a master chart. These data were classified and analyzed as per the objectives. Categorical data were expressed in terms of either frequency or proportions. Continuous data were expressed in terms of mean with standard deviation (SD). Inferential statistics, such as Chi-square test and odds ratio (OR) with confidence interval (CI), was used to find out association. "Microsoft Excel" and "Primer" were used for data analysis.

Ethical clearance was taken from the institutional ethical committee and assent or consent was taken from each participant (Ethical approval was taken on 19 Nov 2016 from Ethical

Committee of SMS Medical College, Jaipur). Privacy and confidentiality of data were ensured by asking not to write down the names of the students and collection of questionnaires was done in a sealed carton with a thin slit.

Results

Most of the participants (67.56%) were in the age group 13–16 years and majority were Hindus. Almost equal proportion belonged to nuclear (50.3%) and joint (49.7%) families. Sixty-seven percent belonged to middle-class while only 8% were from upper class. Parents of 29% and 23% of the adolescents were positioned at "low" or "highly positive parental influence" category, respectively, based on their parent's occupations score. Combined education score of parents depicted that majority (48%) of the study population had their parents highly positioned while 38% were at a low position. Only 17% of the adolescents were from the arts stream, 37.67% belonged to science, and 45.12% were from commerce. Thirty-seven percent of the adolescents were malnourished while 4.56% were obese and 15% were overweight. The majority (96.5%) of the adolescents stayed with their parents.

Three-fourth of the study population (682/900) were driving one or the other type of vehicle to commute. Out of which, 64% were exposed to high-risk road safety behavior. There is no statistically significant difference in the two age groups. Considering adolescents from a joint family get less attention from parents and are pampered by grandparents, they were more exposed to high-risk behavior on roads OR was calculated and there was 1.5 times more risk to an adolescent of joint family on roads (OR = 1.48, 95% CI 1.08–2.03). When both the parents were positioned on the basis of their combined occupation, it was observed that the risk on roads was decreasing with rising position of parents ($P < 0.001$), three out of four adolescents of lower-positioned parents were at high risk of road safety behavior. A lesser proportion of adolescent from upper middle class and upper class are exposed to high risk on roads though statistically significant association could not be elicited ($P = 0.06$). No other variable had significant association on road safety behavior [Table 1].

Multiple logistic regression analysis

A step-wise logistic regression analysis was done to find out independent determinants of high-risk behaviors for road safety among adolescents. Significantly associated variables identified in univariate analysis, i.e. type of family and influence of parent's occupation were put into the model. Probability of removal from the model was kept at $P > 0.10$ and to keep in the model was at $P < 0.05$. Overall, the model fit was found to be statistically significant ($P < 0.001$). Living in a joint family was found to have a significant risk for road safety (OR 1.42; 95% CI 1.03–1.95) along with the high influence of parent's occupation (OR 2.13;

Table 1: Cross-tabulation between road safety behavior and sociodemographic characteristics among adolescent drivers (*n*=682)

Study Variables	Sub-group	Total (*n*=682)	High Risk *n*=434 (63.6%)	Low Risk *n*=248 (36.4%)	*P*
Age Group	13-16 years	456	286 (62.7)	170 (37.3)	0.53
	17-19 years	226	148 (65.5)	78 (34.5)	
Family Type	Nuclear	351	208 (59.3)	143 (40.7)	0.02
	Joint	331	226 (68.27)	105 (31.72)	
Sex	Male	383	242 (63.18)	141 (36.81)	0.84
	Female	299	192 (64.21)	107 (35.78)	
Socio-economic Status	Upper	57	30 (52.63)	27 (47.36)	0.06
	Upper Middle	205	119 (58.05)	86 (41.95)	
	Lower Middle	257	175 (68.09)	82 (31.90)	
	Upper Lower	135	91 (67.40)	44 (32.59)	
	Lower	28	19 (67.85)	9 (32.14)	
Both Parent's Occupation Score	Low position	165	94 (56.97)	71 (43.03)	<0.001
	Moderate position	334	201 (60.17)	133 (39.82)	
	High position	183	139 (75.95)	44 (24.04)	
Both Parent's Education Score	Low position	364	222 (60.98)	142 (39.01)	0.29
	Moderate position	104	68 (65.38)	36 (34.61)	
	High position	214	144 (67.28)	70 (32.71)	
Education Stream	Science	262	159 (60.68)	103 (39.31)	0.33
	Commerce	306	197 (64.37)	109 (35.62)	
	Arts	114	78 (68.42)	36 (31.57)	
BMI (Kg/m^2)	Under Weight (<18.5)	247	155 (62.75)	92 (37.24)	0.47
	Normal (18.5-23)	307	196 (63.84)	111 (36.15)	
	Overweight (23-27.5)	102	70 (68.62)	32 (31.37)	
	Obese (>27.5)	26	13 (50.00)	13 (50.00)	
School Type	Government	375	247 (65.86)	128 (34.14)	0.21
	Private	307	187 (60.91)	120 (39.08)	

BMI=Body mass index

95% CI 1.45–3.12). The proportion of cases correctly classified by this model was 63.6% [Table 2].

The majority (49%) of the adolescents were driving two-wheeler, out of which 40% and 59% were driving motorcycle and scooter, respectively. Safety belt was not used by 28% while 49.5% of two-wheeler drivers did not use helmet. Seventy-two percent car drivers and 76.6% two-wheeler drivers were driving without license. More than 50% car drivers and 27% two-wheeler drivers used mobiles while driving. Driving under the influence was 10.6% in car drivers and 5.14% in two-wheeler users [Table 3].

Discussion

This study was carried out among school-going adolescents of class 11th and 12th in Jaipur city. Almost three-fourths of the respondents were "at-risk" as far as behaviors related to safety on roads were concerned, similar observations were made by authors from Delhi.[11] We found that half of the adolescents were driving two-wheelers. However, in another study done in Aurangabad,[12] about three-fourth were driving two-wheelers. Aurangabad city has many educational institutes, and the residential area is in outskirts of the city. The distance from the residential area to workplace, schools, and colleges has increased and, moreover, busy parents also might have led to increased vehicle use among adolescents. Safety belt was not used by about 30% of the car drivers and half of the two-wheeler drivers did not use helmets. In Spain, in a large cohort, a house-to-house survey documented the proportion as 16%.[13] The proportion of two-wheeler drivers not using helmet was 10% in the study by Deborah Carvalho Malta,[14] where students from ninth standard were included in the study. Seventy-two percent car drivers and 76% two-wheeler drivers drove without license, similar finding (68%) were found by Salve.[12] Subhashisa Swain[10] found the prevalence of 75% individuals who did not use either helmet or seatbelt while driving. Every third adolescent used a mobile phone while driving in our study, a similar result was found in the study by Subhashisa Swain.[10] Whereas, a significantly high (73%) proportion was found in the study by Dellinger,[15] maybe because, in this study, nurses and doctors responded on behalf of admitted adolescents of accident cases. In a study conducted by Pulido *et al.*, it was documented that 6.4% were using mobile phones while driving.[13] In the present study, more than half of the car drivers and around one-fourth of the two-wheeler drivers used mobiles while driving. A study from Aurangabad observed that 32% of adolescents used mobile while driving two-wheelers.[12] The observation of driving under the influence is more (10%) during car driving than two-wheeler driving (5%) in our study, and it was explained by the fact that more two-wheelers are used for commuting to school and more cars are used for fun trips or out-of-school activities. The study depicts that there is 1.5 times more risk to adolescents of joint families on roads. Adolescents of highly positioned parents had significantly more risk on roads maybe because they had easy access to motorized vehicles and smart mobile phones.

Table 2: Multiple logistic regression analysis documenting independent factors associated with road safety

Variables	OR (95% CI)
Family type	
Joint	1.42 (1.03-1.95)
Nuclear	Reference category
Parents Occupation Influence	
High	2.13 (1.45-3.12)
Low	Reference category

OR=Odds ratio, CI=Confidence interval

Conclusion

Almost 75% school-going students drive vehicles and majority of them were found to be at risk on roads while driving. Most of them do not use a safety belt or helmet while driving. Driving under alcohol influences was found increased among youth. Young children do not understand or react to complex traffic situations in the same way as adults and lack certain abilities, which increase their risk to road traffic crashes. Road safety initiatives need to be planned by leaders and policymakers, taking into consideration children's vulnerabilities, inexperience, and developmental need for life.

Road safety should be embedded in the concept of universal health coverage and needs to be a part of training for the primary care physicians in India. Primary care physicians are the axis of first-contact care in all cases of RTI. So, family medicine-trained primary care experts should learn the art of capacity building of the "first responders" and take initiatives to train them so that they can serve the last man on the road.[16]

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Table 3: Use of safety measures (helmet and seat belt) on road as per the type of vehicle

Type of vehicle (n=682#)	No. (%)	Not using any safety measures no. (%)	Use of Mobile Phone While Driving no. (%)	Driving under the influence (Drug/alcohol) no. (%)	Driving without license no. (%)
Car	104 (15.2)	29 (27.9)	54 (51.9)	11 (10.6)	75 (72.1)
Motorcycle	274 (40.1)	145 (52.9)	85 (31.0)	20 (7.3)	226 (82.5)
Scooter	404 (59.2)	186 (46.0)	97 (24.0)	12 (2.9)	286 (70.8)
Cycle	195 (28.6)	102 (52.3)	30 (15.4)	7 (3.6)	NA

#Total is more than "n" because more than one type of vehicle is driven by a student

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Conflict of interest

There is no conflict of interest.

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