



The road user behaviour of school students in Iran



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ABSTRACT

The present study developed a Persian version of the Adolescent Road User Behaviour Questionnaire (ARBQ) and investigated the psychometric properties of the scale in a sample of school students in the province of Tehran (Iran). In total 1111 adolescents completed the Persian version of the ARBQ. Exploratory factor analysis, using the shortened 21-item version of the scale revealed the presence of three reliable factors which were also supported using confirmatory factor analysis.

According to this research, engagement in dangerous playing in the road was significantly higher among males, residents of large urban areas, students from private schools, students in the south of Tehran, those who reported relatives or friends had been killed in a road crash and those with a personal history of road accidents. Moreover, older adolescents, those who reported relatives or friends having been killed in a road crash and those with a traffic accident history reported higher involvement in unsafe crossing behaviour. Females, older adolescents, residents of small urban areas, students from schools in small urban areas and those with an accident history also reported less frequent engagement in planned protective behaviours.

This study confirms that the ARBQ is a useful framework for investigating adolescents' on-road behaviours in Iran. This research also showed that adolescents put themselves at risk by engaging in hazardous behaviours. As is the case in most countries, this study revealed the need for interventions, such as education and enforcement to improve the on-road safety culture amongst Iranian adolescents.

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1. Introduction

Road traffic accidents pose a major public health problem by causing a large number of injuries, disabilities and fatalities, especially in the low and medium-income countries (Peden et al., 2004; Olukoga et al., 2011; Olukoga, 2003). This is also the case for Iran, which in 2010 recorded a total of 414,161 injuries and 23,249 deaths. The number of fatalities translates into a rate of 12.4/10,000 registered vehicles, which is substantially higher than in most developed countries, such as New Zealand (1.2/10,000 registered vehicles), Austria (1.0/10,000 registered vehicles), the USA (1.3/10,000 registered vehicles) and is more than twenty times higher than the 0.6/10,000 registered vehicles reported by the UK (NZTA, 2011; Bahadorimonfared et al., 2013). Furthermore, the Iranian Forensic Medicine Organization (2012)

reported that from 2006–2011 a total of 120,070 people died on Iranian roads and of these 7565 (6.3%) were adolescents aged between 11 and 17 years old.

A number of studies have reported that adolescents have an inflated risk of being killed or injured on the roads (Elliott and Baughan, 2004; Sullman and Mann, 2009; Sullman et al., 2011, 2012). One of the reasons for this inflated risk is that adolescents carry out a variety of unsafe and potentially risky on-road behaviours which increases the risk of being killed or injured on the road (West et al., 1998; Poudel-Tandukar et al., 2006; Campbell and Keegan, 2000; Elliott and Baughan, 2004; Sullman and Mann, 2009; Sullman et al., 2011, 2012).

One important step for improving the safety of Iranian adolescents is to understand the behaviours that put them at greater risk of being killed or injured on the road. Although there is currently no widely agreed upon framework for investigating the on-road behaviours of adolescents, one which has been utilised in several countries across the world is the Adolescent Road User Behaviour Questionnaire (ARBQ; Elliott and Baughan, 2004). Using

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data from adolescent school students in the UK, Elliott and Baughan investigated the psychometric properties of their 43-item ARBQ and found three factors best described their data. The first factor consisted of items relating to crossing the road in an unsafe manner (e.g. run across a road without looking because you are in a hurry), which they called “unsafe crossing behaviour”. The second factor, “dangerous playing in the road” consisted of items involving playing on the road (e.g. hold on to a moving vehicle when riding a bike). In contrast the third factor “planned protective behaviours” was comprised of safety behaviours that reduce the chance of being killed or injured on the road (e.g. wear bright or reflective clothing when out on foot in the dark). The items of the ARBQ measure not only different types of pedestrian behaviours but also a small number involving: bicycles, skateboards and rollerblades (e.g. use lights on your bike when it is dark). Elliott and Baughan also developed a short 21-item version of the scale, which reflected the same three factors and was developed for use in conjunction with other psychometric scales.

The psychometric properties of the ARBQ have also been investigated in New Zealand (Sullman and Mann, 2009), Spain (Sullman et al., 2011), Belgium (Sullman et al., 2012) and France (Abou et al., 2008). These studies all supported the presence of the three factors and the three factors were also supported for the 21-item version of the scale in Spain and Belgium using confirmatory factor analysis. However, these findings contrast with the New Zealand research which produced a 19-item version of the scale using exploratory factor analysis (Sullman and Mann, 2009).

Although there were considerable differences between the four studies which have used the ARBQ, in terms of different: countries, populations, cultures, ethnic groups, languages, traffic conditions and rules, road traffic environments and population densities, there has been a surprising number of consistent findings. For instance, in terms of gender, in all four studies male students reported more frequent engagement in playing on the road than female adolescents (Elliott and Baughan, 2004; Sullman and Mann, 2009; Sullman et al., 2011, 2012). Although, the New Zealand study did not show statistically significant differences between gender and unsafe crossing behaviour (Sullman and Mann, 2009), the other three studies all found that males were more likely to be involved in these types of potentially risky behaviours (Sullman et al., 2011, 2012). However, none of the previous studies found a significant relationship between planned protective behaviour and gender.

There were also similarities in the relationships the different ARBQ factors had with age. For example, the English and Spanish studies found that older adolescents reported more unsafe crossing behaviour, while also engaging less often in planned protective behaviour and dangerous playing in the road (Elliott and Baughan, 2004; Sullman et al., 2011). In Belgium, adolescents who were 11–12 years of age reported a lower frequency of unsafe road crossing behaviour, than those aged 13–14 years and greater than 15 years of age (Sullman et al., 2012). Finally, the Belgian research also found that younger respondents reported more planned protective behaviour than older adolescents (Sullman et al., 2012), as was also the case in the UK and Spanish studies (Sullman et al., 2011, 2012). However, as the New Zealand research used very different age categories it was not possible to compare their results with the other ARBQ studies (Sullman and Mann, 2009).

As well as age and gender, the ARBQ factors have been found to be related to an adolescent’s place of residence. Elliott and Baughan (2004) found that students from large urban areas reported engaging more often in unsafe road crossing behaviours than those from rural and small urban areas. Furthermore, adolescents living in large urban areas reported less frequently engaging in dangerous playing on the roads than adolescents from rural areas, while rural residents reported more planned protective behaviours than those

from small and large urban areas. However, in contrast to the UK research there were no statistically significant differences between living areas and the ARBQ factors in New Zealand, Belgium or Spain (Sullman and Mann, 2009; Sullman et al., 2011).

As would be expected, given the fact that the ARBQ investigates behaviours thought to be important for road safety, previous research has found that adolescents who self-reported previous involvement in a road crash also reported more frequently engaging in the two types of potentially risky behaviours and also, unexpectedly, planned protective behaviours (Sullman et al., 2012). Also surprising was the fact that thus far only one study has investigated the relationship the ARBQ factors have with prior crash involvement. As there is only one study, this relationship may be an anomaly or confined solely to Belgium. Therefore, it is important that research be conducted to test this relationship in a novel sample and preferably in a novel country and culture. Another important gap in the literature is that all previous research using the ARBQ has been conducted in developed countries. This is a particularly important limitation as the size of the road safety problem, in terms of injuries and fatalities, is considerably larger in less developed countries. Therefore, the present study investigated the psychometric properties of the ARBQ in Iran, a developing country with a non-European culture and background. The replication of these findings is a critical step to confirm the suitability of the ARBQ as a framework to measure road user behaviours in this at-risk age group. More specifically, the present study investigated the factor structure of the ARBQ in a large sample of Iranian school students using both exploratory and confirmatory factor analysis for the long and short versions of the ARBQ. The study also investigated the relationships the resultant factors had with age, gender, place of residence, along with the individuals’ accident history and those of their friends and family.

2. Methods

2.1. Materials

The ARBQ (Adolescent Road-User Behaviour Questionnaire) is a self-report tool for investigating how often participants engage in 43 different road-user behaviours. For example, “How often do you not look because you can’t hear any traffic coming?” Responses are made on a five point Likert Scale (1 = never to 5 = very often). Previous studies have found that the questionnaire is measuring three latent variables: “unsafe road crossing behaviour”, “dangerous playing on the road” and “planned protective behaviour” (Elliott and Baughan, 2004; Sullman and Mann, 2009; Sullman et al., 2011, 2012). These three factors had internal reliability scores of .89, .85 and .76, respectively.

The questionnaire also asked about the participants’ demographic and descriptive details, including: age, gender, nationality, living area, mother’s education level, father’s education level, school type (public or private), school grade, location of the school, along with whether they (or their friends and/or family) had been involved in a road crash.

2.2. Setting and participants

The present cross sectional study was carried out in secondary schools in the province of Tehran, Iran. The sample was comprised of 1200 students from large and small urban areas which were randomly selected. Tehran city was selected as the large urban area and Pishva was selected as the small urban area within the same province. In the 2011 Nationwide Iranian Census Tehran city had a population of 8,244,535 while Pishva had a population of 75,454 (Iranian Statistics Center, 2011).

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