



Original Article

Correct use of safety belts and child restraint devices in cars among children in Goiânia^{☆,☆☆}

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ABSTRACT

Objective: to conduct an observational study, by means of campaigns, regarding the use of child restraint devices in cars in Goiânia.

Methods: this was a cross-sectional study using a convenience sample built up as cases arose. The data were gathered into an Excel spreadsheet and were analyzed descriptively and statistically (SPSS 16.0), using chi-square and taking $p < 0.05$ as significant.

Results: in 2006, 410 cars were evaluated, and in 2010, 544 cars were evaluated. Around 85% of the occupants were using seat belts correctly at both times ($p = 0.650$). In 2006, it was observed that a total of 273 passengers were occupying the rear seats, while in 2010 there were 226. Among these, 178 and 170 were using seat belts, respectively, i.e. 65.2% and 75.22% ($p = 0.001$). In 2006, five children were occupying the front seat without using the seat belt, while in 2010, this number was 42 ($p < 0.001$). In 2010, it was observed that 458 vehicles were transporting children on the rear seats, and this was being done correctly in 214 vehicles, i.e. 46.72%. In 2006, of the 410 vehicles analyzed, only 90 of them (21.95%) were transporting children correctly ($p < 0.001$). In addition, there was a difference in the variables within the year evaluated, in which transportation done correctly in the front seat was much more frequent than transportation done correctly in the rear seats, in both years ($p < 0.001$). Cars transported one to four children, while vans transported one to nine children. In 2006, one van transporting children irregularly was observed, while in 2010 it was done correctly in all cases.

Conclusion: comparing these two years (2006 and 2010) in which data were gathered, we can conclude that changes in behavior among drivers in Goiânia have begun, with regard to safety when transporting children in vehicles, with an improvement of 25% ($p < 0.001$). A large part of this has come through changes in knowledge among this segment of the population, through campaigns that have been carried out, including through the media, and because of legal obligations.

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Uso correto do cinto de segurança e dos dispositivos de restrição infantil em automóveis de Goiânia

R E S U M O

Palavras-chave:

Acidentes de trânsito
Crianças
Prevenção de acidentes
Sistemas de proteção para crianças
Restrição física

Objetivo: fazer um estudo observacional, por meio de campanhas, sobre o uso dos dispositivos de restrição infantil em automóveis de Goiânia.

Métodos: estudo transversal por amostra de conveniência conforme surgimento dos casos. Os dados foram coletados em uma tabela Excel, analisados de forma descritiva e estatística (SPSS 16.0), com o uso do qui-quadrado, com $p < 0,05$ como significativo.

Resultados: em 2006, foram avaliados 410 automóveis, enquanto que em 2010 foram avaliados 544, nos quais cerca de 85% das pessoas usavam o cinto de forma correta nos dois períodos ($p = 0,650$). Em 2006, foram observados 273 passageiros no banco dianteiro e em 2010, 226. Usavam cinto de segurança 178 e 170, respectivamente, ou 65,2 e 75,22% ($p = 0,001$). Em 2006, cinco crianças ocupavam o banco da frente sem o uso do cinto de segurança. Em 2010, esse número foi de 42 ($p < 0,001$). Em 2010, foram observados 458 veículos que transportavam crianças no banco traseiro, 214 de maneira correta, ou 46,72%. Em 2006, dos 410 veículos analisados, apenas 90 (21,95%) transportavam crianças de maneira correta ($p < 0,001$). Além disso, houve diferença entre as variáveis dentro do ano avaliado, no qual o transporte correto no banco da frente foi bem mais frequente do que o no banco de trás, nos dois anos ($p < 0,001$). Carros transportavam de uma a quatro crianças e as vans, de uma a nove crianças. Em 2006 foi observada uma van que transportava crianças de maneira irregular, enquanto que em 2010 todas estavam corretas.

Conclusão: na comparação desses dois períodos, podemos avaliar que houve um início de mudança no comportamento do motorista goianiense no que tange à segurança no transporte de crianças em automóveis, com melhoria de 25% ($p < 0,001$). Grande parte disso decorreu da mudança de atitude da população após as campanhas feitas, até pela mídia, e da obrigatoriedade da lei.

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Introduction

According to the National Traffic Department (DENATRAN), traffic accidents are the main cause of deaths among children aged one to fourteen years in Brazil. In 2008, 22,472 cases of injuries among children up to the age of 12 years, and 802 deaths in the same age group, were recorded.¹ The World Health Organization (WHO) has estimated that in 2015 traffic accidents will be the main cause of morbidity and mortality among children. This situation generates high costs for the healthcare system, especially for developing countries.² According to the mortality information system (SIM) of DATA-SUS (Informatics Department of the National Health System, SUS), there were 5309 deaths due to external causes (as the main cause of death) in the age group from one to fourteen years in 2010, thus representing 31.5% of the total for that year.³

With the aim of diminishing these high accident rates among the youngest age groups, campaigns have been conducted over recent years. Special attention has been given to the use of child restraint devices (CRDs) in vehicles. In Brazil, in conformity with what has already become the reality in other countries, a law regulating the use of these CRDs was created. Resolution no. 277 of the National Traffic Council (CONTRAN), of May 28, 2008,⁴ established minimum safety conditions for transporting passengers under the age

of 10 years in vehicles and clarified the use of CRDs. This law came into force in its year of publication, on an educational basis, and compliance became obligatory from 2010 onwards.

CRDs are popularly known as “child seats” and, according to the CONTRAN resolution, they include “baby comfort seats” or “convertible seats”, which are used up to the age of one year, “child seats” for the ages of one to four years, “booster seats” for the ages of four to seven and a half years, and finally, the vehicle’s own seat belt for children over the age of seven and a half years.⁴ The aim of this study was to conduct observations, through campaigns, regarding CRD use in cars in the city of Goiânia.

Material and methods

This was a cross-sectional study on a convenience sample. In May 2006, a survey was conducted in Goiânia in front of the main private schools, at the time that children arrived, regarding the correct use of protection equipment in vehicles. The data observed included whether the driver was using the seat belt, whether the front-seat passenger was using the seat belt, whether the front-seat passenger was a child or an adult and whether the appropriate CRD was being used on the rear seats. This campaign was supported by the Brazilian Society of Orthopedics and Traumatology (SBOT) in Goiás and the

Student Trauma Association of the School of Medicine, Federal University of Goiás.

A new campaign was conducted in May 2010, in exactly the same format at the first survey. Its aim was to assess whether, after the law became an obligation and safety concepts had been introduced through educational campaigns on correct and necessary use of CRDs, there had been any changes in behavior among drivers in Goiânia.

The data were gathered and stored in an Excel 2007 spreadsheet, and were analyzed descriptively and by means of the SPSS software, version 16.0, using the chi-square statistical test. Differences with $p \leq 0.05$ were considered to be significant.

Results

In 2006, 410 cars were assessed and in 2010, 544. There was no significant difference regarding the drivers' use of seat belts ($p = 0.650$). Around 85% were using the seat belt correctly on both occasions (Fig. 1).

In 2006, there were 273 front-seat passengers and in 2010, 226. Of these, 178 and 170, respectively, were using the seat belt, i.e. 65.2 and 75.22% (Fig. 2). This difference was significant ($p = 0.001$). It is important to highlight that in 2006, five children were using the front seat without using the seat belt, while in 2010, 42 were doing so ($p < 0.001$).

In 2010, 458 vehicles were seen to be transporting children on the rear seats, of which 214 were doing this correctly, i.e. 46.72%. In 2006, of the 410 vehicles analyzed, only 90 (21.95%) were transporting children correctly (Fig. 3). This improvement was significant ($p < 0.001$). In addition, there was a difference between the variables within the year evaluated such that correct transportation on the front seat was much more frequent than on the rear seats, in both years ($p < 0.001$).

Among these vehicles, cars transported one to four children and vans, one to nine children. In 2006, one van transporting children in an irregular manner was observed, while in 2010, all of them were correctly licensed (Fig. 4). There was no significant difference.

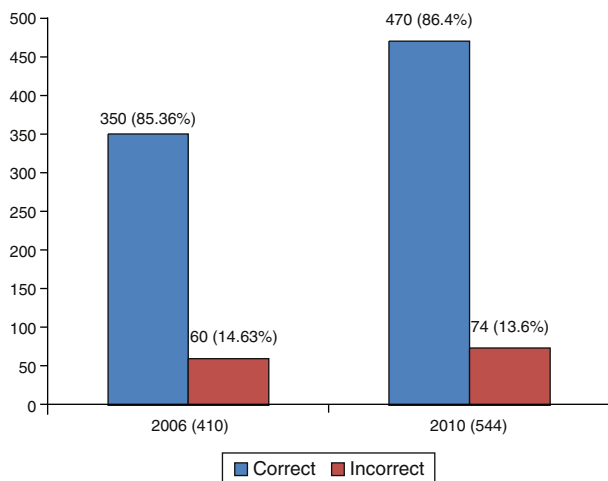


Fig. 1 – Drivers who used seat belts in the two evaluations in 2006 and 2010, without any significant change.

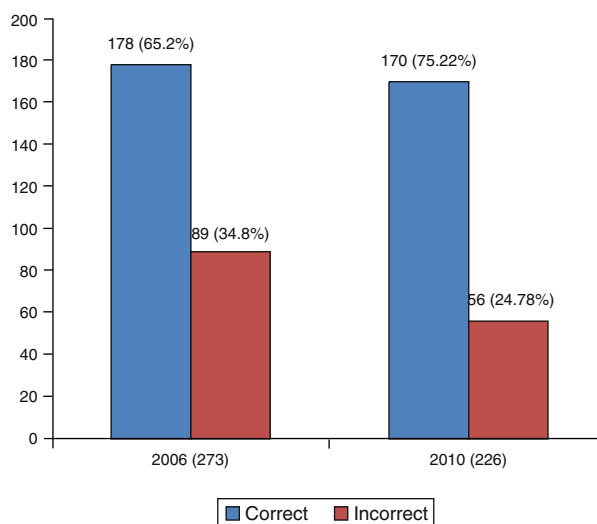


Fig. 2 – Front-seat passengers who used seat belts, with a significant improvement ($p = 0.001$).

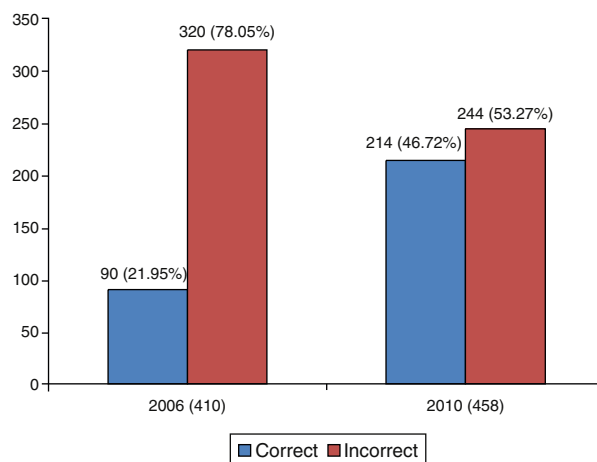


Fig. 3 – Children in the rear seat of the car using a belt or CRD correctly.

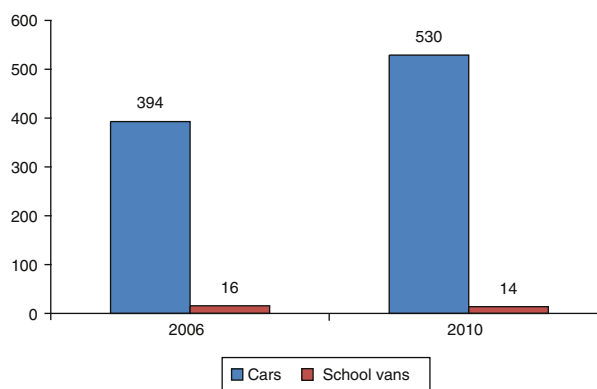


Fig. 4 – Types of vehicle analyzed.

Discussion

In 2010, the United Nations Organization (UNO) published General Assembly Resolution no. 64/255, which proclaimed



Fig. 5 – Information campaign among the population, at school gates, with traffic agents, who noted and gave advice regarding the correct use of CRDs and seat belts.

2011–2020 as the Decade of Action for Road Safety, with the aim of avoiding increases and then achieving decreases in the numbers of deaths in traffic accidents around the world. According to WHO, 1.3 million people die every year in traffic accidents, i.e. more than 3000 per day, and 90% of them in poor or developing countries. More than 30 million people suffer injuries and have sequelae and increased expenditure on recuperation every year, which may reach 3% of these countries' gross domestic product (GDP).²

Correct use of seat belts decreases the risk of death in cases of car accidents by up to 40%.^{5,6} However, this does not adequately prevent injuries among children under the age of 10 years, who suffer abdominal and high thoracic injuries caused by incorrect positioning of the seat belt, and also increased mortality.⁷⁻⁹

In other countries, compulsory use of CRDs dates from the 1980s, and the effect relating to reductions in deaths and serious injuries is already known. This places these devices as the most efficient method for reducing mortality. A study conducted in the state of North Carolina, USA, where the law making use of CRDs compulsory dates from 1985, showed that there was a 42% reduction in deaths and serious injuries among children aged four to 15 years from 1985 to 1994, in comparison with the five years just before the law came into force.¹⁰

To monitor traffic accidents relating to children, studies need to be conducted frequently, in addition to campaigns, since the strategies that have an impact on adults do not have a similar effect among children (Fig. 5). When children are under the age of six years, they depend on adults using CRDs in their cars and making the children use them. After reaching this age, they become capable of fastening their seat belts alone, but the adult driving the car does not always set an example and, in such situations, the child remains unprotected.¹¹⁻¹³

Studies on the impact of using safety devices on children inside cars have only recently been conducted in Brazil, in the same way that the law regulating this is recent. It is not possible to calculate the impact that these measures will have on Brazilian public health. A preliminary study conducted by

the Institute of Applied Economic Research (IPEA) showed that there was a 23% reduction in the absolute number of deaths, comparing the first year in which the law was in force with previous years. However, it was emphasized that the law would need to be in force for a longer period, with greater monitoring of compliance, for data of greater significance to be obtained in the future.¹⁴

For our survey, we started from the idea that drivers who were aware of the potential risks that their passengers run would take safety measures to minimize these risks. However, large-scale measures can only be implemented if there are educational campaigns and laws in this regard. The effects that seat belt use provides, with regard to prevention of fatal injuries or even important sequelae, have long been known. In our survey, on both occasions, there seemed to be high rates of seat belt use among drivers (85% in 2006 and 86% in 2010) and among front-seat passengers (65% in 2006 and 75% in 2010). Nonetheless, even though these numbers may demonstrate that the population is aware of the importance of using seat belts, they are not ideal and are reflected in the degree of concern that these parents have regarding transportation of their children and whether they adhere to using CRDs.

In 2006, we observed the correct use of CRDs in only 90 of the 410 vehicles analyzed, and in 2010, in 214 of the 458 vehicles that were transporting children on the rear seats. This showed that there had been an increase in CRD use of 25.3%. However, we still observed that 132 children were being transported on the front seat and 42 without using the seat belt. In relation to school transport vans, we noted a high concern for safety, even before the advent of the law and the educational campaigns. A similar change occurred decades earlier with the application of seat belt use among drivers and passengers, with campaigns in the media that are now known by the population. Until then, much had been said about seat belt use and little about the importance of CRDs.

We take the view that the adherence to CRD use will be high, partly because of the compulsion of the law. Even so, there will always be the need for educational campaigns, given that these devices are not an integral part of vehicles, like seat belts, and they place an additional financial burden on the population. The impact relating to reduction of morbidity and mortality is directly proportional to the adherence rate and awareness of the benefit of using CRDs. Evidence for this, in the Brazilian context, will have to await a longer time of application of these devices.

We orthopedists, through the national and regional SBOT and individually in relation to our patients, have the duty to engage with the society that we live in, to promote a culture of traffic accident prevention, at all levels and of any type. We cannot allow the lives of thousands of Brazilians to be destroyed within our environment, at any age, and least of all, the lives of our children. Even without deaths, the physical and psychological sequelae resulting from severe trauma remain and permanently limit their future. Patients with multiple trauma, exposed fractures and severe deformities will continue to appear at an exponential rate for as long as the executive branch of government does not police these occurrences and the judiciary does not hand down exemplary punishment. The laws for this already exist, and they simply have to be put into action. We do not have enough

hospital, emergency services, operating theaters, orthopedists and rehabilitation centers to care for so many injuries. Brazil is allowing a generation of victims with sequelae from traffic violence to appear and our future as a developed nation may be compromised.

Conclusion

In comparing the two periods (2006 and 2010) during which data were gathered, we can make the assessment that there were the beginnings of changes in the behavior of drivers in Goiânia, with regard to safety in transporting children inside cars, with an improvement of 25% ($p < 0.001$). A large part of this was due to changes in the population's knowledge, coming from the campaigns conducted, including in the media, and because of the obligatory nature of the law. We believe that greater monitoring of traffic by the authorities, along with better education and explanations for the population through campaigns, may further improve the rates of use of CRDs and seat belts.

Conflicts of interest

The authors declare no conflicts of interest.

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