Pupil behaviour on school buses and potential risk factors for injury: an observational study

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Objective To observe pupil behaviour on school buses in Israel and identify hazards as a basis for improving school bus safety.
Methods Data on student, bus driver and chaperone behaviours and on hazards associated with school buses, bus loading zones and bus stops were collected during an observational study conducted on school buses in rural communities in Israel. This report focuses on observations of student behaviour during school bus rides. Future reports will discuss the other findings. Student behaviours were assessed by means of χ^2 tests and logistic regression models.
Findings Observations were made on 362 rides on 125 buses on which 11 000 pupils travelled to and from school. Seatbelt use among the pupils was limited: on 23% of the rides all pupils fastened seatbelts, while on 42% none did. Seatbelt use was more frequent among primary school pupils than among older pupils. Pupil behaviours, such as rowdiness, noisiness, conflicts between pupils and not remaining seated were observed. These and other unsafe behaviours were more frequent on afternoon bus rides (odds ratio, OR: 3.2, 95% confidence interval, CI: 2.1–5.3), on routes with 5+ bus stops (OR: 4.1; 95% CI: 2.5–6.5) and on rides with primary school pupils (OR: 1.8; 95% CI: 1.2–2.9).
Conclusion Without enforcement, government regulations and seatbelt availability on school buses are not enough to ensure seatbelt usage among pupils. Bus drivers cannot be expected to enforce seatbelt use and deal with pupil misconduct while also driving safely. Innovative strategies for improving pupil behaviour on school buses are needed to increase pupil safety.

Une traduction en français de ce résumé figure à la fin de l'article. Al final del artículo se facilita una traducción al español. الترجمة العربية لهذه الخلاصة في نهاية النص الكامل لهذه المقالة.

Introduction

In Israel, 90% of schoolchildren living in rural communities travel daily by school bus.[1] Since 1 September 2006, seatbelts have been mandatory in all vehicles used for school transportation in Israel.[2] The Ministry of Transportation introduced this seatbelt regulation following a tragic collision between a school bus and a jeep on the last day of the 2004 school year, which resulted in the death of three children and minor to severe injury of 50. The implementation of seatbelts in school buses was thus a response to a single mass casualty event rather than the outcome of research regarding day-to-day bus-related injury risks.

Injury data from countries around the world have shown that bus travel is the safest method for travelling to school.[3,4] Data regarding bus-related injuries among Israeli children show that the majority of casualties are not due to road crashes but rather to outside events, such as children getting on and off the bus or pedestrians crossing near the bus.[5] Although information about injuries related to school transportation in Israel has not been sufficiently recorded, data have been collected from various sources. According to the Ministry of Education – which conducts enquiries on school-related traffic injuries at its discretion, usually when fatalities are involved – 67 students were injured while travelling on school transportation vehicles from 2003 to 2006 (40 were injured in the above-mentioned crash in 2004) (Y Shaul, Department of Traffic Safety, personal communication, 2006). The Israel Trauma Registry collects data on trauma-related hospitalizations. From 2002 to 2005, 75 children aged 6–17 years were hospitalized for bus-related injuries, although the injuries were not specific to a school bus (the data include injuries to children riding on both school and municipal buses, injuries incurred while boarding or disembarking from a bus and injuries caused by a bus while children were crossing a road).[5]

Most studies regarding school transportation safety and injuries have focused on injuries occurring outside the bus, while few have observed pupil behaviour on buses.[6–9] Rowdiness, excessive noise and violence on the bus have been shown to endanger passengers and interfere with bus driver concentration.[6] One study evaluating pupil behaviour measured suspension of bus-riding privileges, bus driver referrals and teacher and bus driver questionnaire responses.[7] A survey of bus drivers found that noise outbursts (61%), out-of-seat activity (48%) and roughhousing (31%) were among the most distracting pupil behaviours.[9] It is both impractical and dangerous to expect bus drivers to manage pupil behaviour and stop disruptions while also ensuring that they are driving safely.

School bus transportation is challenging, in part because new safety measures are continually being developed, modified and assessed. The initial aim of this study was to examine seatbelt usage on school buses following the introduction of the government regulation requiring seatbelts in all buses used for school transportation. However, since on-bus observations were chosen as the most effective method for measuring seatbelt usage, it was decided also to evaluate pupil and bus driver conduct as possible factors affecting school transportation safety.

Methods

An observational study was conducted on board vehicles used for school transportation in Israel between December 2006 and March 2007. The study population consisted of pupils enrolled in the general education system who lived in rural communities

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and travelled by means of school transportation to and from school in both the morning and the afternoon. The study sample was designed on the basis of 18 regional councils in a single geographic region in central Israel. The number of daily school transportation routes (over 1300); the number and type of schools (primary and secondary schools, over 100); route direction (to or from school); school bus category (private, public or regional council bus) and number of pupils studying in each regional council (approximately 31 000) were used to select the study sample. School transportation for children with special needs was excluded. Each observation began at the first bus stop and ended at the final destination. The final study sample included 16 regional councils (two regional councils were not included because they were not responsive in helping with technical needs for the study, such as providing routes and time schedules) and sampled over 20% of the school transportation routes in the designated area.

Nine observers received training from the principal investigator at the Israel National Center for Trauma and Emergency Medicine Research or from the observational coordinator. Observers travelled on buses without identifying themselves or explaining their purpose to the student passengers. Questions directed to drivers were asked either before or at the end of the ride.

The Ministry of Education approved the study and requested that the selected regional councils cooperate. In addition, each regional council traffic coordinator assisted by providing information regarding the number of pupils enrolled in school in each regional council, the number and types of schools, the number and types of buses used for school transportation and the bus routes and schedules.

A pilot study was performed to test the questionnaire, to identify routes and to test validity. Validity was substantiated both during the pilot and during some of the actual observations, in which a second observer was on the same bus. After the observation, the questionnaires were compared for discrepancies. Prior to each observation, transportation coordinators were contacted to ensure no schedule changes. Individual-level variables were not collected.

The questionnaire was designed to identify risk factors for childhood injuries associated with school transportation. The questionnaire covered four major topics: (i) school and bus infrastructure: the area surrounding school bus loading zones and the buses themselves; (ii) bus ride: observations of pupil, bus driver and chaperone behaviours; (iii) hazards: risks associated with the bus ride or bus stops; and (iv) bus driver: experience, training and attitudes. This report focuses on pupils' behaviour during the school bus rides. Future reports will discuss the other findings.

Pupil behaviour was measured by observing the pupils during the bus ride. The observed behaviours included: seatbelt use during the ride, remaining seated while the bus was in motion; remaining seated until the bus came to a complete stop; refraining from rowdiness and extreme noise; refraining from verbal or physical conflict (including aggressive interaction such as wrestling, grabbing or hitting); and not distracting or disturbing the driver. Behaviour was classified as positive if during the ride all of the above behaviours were observed. Pupil behaviour was rated on a scale of 1 to 4: 1 = during the entire ride, 2 = during most of the ride, 3 = during some of the ride, and 4 = none of the ride.

Excel (Microsoft, Redmond, United States of America) and SAS (SAS Institute Inc., Cary, USA) were used for data entry and assessment. χ^2 tests were performed for comparison of student characteristics according to seatbelt use. Logistic regression models assessing student behaviour during the bus ride were used to calculate odds ratios (OR) and 95% confidence intervals (CI). The Hosmer and Lemeshow test was used to measure the goodness of fit of the model.

Table 1. **Study population, schools, buses and type of seatbelt in a study of seatbelt use on school buses in Israel, December 2006–March 2007**

Parameter	Value	
	No.	%
Study population		
Pupils in the geographical area of the study	31 700	100
Observations of school transportation	362	100
Pupils in study sample	~11 000	34.7
Total schools in sample	88	100
Primary schools[a]	50	56.8
Middle/high schools[b]	28	31.8
Combined primary-secondary school	10	11.4
Total buses in sample	125	100
Type of seatbelt in bus		
Lap belts	108	86.4
Lap–shoulder belts	13	10.4
No seat belts	4	3.2

[a] Primary school comprises grades 1–6 (ages 6–12).
[b] Middle and high schools comprise grades 7–12 (ages 12–18).

Results

A total of 362 observations on buses used for school transportation were performed between 17 December 2006 and 7 March 2007. Approximately 11 000 pupils were observed – 35% of the pupils living in the geographical area of the sample population. The observations took place on 125 different buses used for school transportation (Table 1).

Bus and bus ride

The buses used for school transportation were manufactured between 1986 and 2007; 23% were manufactured between 2003 and 2007, while 33% were manufactured between 1986 and 1988. Buses manufactured before 1998 were 3.8 times more likely to have a hazard (e.g. protruding metal rods, broken seatbelts, torn seats or lack of arm rail by the door) than newer buses. Although seatbelts had been installed in almost all of the buses (97%), only 10% were equipped with lap–shoulder belts. Buses lacking seatbelts were at least 10 years old, and 85% of the buses with lap–shoulder belts were newer buses ($P < 0.0001$).

The length of the bus rides ranged from 5 to 80 minutes, with an average length of 26 minutes (standard deviation, SD: 12.6); 69% took up to half an hour. The number of bus stops ranged from

Table 2. **Seatbelt use on school buses among Israeli school pupils by selected variables, Israel, December 2006–March 2007**

Variable	Total		All pupils use seatbelt		Some pupils use seatbelt		No pupils use seatbelt		*P*-value
	No.	%	No.	%	No.	%	No.	%	
Total rides[a]	**351**	**100**	**81**	**23.1**	**124**	**35.3**	**146**	**41.6**	
Time of day									0.2
To school (morning)	**170**	**48.4**	43	25.3	64	37.6	63	37.1	
From school (afternoon)	**181**	**51.6**	38	21.0	60	33.2	83	45.9	
No. of bus stops									>0.05
1–4	**211**	**60.1**	53	25.1	72	34.1	86	40.7	
5+	**140**	**39.9**	28	20.0	52	37.1	60	42.8	
Route length									
<25 minutes	**181**	**51.6**	37	20.4	61	33.7	83	45.8	0.04
>26 minutes	**141**	**40.2**	41	29.1	47	33.3	53	37.6	
unknown	**29**	**8.3**	3	10.3	16	55.2	10	34.5	
School type									<0.0001
Grades 1–6	**200**	**56.9**	70	35.0	83	41.5	47	23.5	
Grades 7–12	**151**	**43.0**	11	7.3	41	27.2	99	65.5	
Chaperone on bus									<0.0001
Yes	**44**	**12.5**	22	50.0	16	36.4	6	13.6	
No	**307**	**87.5**	59	19.2	108	35.2	140	45.6	
Seatbelt type									<0.0001
Lap only	**300**	**85.4**	58	19.3	116	38.7	126	42.0	
Lap–shoulder	**37**	**10.5**	22	59.5	7	18.9	8	21.6	
No belt	**14**	**4.1**							

[a] On 11 rides (3%) seatbelt use was not reported.

1 to 16, with a mean of 4. The maximum number of pupils on a bus was 55.

Seatbelt use

Seatbelt use was observed and recorded on 351 bus rides; on 23% of the rides all the pupils fastened seatbelts and on 42% none did (Table 2). School type (primary versus secondary school), presence or absence of an adult chaperone, seatbelt type (lap versus lap–shoulder belts) and length of ride (more or less than 25 minutes) were associated with seatbelt use. While seatbelt use varied with bus route (to or from school) and number of bus stops, these differences were not statistically significant. Primary school pupils (grades 1–6) were 5 times more likely to fasten seatbelts than secondary school pupils (middle and high school, grades 7–12). On rides in which a chaperone was present, pupils were 2.6 times more likely to fasten seatbelts; on 49% of the bus rides with a chaperone all the pupils fastened seatbelts, compared to 19% on rides without a chaperone ($P < 0.0001$). Interestingly, on buses with lap–shoulder seatbelts pupils were almost 3 times more likely to fasten seatbelts than pupils on buses with lap-only seatbelts (59.5% versus 19.3%).

Pupil behaviour

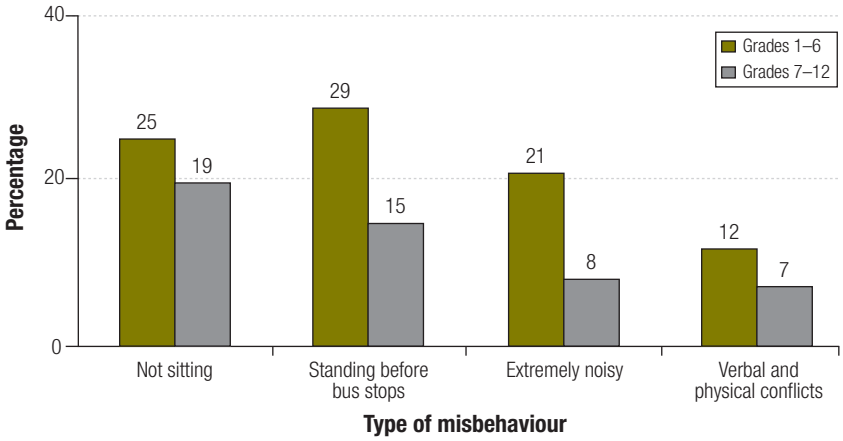
The following pupil behaviours were observed: not sitting while the bus was in motion, standing up before the bus came to a complete stop, being rowdy or extremely noisy, and engaging in physical or verbal conflicts. At least one of these behaviours was reported on 40% ($n = 218$) of the bus rides. Differences in the frequency of unsafe behaviour were observed between bus rides to and from school (27.2% versus 51.3%), between primary and secondary pupils (46.2% versus 31%), and between routes with 1–4 stops and routes with 5 or more stops (27.5% versus 58.3%). The presence of a chaperone and the length of the bus route (in minutes) were not found to have a statistically significant association with these behaviours.

We found that on afternoon rides from school to home pupils were 2.3 times less likely to remain seated while the bus was in motion ($P < 0.0001$), 1.8 times more likely to stand up before the bus came to a complete stop at the bus stop ($P = 0.002$), 2.5 times more likely to be extremely noisy ($P = 0.003$) and 3.2 times more likely to engage in conflicts ($P = 0.005$). We also found that there was a twofold greater chance of observing at least 2 of the above behaviours in the afternoon compared to the morning (22% versus 10%, $P < 0.0001$).

On routes with 5 or more stops compared to 1–4 stops, pupils were less likely to remain seated (34% versus 14.7%; $P = 0.004$) and more likely to stand before the bus came to a complete stop (38.9% versus 11.9%; $P = 0.001$), be extremely noisy (21.5% versus 11.5%; $P = 0.002$) and engage in conflicts (15.3% versus 6.4%; $P = 0.001$). On 28% of the routes with 5 or more stops, at least 2 of the above behaviours were observed, compared to 9% on rides with up to 4 stops ($P < 0.0001$).

Primary school pupils were 2.3 times more likely to engage in at least 2 of the observed behaviours than middle and high school pupils (21.8% versus 9.6%; $P = 0.003$). On 25% of bus rides with primary school pupils, the pupils did not remain seated while the bus was in motion compared to 18.6% of rides with older pupils. Younger pupils were also more likely than older pupils to stand before the bus came to a complete stop (28.6% versus 14.7%; $P = 0.002$), to be rowdy and noisy (21.4% versus 7.7%; $P = 0.002$) and to engage in conflicts (12.1% versus 7.1%; $P < 0.0001$) (Fig. 1).

Fig. 1. **Frequency of misbehaviour[a] on school buses among Israeli schoolchildren, by grade level, Israel, December 2006–March 2007**



[a] Percentage of bus rides on which the behaviour was observed.

Logistic regression for positive pupil behaviour while travelling on the bus considered time of route, number of bus stops and type of school (Table 3). Positive behaviour was greater on the way to school (OR: 3.3, 95% CI: 2.1–5.3), on routes with fewer than 5 bus stops (OR: 4.0; 95% CI: 2.5–6.5) and among middle and high school pupils (OR: 1.8; 95% CI: 1.2–2.9).

Noise, conflicts between pupils, and pupils moving around on a travelling bus were all disruptive to the bus driver. On the basis of observations of pupil and bus driver behaviour and interviews with bus drivers, it was concluded that pupils disturbed the bus driver 4.5 times more on noisy bus rides (48.2%) compared to quiet ones (10.5%; $P < 0.0001$). Similarly, pupils disturbed the bus driver 6 times more on bus rides in which there were conflicts between pupils (66.7%) compared to rides without conflicts (10.7%; $P < 0.0001$).

Discussion

An important finding of this study is that seatbelt use among school-age children and adolescents is not dependent on seatbelt availability or on regulations requiring seatbelts in vehicles used for school transportation. In this study, seatbelts were found to be installed in 97% of the vehicles, yet in 42% of the observations none of the pupils fastened them. Among students in the higher grades, seatbelt use was even less frequent. Although seatbelt use was minimal, certain conditions increased it: use of seatbelts was greater when the bus was equipped with lap–shoulder belts, when a chaperone was present and when the pupils on the bus were primary school children. Hence, the use of better-fitting belts, such as lap–shoulder belts, and the presence of adult chaperones would appear to be more important than regulations or seatbelt availability for increasing seatbelt use, especially among middle and high school students.

While the use of seatbelts has proved to be an effective method for reducing traffic-related injuries and fatalities in private cars, controversy exists over the effectiveness of their use in school buses.[10–12] If seatbelts are to be beneficial, it must be ensured that not only do all school bus passengers wear them, but that they wear them correctly.[10]

Another major finding of this study is that pupil behaviour is highly dependent on other factors in the school bus environment. In general, morning bus rides (from home to school) were calmer, while rowdy behaviour and conflicts between pupils were more common on afternoon rides (from school to home). In addition, unsafe behaviour was more likely to occur on bus routes with 5 or more bus stops and on bus rides with primary school pupils. Pupil conduct not only affected the overall bus environment, but also bus driver concentration.

Bus drivers and transportation coordinators say that it is unrealistic to expect the bus driver to enforce seatbelt use and address misconduct while concentrating on driving safely (focus group with bus drivers and transportation coordinators, April 2007). The risk factors observed in this study, including out-of seat activity, excessive noise and rowdiness, standing before the bus comes to a complete stop and distracting the bus driver, should therefore be addressed through strategies for improving behaviour and enhancing safety during school bus transportation.

The safety of children travelling by means of organized school transportation depends on many factors. In Israel, as in many developed countries, school transportation safety guidelines have been recommended, including codes of conduct for pupils; a "no standing" rule; specialized training and requirement of an outstanding driving record for bus drivers; measures to create a safe road environment, such as school zone speed limits and marked bus and pedestrian fences at waiting areas; and vehicle standards, such as seatbelts, flashing lights and maximum bus age limits.[1,13–16] Initiatives to improve the school bus environment in the United States include assigned seating, surprise bus visits by school authority figures (e.g.

Table 3. **Logistic regression analysis[a] for pupil behaviour on school bus, adjusted for time of ride, number of bus stops and type of school, Israel, December 2006–March 2007**

Variable	No.	% positive behaviour	OR[b]	95% CI	*P*-value
Time of ride					< 0.0001
To school (morning)	173	72.8	3.2	2.1–5.3	
From school (afternoon)	189	48.6	1		
No. of bus stops					< 0.0001
1–4	218	72.5	4.1	2.5–6.5	
5+	144	41.7	1		
Type of school					0.01
Middle/high school	156	68.6	1.8	1.2–2.9	
Primary school	206	53.8	1		

CI, confidence interval; OR, odds ratio.
[a] Hosmer and Lemeshow goodness-of-fit test *P*-value = 0.6.
[b] OR adjusted for other variables in model.

school principals, teachers and policemen), stopping the bus to address rowdy behaviour, teaching appropriate bus behaviour throughout the school year and suspending misbehaved pupils from bus travel.[17,18] While some of these recommendations and interventions are being implemented in Israel, others still need to be assessed and, if proved effective, implemented.

Limitations

The primary limitation of this study relates to bus drivers' behaviours, which may have improved during the observation period (e.g. driving at a lower speed, taking more care to obey traffic laws). However, while we assumed that some of the bus drivers or bus companies might "put on a show" for the observers, we found that, in practice, the observers did not feel that the drivers, students or transportation coordinators altered their demeanour during the observations. Moreover, since misbehaviour was observed and reported by both drivers and pupils, we are confident that our results are reliable. In addition, observers travelled with the same driver on several rides, enabling repeated observation of the driver's behaviour. Another limitation was that individual-level variables such as gender were not assessed.

Conclusion

This is the largest study of its kind of pupil on-bus behaviours based on observations of daily school bus travel to and from school. This study confirms that seatbelt availability and government regulations are not sufficient to ensure seatbelt usage. In order for laws and regulations to be effective they must be enforced. However, responsibility for enforcing seatbelt use and tackling pupil misconduct cannot be assigned solely to the bus driver, whose principle responsibility is to drive safely. Innovative methods for improving pupil conduct on school transportation vehicles should be designed, implemented and evaluated. ■

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الملخص

سلوكيات التلاميذ في الحافلات المدرسية وعوامل الاختطار الكامنة للإصابات: دراسة بالمراقبة

الغرض مراقبة سلوك التلاميذ في الحافلات المدرسية في إسرائيل وتحديد المخاطر كوسيلة أساسية لتحسين السلامة في الحافلات المدرسية

الطريقة لقد جُمعت المعطيات الخاصة بسلوكيات التلاميذ، وسائقي الحافلات، ومرافقي التلاميذ، والأخطار المتعلقة بالحافلات المدرسية، ومواقع ركوب الحافلات ومواقع وقوفها وذلك أثناء دراسة بالمراقبة أجريت على حافلات المدارس في المجتمعات الريفية في إسرائيل. ويركز هذا التقرير على مراقبة سلوكيات التلاميذ أثناء ركوب السيارة. وستناقش التقارير القادمة النتائج الأخرى. وجرى تقييم سلوكيات التلاميذ عن طريق اختبار خي مربع χ^2 ونماذج التحوف اللوجستي.

النتائج أجريت المراقبة على 362 جولة لـ 125 حافلة انتقل فيها 11000 تلميذ لحضور المدرسة والانصراف منها. وكان استخدام حزام المقعد محدوداً بين التلاميذ: ففي 23% من الجولات ربط جميع التلاميذ حزام المقعد، بينما لم يحدث ذلك في 42% من الجولات. وكان تلاميذ المدارس الابتدائية أكثر استعمالاً لحزام المقعد مقارنة بالتلاميذ الأكبر سناً. كما روقبت سلوكيات التلاميذ مثل المشاكسة، والضجيج، والنزاعات، وعدم بقاء التلاميذ في مقاعدهم. وكانت هذه السلوكيات وغيرها من السلوكيات غير الآمنة أكثر حدوثاً في الجولات في فترة بعد الظهر (نسبة الأرجحية: 3.2؛ فاصلة الثقة 95%، 2.1 – 5.3)، وفي الطرق التي تتوقف فيها الحافلة أكثر من خمس مرات (نسبة الأرجحية: 4.1؛ فاصلة الثقة 95%: 2.5 – 6.5)، وفي جولات تلاميذ المدارس الابتدائية (نسبة الأرجحية: 1.8؛ فاصلة الثقة 95%: 1.2 – 2.9).

الاستنتاج إذا لم يجري تفعيل النظم الحكومية وتوفير أحزمة المقاعد في الحافلات المدرسية لن يكون الأمر كافياً لضمان استخدام التلاميذ لهذه الأحزمة. ومن غير المتوقع لسائقي الحافلات أن يتمكنوا من مراعاة استخدام التلاميذ لأحزمة المقاعد والتعامل مع سوء سلوك التلاميذ أثناء قيامهم بالقيادة الآمنة. وهناك حاجة إلى استراتيجيات مبتكرة لتحسين سلوكيات التلاميذ في الحافلات المدرسية لتوفير المزيد من السلامة للتلاميذ.

Résumé

Comportement des élèves dans les bus scolaires et facteurs de risque de traumatisme : étude observationnelle

Objectif Observer le comportement des élèves dans les bus scolaires israéliens et identifier les dangers en vue d'améliorer la sécurité de ces bus.

Méthodes Des données sur les élèves, les chauffeurs de bus et le comportement des accompagnateurs, ainsi que sur les dangers associés aux bus scolaires, à leurs zones d'embarquement et à leurs arrêts, ont été collectées dans le cadre d'une étude observationnelle menée sur les bus scolaires de communautés rurales israéliennes. Le présent rapport porte principalement sur les observations du comportement des élèves pendant les trajets en bus. Des rapports ultérieurs examineront les autres résultats. Ces comportements ont été évalués par des tests du χ^2 et des modèles de régression logistique.

Résultats Les observations ont été réalisées sur 362 trajets effectués par 125 bus à bord desquels 11 000 élèves ont voyagé pour rejoindre ou quitter leur école. L'utilisation des ceintures de sécurité par les élèves était limitée : tous les élèves avaient leur ceinture attachée sur 23 % des trajets, tandis que sur 42 % d'entre eux, aucun élève n'avait bouclé sa ceinture. L'usage de la ceinture était plus fréquent chez les élèves du primaire que chez les élèves plus âgés. Les comportements des élèves tels que chahut, bruit, conflit avec d'autres élèves et station debout en dehors des arrêts, ont été observés. Ces manifestations et d'autres comportement à risque étaient plus fréquents dans les bus de fin de journée (Odds ratio, OR : 3,2 ; intervalle de confiance à 95 %, IC : 2,1-5,3), sur les trajets comportant plus de 5 arrêts (OR : 4,1 ; IC à 95 % : 2,5-6,5) et sur ceux impliquant des élèves du primaire (OR : 1,8 ; IC à 95 % : 1,2-2,9).

Conclusion En l'absence de mesure coercitive pour faire appliquer le port de la ceinture, l'existence d'une réglementation et la disponibilité de ceintures de sécurité sur les bus ne suffisent pas pour obtenir que tous les élèves soient attachés. On ne peut attendre des chauffeurs de bus qu'ils puissent faire appliquer le port de la ceinture et s'opposer aux mauvais comportements des élèves, tout en conduisant sans risque. Des stratégies innovantes pour améliorer le comportement des élèves dans les bus scolaires sont nécessaires si l'on veut renforcer la sécurité des passagers de ces bus.

Resumen

Comportamiento de los alumnos en los autobuses escolares y posibles factores de riesgo de traumatismos: estudio observacional

Objetivo Observar el comportamiento de los alumnos en los autobuses escolares en Israel y determinar los riesgos asociados como base para mejorar la seguridad en esos vehículos.

Métodos Mediante un estudio observacional llevado a cabo en autobuses escolares en comunidades rurales de Israel, se reunieron datos sobre el comportamiento de los estudiantes, los conductores de autobús y los acompañantes, y sobre los peligros asociados a los autobuses escolares, las zonas de recogida de pasajeros y las paradas de autobús. Este trabajo se centra en las observaciones relativas al comportamiento de los estudiantes durante los viajes en autobús escolar, y en futuros trabajos se considerarán los otros resultados. El comportamiento de los estudiantes fue analizado mediante pruebas de ji cuadrado y modelos de regresión logística.

Resultados Las observaciones corresponden a 362 viajes realizados por 125 autobuses para transportar hasta o desde la escuela a un total de 11 000 alumnos. Los alumnos hicieron un uso escaso del cinturón de seguridad: en el 23% de los viajes todos los alumnos se abrocharon el cinturón, mientras que en el 42% de los casos ninguno lo hizo. El uso del cinturón de seguridad fue más frecuente entre los alumnos de primaria que entre los alumnos de mayor edad. Se observó el comportamiento de los alumnos, como el grado de alboroto, el ruido, los conflictos entre ellos y su tendencia a levantarse del asiento. Estas y otras conductas de riesgo fueron más frecuentes en los viajes realizados por la tarde (razón de posibilidades, OR: 3,2; intervalo de confianza del 95%: 2,1–5,3), en las rutas con más de 5 paradas (OR: 4,1; IC95%: 2,5–6,5) y en los viajes con alumnos de escuelas primarias (OR: 1,8; IC95%: 1,2–2,9).

Conclusión Sin medidas de vigilancia del cumplimiento, la normativa existente y la implantación del cinturón de seguridad en los autobuses escolares no son suficientes para garantizar el uso del cinturón entre los alumnos. No se puede esperar de los conductores de autobús que obliguen a usar el cinturón de seguridad y que atajen la mala conducta de los alumnos sin dejar de prestar la debida atención a la conducción. Se requieren estrategias innovadoras para mejorar el comportamiento de los alumnos en los autobuses escolares y aumentar su seguridad.

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