

SHORT REPORT

Adolescent injuries in relation to economic status: An international perspective

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Background

Injuries account for a large proportion of morbidity and needs for medical care in otherwise generally healthy school children. Improved understanding of the social context of injuries could help to focus more effective injury prevention interventions.

The Health Behavior in School-Aged Children (HBSC) study^{1,2} is a multinational quadrennial school-based survey conducted since 1983, using representative samples of 11, 13 and 15-year-old students. In 1997–98, 12 countries (Flemish Belgium, Canada, England, Estonia, Hungary, Israel, Lithuania, Poland, Republic of Ireland, Sweden, Switzerland, and the USA) collected information regarding the epidemiology of medically attended non-fatal injuries among school children,³ thus providing an opportunity to investigate the relationship between the influence of social and economic status and of risk of injury.

This study also provides an opportunity to examine the relationships from an international perspective and to show similarities and differences between different countries. The application of the same standard questionnaire in different countries permits analyses of a large sample by combining results obtained from all participating HBSC members.

Objective

The aim of this study was to evaluate the relationship between self-perceived family economic status and non-fatal injury rates in young adolescents.

Materials and methods

The analysis was based on the results from the 1997–98 HBSC survey using combined nationally representative samples from the 12 countries, comprising 53,533 students without missing values for two key questions (94.6%). In the above sample, 22,123 students reported at least one injury.

Injuries were measured by seven items: The first question measured the number of medically attended injuries occurring to the respondent during the previous 12 months. The following questions described the most serious injury by location of the event, activity context, nature of injury, and severity determined by lost school days and medical treatment (having a cast put on or receiving stitches, needing crutches or a wheelchair, surgery or overnight hospitalization). Cases that needed at least one of the above-mentioned treatments were defined as a relatively severe injury.¹

In the 1997–98 HBSC survey, social class was measured by the following variables: father's occupation, mother's occupation, family car ownership, child's bedroom occupancy, subjective family affluence and family holidays, and combined family affluence scores were developed.^{1,2,4} In the present study, only the subjective perception of being 'well off' was chosen as the primary variable for social inequality. Students were asked to indicate, on a 5-level scale: 'How well off do you think your family is?' (very well off, quite well off, average, not very well off, not at all well off).¹

Significant differences in family 'well off' perceptions were observed between countries. The percent of families classified as 'very well off' ranged from 0.8% (Estonia) to 33.9% (USA); the percent of families 'not at all well off' from 0.7% (Estonia) to 4.4% (USA).

The percentage of students reporting injuries was calculated for the five social classes (social specific injury rate): (1) on the basis of the combined sample as total and by gender, age, severity, location of event and activity context, and (2) on the basis of national data subsets only. The differences between injury rates within social classes were tested for separate countries by the chi-squared Pearson test and the test for linearity of associations using the SPSS package.

Results

In the total combined sample, 41.3% of students reported at least one medically attended injury in the prior 12 months.

The percentage of injured students ranged from 24.1% in Poland to 50.4% in Israel.*

The risk of injury was increased for both the highest and the lowest economic group (Table 1). Students who described their family economic status as ‘average’ and ‘not very well off’ were at the lowest risk of injury.

Overall, boys in all countries reported more injuries than girls (47.1% vs. 35.9%). By age, the overall risk of injury was the highest for 13-year-old students (41.6% vs. 42.6% vs. 39.9%); however, in some countries, the risk of injury increased with age (Belgium, Canada, Sweden) and in others it decreased with age (Israel, Lithuania).

*Data for Israel weighted for the Jewish and Arab population.

Table 1. Injury rates (per 100 students) by family economic status – combined sample from 12 countries.

| Group of Students | Family economic status | | | | |
|-------------------|------------------------|----------------|---------|-------------------|---------------------|
| | Very well off | Quite well off | Average | Not very well off | Not at all well off |
| All injuries | 48.0 | 43.2 | 38.6 | 37.9 | 44.3 |
| Boys | 52.6 | 48.4 | 44.8 | 43.5 | 49.7 |
| Girls | 42.5 | 37.7 | 33.3 | 33.6 | 40.3 |
| 11 years | 48.5 | 42.5 | 38.0 | 36.5 | 49.2 |
| 13 years | 48.5 | 43.9 | 40.5 | 39.0 | 42.9 |
| 15 years | 46.2 | 43.1 | 37.3 | 37.8 | 41.4 |
| Severe cases** | 24.0 | 19.6 | 17.4 | 17.4 | 24.3 |

**Eleven countries without Sweden.

Table 2. Injury rates (per 100 students) by family economic status in different countries.

| Country | Family economic status | | | | | Significance | |
|-----------------|------------------------|----------------|---------|-------------------|---------------------|----------------|----------------|
| | Very well off | Quite well off | Average | Not very well off | Not at all well off | p ₁ | p ₂ |
| Flemish Belgium | 41.4 | 32.4 | 28.8 | 30.5 | 31.5 | 0.028 | 0.089 |
| Canada | 37.7 | 39.9 | 36.8 | 36.6 | 36.3 | 0.277 | 0.178 |
| England | 52.0 | 43.4 | 39.1 | 41.4 | 43.9 | 0.000 | 0.000 |
| Estonia | 60.0 | 53.4 | 43.0 | 47.4 | 41.7 | 0.048 | 0.173 |
| Hungary | 54.0 | 49.9 | 45.0 | 43.6 | 41.3 | 0.002 | 0.000 |
| Israel* | 54.6 | 48.6 | 47.1 | 54.0 | 71.4 | 0.000 | 0.000 |
| Lithuania | 60.5 | 40.4 | 37.9 | 37.2 | 44.9 | 0.000 | 0.058 |
| Poland | 35.0 | 22.8 | 24.5 | 23.5 | 21.9 | 0.050 | 0.337 |
| Ireland | 52.4 | 52.1 | 47.4 | 54.2 | 54.4 | 0.027 | 0.142 |
| Sweden | 38.2 | 33.6 | 36.1 | 36.0 | 41.8 | 0.166 | 0.695 |
| Switzerland | 44.1 | 46.2 | 45.3 | 48.8 | 50.0 | 0.486 | 0.213 |
| USA | 47.7 | 46.8 | 46.4 | 47.4 | 54.2 | 0.309 | 0.517 |

p₁ – Pearson chi-square; p₂ – linear-by-linear association.

*Data for Israel weighted for the Jewish and Arab population.

Of the total number of reported injuries, 41.5% needed advanced medical treatment or rehabilitation. The proportion of such relatively severe injuries varied from 15.2% (Switzerland) to 60.3% (Belgium). The overall frequency of severe injuries was 19.1% and ranged from 7.5% (Switzerland) to 26.8% (Hungary).

The U-shaped relationship between injury rates and family material status was observed for boys and girls, for three age groups, and for the more severe cases (Table 1). Although the relationship is U-shaped for both total and severe injuries, an important difference is observed. For total injuries the frequency is highest for those ‘very well off’, while for more severe injuries there is no difference between the two marginal categories. However, the percentage of more severe cases is much higher for students

‘not at all well off’ than in the remaining economic groups (Table 1).

Differences between countries in the shape of that relationship are illustrated in Table 2. The relationship was not statistically significant in Canada, Switzerland, Sweden and the USA. In Canada, the proportion of injured students tended to decrease but in the next three countries it increased for the poorest students. For the remaining eight countries the relationship was statistically significant and for five of these countries the pattern was U-shaped on the figure, with the lowest rate just in the middle category ‘average’.

In Flemish Belgium, England, Estonia, Hungary, Lithuania and Poland, the highest injury rates were reported by students from ‘very well off’ families, but in Israel and the Republic of Ireland by students from ‘not at all well off’ fam-

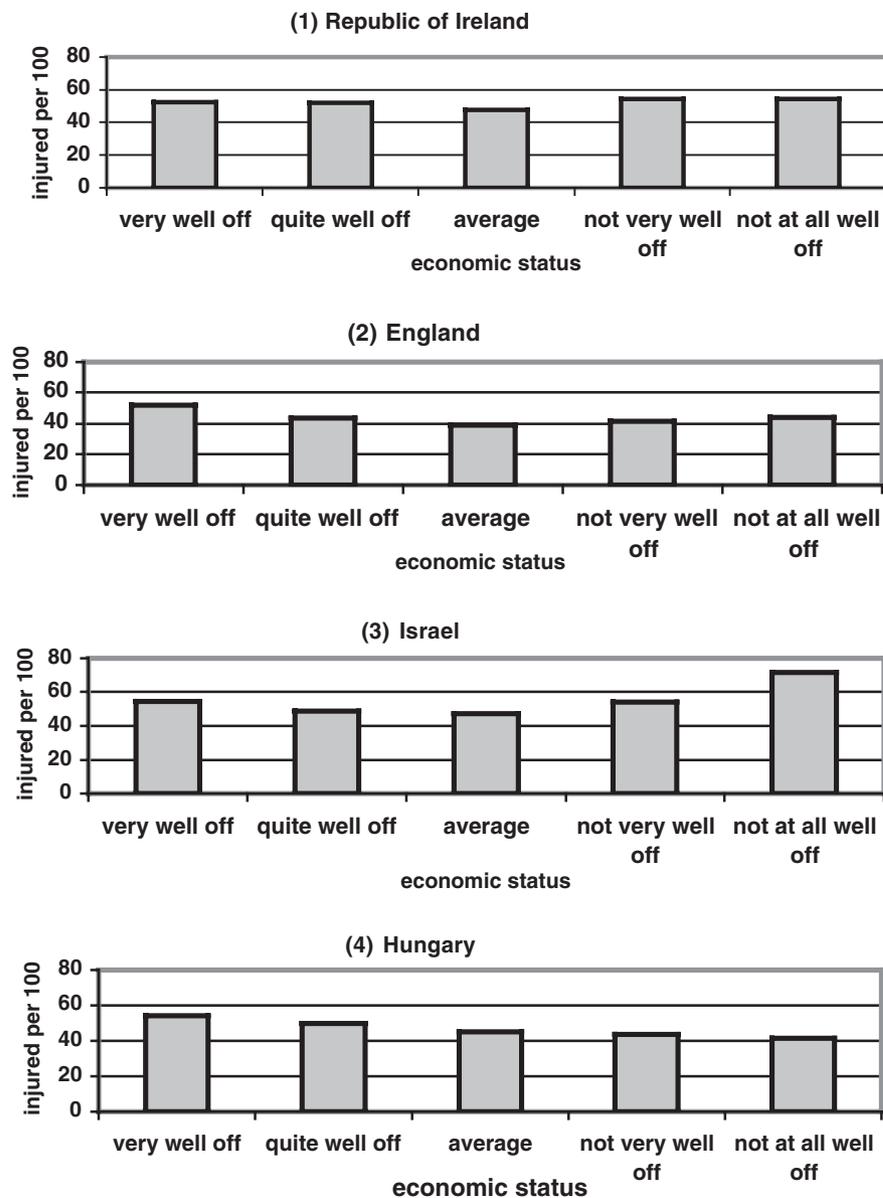


Figure 1. Distributions of percentage of students reporting injuries by perceived economic status.

Table 3. Injury rates (per 100 students) by family economic status and injury events* – combined sample from 10 countries.

| Type of activity | Family economic status | | | | |
|---------------------|------------------------|----------------|---------|-------------------|---------------------|
| | Very well off | Quite well off | Average | Not very well off | Not at all well off |
| Biking | 5.2 | 3.3 | 3.3 | 3.1 | 3.5 |
| Skating | 3.3 | 2.4 | 2.1 | 1.9 | 2.5 |
| Sports | 12.6 | 10.5 | 9.4 | 7.6 | 11.1 |
| Riding in a car | 1.1 | 0.9 | 0.7 | 0.8 | 1.1 |
| Walking/ Running | 4.4 | 3.6 | 4.2 | 4.0 | 5.1 |
| Fighting | 1.6 | 1.1 | 1.2 | 1.2 | 2.7 |
| Others | 6.1 | 6.2 | 5.9 | 7.2 | 6.7 |
| Unknown event | 13.6 | 15.2 | 11.6 | 11.7 | 11.6 |
| Total | 47.9 | 43.2 | 38.4 | 37.5 | 44.3 |

* Data for Estonia and Lithuania excluded due to different injury event categories; the activity context was reported in 68.6% of cases.

ilies. The test for linearity of association showed a significant trend for England, Hungary and Israel, but the trend was the most evident in Hungary (Table 2).

Figure 1 shows the four shapes of relationship under study: (1) Symmetrical U-shape, (2) U-shape with increased frequency for high economic status, (3) U-shape with increased frequency for low economic status, and (4) decreasing percentage of injuries with decreasing economic status.

Analysis of the percentage of injured students (per total number of respondents) in relation to specific types of activity, on the basis of data from 10 countries, showed that (Table 3):

- Injuries during biking and skating were positively associated with economic status (the highest rate for the most well off students),
- Injuries during sports and driving a car were more frequent both in the richest and in the poorest families,
- Injuries during walking/running, fighting and described as ‘others’ were negatively associated with economic status (the highest rates for the least well-off students).

The location of the injury was reported in 19,061 cases (86.2%). Analysis of the injury rates in relation to the specific location of the event showed:

- The percentage of students injured at home, at school and in the street was higher in both marginal economic groups, with the highest value for the poorest students,
- The rates of injuries at sports facilities decreased with worsening of the economic status.

Conclusion

A significant relationship exists between overall and specific types of injuries and economic level. The varying type of

relationship suggests both complex mechanisms of injuries that change with the socioeconomic context and mechanisms that may be consistent within specific economic categories or possibly other factors. Future analysis is needed to explain the impact of other social inequality indicators and combined family affluence scores used in HBSC studies.

References

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