Bicycle Helmet Wearing in a Sample of Urban Disadvantaged Primary School Children

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Abstract
Bicycle helmet wearing is currently not legally enforced in Ireland and little is known about the self-reported practice amongst young children. The principal aim of this study was to assess self-reported helmet wearing amongst a sample (n=314) of primary school children (aged 8-13 years) attending disadvantaged schools in Dublin. Approximately 86% of the sample owned a bike and provided a response to the question on helmet use. The findings indicate that helmet wearing is not a widespread practice (50.4%; 159/314 report never wearing helmets). As children get older, reported practice is also less likely with 67% (27/40) of 12/13-year-olds compared to 38% (31/81) of 8/9-year-olds reporting never wearing protective headgear. Regardless of age, more girls (61%; 82/135) than boys (39%; 52/135) indicated always/sometimes using helmets when cycling. Conversely, the findings show that (mandatory) seatbelt wearing is standard practice for the majority (93%; 295/320). The findings relating to helmet wearing add further to the debate around the mandatory introduction of protective headgear for cyclists.

Introduction
The UK Department of Transport1 identified that, in 2008, 115 pedal cyclists were killed and 2,450 seriously injured on roads in Britain. In the Republic of Ireland, 7 road bicycle deaths were recorded during the same year whilst, according to a Health Service Executive report2, an approximate average of 263 cyclists were admitted annually to hospital with accident related injuries during 2005-2008. Hospital costs for these cases have been estimated at over one million euro per year3. According to Elke and Elvie4, children under fifteen are at greatest risk of serious injury through cycling-related accidents. At present, however, there is no regulatory enforcement of helmet wearing for cyclists. While it still remains that mandatory seatbelt wearing is standard practice for the majority of Irish motorists (93%),5 cycling-related accidents are frequently cited as an issue for which there is a need for the enforcement of helmet wearing for cyclists. As such, the RSA5, acknowledges that the use of protective headgear is important in reducing the risk of head injuries amongst cyclists.6•4

Methods
Children from 7 designated urban disadvantaged schools were invited to participate as part of a larger assessment of children's physical health behaviour11. Adapted versions of the self-report Health Related Behaviour Questionnaire16 and a Health Related Quality of Life measure, the Kidscreen-2717, were completed by the participants (n=314). Questionnaires were completed in the school setting in small groups with the research team present. The questionnaire was explained to the students using age appropriate language and children were provided with additional support to complete the questions when requested. The study was conducted in accordance with the Psychological Society of Ireland Professional Code of Ethical Conduct and ethical approval was granted by Trinity College Dublin Health Ethics Committee. Questions relevant to the current study were extracted and data were analysed using PASW18.

Results
Participants were aged 8-13 years (mean=10.27, standard deviation=1.23) and 48% were female. A little over 86% (271/314) indicated that they owned a bike and of these 270 provided a response to the question on helmet wearing. More than one in five of this subsample (22%, 59/270) reported always wearing a helmet compared to 39% (70/270) who indicated that they only used it some of the time. The findings relating to helmet wearing add further to the debate around the mandatory introduction of protective headgear for cyclists.

As this debate continues, there is still very little data available on the helmet wearing practices of young children in Ireland and associated risk factors11. Therefore, the principal aim of this study was to assess self-reported helmet wearing by a sample of primary school children and to explore factors which influence reported use.

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The responses to a similar question on seatbelt-wearing showed, for instance, that 93% (252/270) reported that they always wore a seatbelt when in the car. No differences emerged between genders or across age groups. A direct logistic regression analysis was conducted to assess the relationship, if any, between wearing a bicycle helmet (yes or no) and several possible predictors or risk factors including: age, gender, frequency of cycling; frequency of seat belt wearing; and a measure of parental support as measured from the Kidscreen-27. The model was statistically significant (C2 (9, n=268) = 40.79, p<0.001) and was therefore, able to distinguish between those who did/did not wear a bicycle helmet. The model as a whole explained between 14% (R2) and 19% (Nagelkerke R squared) of the variance in helmet wearing, and correctly classified 67% of cases; therefore, it was adequate, for assessing possible predictors.

The analysis revealed that only age and gender were significant predictors (p<0.001) of helmet wearing thereby supporting the results observed within the descriptive statistics.

![Figure 1](https://example.com/f1.png)

**Figure 1** Proportion of children by age group who reported wearing a bicycle helmet

**Discussion**

The findings indicate that helmet wearing is not a widespread practice whilst children are also less likely to report wearing a helmet as they get older. In addition, females were more likely to report wearing protective headgear. Conversely, the data show that seatbelt wearing is standard practice for the vast majority regardless of age. Few findings are currently available on reported practices of helmet wearing amongst younger children aged 8-12 years. A review of bicycle safety data in Norway during 2005 found that approximately 63% of children under 12 years were helmeted when cycling compared with approximately half of the current sample (who reported always or sometimes wearing one). However, both our study and the Norwegian research, indicate a much higher prevalence of helmet wearing amongst children under 12 years when compared to a 2002 Irish study which examined helmeted reported use by children aged 10-17 years. This National Health and Lifestyle Survey (NHLS) report indicated that only 8% of the respondents (n=5712) reported wearing a helmet. Similarly, the UK Department of Transport in 2008 estimated a practice rate on major roads of approximately 17% amongst children aged 7-16 years which, whilst higher than the NHLS study, is much lower than found amongst the sample in the current study.

Erke and Elvik showed that, as children get older, helmet wearing decreased from almost two-thirds of 5 to 11-year-olds to approximately one quarter of 12 to 17-year-olds. This is comparable to the pattern of decline identified in the current study where the proportions of helmet wearers reduced from 62% of 5 to 8-year-olds to approximately one third of 12-year-olds. A similar inverse pattern, albeit based on a much lower reported practice overall, emerged in the National Health and Lifestyle Survey where helmet wearing decreased from 14% of 10 to 11-year-olds to only 5% of 15 to 17-year olds. On the positive side, it is reassuring to note that reported seatbelt wearing in the current study is much higher than the 50% of primary school-aged children estimated by the Road Safety Authority to wear a seatbelt. Indeed, the current findings are more consistent with a UK study by the Department of the Environment where 96% of children were found to wear restraints.

This study was conducted as part of a larger evaluation of a health promotion initiative in schools located in Dublin. The study is exploratory and has several limitations. Firstly, there may be a number of reasons for the low level of reported bicycle helmet wearing in this sample. For example, the children were attending schools located in areas characterised by high levels of disadvantage. Thus, factors such as cost (or availability) may have impacted the practice of helmet wearing. This issue supports the concern from some quarters, that the mandatory enforcement of protective headgear may decrease the number of cyclists rather than increase the number of helmet wearers. Some agencies have attempted to address these difficulties by introducing subsidised, or free, helmet schemes. Second, the use of self-report measures is the current study raises questions about social desirability. For example, an interesting study by Scheiber & Sacks examined both observed and reported practice from the Oregon Behavioural Risk Factor Surveillance System survey and found that children were less likely to report 'always' wearing a helmet (15%) than when observed directly (at 20%). However, whilst 'different absolute estimates' were recorded, across time, similar degrees of change were also found. Social desirability is a legitimate concern in any self-report study. However, the difference found in reported seatbelt wearing versus helmet use may suggest that there is at least an increased awareness of the importance of seatbelt wearing in cars and perhaps a lower level of social pressure regarding bicycle helmet use. In addition to examining other possible predictors impacting helmet use, future research could also explore further the differences in legislated safety versus voluntary practices amongst children to identify whether seatbelt and bicycle helmet wearing are carriable and if mandatory enforcement underpins differences in reported practice.

It has been acknowledged that helmets are only useful if headgear is of high standards and is worn correctly. Helmets have also been found to only protect from certain types of direct impact head injuries and hence, their limitations and desirability needs to be acknowledged. Prior to the introduction of such schemes to support mandatory wearing, proponents of both sides of the debate have argued that cost-benefit analysis may provide a useful tool to identify the effectiveness of introducing such legislation.

In Ireland, helmet wearing is promoted by both the RSA and the IMO as good cycle-safety practice and it is worth noting, in this context, that cycling helmets have just been included as a new addition to the 'basket of goods' used by the Central Statistics Office to compile its new five-yearly Consumer Price Index. This would appear to indicate that consumers/cyclists are indeed changing their cycle safety practices, although our findings suggest that promotional efforts should be targeted at children as well as adults. However, additional large-scale research is needed, both to examine more diverse samples of children in Ireland and elsewhere and to elicit more detailed information regarding the views and experiences of children and their parents in relation...
to cycling and other health and safety behaviours. Further research should also explore how parental-perceived awareness and acceptance of legally enforced versus voluntary practices, affects their children’s overall awareness of, and adherence to, appropriate cycle safety.

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