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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%; 136/270 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%; 252/270). 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 year². According to Elke and Elvik³, 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 of any age in the Republic of Ireland.

There is ongoing debate about the effectiveness of helmet wearing in reducing the risk of head injuries amongst cyclists^{1,4-6}. In the Republic of Ireland, several medical and safety organisations have consistently argued for compulsory protective headgear. For example, the Irish Medical Council⁷ argues that mandatory usage can reduce the incidents of bicycle-related head injuries whilst the Irish Road Safety Authority⁸ also promotes the use of bike helmets by all cyclists. To support their position, the RSA⁸ present evidence from two well known, albeit now dated, studies^{9,10} which conclude that wearing a helmet may reduce the risk of head injury by 69%-85%. Furthermore, a more recent review of the literature by the UK Department of Transport¹, concludes that, overall, the use of properly fitted and correctly used helmets is expected to "be effective at reducing the risk of head injury, in particular cranium fracture, scalp injury and intracranial (brain) injury" (p1). However, other recent research suggests that any association between bicycle helmet wearing and risk reduction may not be so clear-cut^{4,6,11}. Many cycling associations argue strenuously that, where such laws have been introduced, they have not been proven to reduce head injuries, but may instead, merely reduce the number of cyclists on the road¹². Other critics of mandatory enforcement highlight research evidence to suggest that the improper use of helmets may increase the risk of other related injuries such as strangulation¹³.

As this debate continues, there is still very little data available on the helmet wearing practices of young children in Ireland

and associated risk factors¹⁴. 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.

Methods

Children from 7 designated urban disadvantaged schools were invited to participate as part of a larger assessment of children's health behaviour¹⁵. 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 Sciences Ethical Committee. Questions relevant to the current study were extracted and data were analysed using PASW¹⁹.

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 28% (75/270) who indicated that they only did so some of the time. However, half (136/270) reported never using protective headgear when cycling. More than one third (38%, 103/270) reported cycling more than three times a week although a little less than 5% (13/270) indicated they usually cycled to school. Chi-square analysis indicated no significant association between frequency of cycling and reported helmet wearing ($\chi^2(2, n=268), p=.46, \phi=.07$). Comparisons across age groups indicated that older children were less likely to report wearing a bike helmet. For example, approximately two-thirds (67%, 27/40) of 12- and 13-year-olds reported never wearing a helmet compared with 38% (31/81) of 8- and 9-year-olds (Figure 1). Chi-square analysis revealed that this

proportional change differed significantly across age groups [(3, n=270)=12.4, p=.006, phi=0.22], showing a decrease in reported helmet wearing as children got older, albeit with only a small to moderate effect. Regardless of age, more girls (61%; 82/135) than boys (39%; 52/135) indicated always/sometimes using helmets when cycling.

The responses to a similar question on seatbelt-wearing showed, by contrast, that 93% (252/270) reported that they always wore a seatbelt whilst only one child said that they never 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 ($\chi^2(9, n=268) = 40.79, p < .001$) and was therefore, able to distinguish between those who did/did not wear a bicycle helmet. The model as a whole explained between 14% (Cox and Snell R square) 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 ($p < .001$) of helmet wearing thereby supporting the results observed within the descriptive statistics.

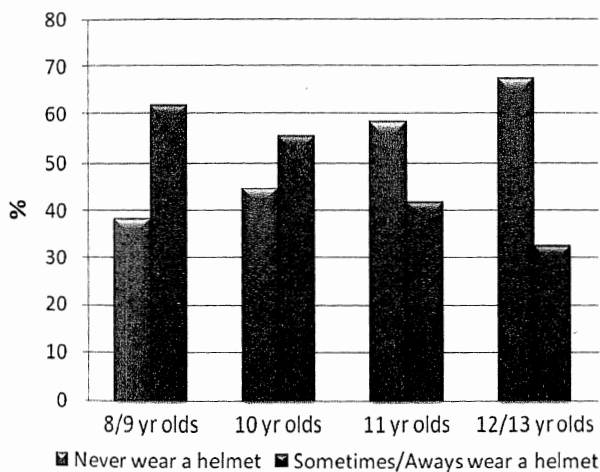


Figure 1 Proportion of children by age group who reported wearing a bicycle helmet

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 2006³ found that approximately 63% of children under 12 years wore helmets 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 reported use by children aged 10-17 years¹⁴. This National Health and Lifestyle Survey (NHLS) report¹⁴ indicated that only 8% of the respondents (n=5712) reported wearing bicycle helmets. Similarly, the UK Department of Transport¹ in 2009 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 Elvik³ showed that, as children get older, helmet wearing decreased from almost two-thirds of 5 to 11-year-olds to one quarter of 12 to 17 years-olds³. This is comparable to the pattern of decline identified in the current study where the proportions of helmet wearers reduced from 62% of 8 to 9-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 survey¹⁴ 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 80% of primary school-aged children estimated by the Road Safety Authority to wear a seatbelt¹⁸. 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 restraints¹⁹.

This study was conducted as part of a larger evaluation of a health promotion initiative in seven 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^{4,11,12,22}. Some agencies have attempted to address these difficulties by introducing subsidised, or free, helmet schemes²⁰. Secondly, the use of self-report measures in the current study raises questions about social desirability. For example, an interesting study by Schieber & Sacks²³ 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 found²³. 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 comparable 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^{5,23,24}. Helmets have also been found to only protect from certain types of direct impact head injuries and hence, their limitations also need to be acknowledged⁵. 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^{21,22}.

In Ireland, helmet wearing is promoted by both the RSA⁸ and the IMO⁷ 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 Office²⁵ 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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