Discussion section – Marjolein Boele

*Abstract* ***(for your information)***

*The risk of head injury from a bicycle crash is higher for young children than for adults. Although head injury severity may be reduced by a helmet, helmets are not mandatory in the Netherlands. Yet public support for voluntary use of bicycle helmets for children is high and there is great interest in school-based helmet promotion programmes. This study evaluated the effect of a five-year school-based campaign (for 4 to 8-year-olds) on helmet wearing rates and identified its success and failure factors. The programme provided bicycle helmets for free and education for each child, as well as information for their parents. The evaluation study compared observed helmet wearing rates before the campaign, with yearly rates during the five-year programme, and related those to wearing rates in a control area. Parents, together with their children, completed questionnaires on self-reported helmet wearing, attitudes, beliefs, and barriers. The results showed that observed bicycle helmet wearing increased in the first campaign year, but varied in later years. This variation in rates coincided with variations in campaign intensity over the years. Factors associated with self-reported helmet wearing were children’s age, with higher wearing rates for younger children than older children, and parental rules for helmet use. Children and parents are positive towards helmet use when children are perceived to be less competent cyclists. The most important reason for not wearing helmets is that peers do not wear helmets. Overall, parents and children seem to be influenced by the norm in the Netherlands that children above a certain age cycle without a helmet.*

**Discussion – Marjolein Boele**

This five-year longitudinal evaluation study investigated the effect of a school-based bicycle helmet campaign among 4 to 8-year-olds on helmet wearing rates and identified its success and failure factors. The evaluated programme provided free helmets and education for each child, as well as information for their parents. The evaluation study compared observed helmet wearing rates before the intervention, with yearly rates during the five-year programme, and related those to the rate changes in a control area. Parents together with their children also completed questionnaires on self-reported helmet wearing, attitudes, motives, and barriers for helmet use.

The results show that observed bicycle helmet use in the experimental area increased significantly in the first year of the campaign, when the distribution of the free helmets was combined with additional supporting activities and information for parents, but varied in later years. After the first year of the campaign nearly five times as many young children (4-8 years old) were observed wearing a bicycle helmet; an increase from 3.3% to 15.7%. This behavioural effect is larger than is usually achieved in voluntary health promotion campaigns, which range usually around 3 to 5% (Renes et al., 2011). A possible explanation for the variation in helmet usage rates in later campaign years coincided with variations in campaign intensity. In year 2 and 3 of the campaign only free helmets were provided to the children in Grade 1. Other campaign activities, such as education for children and information for parents were stopped after the first year. International reviews of helmet campaigns (Owen et al., 2011; Royal et al., 2007) have also shown that these elements are important for a successful bicycle helmet campaign. Moreover, a recent French study (Richard, Thélot, & Beck, 2013) that analysed voluntary helmet use in France following public awareness campaigns showed that helmet use among cyclists (aged 15-75 years) increased by a factor of three, from 7.3% in 2000 to 22% in 2010 with greater helmet use for people reporting being well informed on health topics.

The results of self-reported helmet use were consistent with the results on observed bicycle helmet use. As the campaign progressed the percentages of self-reported helmet use decreased steadily. The questionnaire study also indicated that a majority of the children in grades 4 to 8 do not wear bicycle helmets. This is an important barrier for long-lasting behavioural effects. Based on the motive analysis, helmet use, or the lack of it, by the children’s peers appears to be an important factor. Both parents and their children seem to be guided by what they perceive as normal. One of the main reasons for not wearing helmets is same age friends not wearing helmets, especially in higher grades. Several psychological theories emphasize that adults and children are influenced by other people’s behaviour and the perceived underlying social norm (Berkowitz, 2004; Cialdini, 2007). Note that the campaign was based on the premise that if all children would wear helmets, helmets would become the norm. Such a shift in norms did not happen. Evaluation of previous Dutch bicycle helmet campaigns also showed that social norms are important to children and but that these were also hard to change (Seijts et al., 1995; Steenbakkers et al., 1996). In these studies, children reported that they stopped wearing their bicycle helmets because of negative reactions from the social environment. As children grow older, social norms probably play a role in their decisions about whether or not to wear a helmet.

The reduction of injury risk was the most important factor for parents to have their children wearing helmets, when children were young. However, as children grow older this motive became less important. These age-related change in parental perceptions was reflected in lower self-reported helmet wearing rates in older age groups. Parents believed that children by the age of 7 (Grade 4) have become ‘safe’ cyclists. Also, the perceived familiarity with the regular cycling routes may contribute to this higher level of confidence, leading to the perception of helmets no longer being needed. Unfortunately, these parents may be overestimating their children’s cycling skills and be underestimating the risk of head injuries. Accidents statistics show that the share of children with serious head injuries in single-bicycle crashes increase from age range 0-5 years to age range 6-11 years (SWOV, 2016).

Parenting style was also shown to be a factor. Self-reported helmet wearing was higher among children, whose parents imposed strict and clear rules. In our study, however, only a quarter of parents did. Nearly three quarters of the parents did not enforce such rules for helmet wearing. Research examining parenting variables and estimations of children’s bicycle helmet use also identified parental rules as an important factor (Ross, Brinson, & Ross, 2014). Their study (Ross et al., 2014) also found that parents reported stricter helmet rules for children as beginning cyclists than for children who were already more experienced.

The age-related decline in helmet use is also supported by observations in previous studies (Berg & Westerling, 2001; Ross et al., 2014). Age was also the single dominant predictor of helmet use in a school-based survey in 26 countries among children aged 11, 13 and 15 year old (Klein, Thompson, Scheidt, Overpeck, & Gross, 2005). The authors (Klein et al., 2005) explained that younger children are more likely to comply with pro-safety messages from their parents or other children than older children do. A Cochrane review on non-legislative bicycle helmet interventions also concluded that the promotion of helmets is more effective for younger children than for older children and young people (Owen et al., 2011). In this respect, the findings of our study are not different.

*Strengths and weaknesses*

To our knowledge, this is the first study that evaluated the longitudinal effect of a voluntary bicycle helmet campaign in the Netherlands. Additional strength of this study was the use of a comparable control area without helmet use campaign activities. The use of a control area enabled the investigation of helmet usage of children without the support of a bicycle helmet campaign. As bicycle helmet wearing rates increased in the experimental but not in the control area, we have reason to believe that this increase was the result of the campaign. Although respondents of the study did not differ beforehand on aspects such as age, distribution of grades or distance from home to school, we cannot totally exclude that other, non-observed, differences between the two research areas could also have influenced bicycle helmet usage. As the observation study also used a pre-test, the increased helmet use in the first year of the campaign can be attributed to the campaign.

It is also an advantage that the effect of the campaign on helmet use has not only been measured with self-reported helmet use, but also with observed helmet use. Previous studies have shown that owning a (free) helmet does not always result in wearing a bicycle helmet (Ross et al., 2014).

Our study also had some limitations. In 2013, due to financial constraints, the observation study was only performed near schools in the experimental area. Therefore, it is not possible to attribute the increase in helmet use solely to the campaign in this year. Despite the efforts to commit parents to participate in follow-up questionnaires for several years with a reward system and personalised, repeated contact, the questionnaire study had low response rates throughout the campaign. The low response rates may reflect a lack of interest in bicycle helmets by parents and/or schools. Not all schools were prepared to participate, for reasons including a too heavy work load. Although the time to complete the questionnaire was relatively short (5-10 minutes), questionnaire study had low response rates. The generalizability of the results of this study is therefore limited.

*Conclusion*

The aim of the bicycle helmet campaign was to promote voluntary helmet use in young children in experimental area. This five-year longitudinal evaluation study showed that bicycle helmet use increased in the first year when distribution of free helmets was combined with additional campaign activities such as education and information for children, parents and teachers. This behavioural effect was not sustained in the following campaign years. Factors associated with self-reported helmet wearing were children’s age, perceived cycling skills, parental rules and social norms. Parents and children seem to be influenced by the norm in the Netherlands that children above a certain age cycle without a helmet.