

Contents lists available at [ScienceDirect](#)

Transportation Research Part F

journal homepage: www.elsevier.com/locate/trf

Barriers and facilitators of bicycle helmet use among children and their parents



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ARTICLE INFO

Article history:

Received 4 October 2014

Received in revised form 11 March 2015

Accepted 11 March 2015

Available online 7 April 2015

Keywords:

Bicycle helmet use

Barriers

Facilitators

Risk

School children

Adults

ABSTRACT

Despite the fact that bicycle helmet use protects against head injuries, helmet use rate is still low even in countries with high concern for traffic safety. Earlier research shows that helmet use declines with age and that helmet use is low especially among teenagers. The aim of the present study was to investigate barriers and facilitators of helmet use among primary and secondary school pupils and their parents. Identical surveys were conducted among school children ($n=235$) and their parents ($n=106$). Children's and adults' responses concerning cycling, helmet use, helmet ownership, risk assessment and barriers and facilitators were compared and separate regression analyses conducted. Helmet use rate was lower among pupils than adults and they scored higher in most of the barrier items. The results of regression analyses showed that among children, age, gender, barriers and facilitators predicted helmet use while among adults only frequency of cycling and barriers were related to helmet use. Among children, the strongest correlates of not using a helmet were the belief of not needing a helmet and wish to use a cap or a hat instead. Having a helmet wearing as a habit and feeling safer were the strongest correlates of using helmet. Among adults, the strongest correlates of not using a helmet were "helmet looks ridiculous", "just going to short trip" and riding close to home while the strongest correlate of using a helmet was the habit of helmet use. It was concluded that targeting the barriers in helmet wearing campaigns might work better both among children and adults than emphasising the benefits at least among Norwegian child and adult cyclists.

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1. Introduction

Cycling is a healthy and environmentally sound means of transportation (Lindsay, Macmillan, & Woodward, 2011). For some road user groups, like school children, cycling provides often the only effective means of transportation when distances are too long for walking and when car or bus transportation is not available or possible because of the age of the traveller. This is especially the case in sparsely populated countries like Norway. While virtually all countries promote bicycle use among children, teenagers and adults, a cycling accident is also one of the main risk factors in a child's or teenager's life (OECD, 2004; World Health Organization, 2008). For example in UK, about 75% of trauma among children occurs on the roads (Sinha & Lander, 2013). Therefore, it is essential to improve passive safety (i.e. protection in the case of an accident) among cyclists and especially among children (World Health Organization, 2008).

Several studies show that a bicycle helmet is an effective way of preventing head injuries. According to a Cochrane survey conducted already in 1999, head injury is a leading cause of death among cyclists and bicycle helmets are effective in

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reducing head, brain and face injuries (Thompson, Rivara, & Thompson, 1999). A qualitative review about the protective effectiveness of helmets among children concluded that bicycle helmets are effective even when taking biases into account and recommended habitual use of helmets (Lastennet, Sizun, Dobrzynski, & De Parscau, 2001). Attewell, Glase, and McFadden (2001) conducted one of the first quantitative reviews of bicycle helmet use and head injuries. They reported a summary odds ratio estimate for efficacy as 0.40 for head injury, 0.42 for brain injury, 0.53 for facial injury and 0.27 for fatal injury (Attewell et al., 2001). This indicates a statistically significant protective effect of helmets and the authors concluded that “the evidence is clear that bicycle helmets prevent serious injury and even death” (Attewell et al., 2001). While some later investigations claim that the results of Attewell et al. (2001) showed inflated safety benefits for helmet use because of some methodological problems (e.g. publication bias) (Curnow, 2003; Elvik, 2011), it is still clear that bicycle helmets provide an effective and easy means for protection against head trauma among cyclists. The effectiveness of bicycle helmet in head injury reduction has recently been demonstrated in several case-control studies (Amoros, Chiron, Martin, Th  lot, & Laumon, 2012; Bambach, Mitchell, Grzebieta, & Olivier, 2013; Hagel, 2011; Persaud, Coleman, Zwolakowski, Lauwers, & Cass, 2012) and biomechanical studies (Cripton, Dressler, Stuart, Dennison, & Richards, 2014; Schejbalov  , Mi  unek, & Schmidt, 2013). World Health Organization (2008) has estimated by using a cost-benefit analysis that one unit of money invested on bicycle helmet campaigns returns as 29 units. We can expect the protective effect to be more significant among children and teenagers, who get involved in bicycle crashes more often than adults due to their way of using bicycles as means of commuting and in free time activities (Sleet, Ballesteros, & Borse, 2010).

The main problem in cycling helmets is simply that the helmet use rate is low in many countries while there seem to be high variation in helmet rates among different countries and regions. Klein, Thompson, Scheidt, Overpeck, and Gross (2005) studied the prevalence of helmet use in 26 countries by using a school based survey. According to results, reported helmet use varied greatly by country from 39.2% to 1.9%. Hence, helmet use did not reach 50% in any country (Klein et al., 2005). The highest helmet use rate (39.1%) was reported in Norway. Since the Klein & al.’s study was conducted over 15 years ago, we can assume that the current helmet wearing rates are higher. In an observational study conducted in Eastern Norway in 2008, 39% (35% females and 41% males) of passing bicyclists above 17 years of age used a helmet (Muskaug, Nygaard, Rosland, Johansen, & S  vold, 2009). It should be noted, however, that this figure included only adults and was based on observed helmet use unlike the 26 country study by Klein et al. (2005). According to Trygg Trafikk – The Norwegian Council for Road Safety – the current helmet wearing rate in Norway is 54% (Trygg Trafikk, 2014). Although there is a considerable increase in helmet use when compared to Klein et al. (2005) and Muskaug et al. (2009), the helmet wearing rate is still low even in Norway, which ranks as the second best in road safety (measured with road fatalities per registered vehicle or fatalities per vehicle-kilometre) in 2011 (OECD, 2014). In the present study, the aim was to investigate reasons for not using a bicycle helmet among primary and secondary school children and their parents in Norway.

Researchers have been investigating reasons for children and adolescents not wearing a bicycle helmet since 80s. In a study by Finnoff & all. conducted in 1999 in Minnesota, one of the most common reasons for not using a helmet was not owning one (Finnoff, Laskowski, Altman, & Diehl, 2001). Robertson and colleagues studied reasons for not using a bicycle helmet in rural Saskatchewan and found that helmet costs and lack of awareness were main barriers to helmet use (Robertson, Lang, & Schaefer, 2014). Secginli, Cosansu, & Nahcivan investigated prevalence of bicycle helmet use in two primary schools in Istanbul and reported a very low helmet use rate of 4.4% among 8–16 year olds (Secginli, Cosansu, & Nahcivan, 2013). One of the barriers for helmet use was not owning one in addition to parents’ and friends’ helmet use. Children’s and adolescent helmet ownership is probably partly related to the same factors as helmet use (e.g., attitudes) in addition to parents’ education and income level (Towner & Marvel, 1992).

Many studies have shown that bicycle helmet use is related to the a child’s or teenager’s age so that younger children are more likely than teenagers to wear helmets (Dellinger & Kresnow, 2010; Klein et al., 2005; Lang, 2007; O’Callaghan and Nausbaum, 2006). Klein et al. (2005) analysed data from 26 countries and found that age was the strongest individual predictor of use across countries. In general, younger primary school children use helmet regularly whereas the use rate declines among secondary school aged children. The main challenge in bicycle helmet interventions is to prevent decrease and maintain high use rates during adolescence. To develop effective interventions, it is essential to study which factors influence helmet use in different age groups. It can be assumed that different specific factors are relevant for children (e.g. parent’s opinions), teenagers (e.g. peer pressure) and adults (e.g. convenience). In the present study, factors related to bicycle helmet use are studied among primary and secondary school children and their parents.

Bicycle helmet use has been studied from different points of view ranging from peer influence and household factors (Dellinger & Kresnow, 2010) to social psychological models of helmet use (Fishman, Washington, & Haworth, 2012; Lajunen & R  s  nen, 2001, 2004). Hence, the previous research has helped us to identify several factors influencing the helmet wearing rates among children and adolescents. The most important barriers to helmet use seem to be negative peer pressure and fear of appearing dumb (Forjuoh, Schuchmann, Fiesinger, & Mason, 2003; Howland et al., 1989; Loubeau, 2000; Rezendes, 2006; Stevenson & Lennie, 1992), lack of knowledge and awareness (Pierce, Palombaro, & Black, 2014; Robertson et al., 2014), inconvenience and finding the helmet uncomfortable (Finnoff et al., 2001; Loubeau, 2000; Rezendes, 2006; Stevenson & Lennie, 1992), and poor fit of helmets due to hair style (Forjuoh et al., 2003; Pierce et al., 2014). In some studies, perceiving the injury risk low or considering oneself as a safe rider (and, thus, facing low accident risk) have been listed as barriers to helmet use (Finnoff et al., 2001; Forjuoh et al., 2003). Interestingly, riders may agree that helmets provide a good protection against a head injury but still not use one if they assess the injury risk low (Finnoff et al., 2001).

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