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Attitudes towards cycle skills training in New Zealand adolescents



Sandra Mandic^{a,*}, Charlotte Flaherty^b, Tessa Pocock^a, Alex Mintoft-Jones^a, Jillian Frater^c, Palma Chillón^d, Enrique García Bengoechea^e

^a Active Living Laboratory, School of Physical Education, Sport and Exercise Sciences, University of Otago, Dunedin, New Zealand

^b Dunedin City Council, Dunedin, New Zealand

^c University of Canterbury, Christchurch, New Zealand

^d Faculty of Sport Sciences, University of Granada, Granada, Spain

^e Participatory Research at McGill, Department of Family Medicine, McGill University, Montreal, Canada

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ABSTRACT

Introduction: Cycle skills training (CST) increases cycling skills in children. Whether CST could be beneficial to adolescents and whether adolescents would be interested in taking on such training remains unknown. This study examined correlates of adolescents' perception that CST could make them safer in traffic.

Materials and methods: A total of 1453 adolescents (age: 15.1 ± 1.4 years; 44.9% boys) from 12 secondary schools in Dunedin (New Zealand) participating in the BEATS Study completed an online survey in 2014–2015. Questions assessed demographics, travel to school habits, attitudes towards cycling and CST, normative beliefs, perceived behavioural control and behavioural intention for cycling to school. Data were analysed using linear mixed models.

Results: Out of 38.5% of adolescents who perceived that CST could make them safer in traffic, nearly half would take CST at their school (43.1%). In a multivariate analysis, enjoying cycling for recreation, perceiving cycling to school as being useful, cycling frequently with parents, school's encouragement, and desire to cycle to school were positively associated with adolescents' perception that CST could make them safer in traffic (all $p < .05$).

Conclusion: Enjoyment of cycling for recreation, finding cycling to school useful, desire to cycle to school, frequent cycling with parents, and encouragement from schools were associated with favourable perceptions of CST in adolescents. Therefore, raising adolescents' awareness of the benefits of CST and potentially offering such training in secondary schools could be beneficial. Future interventions should involve parents and schools and aim to increase adolescents' interest in taking CST at school.

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* Corresponding author at: School of Physical Education, Sport and Exercise Sciences, University of Otago, PO Box 56, Dunedin, New Zealand. Fax: +64 3 479 8309.

E-mail addresses: sandra.mandic@otago.ac.nz (S. Mandic), charlotte.flaherty@dcc.govt.nz (C. Flaherty), jillian.frater@pg.canterbury.ac.nz (J. Frater), pchillon@ugr.es (P. Chillón), enrique.garcia@mail.mcgill.ca (E. García Bengoechea).

1. Introduction

Although walking is a popular form of active transport to school, cycling to school is less common among adolescents in many developed countries (Chillon et al., 2009; Larsen et al., 2009; Leslie, Kremer, Toumbourou, & Williams, 2010; Mandic, Leon de la Barra, et al., 2015; Mandic, Mountfort, et al., 2015; McDonald, 2007; Nelson, Foley, O’Gorman, Moyna, & Woods, 2008) and has been declining over the last two decades (McDonald, 2007; Ministry of Transport, 2015a). Traffic safety is one of the key concerns regarding cycling for transportation among all segments of the population (Department for Transport, 2015; Krizek, Forsyth, & Baum, 2009; Sallis et al., 2013), but especially in children and adolescents. High rates of bicycle-related injuries in young people have been reported in the United States (National Highway Traffic Safety Administration, 2015) and European Union (Candappa et al., 2012). In the United States, children under 15 years of age and adolescents (15–19 years of age) accounted for 7% and 8% of all cyclists killed and for 11% and 15% of those injured in traffic crashes, respectively, in 2013 (National Highway Traffic Safety Administration, 2015). Among adolescents, in the European Union, cycling fatalities peak between the ages 12 and 17 years when adolescents are likely to increase their independent, solo cycle travel (Candappa et al., 2012). In New Zealand (Ministry of Transport, 2015b) and Australia (Boufous, Rome, Senserrick, & Ivers, 2011), adolescents have the highest rates of bicycle-related accidents compared to other age groups. In New Zealand, 22% of cyclists killed or injured in traffic crashes are aged 10–19 years (Ministry of Transport, 2015b). When the time spent cycling among different age groups was taken into account, New Zealand cyclists 13–17 years of age and 18–44 years of age were at a greater risk of being in a collision with a motor vehicle compared to other age groups (Ministry of Transport, 2015b).

Many factors contribute to trends in bicycling fatalities, including the prevalence of bicycling, road design and engineering, traffic law enforcement, driver and bicyclist behaviour, helmet use, and traffic volume (Krizek et al., 2009). Government interest in road safety and alternatives to motorized transport has created a focus on aspects of bicycle safety, including cycle skills training. Bicycle riding is a motor skill which requires a large amount of practice to make movements efficient and automatic (Ellis, 2014). Cycling in traffic also requires cognitive skills and considerable alertness for the successful selection of task-relevant information in complex traffic situations (Ellis, 2014). Children with inadequate cycle skills have much higher accident rates compared to other children, even though they may cycle less frequently (Preston, 1980). Moreover, parental confidence in the child’s cycle skills is one determinant of cycling to school levels in children (Ducheyne, De Bourdeaudhuij, Spittaels, & Cardon, 2012; Trapp et al., 2011) and mediates the association between parental perceptions of safety and cycling in children (Trapp et al., 2011). Therefore, in addition to making the environment safer, development of cycling skills is an important strategy to help minimize parental safety concerns and increase rates of cycling in children and adolescents.

The over-arching aim of CST courses is to give children the skills and confidence to cycle safely in an environment with traffic. Cycle training programmes differ in duration, content, and training type (Ellis, 2014), with the most effective approaches involving repetition of safety-related messages and multiple practice opportunities (Macarthur, Parkin, Sidky, & Wallace, 1998). Classroom-based (Nagel, Hankenhof, Kimmel, & Saxe, 2003) and internet-based (McLaughlin & Glang, 2010) education programmes are effective in teaching bicycle safety behaviours to kindergarten and grade 1–3 children. Programmes with a practical component expose children (age 8–10 years) to cycling in a traffic-free environment (i.e. playground) (Ducheyne, De Bourdeaudhuij, Lenoir, & Cardon, 2013; van Schagen & Brookhuis, 1994) and/or cycling on the road with traffic (Colwell & Culverwell, 2002). In most but not all studies (Macarthur et al., 1998) CST programme conducted in a traffic-free environment increased knowledge (McLaughlin & Glang, 2010; van Schagen & Brookhuis, 1994) and improved cycling skills (Ducheyne, De Bourdeaudhuij, Lenoir, & Cardon, 2014; Ducheyne et al., 2013; van Schagen & Brookhuis, 1994) in primary school children. However, a recent systematic review found that although CST interventions may increase the knowledge of cycling safety, this did not seem to translate into reduced rates of injuries or improved bicycle handling skills and attitudes toward safe cycling in young people (Richmond, Zhang, Stover, Howard, & Macarthur, 2014). Educational programs aimed to make cycling to school safer for children should develop motor skills (such as pedalling, balancing, steering and braking) and cognitive skills (such as concentration, attention and judgment), as well as provide education about the road rules, the right protective gear and bicycle maintenance (Ellis, 2014; Trapp et al., 2011).

Compared to children, adolescents have more developed motor and cognitive skills. However, factors related to social influences and risk-taking may have different impact at different ages (Ellis, 2014) and may contribute to the high risk of bicycle-related injuries observed in adolescents. One study found that 12-year old children cycled faster and made more mistakes in a simulated traffic environment compared to 8-year and 10-year old children (Briem, Radeborg, Salo, & Bengtsson, 2004). Children and adolescents tend to imitate peers irrespective of whether they demonstrate safe riding or engage in risky cycling behaviour (Babu et al., 2011; Ellis, 2014). Bicycle crashes often occur because children and adolescents engage in risky behaviours on their bicycles (Ellis, 2014). Risk-taking is heightened during adolescence (Ellis, 2014). Particularly in adolescent boys (Colwell & Culverwell, 2002). Self-efficacy towards safe cycling skills is negatively correlated with risky cycling behaviour and risky cycling intentions in adolescents from the Netherlands (Feenstra, Ruiter, & Kok, 2010). A study from London, UK, revealed no effects of CST on accidents or adolescents’ attitudes towards safe cycling behaviour (Colwell & Culverwell, 2002). Taking or passing a CST programme was not associated with the reduced likelihood of cycling-related injury in adolescents (Colwell & Culverwell, 2002). Consequently, programmes that improve the knowledge of road safety

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