Journal of Transport & Health 6 (2017) 313–326

Contents lists available at ScienceDirect

Journal of Transport & Health

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

Walking time to school, children's active school travel and their related factors

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ARTICLE INFO

Article history:
Received 20 September 2016
Received in revised form
30 January 2017
Accepted 30 January 2017
Available online 16 February 2017

Keywords:
Physical activity
Walking time
Active school travel
Children's active travel

ABSTRACT

Active school travel is one of the main opportunities for promotion of physical activity among children. Low physical activity in this group is associated with potential health risks. This research has three aims including two main aims and one intermediate aim. The two main aims were to identify variables that explain why the perceived walking time to school (PWTS) is below or above a threshold and to examine the role of PWTS as well as socioeconomic status, household factors, parental attitudes towards walking and walking safety on active school travel among children. The intermediate aim was to identify a threshold for the PWTS. This threshold may provide information about how to plan transport and roads around schools. Data were gathered in Rasht, Iran in 2014. The 1078 questionnaires were distributed among pupils aged 7–9 years in nine schools. The children were instructed to bring the forms to their parents who completed them (n=735, return rate=80%). To predict active school travel (0=inactive modes, 1=active modes), and PWTS (0=long, 1=short) two binary logistic regression analyses were carried out. Results showed that a 10 minutes PWTS was the threshold where the proportion of active mode use (walking) starts to decrease compared to the best performing alternative mode. Higher parental age (OR=1.02) and household income (OR=1.27), accessibility to public transport (OR=0.42), attending public school (OR=0.36), access to school service (OR=0.45) and contextual and design preconditions for walking (OR=0.81) were associated with PWTS to eligible schools. PWTS (OR=15.24) was a strong negative predictor of active school travel. Mother's driving license (OR=0.49), more owned cars (OR=0.53), higher mother's educational degree (OR=0.74), accessibility to public transport (OR=0.26), and access to school service (OR=0.22) were related to active school travel. This research found that PWTS is the most important barrier for children's active travelling while adjusting for a wide-range of demographics, socio-economic variables as well as safety and attitude factors in Iran.

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http://dx.doi.org/10.1016/j.jth.2017.01.012
2214-1405/

1. Introduction

Active school travel is one of the main opportunities that parents have to promote physical activity among their children. Low rates of physical activity are associated with potential health risks among children, such as cardiovascular problems and bone health issues (Andersen et al., 2006; Biddle et al., 2004), metabolic syndrome (Bell et al., 2007; Pan and Pratt, 2008), high blood pressure (Leary et al., 2008; Sugiyama et al., 2007) and obesity (Hedley et al., 2004). Furthermore, since active school travel involves physical activity it could also promote mental health among children (Fotel and Thomsen, 2002; Fyhri and Hjorthol, 2009).

"Community school" (i.e. easily accessible schools for pupils in all urban regions), "Safe Route to School" (SRTS),"Walking School Bus" (i.e. children collectively walk to school in an adult-supervised and timetabled manner), School Travel Plan (STP), and Optimal School Siting (e.g. proximity of good quality schools in all regions) have been implemented as programmes targeted to promote physical activity in developed contexts such as North America, Europe, New Zealand, and Japan (McDonald, 2007; Easton and Ferrari, 2015; Collins and Kearns, 2010; Schoppa, 2012). Meanwhile, research regarding children's (pupils at elementary schools) active school travel in middle income or developing countries in Western Asia or the Middle East context remains scant (Mehdizadeh et al., 2016). Iran is an interesting case because the above-mentioned policies have not been implemented in this country. Furthermore, the overall active travel mode use in Iran is low, both in the general population and among children (Esteghamati et al., 2011; Hajian-Tilaki and Heidari, 2007; Kelishadi et al., 2010). Active school travel mainly includes walking in Iran and bicycling is rather uncommon. Consequently, active transport is here defined as walking and bicycling was excluded in the current study.

1.1. Aims

The core motivation underlying the current study was to add to the empirical knowledge base about predictors of short perceived walking time to school and active school travel (walking) in a developing Iranian context. Identifying a threshold for walking time to school may yield information about how to plan transport and roads around schools. Easily accessible schools for pupils in all urban regions might increase the probability of active school travel among children. In the current study, we defined the threshold for perceived walking time to school as the distance where walking starts to decrease compared to the best performing alternative mode. The best performing alternative mode refers to the mode which is most frequently selected at each perceived walking time to school (PWTS), excluding walking. Further, a walking time threshold could be used as a dependent variable for identifying variables that explain why PWTS is below or above the threshold, and also as an explanatory variable for identifying variables that explain why pupils walk or use a non-active mode in an Iranian setting. To sum up, this study has two main aims and one intermediate aim:

1) To identify variables that explain why PWTS was below or above the threshold. This included an investigation of factors affecting school choice as an explanatory factor for home-to-school distances in Iran.

2) To identify variables that explain why pupils walk. This included an examination of the role of PWTS as well as demographic, socio-economic, attitudes, and safety perception for walking.

3) An intermediate aim was to identify a walking time threshold using a somewhat similar definition as in previous studies in a new context: Iran.

1.2. Literature review

The majority of previous school travel studies have been conducted in high income regions such as North America, Western Europe, Australia, New Zealand and Japan. Meanwhile, the research is meagre in developing countries in Eastern Europe and, in particular, in less developed low income countries in Asia such as Iran. Table 1 shows important findings and methodological approaches in some previous studies related to active school travel in different regions of the world.

In North America, several studies have reported important barriers on children's active school travel. For instance, higher home-to-school distance (or walking time) has been reported to be the most important explanatory variable on active school travel (e.g. McDonald, 2008a, 2008b; McDonald et al., 2011). Household socioeconomic status such as increased car ownership (McDonald, 2005; McDonald et al., 2011; McMillan, 2003), higher income (Babey et al., 2009; McDonald, 2008a; Vovsha and Petersen, 2005), higher educational degree among mothers (McMillan, 2003), perceived neighborhood safety problems (e.g. McMillan, 2007; Rothman et al., 2015), and demographic characteristics (e.g. younger children) (McDonald, 2008b; McDonald et al., 2011) were also negatively related to active school travel among children. McDonald (2012) reported that there is a gender gap on school travel in the United States, while Mitra and Buliung, (2015) have found that gender exert no influences on mode use on school travel among children in Canada.

Furthermore, several studies have been conducted in Western Europe. These studies have examined demographic, socio-economic and built-environment characteristics associated with school travel mode use in countries such as the United Kingdom (e.g. Easton and Ferrari, 2015), Netherlands (Van Goeverden and De Boer, 2013), Belgium (Zwerts et al., 2010), Scotland (Waygood and Susilo, 2015), Ireland (Nelson et al., 2008), and Scandinavian countries (Fyhri and Hjorthol, 2009; Johansson et al., 2011). In these high income countries, several of the studies reported that distance (or travel time) had the most important role in reducing the probability of active school travel among children (e.g. Cooper et al., 2003; Fyhri and Hjorthol, 2009; Waygood and Susilo, 2015). Similarly to the North American context, the studies also reported significant