The impact of electric bikes on health through increased physical activity: A systematic review

Key Words: Electric bikes, e-bikes, physical activity

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Background:

Physical activity is associated with health and fitness benefits. However, most adults do not do enough activity to meet the recommended guidelines of 150 minutes of moderate to vigorous physical activity per week. The promotion of active transportation, through cycling and walking, has been highlighted as an effective means through which to increase physical activity behaviour. However, physical, topographical and practical barriers are often reported as factors that impede active transportation. Electrically assisted bicycles (e-bikes) may overcome some of these barriers, offering an alternative mode of active transportation that could have a positive impact on health. However, there is currently a lack of review work synthesising studies that have examined the impact of e-biking on increasing physical activity and subsequent health related outcomes.

Aims & Objectives:

The aim of this review is to systematically synthesise the current literature pertaining to the use of e-bikes and their impact of health through increased physical activity. The search aims to include literature that is relevant to answer the following research questions:

- Does the use of an e-bike lead to sufficient physical activity (duration, frequency and intensity) to promote health benefits?
- Does use of an e-bike lead to changes in cardiorespiratory, metabolic or muscular outcomes?

How do physiological responses to an e-bike compare to other modes of active transportation (e.g., bicycling and/or walking)?

Method:

Published intervention and observational studies in adults over 18 years of age will be considered for inclusion. Databases to be searched will include: Web of Science, PsycINFO, EMBASE, MEDLINE, CINAHL, SPORTDiscus, Scopus. Once all literature searches have been conducted the titles and abstracts of search results will be screened by two reviewers independently. Studies that have insufficient information to be excluded or are deemed eligible for inclusion will be retrieved for full text analysis. Full texts will be screened by two reviewers independently to determine eligibility. Data will be extracted by two reviewers independently using a data extraction template that will be created based on the specified data to be extracted below.

Outcome measures:

Studies will be included if they report on objectively measured physical activity outcomes including exercise intensity, duration and/or frequency (e.g., METs, energy expenditure, time spent in MVPA). Health related outcomes will be reported if applicable including a) Cardiorespiratory outcomes (e.g., heart rate, maximum oxygen uptake, blood pressure, maximal aerobic power); b) Muscular outcomes (e.g., muscular endurance, isometric strength); c) Metabolic outcomes (e.g., glucose tolerance, insulin sensitivity); or d) Quality of life measures.