Technology-facilitated health behaviour change in individuals with disabilities: a systematic review

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Summary

A systematic review was conducted to investigate how technology is being used to help facilitate health behaviour change in individuals with a physical disability. Results found that technologies focused on four types of solutions; self-healthcare management of physical disability, assisted healthcare, supervised healthcare and continuous monitoring of physical disability. Audit/Research Service Development Technical.

Aims & Objectives

The purpose of the review was to investigate how technology is being used to help facilitate health behaviour change in individuals with a physical disability. The review was concerned with the type of technology used, the health behaviour targeted, and the effectiveness of the technology used. Of additional interest; identifying barriers and facilitators to the use of the technology.

Background

Encouraging health-promoting behaviours and discouraging unhealthy behaviours is of significance for personal wellbeing, minimising the cost of care, and improving health outcomes. This is especially pertinent for individuals with a physical disability. Developments in technology, including advancements in wearable technology, mobile applications and novel technologies, mean that healthcare is becoming increasingly digital. A proliferation of digital technologies, for instance self-administered mobile applications and wearable devices used to record and monitor biomedical and behavioural measures, are changing the way in which NHS services, health care professionals and individuals approach, manage and experience health and wellbeing (Morgan, 2015).

A recent meta-analysis concluded that iPads and iPhones were frequently used in the literature to deliver healthcare interventions to individuals with disabilities (Cumming, Draper, Cathi, 2017). Further, supporting the self-management of long-term conditions is a priority area for population health as more people have chronic conditions and physical disabilities. The potential of digital technologies for supporting self-management is especially relevant (Morgan, 2015). However, evidence around self-administered health monitoring technologies, their theoretical underpinnings, integration into self-management and relationship with, and influence on, behaviour and behaviour change is greatly lacking. Some psychological theories of technology acceptance have been applied to try to understand an individual's engagement with health technology including the Technology Acceptance Model (Davis, 1989, Bagozzi, Davis & Warshaw 1992).

The purpose of this review is to investigate the role of technology in changing health behaviours for individuals with physical disabilities. The following questions guided the review:

Research Question 1
What devices are being used to encourage, change or maintain a health behaviour for individuals with physical disabilities?
Research Question 2
How are the devices being used to support people with disabilities?
Research Question 3
How effective is digital device use in supporting people with physical disabilities?

Research Question 4
What barriers and facilitating factors have been identified concerning introducing technology to a physically disabled population to encourage health behaviours?
Research Question 5
What study designs have been employed in the literature to research introducing technology to a physically disabled population to encourage health behaviours?

A scoping review generated search terms related to technology, disability and behaviour change. The search included adults 18-65 living with a physical disability. Terminology was kept broad in order to include studies with varying physical disabilities. Adults in community, primary care, outpatient and inpatient populations were also included. Interventions aimed at carers are excluded from this study. Studies including any technology, computer-based, app form or novel technology utilised with the aim of changing a specific health behaviour were included. Searches were limited to articles published in the English language, peer-reviewed journals, from January 2009 to January 2019. The results of the review found 1,571 studies, with 16 studies qualified for inclusion in the review. The technologies focused on four types of solutions: self-healthcare management of physical disability assisted healthcare, supervised healthcare and continuous monitoring of physical disability. Technology effectiveness varied depending on the disability, purpose of technology and type of technology.

Discussion
The results of this review highlight how technology and what technology is currently utilised to promote health-related behaviours and positively impact health-related outcomes for individuals with a physical disability. A lack of consistency of terms to describe both technology and disorders. The variation of terminology across services and countries, to describe both technology and disorders, made drawing specific conclusions challenging as not all relevant studies could have been identified. Further, demographic details of some studies were missing meaning including mean age and specifics of physical disability could not be included. Additionally, case by case consideration is needed to fully understand the use of technology for promoting health behaviours, as two individuals with the same condition may have very different experiences and needs.

Several barriers to the use of technology were also identified. Demographic research states that disabled people are significantly less likely to live in households with access to the internet than non-disabled people (WHO, 2011). This lack of access may restrict individual access to such devices. Likewise, Financial status may also be a barrier to accessing health technology. Further research is needed to understand the adoption of technology to change, promote or maintain health behaviours for individuals with a physical disability. Further research is also needed to understand facilitating factors and barriers to the adoption of the technology to change, promote or maintain health-related behaviours.

References
Bagozzi, R. P., Davis, F. D., Warshaw, P. R. (1992), *Development and test of a theory of technological learning and usage*., Human Relations, 45 (7): 660–686, doi:10.1177/001872679204500702
Cumming, Therese M., & Draper Rodríguez, Cathi. (2017). *A Meta-Analysis of Mobile Technology Supporting Individuals with Disabilities*. Journal of Special Education, 51(3), 164-176.
Davis, F. D. (1989). *Perceived usefulness, perceived ease of use, and user acceptance of information technology,* MIS Quarterly, 13 (3): 319–340, doi:10.2307/249008, JSTOR 249008
Morgan. H. M. (2015). @selfhealthtech: *Using self-administered health monitoring technologies to support the self-management of long-term conditions: What about behaviour change?* Frontiers in Public Health, Vol.4.
World Health Organization, 2011. *World report on disability*. New publications. (2011). 12(3), 21.

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