

IMPACTS OF ASSISTIVE TECHNOLOGY INTERVENTIONS ON INFORMAL CAREGIVERS

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INTRODUCTION

In the United States, over 50 million informal caregivers assist individuals who are ill or disabled.[1] The replacement value of informal caregiver's unpaid contributions has been estimated at \$350 billion annually in the United States.[1] To maintain the quality of life of those they help, caregivers may experience a great deal of stress that can lead to their physical or emotional burnout.[2] The potential for burnout poses a challenge to health care systems, as informal caregivers provide assistance four times more frequently than do formal caregivers.[3]

Assistive technology (which includes mobility aides such as walkers, canes and wheelchairs; environmental modifications such as grab bars and railings; and dressing aides such as reachers and shoehorns) helps users perform activities of daily living. A principal justification for providing assistive technology to older adults is that it reduces their dependence on care givers and leads to a decrease in caregiver stress. Evidence to support or to refute this claim has been questioned. [4,5]

OBJECTIVE

To identify the outcomes of assistive technology interventions for informal caregivers of adults with physical and/or cognitive disabilities.

METHODOLOGY

A systematic review was conducted using the following data sources: Embase, Medline, Cumulative Index to Nursing and Allied Health Literature, Google Scholar and active researchers in this area.

Study Selection

To locate research that identified the outcomes of assistive technology interventions on informal caregivers of adults, electronic data bases were searched to identify studies published until November 2010 using MeSH and key words including self-help devices, assistive technology, assistive devices, caregivers, spouses, and wheelchairs.

After deleting duplicates, the first author reviewed the titles of all citations, and reviewed abstracts of potentially eligible studies. Articles were excluded that did not report original data, did not provide assistive technology as the main component of the intervention, included only care recipients under the age of 18, or failed to clearly delineate findings for informal and formal caregivers or for caregivers of assistive technology users and non-users. Full articles were obtained for abstracts that appeared to meet the inclusion and exclusion criteria. The first and second author independently reviewed the retrieved articles and discussed any disagreement until consensus was reached. Reference lists of included studies were reviewed to identify additional studies and Google scholar was used to identify papers that cited the included studies. Authors who had recently published in this area were contacted to identify other, potentially unpublished, studies.

Study Appraisal

Information from the studies was abstracted using a study specific-form. All studies were critically appraised by the first author and a trained master's level research assistant. Quantitative studies were evaluated using Downs and Black's review criteria[6] and assigned a level of evidence based on the Centre for Evidenced Based Medicine

criteria.[7] Qualitative studies were reviewed using the Critical Appraisal Skills Program (CASP) qualitative evaluation form [8] and assigned a level of evidence based on Kearney's criteria.[9] To be consistent with the Centre for Evidenced Based Medicine levels, Kearney's levels were reversed scored as follows: I=dense explanatory description, II=depiction of experiential variation, III=shared pathway or meaning, IV=descriptive categories, V=findings restricted by a *priori* frameworks. We evaluated the quantitative and qualitative methods separately for mixed-methods studies using the previously described approaches. A narrative synthesis of the included studies was performed and studies were compared in terms of design, level of evidence, population, type of assistive devices, and assistive technology outcomes identified.

RESULTS/ DISCUSSION

The search strategy identified 19 studies that met the specified criteria. In terms of methods, 68% were quantitative, 21% were qualitative and 11% were mixed-methods. Most assistive technology users and caregivers were >60 years. With the exception of studies based on national survey data (n=4), most included only small sample sizes of caregivers. Concerning assistive devices, 42% of studies looked at the outcomes of a wide variety of assistive devices, 32% focused exclusively on the impact of mobility devices like wheelchairs and walkers, 10% examined tele-surveillance devices, and 16% looked exclusively at the effectiveness of devices for individuals with cognitive impairment. Among reviewed studies, the quality of evidence was either low or very low (Level 5-4 for quantitative studies and grades V-IV for qualitative studies).

Findings from these studies suggest that assistive technology reduces caregiver burden in some circumstances. Unfortunately, the impact of AT on caregivers is often inferred from simple variables like hours of care. Aggregate findings indicate that assistive technology use may help decrease hours of informal care with some devices. Although limited evidence is available on physical and psychological burden, some suggests these kinds of burden may be reduced with the use of assistive technology. However, some users and

informal caregivers may feel stigma associated with the use of some devices. Mixed results were found most frequently for wheelchairs. That may reflect the size and weight of these devices, problems of accessibility and transportation that may be encountered. Few causal inferences can be drawn from the included studies because of the research designs that were used.

CONCLUSION

Despite growing concerns about caregiver burn-out, scant attention has been paid to the effects of assistive devices on assistance users' informal helpers. This produces an incomplete portrayal of the impacts of assistive technology use that has implications for policy and practice, especially in terms of the funding provided for assistive technology devices and services and the manner in which these devices are prescribed.

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