Technology designed for older adults to support chronic disease self-management: A systematic review

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Introduction

- The U.S. population aged 65 and older ("older adult") is projected to almost **double** from 43.1 million (2012) to 83.7 million by 2050[1]
- As of 2012, 117 million people, about **half of all adults in the U.S.**, were living with one or more chronic conditions[2]
- Shifting demographic and prevalence of chronic conditions results in a **growing number of older adults** living with chronic conditions
- Advancements in technology (i.e., smartphones, applications) and connectivity (i.e., mobile broadband availability) has resulted in an **explosion of technology-enabled tools**[3]

Purpose

- Understand **extant literature** describing technology designed for older adults to support chronic disease self-management
- The proliferation of technology designed to support chronic disease self-management has **outpaced the research** describing the degree to which older adults use it
- Recent research describes **considerable disparities** in older adults' use of technology based on health status and sociodemographics[4]

Methods

PRISMA Flow Diagram - Systematic Review

- January 1, 1990 - September 21, 2017
- Scholarly articles published in peer-reviewed journals

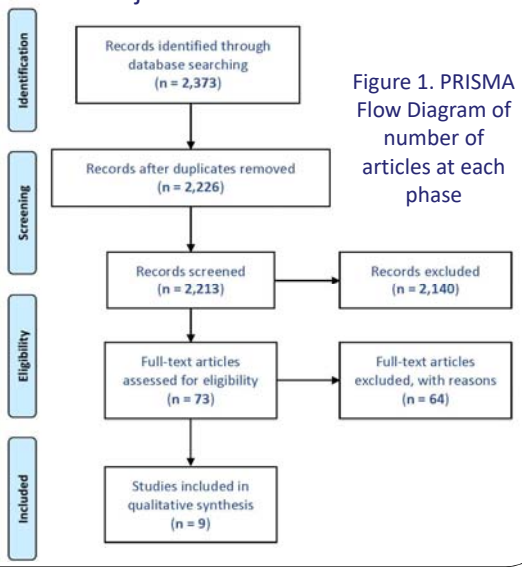

Figure 1. PRISMA Flow Diagram of number of articles at each phase

Inclusion criteria

- Technology gives **personalized information** to consumers/patients
- Study includes individuals **age 65** or more or their **caregivers**
- Paper in a **peer-reviewed journal** published in English after **1990**
- Patient or caregiver must be **end user/direct benefactor** of technology

Exclusion criteria

- Intervention targets **providers**
- No **electronic technologies** (technology using electricity) examined in study
- Technology is not designed to support **recommended chronic disease** self-care (i.e., medication behavior, attendance at follow-up appts., physical activity, and dietary behavior)
- A **systematic review** of technology

Results

- **Nine** papers met criteria, all interventions focused on aging care, but age ranges varied considerably, two were design studies
- **Specific technologies** included: mobile phone applications, smart TVs, tablets, pedometers, and semantic web technology
- **Variety of self-management** investigated, from dietary to medication behavior

Year	Technology	Function	Age
2007[9]	Mobile phone app	Physiological tracking	36 to 84
2012[10]	Touch screen tech	Nutrition education	60 to 76
2013[11]	Website	Physical activity	19 to 89
2014[12]	Android	Medication (diabetes)	N/A (design)
2013[13]	Pedometer	Physical activity	Avg. 65.6
2014[14]	Tablet app	Medication	65+
2016[15]	Samsung Galaxy tab	Activity and medication	Avg. 66.8
2016[16]	Semantic web tech	Dieting	N/A (design)
2017[17]	Smart TV	Health Services	65+

Conclusion

- Systematic review describes the **extant literature** for technology designed to support older adults for self-management
- **Diabetes** was the only specific disease examined, although they spanned a wide range of technologies and aspects of self-management
- **None considered socio-cultural factors** known to influence technology use (i.e., SES, technology self-efficacy)
- Results provide **important context for aging researchers and developers** to inform investigations of tech. designed to support chronic disease self-management

Literature Cited at: https://tinyurl.com/yawkyy8j