Review of Empirical Research in Recent Decade About the Use of IT for Older Adults

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Abstract. This study reviews the research articles about the use of IT for older adults' from 2009–2015. As result, fourteen articles published in peer reviewed journals are reviewed.

Keywords: Older adults · IT usage · Review

1 Introduction

The ability to use Computer and information technologies (CIT) is now assumed by most commentators to be a prerequisite to living in the information age. Access to CIT is a major public policy concern as technology has become a significant aspect of economic, social and health equity. Recent data suggest that although CIT use is lower among older, as compared to younger adults access is increasing among older people. Wagner et al. (2010) reviewed 151 existing articles covering the period 1990–2008 and provides a holistic view of the field. They concluded that "although there has been significant research dedicated to the use of computers by older adults, there is certainly still a plethora of opportunities for further study in this increasingly relevant field." Therefore, the purpose of this study is to review the articles that published after 2009 (the end of year in Wagner et al. (2010)'s review). We focus on the papers that reported empirical research findings in order to realize the research progress in these years.

2 Material and Method

The articles for this review were gathered by searching various databases for peer reviewed journal articles on the subject of CIT use by older adults. However, only papers with empirical research (such as survey, experiment, focus group, interview, and secondary data) are included. Search strings included reference to aging (age or aging or old or older or senior or older adults) as well as reference to computer use (computer or Internet or web or interface or mobile phone). Two research assistants and the author are responsible for categorizing the select papers according to their journal discipline, theoretical basis, IT related activities, and variables. Inter-rater reliability was calculated using a variant of Cohen's kappa as 0.72 which is above the recommended minimum of 0.70 (Straub, et al., 2004).

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3 Results

As in Table 1, most journals we found were in HCI discipline, followed by healthcare journals. Table 2 revealed that half of the papers did not outline their theoretical basis. TAM was the most frequently used theory in the study of older adult's CIT usage. In Table 3, survey was the most frequently used data collection strategies, followed by secondary data (such as government or industrial investigation). Table 4 revealed that older adults use ICT for general use, contact people or relatives and health-related activities.

Table 1. Journal dicipline and number of empirical research published

Journal discipline	Number of empirical research published
HCI	6
Healthcare	5
Psychology	1
Gerontology	1
Education	1

Table 2. Theoreitcal basis

Theory	Number of empirical research published
TAM	5
UTAUT	1
TPB	1
No obvious theory mentioned	7

Table 3. Data collection strategies

Strategies	Number of empirical research published
Survey	8
Secondary data	4
Experiment	1
Focus group and interview	1

Table 4. ICT used for older adults

ICT used	Reference
General ICT	Mitzner et al. 2010
	Pan and Jordan-Marsh 2010
	Cotten et al. 2012
	Choi and DiNitto. 2013
	Ramón-Jerónimo et al. 2013
	Elliot et al. 2014
Mobile phone	Kurniawan, 2008
	Conci et al. 2009
Social network ICT	Chung et al. 2010
	Hogeboom et al. 2010

(*Continued*)

Table 4. (*Continued*)

ICT used	Reference
health-related ICT	Chu et al. 2009
	Choi, 2011 Or et al. 2011
	Heart and Kalderon, 2013

4 Conclusion

CIT was found to be promising in increasing the quality of life for older adults. However, successful use of CIT by older adults is predicated on systems that are designed to accommodate the needs and preferences of this user group. As Chen and Chang (2011) concluded that "Technology has been shown to be beneficial to older people, but a digital divide remains".

Appendix

Paper	Data collection and sample	Major findings	Note (the kind of IT, theoretical basis, journal discipline)
Kurniawan, 2008	Online survey of 100 people	1. Older people are passive users of mobile phones 2. Gender differences in preferred design features were observed, with women focusing on haptic aids and men on perceptual aids.	• Mobile phone • No obvious theoretical basis • HCI *this paper might be neglected by Wagner et al. 2010 because it was published in Dec. 2008.
Chu et al. 2009	Experiment 137 adults aged 65+	Reduction in computer anxiety and increases in computer confidence and computer self-efficacy in retrieving and evaluating online health information if older adults receiving computer training	• Internet health information resources • No obvious theoretical basis • Healthcare

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		in appropriate situation	
Conci et al. 2009	Survey 740 questionnaires from people over 65 years old	1. Intrinsic motivations play an important role albeit always mediated by utilitarian motives. 2. A strong influence of the reference social group (children and relatives) in increasing the utilitarian values of the use of mobile phones.	• Mobile phone • TAM • HCI
Chung et al. 2010	Survey 989 (11.1 %) out of 8935	1. Perceived usefulness positively affects behavioral intention, yet it was determined that perceived ease of use was not a significant predictor of perceived usefulness. 2. Negative relationships between age and Internet self-efficacy and the perceived quality of online community websites. 3. Moderating role of age was not found (the relationships among perceived ease of use, perceived usefulness, and intention to participate in online communities do	• Online community participation • TAM • HCI

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		not change with age.)	
Hogeboom et al. 2010	Secondary data A sample (n = 2284) from the 2004 wave of the Health and Retirement Survey was used. (adult age > 50)	Frequency of contact with friends, frequency of contact with family, and attendance at organizational meetings (not including religious services) were found to have a significant positive association with Internet use for adults over 50.	• Internet use for social networking • No obvious theoretical basis • Education
Mitzner et al. 2010	Focus group Older adults (n = 113)	1. Older adults perceive the benefits of technology use to outweigh the costs of such use. 2. Perceived benefits of use and ease of use have positive influence on computer use	• Computer technologies • TAM • HCI
Pan and Jordan-Marsh 2010	Survey 374 (age 50 +) Beijing, China	Perceived useful (+) Perceived ease use (+) Social norm (+) Internet adoption intention: Perceived useful (+) Social norm (+)	• Internet adoption behavior • Extended TAM • HCI

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		Facilitating condition (+) Perceived ease use: Older (+)	
Choi, 2011	Secondary data derived from US National Health Interview Survey (NHIS) 2009 aged 65 or older (n = 5294)	Older-adult users of general health services were more likely to use HIT than nonusers of general health services, while older-adult users of specialized health services were not different from nonusers of specialized health services in their odds of HIT use.	• HIT usage • No obvious theoretical basis • Healthcare
Or et al. 2011	Survey 101 participants of home care nursing practice with adults with chronic cardiac disease	Perceived usefulness, perceived ease of use, subjective norm, and healthcare knowledge together predict most of the variance in patients' acceptance and self-reported use of the web-based self-management technology.	• Web-based interactive self-management technology • Unified Theory of Acceptance and Use of Technology (UTAUT) • Healthcare
Cotten et al. 2012	Secondary data Retired Americans age 50 years or older using data from the Health and Retirement Survey	A positive contribution of Internet use to mental well-being of retired older adults reducing	• Internet use and depression • No obvious theoretical basis • HCI

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		depression categorization by approximately 20–28 %.	
Choi and DiNitto. 2013	Face-to-face or telephone surveys 980 recipients of home-delivered meals in central Texas (78 % were age 60 years and older and 22 % under age 60).	Due to lack of exposure to computer/internet technology; lack of financial resources to obtain computers and technology; or medical conditions, disabilities, and associated pain that restrict use.	• Low-income disabled and homebound adults' and older adults' Internet use. • No obvious theoretical basis • Healthcare
Heart and Kalderon, 2013	Survey 123 respondents(63 from the US and 60 from Israel.)	• ICT use was determined by accessibility of computers and support and by age, marital status, education, and health. • Health was found to moderate the effect of age, healthier older people being far more likely to use computers than their unhealthy coevals. • Only perceived behavioral control (PBC) emerged as significantly affecting intention to use a computer	• Readiness to adopt health-related ICT • Theory of planned behavior (TPB) • Healthcare
Ramón-Jerónimo et al. 2013	Survey 492 individuals over 50 years old in Spain	• Male elders seem to perceive more usefulness due to higher levels of ease of use than woman.	• Internet use • TAM and gender differences for older adults • Gerontology

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		• Ease of use is also better explained by the level of enjoyment for males.	
Elliot et al. 2014	Secondary data a sample of community-dwelling older adults from the National Health and Aging Trends Study (N = 6,443).	• Socioeconomic status (SES), age, and cognitive function accounted for approximately 60 % of the variance in ICT use. • SES was a stronger predictor for Blacks/African Americans, whereas cognitive function was a stronger predictor for Whites. • ICT use was unrelated to depressive symptoms or well-being. However, it acted as a moderator, such that limitations in activities of daily living (ADLs) was a stronger predictor of depressive symptoms for high ICT users, whereas ill-health was a stronger predictor for non/limited users.	• ICT use • IT and depressive • Psychology

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