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Sociodemographic and Family Influence in Elderly Digital Health Behaviours with Chronic Diseases: A Theoretical Review

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ABSTRACT

This paper focuses on the socio-demographic characteristics (age, gender, ethnicity, income, education, and occupation) and family relationships in the determination of digital health behavior among older adults. This study analyzes the literature of the last decade to determine how age, gender, ethnicity, income, education, and occupational status interact with family to influence the adoption of health technologies and shows that social and demographic factors significantly influence digital health behaviors; the role of the family in providing support and encouragement for the adoption and maintenance of these health technologies is equally critical. It also provides theoretical and practical insights for designing digital health interventions tailored to the elderly. This allows emphasizing the prevalence of a multifaceted approach to technology and policy development in consideration of the individual and family factors to promote digital involvement of the elderly. A combination of keywords and MeSH terms was used to search for articles published between 2015 and 2024 in the PubMed, Scopus, and EBSCOhost databases. The family support and collective health objectives have a huge effect on the health acceptance of the elderly population, and thus, interventions should be made to enhance these systems. Previous studies were evaluated then the research gaps and objectives were identified. Providing practical solutions and new insights into the interaction between socio-demographic factors, family dynamics, and digital health behaviors among the elderly can improve health and well-being outcomes through the use of technologies.

Keywords: Digital health, family system theory, Health Belief Model (HBM), Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT)

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INTRODUCTION

The world is ageing, and the number of older adults is expected to exceed 1.5 billion by 2050 (United Nations, 2019) . The percentage of people aged 65 and above is expected to continue increasing substantially worldwide (He et al., 2020), not only in the U.S. also in Europe (Vespa et al., 2018). This change in demographics is particularly significant in underdeveloped areas, and it is associated with an increasing rate of chronic diseases (Abbasian et al., 2020). Wearables, telemedicine, and mobile health (mHealth) applications are among the promising health technologies that can improve access to and outcomes of healthcare among older adults (Kvedar et al., 2014; World Health Organisation, 2019). The tools can be used to provide personalized and remote care, which facilitates efficient healthcare provision (Kumar et al., 2012). The aging trend is accelerating, making it more crucial than ever to take advantage of digital development (Kalhori et al., 2021). Despite the increasing number of older adults using digital health tools, there is a high level of variation in adoption rates, which is attributed to inadequate technical literacy, insufficient access to devices, and a lack of confidence in their effectiveness as health tools (Chen et al., 2021). The COVID-19 pandemic accelerated the adoption of telemedicine, and the number of visits grew by 50% during the first quarter of 2020 as compared to 2019 (Malouff et al., 2021).

There is no equality in smartphone ownership: 73% of adults aged 50-64 own a smartphone as opposed to 53% of adults aged 65 and above (Chen et al., 2021). Other obstacles such as high learning curves and privacy considerations are keeping adoption at bay (Mitzner et al., 2016). Digital health technologies can enhance the quality of life and reduce hospital readmissions by monitoring the elderly in real-time and managing chronic complications (Reeves et al., 2020).

Telemedicine helps overcome geographic barriers, thereby expanding access in underserved areas (World Health Organisation, 2019). These tools are also advantageous in medication adherence, mental health counselling, and physical activity. mHealth adoption requires comprehension of the factors that influence its adoption. Digital literacy, technology anxiety, health status, and self-efficacy influence the concept of acceptance in different groups (Chen et al., 2021; Mitzner et al., 2016), theoretical frameworks of UTAUT and HBM conceptualize them. The research investigates how sociodemographic data and family factors affect the digital health adoption of older adults. The objectives are to explore the relationship between sociodemographic factors, family support, and digital health behaviors and how it can synthesize the essential theoretical frameworks, such as UTAUT, HBM, and family systems theory, to understand patterns of adoption and create evidence-based intervention that would improve the use of eHealth technologies among older adults.

METHODOLOGY

Literature search was based on PubMed and Scopus databases; the search was done on sociodemographic and family factors that affect elderly digital health behaviors. The keywords were digital health, technology adoption, and the theoretical frameworks (UTAUT, HBM, and Family System Theory) and restricted the search to English studies published since 2015. The screening was done based on the title, abstract, and full text articles and only peer-reviewed articles on people aged 65 and above were considered. Two reviewers extracted data separately. In case of disagreements, a third reviewer was used to resolve such differences.

RESULTS

This search identified 639 studies, of which 21 review articles were selected after removing duplicate and irrelevant articles. These papers examined some of the digital health tools, including mobile health apps, telemedicine, wearables, and electronic health records (EHRs). It shows that 42.86% of the articles focused on how socio-demographic factors (age, education, income) influence the use of digital health technologies. Support of family was highlighted in 33.33% of the studies, where the support of family members in the form of emotional and technical assistance increases adherence to digital health. The remaining 23.81% discussed theoretical frameworks (UTAUT, TAM) that help explain and improve digital health adoption. Characteristics of identified documents with demographic effects, family dynamics and digital health acceptance are shown in Table 1.

DISCUSSION

The review integrates the literature on three key topics: socio-demographics, family support, and theoretical frameworks that influence the adoption of digital health among the elderly. Age and income are socio-demographic variables that have a strong influence on eHealth use, as the higher the level of digital literacy, the better the health outcomes and the greater the use of digital tools. Digital health interventions are significantly impacted by family support, emotional support, and technical support, which are essential to the success of a digital health intervention, especially during the treatment of chronic diseases. Theoretical frameworks are sometimes used; however, only 23% of these studies are based on these frameworks, which may indicate their provisional use. This review suggests the potential of digital health tools and the need for theory-based, user-centered interventions that may improve older adults' acceptance and in turn the effectiveness of digital health.

Table 1
Key *research themes in digital health literature*

Theme	Article	Authors	Key Findings
Theme1 sociodemographic Factors Influencing Digital Health Use	Sociodemographic Factors Influencing the Use of eHealth in People with Chronic Diseases	Reiners et al., 2019	Higher age, lower income, lower education, and living alone are linked to lower eHealth use. Family support is crucial.
	Digital Literacy and Health Outcomes	Berkowsky et al., 2022	Higher digital literacy correlates with improved health outcomes. Older adults need support to enhance digital literacy
	Sociodemographic factors and Digital mental Health intervention	Abouzeid & Lal, 2024	Sociodemographic factors like age, gender, race, and education affect the acceptability of digital mental health interventions.
	Adoption and Use of Digital Tools for Physical Activity	Petrica et al., 2024	Age and gender significantly influence the adoption and use of digital tools for physical activity.
	Technology Use Among Low-Income Older Adults	Chan et al., 2023	Age, education, ethnicity, income, and social support significantly impact technology use among low-income older adults.
	Technology Acceptance in Health Informatics	Rahimi et al., 2018	Factors like compatibility, subjective norm, self-efficacy, and anxiety significantly impact health information systems adoption
	Mobility Limitations Among Older Adults	Onyeso et al., 2023	Age, gender, race, location, income, occupation, education, and social status are significant in understanding mobility limitations among older adults.
	Health Technology Adoption by Older Adults with Chronic Diseases	Bertolazzi et al., 2024	Factors that have a strong influence on technology adoption among older adults with chronic diseases include age, education, income, and family support
	eHealth Literacy and Media Health Literacy	Levin-Zamir Bertschi 2018	Media health literacy and eHealth literacy were significantly influenced by age, education, socioeconomic status and family support.
Theme2: Role of family support in Digital Health Adoption.	Family Dynamics and Health Behaviors	Wäsche et al., 2021	The use of eHealth services among older adults is strongly dependent on family and social support.
	Family Support in Chronic Disease Management	Weiss-Laxer et al., 2020	Family cohesion and support enhance health outcomes; need for family-centric health interventions.
	E-Health Services Use Among Older Adults	Wilson et al., 2021	Family and social support are critical in facilitating the use of e-health services among older adults.

Table 1 *(continue)*

Theme	Article	Authors	Key Findings
	Family-Centric Health Interventions	Pediatrics 2020	
	Adherence to mobile health interventions in patients	Triantafyllidis et al., 2022	Family support is crucial in enhancing patient adherence to mHealth interventions.
	Culturally Adapted Interventions	Naderbagi et al., 2024	Family involvement is crucial in designing culturally adapted interventions, providing insights into cultural values and norms that influence health behaviors.
	Adoption-Related Communication Dynamics	Colaner 2022	Communication openness and family support are highlighted as vital for the well-being and adjustment of adoptees.
Theme3: Theoretical Frameworks in Digital Health	Family Health Development & Health Trajectories	Pediatrics 2020	Uses Family System Theory and ecological models to explain family health development and its impact on health trajectories.
	Technology Acceptance in Health Informatics	Rahimi et al., 2018	Integrates components from various theories like TAM and UTAUT to analyze technology acceptance in health informatics.
	Shared Decision-Making Interventions	Bunn et al., 2018	Utilizes context-mechanism-outcome configurations to explain how shared decision-making interventions work for older adults.
	Factors Influencing Telemedicine Adoption	Al-Aiad et al., 2020	Uses thematic analysis to classify factors influencing the adoption and usage of telemedicine for chronic diseases.
	Sociodemographic Factors and Digital Health Literacy	Marta et al., 2023	Uses regression analyses to determine the impact of sociodemographic factors on digital health literacy.
	Cultural Adaptation of Digital Health Interventions	Naderbagi et al., 2024	Based on different frameworks including PEN-3 model, ecological validity model, and theories of cultural humility to help in structuring the adjustment process.
	Adoption-Related Communication Dynamics	Colaner 2022	Utilizes various communication theories to explore adoption-related communication dynamics.

CONCLUSION

This paper has surveyed three major themes, including socio-demographic, family support, and theoretical frameworks in digital health. Digital tools are more likely to be used by younger and educated people with higher income. Engagement and outcomes are improved with the help of family support, which is achieved through communication and emotional encouragement. Nevertheless, gaps remain including little longitudinal studies, the lack of consistency in the application of the theory, and the lack of attention to vulnerable populations (low-income older adults). Future studies should try to use universal methods and long-term programs that focus on the dynamics and needs of the entire family. It is possible to enhance the insights into adoption behaviors by incorporating such models as UTAUT, TAM, HBM, and family systems theory. Disparities will be minimized by promoting digital literacy and increasing its accessibility by age-specific programs that will empower older adults.

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