



## Extending Health Services to Geriatric Patients in Rural Areas Using eHealth Tools

Name

Institutional Affiliation

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Areas

### Introduction

Lately, there has been mounting awareness of the social repercussions of old age. While globally there is a marked increase in life expectancy, particularly due to technological advances which have led to significant improvement in early detection of diagnosis and effective treatment of chronic diseases, the fertility rates are declining, and, as a result, communities are confronted with an aging population (Hage, Roo, van Offenbeek, & Boonstra, 2013; United Nations Department of Economic and Social Affairs, 2017). An increasing number of geriatric population is not only intensifying the demand for healthcare services, and, consequently, escalating medical costs, but also imposing long-term effects on every aspect of human life, including social and economic spheres. Specifically, rural communities are affected by this issue due to “in-migration” of retirees from cities and “out-migration” of young adults from villages to metropolises (Baernholdt, Yan, Hinton, Rose, & Mattos, 2012).

Hage et al. (2013) explain that owing to the marked demographic shift there is a need to promote healthy lifestyle among geriatrics patients, e.g. encourage them to follow a proper diet and do physical exercises that can help to curb diabetes, obesity, cardiac conditions, hypertension, and premature death. Nonetheless, despite the known value of healthy lifestyles, the elderly often prefer sedentary behaviors. Therefore, the purpose of this paper is to explain how eHealth tools could assist elderly people in rural areas.

### Literature Review

#### eHealth

eHealth is an umbrella term for a broad array of healthcare services, which are provided via information and communication applications, like health information systems, electronic health records (EHRs), health data analytics, tools for self-management, and consultative services such as telecare, telemedicine, and telehealth (Barbabella, Melchiorre, Quattrini, Papa, & Lamura, 2016). For the aging population, eHealth can enhance the delivery of medical services and provide new ways to access care without the necessity to walk long distances to hospitals, which are often located in urban areas. In addition, it could make health providers and policymakers integrate and coordinate the detection, management, and treatment of diseases by facilitating interaction and sharing of information between medical staff and the geriatric patients via electronic EHRs or mobile eHealth tools (mHealth) (Barbabella et al., 2016).

## **e-Health Tools Promote Self-Management**

Type 2 diabetes mellitus (DM2) is a pervasive condition among the elderly, which can be concomitant with multiple co-morbidities. It is also linked to several complications such as frequent urination, hunger, thirst, tingling and numbness in the extremities, as well as blurred vision (Kirk et al., 2015). In rural areas, eHealth approaches have been found to be effective mechanisms for supporting self-management attempts to curb DM2-associated complications. For instance, Schrader et al. (2014) conducted a pilot study to investigate the acceptability and feasibility of eHealth program for controlling chronic diseases in the countryside. The authors created a virtual self-management system that integrated Flinders Chronic Condition Management content and espoused goACT software, an existing application that can be accessed by health care workers and patients via Internet-enabled devices. The application helps the elderly people to be conscious of the indications of the present conditions, including DM2 and hypertension, and communicate any marked changes in their wellbeing, thereby facilitating prompt and early control. eHealth measures also allow nurses to recognize the determinants of patients' health seeking practices, including perceived risk factors for diseases, health consciousness, and the ability of Internet users to search for medical-related information, and, subsequently, aid in the formulation of relevant health promotion interventions.

Parker et al. (2018) conducted a systematic review to evaluate the benefits of utilizing digital, mobile, and telehealth applications, as well as to establish the mechanisms through which the aforementioned tools influence self-management and self-efficacy among vulnerable individuals. The authors used CINAHL, Medline, PsychINFO, and CMBASE and identified eighteen clinical trials published between 2009 and 2018, which focused on the effectiveness of eHealth interventions in the management of chronic diseases. The included studies showed that telemedicine improved self-efficacy and self-management practices among patients by inspiring them to follow healthy lifestyles and try self-care activities. Notably, the respondents who adopted telehealth approaches to interact with their primary caregivers and health providers said that they are supported and have a sense of purpose (Chong & Moreno, 2012).

### **eHealth Improves Access to Healthcare Services for People in Remote Areas**

Hallberg, Ranerup, and Kjellgren (2016) interviewed n=46 hypertensive patients to evaluate the efficacy of an interactive mobile phone-based application in enhancing self-care. The results showed that the motivational texts sent via the interactive system provided the patients' insights, inspiration, and comprehension of the disease mechanisms which heightened medication adherence. In an earlier investigation, Shea et al. (2009) compared the effectiveness of telehealth (IDEATel) and usual care among ethnically diverse aged individuals who were Medicare beneficiaries in the clinical management of DM2. The RCT involved the utilization of video conferencing between nurse educators and the elderly patients every four-six weeks for self-care training, review of blood pressure and glucose measurements, as well as customized goal setting. Furthermore, the eHealth tool allowed the respondents to access educative information about self-care and symptoms of the disease. Overall, the eHealth videoconferencing interface facilitated case management of elderly DM2 patients, which resulted in net improvements in the control of blood pressure levels, blood sugar, and low-density cholesterol. As for impact on nurses, the resulting improved quality of care tended to enhance job satisfaction and morale, and subsequently, organizational citizenship behavior (OCB).

Barbabella et al. (2016) conducted a policy analysis of the significance of eHealth tools in delivering care to the aged population. The findings showed that, generally, eHealth programs for monitoring and care, as well as for self-management and virtual consultation, had the strongest proof that supported their usage by patients with chronic diseases and multi-morbidity. Besides, the

authors noted that in rural areas with few or no medical professionals, eHealth tools were necessary to facilitate remote rehabilitation, treatment, and consultation. The e-consultations improved the overall quality of life among the elderly by enhancing self-efficacy, control of modifiable conditions like DM2 and hypertension, medication adherence, and improved peer support. In particular, medication adherence, which was facilitated by eHealth and mHealth tools led to reduced number of visits to emergency rooms (ER), decreased number of inappropriate admissions, and shortened periods of hospital stay. Furthermore, the utilization of environmental sensors and body monitoring apps helped minimize expenses for office consultations (van Gaans & Dent, 2018), support tailored patient care, and facilitate continuity of care (Totten et al., 2016).

### **eHealth Enhances Health Literacy**

As illustrated in the previously reviewed pieces of literature, it is apparent that self-care and self-management are closely associated with health literacy and can be accomplished through the use of eHealth tools and telemedicine programs. For instance, Parker et al. (2009) conducted a two-arm pragmatic practice-level cluster RCT to assess the influence and implications of an mHealth-enhanced preventive intervention to control obesity or overweight in Adelaide and Sydney, Australia. Although the research engaged young adults as well, the preliminary findings suggest that eHealth services play a major role in enhancing self-care by serving means of educating aged patients on the importance of maintaining healthy body mass index (BMI), doing physical exercises, and avoiding sugary or fatty products.

In another investigation, Landry (2015) adds that health literacy entails the capacity to find, comprehend, review, and share information which may help maintain or enhance health. Wolf et al. (2014) carried out a quasi-experimental RCT to compare the efficacy of a conventional, community-based DM2 brief education and counseling practice (CARVE-IN) with the use of mHealth DM2 health promotion program (CARVE-OUT). The outcomes of the investigation illustrated that the outsourced DM2 education and counseling approach (mHealth) was more feasible in enhancing health literacy compared to the traditional method of holding community-based mass educational forums.

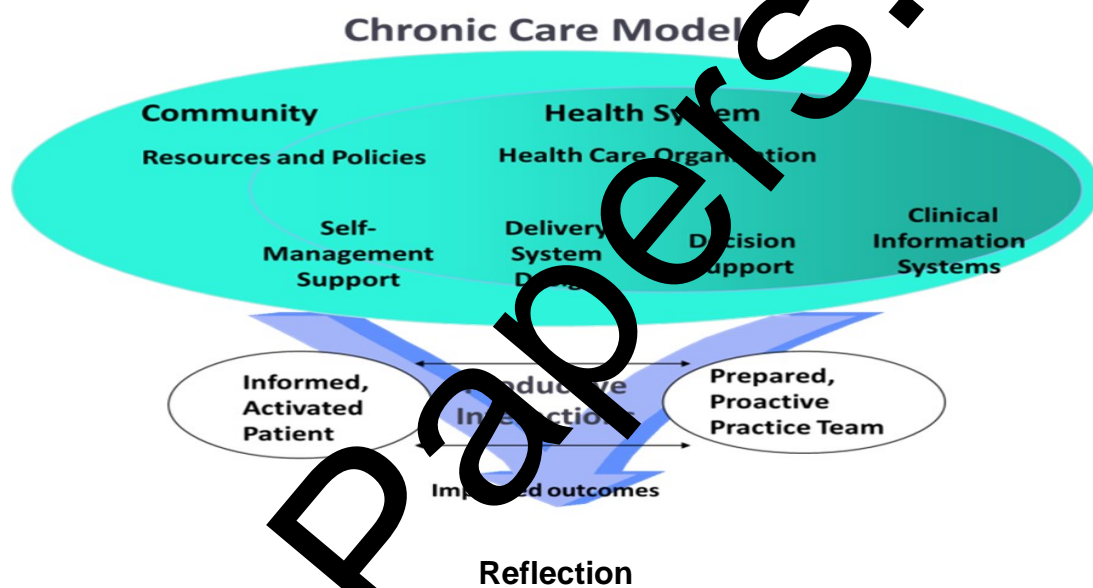
### **Theoretical Philosophy**

As stated earlier, the aged population is vulnerable to chronic conditions, including DM2 and uncontrolled blood pressure, which are further complicated by multi-morbidities and the negative effects of frailty (Hague et al., 2013; Baernholdt et al., 2012). In both rural and urban areas in developed and developing countries, chronic illnesses are a major financial and social burden of communities and individuals. Various theories have been proposed to guide the delivery of care to the chronically ill people, one of which is the Chronic Care Model (CCM). According to Gee, Greenwood, Perniti, Ward, and Miller (2015), the CCM is a well-known and authenticated theory that demonstrates a comprehensive advance to providing care to the chronically ill patients by supporting clinical and functional outcomes. The framework encompasses six codependent elements, in particular, health system support, community resources, self-management support, decision support, delivery system design, and clinical information systems (Gee et al., 2015).

According to CCM, chronic illnesses are one of the main issues in the community where the sick individual will access the necessary medical services with the help of established health systems. It emphasizes the significance of facilitating self-care by encouraging the patients with the appropriate knowledge, skills, and confidence to manage their condition by themselves (Coleman, Austin, Brach, & Wagner, 2009). While the "delivery system design" is fundamental in enabling a client-centered multi-disciplinary team approach to care, "decision support" is necessary to guarantee that patients and healthcare providers have access to the most relevant evidence-based care recommendations (Siminerio, 2010). Lastly, Gee et al. (2015) outline that CCM highlights the

role of “clinical information systems” in ensuring access to the required information and skills to heighten self-management, and subsequently, enhance health.

CCM is useful when applied to eHealth tools since it helps improve the well-being of geriatrics patients in rural areas. For instance, to take care of an aged diabetic patient, a nurse will require to have access to an established EMR system to specify his/her symptoms and condition, as well as facilitate the tracking of progress and delivery of quality long-term care. At the community level, the medical staff and the aged population may embrace the Enhanced 9-1-1/Global Position Wizard, a telemedicine App that monitors the conditions of patients with severe hypoglycemia (Dassau, Jovanovic, Doyle, & Zisser, 2009). With regards to self-management, nurses can utilize mHealth technologies to send prompts to elderly patients through their mobile phones to remind them to monitor their blood glucose or blood pressure. Lastly, with respect to clinical information systems and decision support, effective digital systems ensure that medical experts have access to professional support that is enabled via evidence-based decision guidelines (Gee et al., 2015; Siminerio, 2010).



From the reviewed pieces of literature, it is clear that the adoption of community-based, technology-supported services applications are substantially effective in detecting, managing, and controlling modifiable risk factors for chronic ailments among geriatric patients in rural communities (van Velsen et al., 2015). As stated earlier, eHealth brings services to the client and enhances efforts to curb complications associated with frailty. Furthermore, other empirical studies have highlighted eHealth's benefit in fostering nurse-patient rapport and social interactions (Barbabella et al., 2016). Similarly, the elderly often suffer from social isolation, and online communities can help them not to feel alone (Roberts, Philip, Currie, & Mort, 2015).

Irrespective of the discussed positive impacts of eHealth tools and systems on the welfare of geriatric patients in rural communities, they may not be helpful to octogenarians and nonagenarian with a typical reduction in mental and physical functions. For instance, Roberts et al. (2015) evaluated the efficacy of a technology to support Older Adult's Personal and Social Interaction project (TOPS) in improving the QoL among the elderly with chronic pain. The outcomes illustrated that in-person nurse visits are more effective than technology-based tools or e-consultations in enhancing the overall wellbeing of the respondents, particularly those aged 80 and above.

### Nursing Implications

An inter-disciplinary approach entailing technology providers, community members, policymakers, and medical experts is essential to the accomplishment of the mission of digital-enabled enhanced healthcare service delivery in rural areas, where there is an increasing number of the aged population (Effken & Abbott, 2009). Granja, Janssen, and Johansen (2018) posit that nurses are the frontline clinical healthcare providers and they can assess patients by directly asking questions to evaluate where the older adults get health information. Additionally, nurses serve in the communities, and, therefore, have a comprehension of the culture, informal communication strategies, as well as subcultures, and this knowledge is essential when designing and implementing the sustainable rural eHealth programs. For instance, nurses should be aware of the communities' food types, so that they can advise the best diet combinations necessary to control blood glucose, or know the community's language to ensure proper communication and be sure that the patients understand them (Parker et al., 2018). Finally, nurses can promote the use of eHealth among geriatrics to curb social isolation by showing them how to join online support groups (Khosravi, Rezvani, & Wiewiora, 2016)

### **Conclusion**

As illustrated in the appraised empirical studies, the number of aged population is constantly increasing in rural areas, and they are susceptible to chronic ailments owing to their reduced mobility and inactivity. This paper argued that eHealth tools can provide solutions to the health concerns of the elderly living in rural areas, as these technologies allow to get access to quality clinical services, improve medication adherence, reduce the risk of hospitalization, and prevent some diseases by promoting self-care and self-management. Nonetheless, eHealth tools are not necessarily useful for all the vulnerable geriatrics, particularly for those older than 80 years who are likely to receive more benefits from personal visit or institutionalized care.