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Visioning the Future of Gerontological Digital Social Work

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ABSTRACT

Gerontological Social Work education has been substantially altered by the advancement of today's digital technologies, influencing both the training and tools required to ensure student success in social work research, policy, and practice. The goal of this paper is to present the state of the science on gerontological digital social work education, identify implications for emerging technologies, and define areas for social work student competencies and proficiencies to advance the field of gerontological digital social work. This paper underlines the role of gerontological digital social work education in preparing future researchers, practitioners, and policymakers when engaging in Digital Therapeutic Teams. We provide insightful considerations pertaining to emerging technologies which present unique opportunities for innovation. Furthermore, this paper presents training and education opportunities for social work education in preparing future gerontologist practitioners, researchers, and policymakers to engage in multidisciplinary team efforts and leverage digital technologies and digital therapeutics.

Introduction

Gerontological social work has been substantially altered by the advancements in today's digital technologies, along with the training required to ensure success in research, participation on interdisciplinary teams, policy, and practice. Digital technologies are a wide array of software and hardware tools that help deliver, engage, manage, and enhance communication, learning, and services (Guri-Rosenblit, 2009). Similar to other scientific fields, digital technology, including digital therapeutics, has transformed how social workers engage, provide services, and communicate with older adults, caregivers, families, groups, organizations, and communities (Goldkind et al., 2019; Makin, 2019; Peláez & Marcuello-Servós, 2018). Social work education has an important role in preparing future researchers, practitioners, and policymakers in adopting, understanding, and applying digital technologies
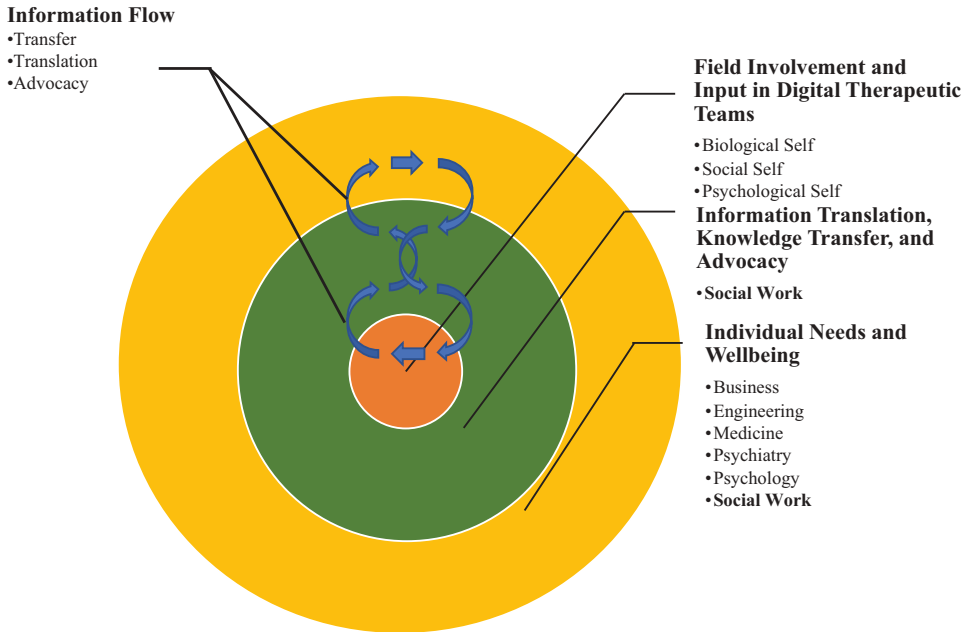
and digital therapeutics to help improve wellbeing and quality of life of older adults.

Gerontological social work incorporates the values of the profession, service, social justice, dignity and worth of the person, importance of human relationships, integrity, and competence, with an emphasis on helping meet the psychosocial needs of older adults (Schneider et al., 2000). The incorporation of new and existing digital technologies into the practice of social work facilitates the development of *Gerontological Digital Social Work*. Gerontological digital social work encompasses the development and uptake of technologies in the form of electronic tools (i.e., eHealth and remote technologies) that are used to enhance research, policy, and practice by meeting the biopsychosocial needs of older adults. However, this new developing area of social practice needs to be aligned with careful consideration given to the 2015 EPAS standards to help ensure the wellbeing of older adults (*Council on Social Work Education (CSWE) – 2015 EPAS, n.d.*).

This selective review presents the state-of-the-science of gerontological digital social work technologies and proposes educational strategies to help enhance capacity to engage and utilize these resources in research, policy, and practice. The technologies selected and discussed in this review have been identified throughout the literature as important tools in the improvement and accessibility of services and resources. In our discussion of these resources, both the benefits and challenges pertaining to increased technology use are addressed and carefully considered.

Understanding the Role and Imprint of Gerontological Digital Social Work on Digital Therapeutic Teams

Gerontological social work entails many practice complexities (e.g. diverse individual needs, policy, resource navigation) in helping meet the needs of a growing older adult population (Ray et al., 2014). Digital gerontological social work requires collaboration from multiple disciplines to advance research, policy, and practice for older adults. In working with multidisciplinary teams of gerontologists from various disciplines such as medicine, psychiatry, psychology, engineering, and business, gerontological social work brings forth expertise in *multiple dimensions of aging* by considering the individual and interconnected impacts of the biological, psychological, and social self on successful aging and overall wellbeing (please see Figure 1). Digital therapeutics involves the use of technology platforms such as a smartphone applications, videoconferencing, monitoring technologies (e.g., wearables such as Fitbit or Apple Watch) in combination with professionals to deliver evidence-based interventions digitally (Lougheed, 2019). The use of digital therapeutics can help enhance access to services and

Information Flow
•Transfer
•Translation
•Advocacy

Field Involvement and Input in Digital Therapeutic Teams
•Biological Self
•Social Self
•Psychological Self

Information Translation, Knowledge Transfer, and Advocacy
•Social Work

Individual Needs and Wellbeing
•Business
•Engineering
•Medicine
•Psychiatry
•Psychology
•Social Work

Figure 1. Role of gerontological digital social work on digital therapeutic teams.

simultaneously promote physical health, mental health, and social health (Makin, 2019; Sverdlov et al., 2018).

The collaborative nature of these teams also provides opportunities for social workers to advocate on behalf of older adults for their needs, as supported by the CSWE Interprofessional Practice Track (*Council on Social Work Education (CSWE) – Interprofessional Education and Collaborative Practice, n.d.*). *For example, social workers can present ethical concerns of older adults regarding technologies (e.g., passive monitoring, replacing humans with artificial intelligence) and work with the team to consider alternative approaches (e.g., human connection in technology, active monitoring). Also, with social work's foundation in social justice, social workers should advocate for the inclusion of older adult community members on research teams as equal partners. A large and compelling body of research suggests that the inclusion of community members on research teams improves the effectiveness of interventions as well as uptake and dissemination (Hassouneh et al., 2011; Komaie et al., 2018; Tse et al., 2015).*

Social workers' involvement in teams can help engage and inspire hard-to-reach older adult populations by enhancing access to evidence based treatments, improving access to resources, and including the patient/person/community voice in the development of interventions (Goldkind et al., 2019). Social workers often work with the most vulnerable groups of older adults and therefore competency in the application of digital therapeutics may help promote social justice and enhance the wellbeing of people such as those with serious mental

illness and address health disparities. Social workers' involvement in teams can further result in the translation of research findings that inform real world interventions and applications which assist in advocating for new resources at a legislative level (Sixsmith et al., 2017; Zucker, 2012). Social work research is designed to have a population level effect. Unique to social work training are real-world studies that aim to understand individuals in the context of their environment at a micro, mezzo, and macro level. This creates a comprehensive and holistic approach toward understanding the challenges and needs of older adults.

Implication and considerations for emerging technologies in gerontological digital social work

Although there are many benefits in the utilization of technologies to enhance gerontological social work practice, social workers need to consider and be competent in the ethical implications of technology usage, access, technology design bias, and user involvement in the development of technology-based interventions (Cutler, 2019; McInroy, 2019). Furthermore, social workers should be familiar with new and emerging digital therapeutics to better understand their potential uses in supporting the aging process and quality of life. Social workers currently utilize various technologies such as the internet, video conferencing software, and applications to deliver various services. However, new and emerging technologies present opportunities for innovations in service delivery and improved resources accessibility.

Technologies have the potential to help older adults with daily function and assist with a variety of tasks (Schafer et al., 2012). The evolution of smart home design is improving access to appropriate housing which can help facilitate successful aging in place. According to Kim et al. (2017), advanced sensors placed inside smart homes can help track physiologic and safety parameters. Sensors, along with other devices, can help detect early aggravations of chronic conditions and improve response to emergencies, such as falls and cardiac arrest (Kim et al., 2017). Emerging online resources and technologies such as telepresence devices, phone applications, and personal assistive devices present opportunities to enhance one's ability to age in place and support healthy aging (Kwon, 2017).

The below selective review describes five emerging technologies for older adults: (1) sensors; (2) wearables; (3) robots; (4) telepresence; and (5) smartphone apps. These technologies and their application present unique opportunities in addressing the challenges experienced by older adults and enhancing wellbeing.

Sensors

Sensor monitoring in the homes of older adults offer a multitude of applications including movement tracking, detection of declines in daily

functioning, and assessments of living environments (Jansen et al., 2018; Nambiar et al., 2016). These forms of technologies are intended to promote independent living, monitor, and help promote aging in place (Health, N. C. for E, 2017; Kim et al., 2017, p. 27). Due to challenges that are often encountered throughout the aging process, older adults can experience difficulties, which may affect their ability to maintain their independence and thus the ability to age in place. Technology interventions can help reduce the need for institutionalized care and improve access to resources for older adults and their caregivers (K. L. Fortuna et al., 2019). Older adults aging in place connected to technology often report better connections to resources and services (Golant, 2017) and thus may impact community tenure.

Sensors can be utilized to help detect declines in the physical, sensory, and cognitive capabilities of older adults users (Alexander et al., 2011a; D'Onofrio et al., 2018; Jansen et al., 2018; Nambiar et al., 2016).This information can assist with prevention and early interventions and limit the progression of declines (Majumder et al., 2017). However, the use of such technologies raises many concerns and challenges around privacy and decision autonomy of older adults (Nambiar et al., 2016). Examples of successful applications of these sensor technologies can be observed in facilities such as Tiger Place, which utilize sensor technologies to create an aging in place living environment (Alexander et al., 2011b; Rantz et al., 2008, 2015; Tyrer et al., 2006). Moreover, Tiger Place has developed a care model, which intertwines personal care while leveraging existing and emerging technologies to help promote early illness recognition, fall detection, and enhanced health outcomes (TigerPlace Institute, 2020). However, the lack of proper application of sensors may raise concerns pertaining to privacy and decision autonomy. Social workers need to be aware of these concerns and work with designers and developers to involve older adults in the creation of sensor technologies. Furthermore, social workers need to effectively communicate with older adults and their families to provide support and education pertaining to the use of these technologies.

Wearables

Wearables are a category of technology devices that can be worn by a user (Kekade et al., 2018), such as Fitbit or Apple Watch. These technologies come in a variety of shapes, and interfaces but the majority of devices are typically in the form of clothing or accessories. Wearables can incorporate multiple sensors which are small, powerful, less disruptive than home sensors, and allow for more user control. Although wearables can serve as an alternative to home sensors, they still present concerns pertaining to usability, privacy, and safety. The key contributor to these concerns is the fact that wearable technologies are often designed without an older adult in mind

(Goodman & Lundell, 2005; Mcfedries, 2013). Incorporating older adults in the design process can help ensure that their particular needs are addressed in the hardware design and software interface (K. L. Fortuna et al., 2017, 2019). For example, if technologies are designed with older adults, and their preferences are incorporated in the design and development, this can help increase perceived usefulness and ease of use, resulting in higher adoption rates. The use of wearables also presents opportunities to provide older adults with the ability to receive continuing healthcare and improved access to resources. For example, a wearable technology may be able to track and record vital signs which may be transmitted to a clinic in the case of emergency, enhancing response times. Utilizing this form of technology can help reduce hospital visits, enhance management of health conditions, and reduce medical checkup costs (Li et al., 2019; Murnane et al., 2016). Recent studies indicate that older adults, including those who reported poor age-related health status, note that that they find wearable technology useful and are interested in adopting and using them (Li et al., 2019; Rupp et al., 2018). Advancements in the applications of wearables, particularly those being designed and developed for and with older adults, can play an important role in helping assist and support aging in place and address concerns pertaining to age-related health and physical challenges.

Robots

Robots are a growing segment of assistive technologies often designed for older adult use. A robot is an artificial agent which executes tasks autonomously, varying in functionality, and is often categorized based on the tasks it carries out (Bemelmans et al., 2012, 2012; Tapus et al., 2007). The key categories of robotics include assistive robots, social robots, socially assistive robots, and telepresence robots. They vary in application and uses, have a range of autonomy, and a range of services they can provide. Robots have been utilized to help support the aging in place process, cognitive and mental health service delivery, provide companionship, address loneliness and social isolation, and provide assistance with activities of daily living and independent activities of daily living (Beer et al., 2015; Graaf et al., 2015). For example, robots such as PARO, which is a robot social robot in the shape of a baby seal, has been shown to have significant positive results in helping improve physiological and psychological health in older adult users (Wada et al., 2005). Study results indicate that older adults who got to interact with the robot were more likely to smile, were more socially engaged, and had better interactions with their caretakes (Wada et al., 2005). The use of pet like robots such as PARO, AIBO (Kimura et al., 2010), or JustoCat (Gustafsson et al., 2015) presents new opportunities in the delivery of interventions for older adults with dementia. Moreover, advanced forms of robotics, which

incorporate voice through the use of artificial intelligence are able to monitor, motivate, and coach older adult who are undergoing physical recovery, rehabilitation, or have training needs (Bemelmans et al., 2012, 2012; Tapus et al., 2007).

Telepresence

Telepresence is the experience of being present in an environment by means of a communication medium (Dolezal, 2009; Kidd & Breazeal, 2004; Steuer, 2000). For example, telepresence software (e.g., Skype, Zoom) and hardware (e.g., smart displays, telepresence robots) utilize various forms of videoconferencing technologies to help connect individuals with family members, friends, service providers, caregivers, and their community. The basic requirements for the communication medium generally include a screen, web-camera, software interface, and speakers. Telepresence technologies vary in their application and use potential, ranging from a smartphone to a telepresence robot like the Giraffe robot (Casiddu et al., 2015). The development of these telepresence robots, like Giraffe, presents opportunities for gerontological social workers to facilitate services and improve access to mental health and cognitive health resources for older adults who may reside in rural areas, homebound older adults, or older adults with mobility limitations. Additionally, gerontological social workers also have the potential to utilize telepresence technologies to develop interventions to help address older adults' experience of loneliness and social isolation (Koceska et al., 2019)

Smartphone apps

Smartphone apps, such as Peer Technology (PeerTECH) utilize various hardware platforms to facilitate peer support which has been traditionally provided in-person within individual or group environments. PeerTECH is a self-management system which helps teach older adults with serious mental illness how to co-manage psychiatric illness and chronic health conditions (K. L. Fortuna et al., 2018). This platform allows for improved access and connectivity between peers, consumers, and colleagues. The development of digital therapeutics such as technology assisted peer delivered self-interventions are associated with improved quality of life, hope, self-efficacy, and empowerment (Naslund et al., 2018, 2014). Social workers' application of PeerTECH can help enhance the development of interventions which utilize peer support to enhance health promotion and availability to services and mental health resources (Davidson et al., 2012).

The Future of Gerontological Digital Social Work Education and Training

The evolution of technology does not only play a role in how social workers access and engage in their education, but also in how they engage

and deliver services as practitioners. Gerontological digital social work education and training in the classroom plays an integral role in helping to prepare students for digital social work practice with older adults. Learning about technology and its applications, uses, benefits, concerns, and challenges can help future gerontological social work practitioners in addressing the diverse challenges and needs of older clients. Gerontological digital social work education and training in the classroom can provide students with a comprehensive toolbox to enhance their practice.

A gerontological digital social work technology toolbox refers to the combination of knowledge, understanding, and mastery of skills which can aid in the application of technology to assist gerontological social work practice, education, and program development. We propose a minor concentration in the Master in Social Work programs that includes 13 competencies, aimed to enhance student preparedness to assist and serve diverse older adult clients, which draw from the NASW standards and ethical principles of service, social justice, diversity and worth of the person, importance of human relationships, integrity, and competence. (Please see Table 1) (NASW Practice Standards & Guidelines, 2020).

However, to ensure that students are provided and equipped with the necessary knowledge of technological resources when entering the field, educators need to also be provided with a toolbox which can enable them to educate their students. To help increase educators' capacity and knowledge of technological resources, social work departments are encouraged to implement workshops and continued education for all faculty. These workshops can be developed in partnership with various instructional departments (i.e., medicine, engineering, business, computer science, nursing, public health) in order to provide educators with the leading research pertaining to technology development and implementation. Departmental recruitment of faculty with expertise in the use and application of technology can aid the development and evolution of coursework toward the integration of technology in gerontological digital social work education and training.

Table 1. Gerontological digital social work minor concentration competencies.

1. History of the digital social work ecosystem and applications to older adult population health.
2. Normal aging and technology.
3. Available technologies to support successful aging.
4. Implementation science: Engaging older adults with technology through client preference.
5. Advocacy strategies to address technology accessibility challenges and solutions for older adults.
6. Role of family and caregivers in technology.
7. Technology literacy.
8. Connecting/bonding virtually using the person-in-environment approach.
9. Team science: Designing technologies for older adults.
10. Trauma-informed digital communication with older adults.
11. Ethics, privacy, and confidentiality.
12. Recognizing signs of mental health challenges, substance use challenges and abuse/neglect.
13. Health disparities in technology access, design, and ownership

Social work internships play a major role in the experiential, educational, and professional development of social work students. Schools of social work should aim to provide students with internship opportunities where they are able to both apply and enhance their gerontological digital social work toolbox. Utilizing internships and the classroom as a space may enhance the mastery of skills required to meet the unique needs of older adults.

The Council on Social Work Education (CSWE, National Association of Social Workers (NASW), and Association of Social Work Boards(ASWB) are in support of the integration of technology in social work practice and education ("NASW Practice Standards & Guidelines," 2017). The NASW new standards for technology in social work practice have helped emphasize the need for technology education and its implications in preparing the practitioners of tomorrow. These standards help emphasize the need for educators to integrate this dimension of practice into the class content. When compared to other fields such as business and engineering, research suggests that technology-focused education is less prevalent in social work curriculum (Margaryan et al., 2011; Zorn et al., 2011). Some of the contributing factors to a slower adoption of technology in social work has been attributed to limited resources, focus on face-to-face interactions, and lack of training. However, a key strength in social work education is its emphasis on the person in environment approach through community engaged research which aims to address the various needs of the individual (e.g. biopsychosocial) and those providing care for them. Faculty can help students develop their ability to apply critical thinking concepts to involve the community in the application and development of intervention which utilize technology. For example, classroom exercise can help students think and generate creative strategies and opportunities to leverage technology resources to develop programs, services, and resources which can address community challenges.

Social work has made significant progress in adopting and harnessing information communication technologies to support practice and administration of human service agencies. These key strides are important steps as social work involvement in technological efforts needs to focus on ensuring the drive toward the technological evolution is available to all members of society and does not further serve in expanding the inequalities and social injustices in our world (Goldkind et al., 2019). Furthermore, a social worker's role is to help ensure that the needs of their clients are met and continue to advocate for the expansion of technology resource availability. Social workers should not only consider leveraging emerging technologies but also apply critical thinking in the application of existing technologies (e.g. landlines, smartphones, tablets, computers, Amazon Alexa) along with the wide array of functions they may offer, such as navigation, messaging, and pinpointing community resources.

Below we describe suggestions for training and education in three key areas: (1) team science; (2) implementation science; and (3) community-engaged research. These key areas present opportunities for social work education in preparing future gerontologist practitioners, researchers, and policymakers to engage in multidisciplinary team efforts to leverage digital technologies and therapeutics to enhance the wellbeing of older adults.

Team science. Team science is defined by the National Institutes of Health as the "a collaborative effort to address a scientific challenge that leverages the strengths and expertise of professionals trained in different fields" (Garg et al., 2018). Therefore, the application of team science to digital gerontological social work would take a collaborative approach, involving multiple diverse fields of study, to advance the science of digital gerontological social work. The adoption and incorporation of team science in gerontological digital social work training and education can bring complementary skillsets and resources to solve complex issues associated with aging. Unlike fields of engineering and other fields of social sciences, gerontological social workers are uniquely equipped to focus on the person in environment and cultivate community-engaged technological strategies and interventions designed to meet the needs of older adults aging in place and transitioning into institutionalized care. In comparison to traditional development approaches (i.e., user-centered design utilizing by fields such as medicine, psychology, computer science, and engineering), the combination of community engagement and user-centered design in developing digital therapeutics has shown to promote adoption and satisfaction (K. L. Fortuna et al., In Press).

Implementation science

Implementation science refers to the process which focuses on the translation of research and innovation to facilitate implementation and dissemination (Koceska et al., 2019). Social work education which focuses on training practitioners on the importance of engagement in implementation science can yield many benefits for practice. For example, social workers' ability to understand and translate emerging technology research into their practice can play a role in promoting innovation in both existing and emerging interventions. Furthermore, the equipping and integration of implementation science education in the social work classroom can influence technology development along with successful dissemination of education and training by future social workers among the individuals and communities they will serve (Bauer et al., 2015).

Intersection of user-centered design and Community-engaged research

Community-engaged research is a collaborative process between researchers and community partners that aims to create and distribute information with

the scope of contributing to the knowledge base and wellbeing of the community (Mikesell et al., 2013). Technology can often be harnessed to help enhance information flow, communication, improve task efficiency, and facilitate advocacy and community organizing. Due to the complex nature of gerontological community engaged research, technology is well suited to the task of dissemination of information, sharing of resources, and streamlining the process of community engaged research.

Gerontological digital social work emphasis on design and development of technology with the community can improve the potential for implementation, better uptake, use, and dissemination of resources. For example, older adults residing in rural communities may not only have limited access to technological resources but also to the prerequisites for utilizing these resources. Social work educators should aim to train future practitioners in communicating effectively to technology developers and designers the challenges experienced by hard to reach older adults who may experience accessibility and usability challenges. Furthermore, social work education should aim to provide future practitioners the training needed to educate communities about technological resources.

The advancements in technology have created an increased need for specialized skillsets which require technology literacy to engage in high-quality research and effective data collection and sharing. Instructors who are knowledgeable and have expanded their technological toolkit can utilize the social work classroom to give gerontological social work students the toolbox needed to utilize emerging technologies. Application of these tools in community engaged research can help improve community participation and engagement, empower communities and their members, and enhance community capacity building (Brown & Dinecola, 2019; Unertl et al., 2016). Furthermore, social workers can leverage technological resources and apply critical thinking to share and distribute information and knowledge pertaining to resources aimed to support wellbeing and healthy aging for older adults. For example, using technology may efficiently distribute information to diverse older adult populations, sharing data in various languages, and across different outlets and formats (audio, writing, and video) to improve access and reception.

Conclusion

Gerontological Digital Social Work education is an important part of ensuring that gerontological social work students are equipped with the tools needed to leverage and apply existing and emerging digital technologies and digital therapeutics to enhance resources, services, and interventions for older adults. Gerontological social work educators, researchers, and field placement sites need to work hand in hand to create both class and field experiences which help enhance competency and understanding

of technological resources. These technology resources include emerging technologies such as sensors, wearables, robots, telepresence, and PeerTECH. Gerontological digital social education should emphasize the role of social work involvement in team science, implementation science, and community engaged research. Furthermore, the dissemination of knowledge should also be extended to gerontological social workers through continued education credit units (CEUs). The emergence of gerontological digital social work education presents an important step toward developing the next generation of gerontological social workers.

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