

Editorial

Older Age and New Technologies in Suicide Prevention

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Advances in medicine and the adoption of healthier lifestyles have resulted in an increase in life expectancy of about 30 years over the past century and thus an increase in the number of older adults (Christensen, Doblhammer, Rau, & Vaupel, 2009). Older adults are not a homogeneous group, with the “youngest old” aged between 65 and 74 years, the middle band between 75 and 84 years, and the oldest group over 85 years (Bum Lee, Hun Oh, Ho Park, Pill Choi, & Hee Wee, 2018). This is important for suicide prevention since the prevalence of suicidal thoughts and behaviors and their associated risk factors vary according to age (Koo, Kolves, & De Leo, 2017).

Globally, suicide rates increase with age and are highest among older adults (65 years and over), for both men and women (Conejero, Olie, Courtet, & Calati, 2018; Shah, Bhat, Zarate-Escudero, De Leo, & Erlangsen, 2016). Conversely, the lifetime prevalence of suicide attempts decreases with age and is higher in the younger old (65–74 years), as compared with the middle old (75–84 years; Koo et al., 2017). In 2016, global figures for the age group 50–69 years showed a suicide rate 50% higher than that for all ages combined (16.5/100,000 vs. 11.1/100,000), while the suicide rate in the age group 70 years and over (27.4/100,000) exceeded this by nearly three times (Lee, Roser, & Ortiz Ospina, 2019). In the European Union (EU-28), suicides in the age group 65+ constituted 28% of all suicides among males and 33% among females (Eurostat, 2015b).

Suicide Prevention in Later Life

Suicidality in old age is related to various risk factors, such as psychiatric disorders, particularly depression (De Leo & Arnautovska, 2011), physical illness (Waern et al., 2002), psychosocial stress (De Leo & Meneghel, 2001), functional impairment (Conwell & Thompson, 2008), and loneliness (Fässberg et al., 2012). Lapierre and colleagues (2011) found that suicide prevention programs in older age are aimed at depression screening, recognition and treatment (involving primary care physicians), and offering community-based support and telephone counselling. Most of these interventions are successful in reducing the rate of suicidal ideation in patients and the suicide rates in communities. Notably, existing programs are mostly effective for women, who in general are more prepared to approach mental health services and other social resources, while men are less inclined to seek medical help (Lapierre et al., 2011).

Some of these factors (i.e., the gender gap, attitudinal barriers to seeking help) have been successfully addressed in other age groups by technology-based suicide prevention efforts (Mok, Jorm, & Pirkis, 2015). Potentially, the use of information and communication technology (ICT) can also enrich the much-needed suicide prevention efforts for older people. Despite the enormous popularity of online suicide prevention, and significant progress in this area over the past two decades (Krysinska et al., 2017; Mok et al., 2015), no use of such interventions has been reported for people in later life. A Medline database search using a combination of MeSH and keywords (*older adults/elderly* and *suicide/suicide prevention*, and *Internet/web-based*) in April 2019 found 84 leads (none reporting on an

intervention or a suicide prevention program) versus 358 leads for *adolescents* and 379 leads for *adults*. This is surprising as people in older age frequently use the Internet and mobile phones (Hargittai & Dobransky, 2017), and technology-based interventions can contribute to mental health and psychosocial well-being in this population (Forsman et al., 2017).

Technology Adoption and eHealth Literacy in Later Life

In the European Union (EU), 38% of people aged 65–74 use the Internet, including social networks, at least weekly, 76% of whom access the Internet at least daily (Eurostat, 2015a). In the United States, in 2017, 67% of adults aged 65 and older used the Internet and 42% reported owning a smartphone (Pew Research Centre, 2017b). Almost three-quarters of “silver surfers” in the United States go online every day, and one in ten (8%) use the Internet repeatedly during the day. Further, one third of older Americans use social networking sites like Facebook or Twitter, the majority of whom (70%) access Facebook every day. In Australia, 68% of those in the 50–69 age group own a smartphone and 62% use it daily, while more than half (55%) access desk computers at least once a week (Office of e-Safety Commissioner, 2018). Use of technology is widespread among older people living with mental health problems, such as bipolar disorder (Bauer et al., 2018) and schizophrenia (Depp, Harmell, Vahia, & Mausbach, 2016), and its use is feasible in older people with moderate severity of Alzheimer disease and other forms of dementia (Moussa et al., 2017).

However, although the use of new technologies among older age groups is increasing, the level of usage is currently by far lower than in younger age groups and not equally distributed. According to US data, 88% of 18–29-year-olds indicate that they use any form of social media, and the proportion is only 37% among those aged 65 and older (Pew Research Centre, 2017a). There is a substantial digital divide among older people related to age, socioeconomic status, and educational level (Hargittai & Dobransky, 2017). In general, technology adoption is much higher among younger seniors, especially the aging “baby boomers,” and in people with higher educational achievement and higher income (Pew Research Centre, 2017b). There are also remarkable differences across cultures and countries. Within EU countries, the use of online social networks in people aged 65–74 ranges from 3% to 53% (Eurostat, 2015b).

Younger age, higher education, more frequent use of electronic devices, and higher computer self-efficacy are associated with greater eHealth literacy, or the ability to

seek, understand, assess, and use health-related information from electronic resources (Hall, Bernhardt, Dodd, & Vollrath, 2015; Tennant et al., 2015). Older women tend to use Web 2.0 websites, such as Twitter and Facebook, to seek health information more often than older men do (Tennant et al., 2015). In a Dutch study, the Internet, along with health professionals and pharmacists, was reported to be the most commonly used and trusted source of health information for older people (Medlock et al., 2015). In a national survey of older Americans, the Internet was a source of health information for one in five (21%) respondents; although the trustworthiness of online information was flagged as a significant consideration (Rideout, Neuman, Kitchman, & Brodie, 2005).

Can Technology Contribute to Psychosocial Well-Being in Later Life?

Despite the generally low methodological rigor of studies in this area (Forsman et al., 2017), research conducted to date provides evidence of benefits that technology-based interventions can offer people in later life. In general, ICT interventions are thought to lead to higher levels of social support and connectedness, and lower social isolation, although the positive effect may last only up to 6 months after an intervention (Chen & Schulz, 2016). There is an overall positive association between Internet use and indices of mental health in later life, such as depressive symptoms, loneliness, and impairments in (instrumental) activities of daily living (Forsman & Nordmyr, 2017). This association may be mediated by enhanced interpersonal interaction at the individual level, and increased access to resources and inclusion at the community level.

Further, interventions aiming at training to use computers and the Internet can increase life satisfaction and perceived social support as well as lower depression scores (Forsman et al., 2017). The use of ICT is also related to better psychological and physical well-being among the oldest-old who use technology to connect with friends and/or family rather than to search for new information (Sims, Reed, & Carr, 2017).

Prensky (2001) distinguished *digital natives* (i.e., those who are born during the digital era and who feel at home in the digital world or are “native speakers”) and *digital immigrants* (i.e., those who are older and who had to learn new foreign language to cope in the digital world). This is related to the need to adapt devices and applications targeted at older people. Even more relevant for older people’s psychosocial well-being and suicide prevention

is the concept of *digital families* (Taipale, 2019). These are extended families with three or more generations living in one or more households, who stay connected and maintain a sense of unity by using at least basic ICT and social media applications. Consequently, ICT is a valuable resource that goes beyond providing individual connection to the digital world by each family member separately. Even more, older family members in digital families are safely guided to use ICT resources.

Potential of Technology-Based Mental Health Interventions in Later Life

There is emerging evidence of the feasibility, acceptability, and effectiveness of web-based mental health interventions for people in later life. A randomized controlled trial (RCT) of Internet-based cognitive behavioral therapy (CBT) for subthreshold depression in people older than 50 years in The Netherlands showed that this type of intervention may be at least as effective as a face-to-face CBT intervention in a group format, and the positive outcomes can be maintained at 1-year follow-up (Spek et al., 2008). In another RCT, Titov et al. (2016) compared clinician-guided versus self-guided Internet-delivered CBT in treating anxiety and depression in Australian adults aged 60 years and over. The study reported large reductions ($d \geq 1.00$) in anxiety and depression scores in both groups, which were sustained at the 3-month follow-up. A pilot RCT showed that Internet-based mindfulness meditation and health-and-wellness education programs were both perceived as credible and acceptable to older Americans (Wahbeh, Goodrich, & Oken, 2016). Of importance, in an earlier online preference survey, the same authors found that older adults often prefer a web-based intervention (43%) over individual (39%) or group-based training (15%).

Despite the recent development of online mental health interventions for older adults, the use of smartphones as means of treatment delivery in this age group remains uncharted territory (Moussa et al., 2017). There is an emerging evidence base regarding the feasibility and effectiveness of text messages in physical health interventions, such as exercise promotion (Müller, Khoo, & Morris, 2016), and a similar evolution can be expected in the field of mental health promotion and treatment.

Although availability of digital devices and technologies and access to the Internet is widespread among older people, it has to be kept in mind that the access to the interventions might be restricted owing to the limited user skills and possibly prejudiced attitudes among older gen-

erations. Moreover, “affordances”, or properties of devices and technologies, determine their relationships with users (Bucher & Helmond, 2018).

Considerations for Suicide Prevention in Older Adults

According to Vahia and Ressler (2017), “application of technology to geriatric psychiatry is an area of rapid growth and exciting possibilities” (p. 815). The promise of ICT-based mental health interventions in later life include social connectedness, increase in life satisfaction, lower depressive and anxiety symptoms, and better coping with functional impairments. Many of these are well-established risk or protective factors for late-life suicidality (De Leo & Arnautovska, 2011; Fässberg et al., 2012). The question is whether the reported benefits could be applied and translated into effective suicide prevention efforts.

First, substantial caveats and challenges need to be addressed. Of particular importance is the digital inequality and the “grey digital divide”, that is, the drop in Internet use with increasing age, related to generational and life-cycle factors, educational achievement, and income (Hunsaker & Hargittai, 2018). Any suicide prevention efforts should be fine-tuned to address the various aspects of the grey digital divide.

Further, people in later life have specific needs, motivations, and ways of using the Internet and other technologies. Some of these are related to health factors, such as disability and reduced functional and/or cognitive status. Despite rapidly growing usage, silver surfers are less likely than their younger Internet counterparts to use online social networks, and less inclined to use instant messaging and other synchronous forms of online communication (Hunsaker & Hargittai, 2018). They are also more cautious and concerned about online risks, data security, and privacy (Vahia & Ressler, 2017). Moreover, older people may be particularly vulnerable to inappropriate advertising and risky medical procedures, including online pharmacies, and unnecessary or inappropriate medical screening tests (Bauer et al., 2018). Some older adults voice concerns that technology use will reduce or replace direct human interactions, including contact with (mental) health care providers (Kuerbis, Mulliken, Muench, Moore, & Gardner, 2017). These factors should be carefully considered when developing and implementing suicide prevention interventions for older adults, ideally by engaging end users in the co-design process (Jongstra et al., 2017).

Moreover, one of the promises of technology-based mental health interventions is their potential cost-effec-

tiveness (Hall et al., 2015; Moussa et al., 2017). Technology-based interventions can also effectively address common barriers to care, such as high cost of treatment, limited access to a specialist, mobility limitations, and stigma (Titov et al., 2016). It is important to ensure that such digital advantages are available to older people in high-suicide-risk groups, such as older adults living in residential facilities (Murphy, Bugeja, Pilgrim, & Ibrahim, 2018) and those with lower socioeconomic status (Lee & Atteraya, 2019). Their physical and cognitive impairments, along with limited financial and community resources, may preclude them benefiting from standard ICT services and devices.

A variety of individual, technical, and environmental factors enhance or inhibit the use of web-based and mobile technology in older adults (Kuerbis et al., 2017). These include age-related changes in individuals' physical and mental capabilities (e.g., visual impairment, hearing loss, deterioration of fine motor skills), their knowledge of and experience with technology, and the design features of devices. Environmental factors, such as the financial cost of devices or services/interventions, social influences (e.g., motivation to connect with younger generations), and psychosocial concerns (e.g., fear that technology will replace face-to-face interaction), also play a role. Device and software design features that consider age-related physical and cognitive changes, providing a clear purpose of technology use and ensuring a supportive learning environment, should facilitate successful engagement of people in later life in ICT-based suicide prevention and related psychosocial interventions (Kuerbis et al., 2017).

Conclusion

In conclusion, it would be naïve to assume that the Internet or any other technology is a panacea for late-life suicide, or suicide in any age group. Nonetheless, it seems the right time to carefully consider possibilities and caveats related to this area. Technology cannot replace face-to-face services and human interactions. However, when thoughtfully designed, piloted, and evaluated, it can be an invaluable addition to the repertoire of late-life suicide prevention programs.

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