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Technology and Sexual Health: A discussion on e-Health tools for the promotion of sexual and reproductive care

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Abstract. Along the present discussion we debate the implementation of e-Health in context of sexual health using information on various recent digital tools. Considering the information collected, there are various challenges that come with such new technologies, but accessibility, low costs and several positive outcomes seem to count for the further development and integration of e-Health in sexual health care. Furthermore, promoting a safe and positive sex life among various populations, even the ones harder to access, may promote gender equality, socioeconomic disparities and literacy on sexuality. **Keywords**. E-Health, technology, psychology, sexuality, sexual well-being

1. Introduction

The term e-Health is nowadays used as an umbrella term to refer to what is related to computers and medicine. The term was developed as the internet created new needs and opportunities which therefore generated the necessity for information and communication technologies in the field of health care [1]. In the meantime, also the mental health sector that treats problems such as depression, anxiety as well as sexual difficulties, is involving digital tools to help individuals [2].

E-health has several benefits such as its cost-effectiveness, reachability, its complementary efficacy to traditional health care methods as well as more accurate health surveillance and the easiness to disseminate knowledge on health education [1]. Furthermore, can it be considered as a helpful tool to health care professionals making their practice more time efficient as e-Health tools can take over some of the tasks that normally come with the profession in this field. Although there seem to be several advantages to e-Health technologies, according to the European Society of Sexual Medicine [1] it is however important to establish quality indicators that provide correct information on sexual health, e-learning, online treatment interventions, and support to professionals, so to avoid negative outcomes and the spread of wrongful information. Furthermore, creating e-Health tools that efficiently complement in-person care are not easy to develop, as there are several elements to take into consideration. Research has shown that e-Health tools have better outcomes when they are tailored to a specific problem and population targeting also specific age groups, gender and sexual orientation [3]. Although these are challenges that e-Health creators must confront themselves with, e-Health tools seem to be so positive and implementable, to the extent that they are oftentimes expected to represent a new strategy to stimulate self-management and agency of health care users.

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However, if this is really the point for the implementation of digital tools is up to debate.

The existing e-Health tools until the present point have targeted several health issues, also in the context of sexuality and various populations. For example, such digital tools have been developed in context of Sexually transmitted diseases (STDs), which represent a major public health issue that involve high economic and social costs [4]. Although condoms are one of the few options that represent an effective solution to prevent such infections, there are several barriers in the implementation that need to be addressed, e.g. high risk behaviors [5]. Thereby e-Health tools can be ways to make prevention programs more accessible, reaching such at-risk groups in a wider manner in a self-paced, private, and anonymous way [3]. Also, women can greatly profit from such e-Health tools. The World Health Organization refers to 800 women dying daily due to pregnancy and childbirth while also frequently being victims of violence and sexual abuse or needing help with family planning. Thereby sexual and reproductive health services (SRH) are not always able to respond to the large number of demands which endangers and disempowers these women [6].

2. E-Health for men's sexual health

Men who have sex with men have accounted for a high percentage of new HIV infections, above all in the Unites States. Estimates report that one in six of men who have sex with men will be diagnosed along their life span [7]. Given the lack of sexual health information these men often have access to, they frequently turn to the internet to increase their knowledge. For this reason, technology-based HIV-prevention programs are considered important [8]. The existing e-Health interventions in this context have shown enhanced intervention acceptability because of ease of use, privacy protection, self-reflection opportunities, increase in sexual health literacy, interaction, and tailoring. Thereby, they seem to offer a pathway for men who have sex with men to change risky sexual behaviors in a private, anonymous, and convenient way suggesting that e-Health interventions for this population, in the sexual risk context are acceptable across sociodemographic groups [9]. Ventuneac and colleagues [10] align with this statement as they investigated digital HIV prevention programs for gay and bisexual men and found that this population is indeed interested in using sexual health related apps for preventive purposes, considering it to be quicker and more cost-effective than in-person interventions. Slightly different results were found by a study of Bailey and colleagues [3] as they developed and tested an e-Health tool called Men's Safer Sex aiming to stimulate safer sex practices like condoms use, in men without specifying their sexual orientation. Results showed that participants felt the need to have access to such tool containing digital interventions about sexual topics like prevention of STDs. However, the trial showed, that men only engaged in the app, when asked to, while clinic users felt frustrated with technical problems and showed concern about consent and confidentiality. Therefore, Bailey and colleagues [3] concluded that e-Health could be a practical supplement to in-person health care that, in this case, shapes sexual behavior. However, authors report the need to resolve IT-related issues and promote engagement. Furthermore, the app should be tested in a bigger sample. Meiskin and colleagues [9] agree that indeed it is necessary to collect more evidence on such prevention programs before drawing conclusions.

3. E-Health for sexual and reproductive services

e-Health has also assumed an important role during the COVID-19 pandemic. A study by Chattu and colleagues [2] explains that digital health tools have been gaining popularity and have revealed their potential in a time that sexual and reproductive health services have been

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disrupted resulting in unwanted pregnancies, stillbirths and associated negative mental health outcomes in women. Therefore, several countries that implemented e-Health technologies have shown to be capable in ensuring a digital access to healthcare compensating the pandemic effects on the health care system. Indeed, the WHO reported that during the COVID-19 pandemic, 60 countries deployed e-Health tools to replace in-person consultations and other health related services. For example, to avoid preventable complications of abortion, doctors have enabled self-management of it through e-Health ensuring women to have a save way of inducing abortion. Besides the capability of maintaining abortions safe and accessible, also other aspects of sexual and reproductive services have been maintained through e-Health platforms such as online consultations. Therefore, e-Health tools have been promising in this field and are argued to be integrated and promoted [11].

4. E-Health as support for family planning in marginalized populations and minorities

According to Chattu and colleagues [2] e-Health has also been able to reach marginalized and socioeconomically disadvantaged populations. Regarding some of the low to middle income countries, e-Health has started to be used and has shown to be a safe and effective tool to support family planning considering the oftentimes limited access to the healthcare systems [6]. For example, through a randomized controlled trial a tailored digital SMS intervention to support pregnant and postpartum women and their partners in family planning was tested in Kenia [6]. Through the intervention, they had the possibility to share information with a nurse, with the final goal to increase contraceptive use. Authors [6] concluded that their study didn't only proof an effective way to reach these families and support their family planning, but also that mobile technology is a productive way to support sexual and reproductive health care in low- and middle-income countries. Furthermore, the intervention targeted not only women but also men to make them more included in the topic of family planning. However, not all participants had the chance to include their partner, which made it difficult to analyze the effect of the men-inclusive component. Conclusively, Dulli [6] explains that the development of this intervention took advantage of the fact that mobile phone use has increased exponentially in countries like Kenia which makes it possible to implement e-Health tools that facilitate access to safe, effective, and voluntary family planning which promotes gender equality and diminishes poverty. However, this raises questions on those who don't have digital access or lack digital literacy. Chattu and colleagues [2] suggest that e-Health should also consider such individuals by promoting health policies that involve e-Health so to promote equity, accessibility and affordability of health technology as future health crises will arise.

Considering the implementation of e-Health in various parts of the world, Chandler and colleagues [12] state that it is important to consider culture when developing e-Health tools that target specific populations. Although including such element is considered of central importance to e-Health, many health care technologies have failed to have an inclusive approach on diverse and minority populations [13]. Furthermore, Chandler and colleagues [12] explain that e-Health tools for these minorities oftentimes have a focus on internal and individual dimensions and thereby neglect external and contextual factors that come from society and community influences. An example of a population that may greatly profit from these considerations are e-Health tools targeting Black women and their sexual health and reproductive needs. Face-to-face interventions regarding prominent problems in this population like STD and HIV infections, have been successful [14] in taking the mentioned dimensions into consideration. However, e-Health tools could overcome other barriers experienced in the

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fact-to-face approach such as easiness in dissemination and access, as well as time constraints and costs. Overcoming such barriers may lead to higher adherence and a bigger dissemination of knowledge amongst Black women increasing health literacy, self-efficacy, self-management, and behavioral change [15]. However, Black women, have reported several obstacles in using e-Health namely lack interest, believing that research didn't prioritize minorities, mistrust and privacy concerns above all in regarding sexual health topics that are further challenges that e-Health has to take into consideration [15]. Indeed, L'Engle and colleagues [16] suggest that e-Health tools should take the target population's concerns into account, while also giving importance to creating content that captures users 'attention, easiness in navigability, interaction-prone content and options of individual personalization. Such efforts were for example made with the app "Girl Talk", that aimed to provide sexual health education to minority adolescents involving tailored cultural content. Furthermore, was it designed to simplify navigation and it was customizable to age, grade level and ethnicity. As a result, this e-Health tools proved to be effective in increasing sex education literacy, so was it also effective in keeping users engaged, although testing only lasted two weeks. As the app however didn't include interactive features, participants that tested the tool explained that they wished it to be incorporated in the future (e.g. live messaging and forums) [17].

5. Sexual well-being in cancer patients using e-Health

e-Health tools have also been implemented regarding cancer patients and their psychological as well as sexual struggles involving oftentimes interventions of forums, online logbooks, cognitive behavioral exercises, videos, and online counseling [18]. Randomized controlled trials through which researchers tested such digital tools showed positive and lasting results for physical as well as psychological dimensions such as sexual distress reduction, improvement of erectile function or female sexual function as well as sexual interest. However, difficulties were also identified namely high dropout rates (22-41%) which seems to be a common problem of digital interventions [18].

Regarding prostate cancer patients, Wootten and colleagues [19] developed and tested a 10-week self-guided online intervention called My Road Ahead (MRA) so to improve sexual satisfaction among men who underwent radical prostatectomy using cognitive behavioral techniques and psychoeducation (e.g. text, video, audio and illustrations) along six modules. Participants who participated in the online intervention and interacted in a forum that referred to the topic of sexuality and prostate cancer significantly improved their sexual satisfaction, sexual function and sexual confidence. Due to these outcomes, Wootten and colleagues [19] concluded that MRA in combination with forum use is an efficient online intervention tailored to specific needs of men with prostate cancer that can significantly improve sexual distress while involving low costs.

6. Sexual e-Health for adolescents

Regarding e-Health in the context of adolescent sexual and reproductive health, L'Engle and colleagues [16] report that there are various innovative and engaging e-Health tools that specifically involve mobile phone use given the high adherence of youngsters to such technologies. However, L'Engle and colleagues [16] report that there needs to be more evidence in this context using robust research designs and generate evidence on efficacy by means of larger sample sizes and more experimental designs. Widman and colleagues [20] state that technology-based interventions for adolescents are promising to improve safer sex behavior and cognitions besides being more cost-effective that in-person interventions. However, future work

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should aim to maintain long lasting effects as outcomes suggest that e-Health interventions have diminishing effects over time. Also, using social media as an e-Health channel seems to be promising in promoting sexual health for youngsters. By investigating young people and their sexual education through social media in various Africa countries, results showed that a large majority of youngsters (84%) preferred social media, above all Facebook to receive, learn and interact with sexual health content. Such results align with previous ones [21] that further recommend strategic integration of sexual health promotion into habitual messages so to maintain participants' social connections with friends. Conclusively, given that adolescents need to learn on sexual health but often associate the topic to feelings of shame, treatment-seeking and asking for information is less common than searching on the web in an anonymous way. Therefore, e-Health may be especially important for younger generations, considering also their frequent use of mobile phones [16].

7. Difficulties associated with e-Health

e-Health tools, according to the World Health Organization, will represent a new strategy between health care professionals and health care users to stimulate self-management and agency. Although this might be true in some cases, Baraitser and Cribb [22] explain that this should not be the main aim of e-Health, stating the advantages shouldn't be measured by the increase of agency. As there are several specific types and aspects of digital health support, they diverge in effects and can therefore be enabling or even disempowering. Furthermore, aspects that are commonly recognized as advantageous in e-Health like the independence in time and space of users and the possibility of constant access, Baraitser and Cribb [22] warn that such aspects can represent forms of intrusion that come with responsibilities. Although computers are frequently seen as neutral objects, nowadays, they have the capability to interact with the environment, have intelligence and stimulate emotions which demands attention from clinical and health policies, above all as we don't have clarity on outcomes of e-Health use in the sense of humans interacting digitally on their health [22].

Further e-Health challenges, come with design and delivery, as well as tailoring to specific populations, cultures and needs [23][12]. Moreover, research revealed it to be challenging to maintain participants engaged over longer periods of time [23]. Such challenge represents a significant concern regarding the behavior changes that e-Health in sexual context commonly target like condom use, as developping a new habit takes time [24]. Considering other difficulties that come with such digital tools, it is important to contemplate on cost-effectiveness because although users may have low-cost involvements, digital development can be expensive. Furthermore, some of these digital tools can take time to be taught to staff and health care professionals, which is a main concern as such professionals usually don't have time on hand to do so [3].

8. Conclusion

As reported along this discussion, e-Health tools have been implemented in various contexts, for example in sexual health, to promote safer behavior and literacy within sexuality [21][3][6][18] [9][19]. In response to the existing health technologies, entities like the European Society of Sexual Medicine (ESSM) [1] have come to recognize the necessity for e-Health tools for sexual health of citizens but also health care professionals. Thereby, e-Health may open new doors for many, considering that some populations avoid health care professionals as well as sexual and reproductive health services due to social stigma, lack of opportunities or other reasons which digital tools can overcome [1].

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Although e-Health tools are opening a window of opportunity for the development of sexual medicine as well as sexual and reproductive services, there are challenges that researchers have recognized and pointed out such as the necessity to specific tailoring to culture, necessities and population so to increase acceptability [23][12][24]. Furthermore, we need to consider that there is still limited knowledge of best practices in e-Health and sexual and reproductive health interventions given them being a novelty. Therefore, it is necessary to evaluate the most efficient methods for users and content delivery as well as development and forms of interaction (e.g. video, mobile apps, etc.) with the aim to understand how to capture users' attention and increase knowledge [1]. Further challenges may involve the consideration of quality indicators that need to be investigated, so to asure efficiency and safety in the use of these digitial tools as well as legal aspects associated to usage and marketing. Therefore, the ESSM recommends the development of an organization of multidisciplinary teams involving sexual medicine experts, IT developers, legal advisors and marketing professionals [1].

Conclusively, although the future challenges to overcome in e-Health are important to be considered, the research performed until now, has found that the consistent use of sexual and reproductive e-Health interventions, have positive outcomes for users in terms of stimulating knowledge (e.g. safer sex), ameliorate health behaviors (e.g. condom use) [17][25] and improve sexual difficulties of cancer patients [19] while overcoming barriers that in-person sexual health care faces. Therefore, continuing to develop and stimulate the use of e-Health may help several populations and improve overall health care [1].

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