

The impact of Science Literacy delivery methods - what works?

Summarised Strengths and Weakness

GROUP 5. Online interactions

V 1.0 | 5 May 2019

NOTES

n.d. = no data provided

GROUP 5. Online interactions

Mechanism	Strengths	Weaknesses	Reference
<p>35. Blogs</p>	<p>The review demonstrated that blogs have potential as a qualitative health research tool for a range of purposes, including data collection. Blogs also have particular application for researchers accessing populations beyond their physical reach.</p> <p>The characteristics of Blogs align with common qualitative methodologies for gathering information about experiences, perceptions and feelings over time making blogging a useful qualitative tool for researchers.</p> <p>The use of blogs as a research tool enables researchers to gain instantaneous access to distant populations, and provide research clarity and transparency with the benefit of a built-in audit trail. They also circumvent the need for lengthy transcription. For the participants, their voices can be captured and disseminated through blogs, close to their vernacular intent, with the added advantage of the choice to remain anonymous in both their writing or responses.</p>		<p>Using Blogs as a Qualitative Health Research Tool: A Scoping Review Wilson, Kenny, and Dickson-Swift 2015</p>
<p>36. E-Books</p>			<p>NO REVIEWS</p>
<p>37. e-Zines</p>			<p>NO REVIEWS</p>
<p>38. Mobile Apps</p>	<ul style="list-style-type: none"> - have achieved wide reach at an unprecedented rate - have become increasingly prevalent among users - there is a significant opportunity to impact health behaviours globally, particularly in low- and middle-income countries - appear to be an ideal platform to deliver both simple and effective interventions - offer more active engagement in health care and improved convenience at substantially lower cost in comparison to text messaging only 	<ul style="list-style-type: none"> - commercial apps have not been comprehensively evaluated to date and they are currently being used without a thorough understanding of their associated risks and benefits (Zhao, Freeman, and Li 2016) - it is difficult to provide up-to-date information because of the dynamic and rapid development of apps and the long processes of doing research and publishing (Dute, Bemelmans, and Breda 2016) - there are an overwhelming number of apps currently available for chronic disease management. This makes it difficult for 	<p>Mental Health Smartphone Apps: Review and Evidence-Based Recommendations for Future Developments Bakker et al. 2016</p> <p>Dietary mobile apps and their effect on nutritional indicators in chronic renal</p>

	<ul style="list-style-type: none"> - are a potential low-cost way to deliver health interventions to both general and at-risk populations (Zhao, Freeman, and Li 2016) - seem a promising health promotion strategy as a monitoring tool. They enable users to set targets, self-monitor and provide tailored feedback (Dute, Bemelmans, and Breda 2016) - there is great potential in using mobile devices to transform how we learn by changing the traditional classroom to one that is more interactive and engaging - educators can teach without being restricted by time and place - educators can be connected with learners on a more personal level with devices that they use on a regular basis - learning can continue after class is over or outside the classroom in places where learning occurs naturally - sensing technologies enable learning to be personalized and customized to the individual learner (Zydney and Warner 2016) - are well accepted among mobile phone users - can easily be downloaded - a large number of users can receive tailored text messages and information at low cost (Regmi et al. 2017) - are promising and proliferating at a very high rate for diabetes self-management (Hood et al. 2016) - are an ideal tool to engage patient populations in chronic disease management (Singh et al. 2016) - offer students a great opportunity to access and use a wide array of information and learning resources and application tools at a convenient time and place - were used for distributing learning resources and tools to enhance, consolidate, reinforce, or monitor medical and nursing students' learning, and help them study for exam - have portability, convenience, and instant access to a wide range of knowledge-based or learning resources (Mi et al. 2016) - can be a useful educational strategy for GDM women with low health literacy due to the apps' flexibility of providing time- and cost-efficient tailored information (Chen and Carbone 2017) - inexpensive smartphones equipped with various sensors are opening new opportunities for rural farmers who previously had limited access to up-to- date agricultural information (e.g., market, weather, and crop disease news) and assistance from agricultural 	<p>patients and providers to stay informed about app options (Hood et al. 2016)</p> <ul style="list-style-type: none"> - unstable WiFi or Internet connections, slow data processing, short battery life, and small screen size (Mi et al. 2016) - many MHapps have not capitalized on the strengths and capabilities of smartphones - evidence-based guidelines that have been developed for other self-help mental health interventions have not been applied to many MHapps. For example, many available MHapps target specific disorders and label their users with a diagnosis. Much research has suggested that this labeling process can be harmful and stigmatizing - lack of appreciation for experimental validation among MHapp developers. There is a risk of researchers developing MHapps primarily for research needs rather than to meet the needs of end users. When an MHapp is released to the public, it is a self-contained product and must operate efficiently in the user's daily routine (Bakker et al. 2016) - individuals' low health literacy is a significant barrier that constrains their Internet use and prevents adequate access to health information (Kim and Xie 2015) - academics were not clear about their roles and need a clear pedagogical approach to mobile learning - iPads could potentially be a distraction because of non-educative usage - there is a lack of innovative pedagogical guidelines on how best to use mobile devices (i.e. iPads) to improve academic processes and achievements (Nguyen, Barton, and Nguyen 2015) - mobile phone technology might be challenging particularly for elderly users (Neubeck et al. 2015) - a digital divide still exists between socioeconomic groups, where people in low socioeconomic groups retain old technologies, such as mobile telephones that can only send and receive short message service texts, and which do not have apps - a major limitation is the long period of time research takes relative to the release of new apps (Neubeck et al. 2015) - ensuring confidentiality and privacy can be a common concern. mMental Health data generated by young patients are often 	<p>disease: A systematic review Campbell and Porter 2015</p> <p>Functionality, Implementation, Impact, and the Role of Health Literacy in Mobile Phone Apps for Gestational Diabetes: Scoping Review Chen and Carbone 2017</p> <p>- Mobile Phone Apps for Preventing Cancer Through Educational and Behavioral Interventions: State of the Art and Remaining Challenges Coughlin et al. 2016</p> <p>Using Mobile Apps to Promote a Healthy Lifestyle Among Adolescents and Students: A Review of the Theoretical Basis and Lessons Learned Dute, Bemelmans, and Breda 2016</p> <p>Mental Health Mobile Apps for Preadolescents and Adolescents: A Systematic Review Grist, Porter, and Stallard 2017</p>
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	<p>experts and government extension workers (Pongnumkul, Chaovalit, and Surasvadi 2015)</p> <ul style="list-style-type: none"> - can have a variety of features including visually engaging design, video and audio capabilities, unrestricted text capabilities, access without cellular or Internet connection, optimized smartphone screen size, content sharing via social media, and tracking progress anywhere and anytime - provide a useful and low-cost way to disseminate cancer prevention and control information to the general population and at-risk populations (Coughlin et al. 2016) - Mobile health (mHealth) offers a particularly powerful and ubiquitous platform for delivering mental health interventions to adolescents - are constantly available, offer greater access, equity of mental health resources, immediate support, anonymity, tailored content, lower cost, and increasing service capacity and efficiency - may overcome geographical barriers to treatment and engage traditionally hard-to-reach groups - may be particularly suited to children and young people who may be more accepting of technology - may reduce barriers to face-to-face help-seeking, such as the stigma or discomfort about discussing one's own mental health, and may engage young people who typically would not seek help through traditional routes (Grist, Porter, and Stallard 2017) - have the potential to play an important part in the future of mental health care, making mental health support more accessible and reducing barriers to help seeking - smartphones are not constrained by geography and are usually used privately by one individual - seeking help by downloading and using an MHapp is well suited to the needs of young adults and other users with a high need for autonomy - are almost always accessible to users, so they can be used in any context and in almost any environment - using MHapps, users can remind themselves throughout the day of ongoing goals and motivations, and be rewarded when they achieve goals (Bakker et al. 2016) - have potential for clinical benefits in patients with renal disease (Campbell and Porter 2015) 	<p>personal and sensitive, and this raises concerns about how these data are handled, transmitted, and stored.</p> <p>In addition</p> <ul style="list-style-type: none"> - potential loss of the mobile device is another commonly identified privacy concern - the persistent and compulsive nature of self-monitoring tools warrants particular caution, as it may put youth under too much pressure to monitor their own mental health constantly - being unable to adhere to the monitoring routine may contribute to feelings of shame and guilt, which could reduce control users have over the ways they interact with interventions (Seko et al. 2014) 	<p>What do we know about mobile applications for diabetes self-management? A review of reviews Hood et al. 2016</p> <p>Health literacy and internet- and mobile app-based health services: A systematic review of the literature Kim and Xie 2015</p> <p>Use of Mobile Devices to Access Resources Among Health Professions Students: A Systematic Review Mi et al. 2016</p> <p>The mobile revolution--using smartphone apps to prevent cardiovascular disease Neubeck et al. 2015</p> <p>Pads in higher education-Hype and hope: iPads in higher education-Hype and hope Nguyen, Barton, and Nguyen 2015</p> <p>Applications of Smartphone-Based Sensors in Agriculture: A Systematic Review of Research</p>
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	<ul style="list-style-type: none"> - self-administered tools have the potential to reduce staff burden and costs, interview bias, and feelings of embarrassment among individuals with low health literacy (Kim and Xie 2015) - iPads were used in different ways by different users, mainly as a tool to access course resource and library databases, a note-taking tool, a communication tool, a presentation/projection device and as a device for online assessment - students and academics agreed iPads to be easy to use and a useful tool to increase flexibility, portability and productivity because it is small in size, easy to use and apps could be loaded (Nguyen, Barton, and Nguyen 2015) - scalability of mobile technologies applications (Wagner 2014) - mobile phone technology might help to increase access to cardiovascular disease (CVD) prevention and reduce inequalities in the prevention - apps are potentially much easier than print material to modify with the latest information - can potentially improve efficiency of provision and overcome barriers of distance to service providers (Neubeck et al. 2015) - mHealth is particularly significant for younger populations, who have a high level of cell phone use across diverse socio-demographic domains - ubiquity and user-friendliness of mobile phones are advantageous in extending service outreach and facilitating large-scale interventions and in lowering the barrier to healthcare access - rapid and timely communication is a feature of mobile phones that makes them efficient in gathering patient-generated data in situ, increasing treatment compliance and, if necessary, offering some interventions on the spot - interactivity of mobile phones can be a potential prompt for a therapeutic relationship between young patients and healthcare professionals - personal nature of the cell phone (Seko et al. 2014) 		<p>Pongnumkul, Chaovalit, and Surasvadi 2015</p> <p>Effectiveness of Mobile Apps for Smoking Cessation: A Review Regmi et al. 2017</p> <p>Youth Mental Health Interventions via Mobile Phones: A Scoping Review Seko et al. 2014</p> <p>Patient-Facing Mobile Apps to Treat High-Need, High-Cost Populations: A Scoping Review Singh et al. 2016</p> <p>Mobiles for Reading: A Landscape Research Review Wagner 2014</p> <p>Can Mobile Phone Apps Influence People’s Health Behavior Change? An Evidence Review Zhao, Freeman, and Li 2016</p> <p>Mobile apps for science learning: Review of research Zydney and Warner 2016</p>
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<p>39. Podcasts</p>	<ul style="list-style-type: none"> - can be used in the education sector (Oloo and Elijah 2015) - are a cost-effective communication tool - humour and the use of narrative can contribute to the entertainment value of a podcast - can empower listeners with health information and create social networks for information-sharing - are uniquely accessible in a number of ways: <ul style="list-style-type: none"> • they require less literacy than text-based resources; • they are easy to share via social media, websites, and email; • they can be accessed on mobile devices while driving, commuting, exercising, or doing other activities of daily life. - certain features of podcasts align with larger media trends: for example, they are compatible with the public's increased expectation of content on-demand entertainment and they are generally designed for niche audiences - may be particularly good vehicles for emotional intimacy and disclosure - provoke more emotional responses than written information on a website - can be produced by amateurs with little technological expertise - they don't have geographic limits to their reach: they can be distributed and shared with anyone who has access to the Internet (Williams 2015) 	<ul style="list-style-type: none"> - may be time-consuming (Williams 2015) 	<p>Methods of Investigating the Use of Podcasting in Higher Education: A Review of Recent Studies Oloo and Elijah 2015</p> <p>How could an effective podcast about alcohol use be designed and evaluated? A review of the literature Williams 2015</p>
<p>40. Social media</p>	<ul style="list-style-type: none"> - allow for personalisation, presentation and participation - content can be tailored to the priorities of the users - the versatility of the different platforms creates numerous options for the presentation of information - the collaborative nature of social media allows for a meaningful contribution from all user groups - synergistic relationships between social media users are encouraged - has the potential to move beyond providing supportive online communities and could have widespread utility within the healthcare setting - cost-effective and wide-reaching modality for administering certain types of interventions (e.g. when logistics make arranging in-person appointments difficult) (Hamm et al. 2013) - can remove geographic and physical access barriers 	<ul style="list-style-type: none"> - availability of misinformation is a risk, as healthcare providers are unable to control the content that is posted or discussed - inappropriate substitution of online information or advice for in-person visits to a healthcare provider can also potentially lead to harmful results - negative uses of social media have also been highlighted in the context of professionalism and confidentiality, use by children and youth due to a limited capacity for self-regulation and vulnerability to peer influence, and promotion of high-risk behaviours (Hamm et al. 2013) - increase health inequities for people who do not have access to or do not use social media - possibility of limited access to the Internet - people with few social networks may be at a disadvantage 	<p>Users, Uses, and Effects of Social Media in Dietetic Practice: Scoping Review of the Quantitative and Qualitative Evidence Dumas, Lapointe, and Desroches 2018</p> <p>Social media use among patients and caregivers: a scoping review Hamm et al. 2013</p>

	<ul style="list-style-type: none"> - can promote health equity and reach certain populations at risk for disadvantage (Welch et al. 2016) - high reach potential of dissemination that can be used by healthcare professionals to improve knowledge translation of evidence-based health information to health consumers and patients - valuable additions to traditional face-to-face clinical encounters to deliver behavioural interventions - can be used for numerous purposes in dietetic practice, including public health (Dumas, Lapointe, and Desroches 2018) - may offer scope to help ease the burden of self-management for chronic disease sufferers - may be a suitable means to provide clinical care and meet patient needs otherwise not being met in face-to-face environments - foster support, information sharing, empowerment and improved disease-specific knowledge - affordances of visibility, persistence, editability and association outside the health context (Merolli, Gray, and Martin-Sanchez 2013) - offers collaboration between users and is a social interaction mechanism for a range of individuals: the public, patients, and health professionals to communicate about health issues with the possibility of potentially improving health outcomes - key overarching benefits: <ul style="list-style-type: none"> • increased interactions with others • more available, shared, and tailored information • increased accessibility and widening access to health information • peer/social/emotional support • public health surveillance • potential to influence health policy (Moorhead et al. 2013) - Facebook is an informal, dynamic, social and flexible environment where more or less structured learning experiences can take place - Facebook can facilitate the interplay between formal education and real life, bridging personal experiences and institutional knowledge (Manca and Ranieri 2016) - generate, share, and receive information through social media may transcend geographic borders and provide an opportunity for anonymity 	<ul style="list-style-type: none"> - acceptability of social media interventions, related to cultural acceptability and norms, might be a problem - privacy concerns and confidentiality may be an issue for certain populations such as older adults and may affect the use of social media interventions - some populations may be particularly sensitive to hostile or misleading comments (Welch et al. 2016) - complicated access to the sites - time issues (Dumas, Lapointe, and Desroches 2018) - quality concerns - lack of reliability, confidentiality, and privacy - as information is readily available, there is the potential of information overload for the user (Moorhead et al. 2013) - social network sites have their own 'grammars' that (young) people have to learn for a proper and aware use - the use of Facebook requires digital and media literacy skills in order to face the cognitive (e.g. information overload and reliability) and ethical challenges (e.g. privacy) (Manca and Ranieri 2016) - health care professionals reported limitations in their ability to form relationships with social media users in comparison to face-to-face interaction - developing new social media platforms may be costly or resource intensive (Taggart et al. 2015) 	<p>Is Facebook still a suitable technology-enhanced learning environment? An updated critical review of the literature from 2012 to 2015: Is Facebook a suitable TEL environment? Manca and Ranieri 2016</p> <p>Health outcomes and related effects of using social media in chronic disease management: A literature review and analysis of affordances Merolli, Gray, and Martin-Sanchez 2013</p> <p>A New Dimension of Health Care: Systematic Review of the Uses, Benefits, and Limitations of Social Media for Health Communication Moorhead et al. 2013</p> <p>Social Media and HIV: A Systematic Review of Uses of Social Media in HIV Communication Taggart et al. 2015</p> <p>Interactive social media interventions to promote health equity: an overview of reviews Welch et al. 2016</p>
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	<ul style="list-style-type: none"> - can offer a neutral platform for engagement - the increased social support provided by social media has been shown to improve treatment adherence and access to HIV testing and prevention services, and assist with coping with HIV-related stigma (Taggart et al. 2015) 		
41. Websites			NO REVIEWS
42. Wikis	<ul style="list-style-type: none"> - collaborative writing applications (CWA) (e.g. wikis and Google Documents) can improve the use of evidence in both public health and health care and positively affect the education and knowledge translation of health professionals - wikis can enable health professionals, patients, and policy makers to implement evidence-based practice at remarkably low cost (Archambault et al. 2013) - hold great potential as an instructional strategy to aid students in learning various skills (i.e. improving writing performance) and gaining new knowledge - allow learners to interact with each other within a virtual learning environment that creates a social space where students can appreciate divergent views and demonstrate team-based skills - provide an archive of interaction, similar to an audit trail, documenting the evolution of co-constructed documents - offer potential application in nursing education by allowing communities of users to share like interests and learn through the support of technology - help to construct knowledge by linking and connecting individuals within a learning environment - facilitate learning among all users by offering a platform or connection for students to share their perceptions while learning about the perceptions and thoughts of others - offer great potential to complement and improve online peer's collaboration - have the potential to expand the amount of feedback from only one instructor to peers - allow faculty to review the work during the development process - mediate the learning context by providing opportunities for learning that is continuous, self-directed, and collaborative 	<ul style="list-style-type: none"> - questions remain about the safety, reliability, lack of traditional authorship, and the legal implications for decision making regarding the use of CWAs in health care - the perceived negative effects include: information overload, fast dissemination of poorly validated information, loss of autonomy, feeling of working in isolation, increased stress, perceived unequal distribution of tasks within teams, biased editing, editing wars, and vandalism/wikispam (Archambault et al. 2013) - collaboration does not occur easily or without guidance - nurse educators need to anticipate the discomfort of students using wikis, be clear on expectations for editing, model expected behaviours, provide timely feedback, offer rewards for contributions, and monitor students closely for contributions (Trocky and Buckley 2016) 	<p>Wikis and Collaborative Writing Applications in Health Care: A Scoping Review Archambault et al. 2013</p> <p>Evaluating the Impact of Wikis on Student Learning Outcomes: An Integrative Review Trocky and Buckley 2016</p>

	<ul style="list-style-type: none">- support the development of a community of learners who engage through cognitive and social processes- can be used as a centralized repository supporting and facilitating student learning by allowing them to easily access information- are an accessible user-friendly space, where users can easily locate, create, edit, and share information (Troky and Buckley 2016)		
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