Conducting Online Healthcare Research With Open-Ended Questions in the Age of COVID-19: A Critical Review

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Background: Worldwide, there is a remarkable increase in Internet use, with a current penetration rate of 62%. This widespread Internet use and the global coronavirus disease (COVID-19) preventive measures provide opportunities for data collection using the Internet in healthcare research. No recent studies have been conducted regarding the methodological issues of asynchronous Internet research that employed opened-ended questions to explore providers' and patients' experiences. **Purpose:** This study utilizes prior research to explore methodological issues that affect online research using open-ended questions to obtain health data. **Methods:** The electronic databases searched were PubMed, CINAHL, and full-text Ovid. Reference lists and the *Journal of Medical Internet Research* were manually searched. The search strategy was based on the PRISMA flow diagram. Articles published between January 2003 and May 2020 were searched. Inclusion criteria were asynchronous online researcher-led studies that used open-ended questions to explore healthcare issues. Methodological issues were extracted from the selected studies. **Results:** The evidence suggests that factors such as technical/website study/survey design issues, smartphone study applications, use of reminders, incentives, overrecruiting participants, using a combination of asynchronous and synchronous methods, trustworthiness, ethical and security issues affect the quality of data obtained in online health research. **Implications for Practice:** Asynchronous online research methods with open-ended questions could be used to collect high-quality data from patients, healthcare providers, and other participants in self-isolation, quarantine, and in diverse locations. However, researchers should be aware of the identified methodological issues. Future research could explore methodological issues and data quality in combined asynchronous and synchronous data collection methods.

Keywords: asynchronous; methodological issues; interview surveys; focus groups; online research

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The Internet is a worldwide network that provides information on multiple subjects and enables users to send and receive messages. Although its use varies by country and demographic factors, the number of Internet users worldwide was 4,833,521,806 as of 30 June 2020, with a 62.0% population penetration (Internet World Stats, 2020). The growth of Internet use between the years 2000 and 2020 in Africa was 42.2%, Asia 58.8%, Europe 87.2%, Latin America/the Caribbean 71.5%, the Middle East 70.8%, North America 90.3%, and Oceania/Australia 67.7%. North America has the highest penetration (89.4%), followed by Europe (87.7%) and Latin America/the Caribbean (68.9%) (Internet World Stats, 2020). Therefore, widespread Internet use and increased written communications demonstrate a growing trend of people comfortable with text-based communications. This growth has opened opportunities for data collection using the Internet in health research, but within this exciting possibility are complex methodological issues. In addition, online research methods have been reported to offer a less resource-intensive approach than traditional data collection methods (Norman et al., 2016).

The Internet has been used to explore patients' and providers' experiences (Bove et al., 2016), but there is a paucity of research on factors influencing the quality of data obtained from asynchronous Internet-based health research that used open-ended questions. Open-ended questions are useful in characterizing attitudes, beliefs, behaviors, and hypothesis-generating activities in healthcare research (Creswell & Creswell, 2017; Stehr-Green et al., 2003). This is important to understand because online studies cannot be considered a duplication of traditional research methods (Tuttas, 2015; S. Williams et al., 2012). Online research is important in the context where cultural and religious circumstances may restrict researchers' face-to-face access to participants of the opposite gender and the general population in the context of COVID-19 because of self-isolation, quarantine, and physical distancing.

There are synchronous and asynchronous modes of data collection in online research. In synchronous research, participants and researchers are online simultaneously with participants responding to questions received from the researchers (Tuttas, 2015). In asynchronous online research, participants can log-in at any time to respond to questions from researchers and post comments on online focus groups (OFG). The asynchronous data collection method is useful when researchers and participants encounter difficulties such as scheduling face-to-face meetings owing to geographic location. It has been suggested that synchronous data collection methods bear strong similarities to traditional methods, but the same claim cannot be made for asynchronous data collection methods (Bruggen & Willems, 2009; S. Williams et al., 2012). This paper critically reviewed the published literature that employed online asynchronous researcher-led, open-ended questions in observational research such as OFG, email interviews, or surveys to obtain thick descriptions of methodological issues in data collection. The findings may inform and assist researchers in conducting online research using open-ended questions.

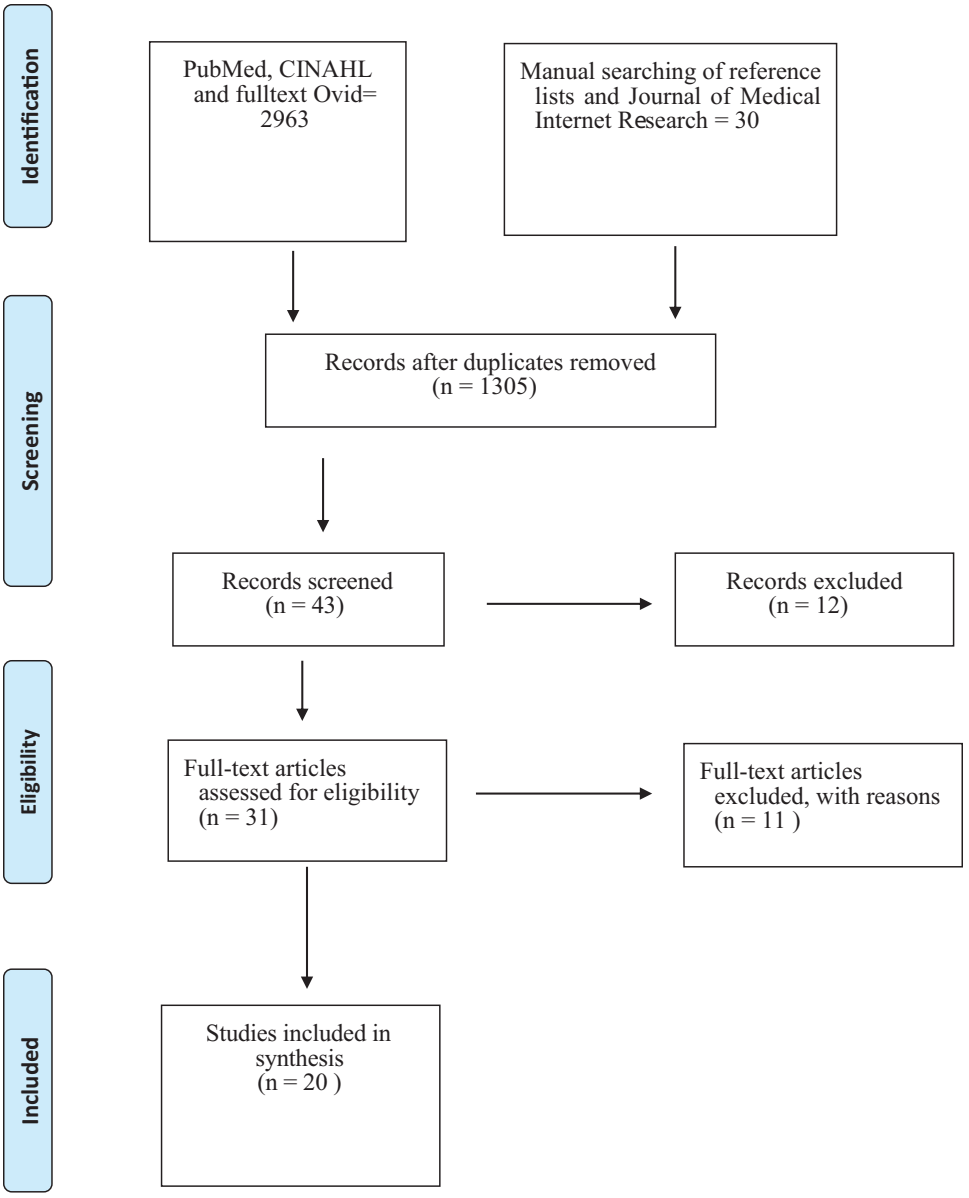

Figure 1. Study flow diagram for literature search and selection.

METHOD

The electronic databases searched were PubMed, CINAHL, and full-text Ovid. Manual searching of reference lists and *Journal of Medical Internet Research* was also done using the PRISMA flow diagram (Moher et al., 2009) (Figure 1). Articles published between January 2003 and May 2020 were searched. Inclusion criteria

were asynchronous online researcher-led studies that used open-ended questions to explore healthcare issues. Studies that focused on methodological issues in synchronous online studies, forum for health information, and support were excluded from the review. Those publications defined as relevant were empirical research published in English. Single and combined search terms included online, sample, data collection, issues, asynchronous, interviews, and focus groups. All full-text articles were reviewed based on the inclusion and exclusion criteria. Single and combined search terms were employed. Methodological issues were extracted into a word document. Content analysis was utilized to identify relevant themes. The included articles were appraised for quality using a critique-led approach that takes the whole body of the literature as the object of inquiry (Dixon-Woods et al., 2005). The quality appraisal involved judgment on credibility and contribution to the study objectives (Daly et al., 2007; Dixon-Woods et al., 2007; Dixon-Woods et al., 2006).

RESULTS

The vast majority of included studies were published after 2010 (n = 16, 80%) and originated from the USA (n = 8, 40%), UK (n = 5, 25%), Canada (n = 3, 15%), Australia (n = 1, 5%), Netherlands (n = 2, 10%), and Sweden (n = 1, 5%). Five studies describe researchers' experiences conducting OFG and email interviews. Two studies were literature reviews of OFG and email interviews. The participant samples for the original research articles include families in separate OFG (e.g., 18 parents and 11 child/adolescents with cancer aged 8–72 years, 369 cancer survivors, and 13 child/adolescents with chronic health conditions) (n = 3, 15%). The participant samples for the remainder include 60 and 79 transgender participants in OFG (n = 2, 10%), 8 male experiences with pregnant partners genetic screening using email interviews (n = 1, 5%), 18 NHS health professionals and healthcare students, 77 youths who self-harm (n = 1, 5%), 257 adults, and 420 participants aged 8–72 years in OFG to develop practical guidelines (n = 2, 10%). A detailed summary is presented in Table 1. The results presented subthemes from the content analysis of the methodological issues described in the 20 identified articles.

Sample Size

A few articles employed a traditional sample size of between five and eight participants per focus group for online studies using open-ended questions (Wilkerson et al., 2014; Zwaanswijk et al., 2007). One study suggests 29 participants as an adequate number in an OFG because of drop-out rates of 30%–66% (Im & Chee, 2006). Zwaanswijk and van Dulmen (2014) online research explored the advantages of asynchronous OFG and face-to-face focus groups as perceived by children, adolescents, and adult participants. Four hundred and twenty participants were engaged in 50 focus groups, with an average of eight participants in each group. In individual online interviews, 8–14 participants were engaged to obtain a range of

TABLE 1. Summary of Included Articles in the Critical Review

Authors (year of publication), country	Aim of the study	Methods/ sampling	Ethical approval	Recruited sample size	Sample size completing research	Quality of data	Data analysis
S. Williams et al. (2012), UK	Description of personal experiences about OFG research.	–	Not required	–	–	–	–
Fritz and Vandermause (2018) , USA	A reflection on the use of in-depth email interviewing in a qualitative descriptive study.	Field notes	Not required	Unclear	Unclear	Rich data	Unclear
Deggs et al. (2010), USA	To explore students experiences and expectations with an online graduate degree program.	Online discussion board	Authors' IRB	9	9	Rich data	
Zwaanswijk et al. (2007), Netherlands	To investigate the communication preferences of childhood cancer patients, parents, and survivors of childhood cancer.	OFG - 1 week. F2F and email recruitment	Research ethics approval from selected medical centers.	31 families that were approached in total, written consent was obtained from 13 families (11 patients and 18 parents).	Seven patients; 11 parents and 18 survivors.	Rich response	Thematic coding scheme

(Continued)

TABLE 1. Summary of Included Articles in the Critical Review (*Continued*)

Authors (year of publication), country	Aim of the study	Methods/ sampling	Ethical approval	Recruited sample size	Sample size completing research	Quality of data	Data analysis
Nicholas et al. (2010), Canada	To examine Internet-mediated qualitative data collection methods among a sample of children with chronic health conditions.	F2F and OFG (1 week). F2F recruitment with consent of parents	Ethical approval was obtained from selected hospitals	13	13	Rich data	Content analysis
Hewitt (2005), Canada	Examines the life and death of threads in a masters-level distance education course	Online interaction in five separate discussion forums, each dealing with a different topic.	Unclear	14	14	Rich data	Content analysis
Meho (2006), USA	Review of studies that used online email in-depth interviewing	Summarized issues with method	Not required	–	–	–	Summary of findings

(Continued)

TABLE 1. Summary of Included Articles in the Critical Review (*Continued*)

Authors (year of publication), country	Aim of the study	Methods/ sampling	Ethical approval	Recruited sample size	Sample size completing research	Quality of data	Data analysis
R. A. Williams et al. (2011), UK	To explore and analyze men's involvement in antenatal genetic screening	Email interviews at 16, 28 weeks postpartum. Participants were recruited via an advertisement in the National Childbirth Trust, UK.	University Ethics Committee	8	8	Rich data	Longitudinal analysis to test a theory
Im and Chee (2006), USA	To describe the practical issues encountered in the online discussion forum.	Ethnic-specific OFG of 6 months duration. Participants recruited from online cancer support groups	Researcher' IRB	29	25	Rich data	Thematic analysis

(Continued)

TABLE 1. Summary of Included Articles in the Critical Review (*Continued*)

Authors (year of publication), country	Aim of the study	Methods/ sampling	Ethical approval	Recruited sample size	Sample size completing research	Quality of data	Data analysis
Sharkey et al. (2011), UK	To explore the potential of online communities to foster engagement and shared learning between NHS professionals, healthcare students, and YPSH	An OFG (14 weeks). Recruited from existing online self-harm forums	NHS Ethics Committee	77 young people who self harm) were recruited anonymously through existing online self-harm websites, and 18 NHS professionals and healthcare students were recruited through health professional websites and university tutors.	Unclear	Rich data	Discourse analysis
Herbert et al. (2013), Australia	To identify challenges involved in engaging young women to participate in a web-based survey.	Participants recruited via F2F, telephone, and email for 10 F2F focus group discussions	Ethical approval from the University of Newcastle, University of Queensland, Family planning NSW clinics.	20	20	Rich data	Grounded theory

(Continued)

TABLE 1. Summary of Included Articles in the Critical Review (*Continued*)

Authors (year of publication), country	Aim of the study	Methods/ sampling	Ethical approval	Recruited sample size	Sample size completing research	Quality of data	Data analysis
Jervaeus et al. (2016), Sweden	To explore childhood cancer survivors' views about sex	OFG Duration of each OFG – 90 minutes, 39 OFG.	Regional Ethical Review Board, Stockholm	369	133 (36%)	Rich data	Content analysis
Boydell et al. (2014), UK	Researchers' experiences designing and attempting to recruit participants to OFG	–	Not required	Failed to recruit participants	None	None	None
Wilkerson et al. (2014), USA	To explore issues encountered when conducting an Internet-based study of the U.S. transgender population	Three studies. Online recruitment Each OFG lasts 90 minutes, and 120 minutes	Not required	79 Unclear 11	66 Unclear 11	Rich data	Unclear
Im and Chee (2012), USA	To develop practical guidelines in OFG	Three studies using OFG Online recruitment Convenience sampling Quota sampling.	Researchers' IRB.	 145 90 22	75 Unclear 17	Rich data	Content analysis Thematic analysis Content analysis

(Continued)

TABLE 1. Summary of Included Articles in the Critical Review (*Continued*)

Authors (year of publication), country	Aim of the study	Methods/ sampling	Ethical approval	Recruited sample size	Sample size completing research	Quality of data	Data analysis
Zwaanswijk and van Dulmen (2014), Netherlands	To investigate participants' preference for OFG or F2F	50 OFG, duration 5–30 days	Not required	Average 8 OFG, 420 participants.	284 persons (aged 8–72 years) completed the online surveys.	Rich data	Not stated
Stewart and Williams (2005), UK	A review of focus group as a data collection method and evaluates its success in online applications.	Review of literature	Not required	–	–	–	–
Townsend et al. (2011), Canada	To investigate the role of emails in volunteer–researcher interactions during recruitment. Recruitment was via email and telephone.	Email interviews duration of 1 week to several months	Ethical approval from the University of British Columbia	29	12	Rich data	Combined thematic analysis and the constant comparative method.

(Continued)

TABLE 1. Summary of Included Articles in the Critical Review (*Continued*)

Authors (year of publication), country	Aim of the study	Methods/ sampling	Ethical approval	Recruited sample size	Sample size completing research	Quality of data	Data analysis
Ferrante et al. (2016), USA	To describe experiences of designing OFG	4 months OFG, participants recruited online, snowball sampling.	Researchers' IRB.	25	17	Rich data	Content analysis
Miner et al. (2012), USA	To explore the experiences of transgender people	Combination of Online synchronous and asynchronous focus groups Convenience sampling	Authors' IRB	60	60% asynchronous study and 40% synchronous.	Rich data	Unclear

Note. F2F = face to face; IRB = Institutional Review Board; NHS = National Health Service; OFG = online focus group; YPSH = young people who self-harm.

responses (Murphy-Oikonen et al., 2010; R. A. Williams et al., 2011). Meho (2006) noted a range of sample sizes of 5–55 participants involved in email interviews and attendance rates of 41.9%–73.9%. Two studies proposed overrecruiting participants for online studies, considering the problems of attrition and online response rates of between 10 and 50% (Deggs et al., 2010; Wilkerson et al., 2014).

Nature and Aim of the Study

One study by S. Williams et al. (2012) indicated that less sensitive research evaluating a health program employed structured questions that allow for a large sample size. Phenomenological research on sensitive issues used a smaller sample size, especially in OFG to provide a suitable environment for self-disclosure. Notwithstanding, three studies demonstrated that a large sample size in OFG for sensitive topics provided more support, enhanced participation, and prevented group size atrophy (Jervaeus et al., 2016; Sharkey et al., 2011; Zwaanswijk & van Dulmen, 2014). Nevertheless, one of the included studies suggested that research exploring opinions that are likely to be perceived as highly personal or sensitive should be done using individual online interview surveys (Wilkerson et al., 2014).

Group Interaction and Dynamics

Hewitt (2005) examined the life and death of threads in a masters-level distance education course and reported that traditional group size (6–15 participants) in an online asynchronous focus group led to rapid attrition. This was indicated by group sizes, postings (responses and comments) rapidly decreasing, with the resultant loss of group interactions and dynamics. A larger group size (45–57 participants) continued to exhibit group interactions and active dynamics, indicated by continued postings and threading throughout the data collection duration. Notwithstanding, responses may cease when participants perceive the topic/questions as not interesting, threatening, and when moderators demonstrate no interest in the topic(s). Moreover, this author reported other factors that affected group interactions as time constraints, the number of discussion questions, when the discussions drifted away from the topic, and the presence of clunker notes. Clunker notes are responses that demonstrate participants simply agreed with each other on a topic. Another study suggested online research lacked group interaction (Zwaanswijk & van Dulmen, 2014). Two studies reported that a combination of asynchronous and synchronous data collection methods was a viable method to obtain in-depth data because participants engage in greater interaction, considered responses, and less monologue (Boydell et al., 2014; Tuttas, 2015). In contrast, several studies that employed open-ended questions in online asynchronous research produced detailed responses from prolonged interactions between researchers and participants, and cohesive bonds between participants (Hewitt, 2005; Nicholas et al., 2010; Stancanelli, 2010; Townsend et al., 2011; S. Williams et al., 2012). Participants could log-in at their convenience and provide well-considered responses and comments (Nicholas et al., 2010; Stewart & Williams, 2005).

Study Duration

Several articles highlighted a range of durations from 1 to 24 weeks for online asynchronous studies (Deggs et al., 2010; Hewitt, 2005; Im & Chee, 2006; Sharkey et al., 2011; R. A. Williams et al., 2011). Some of the literature suggested responding to online questions with depth and breadth can be demanding of participants' time, energy, and interest. As such, participants may resort to sparse or misleading responses and subsequent sample size attrition (Nicholas et al., 2010; S. Williams et al., 2012). In contrast, retention of participants in OFG could be achieved by allowing more social and off-topic interactions and requesting participants to spend no more than 15–30 minutes on each question and to extend the duration of the study over a few weeks so that questions are posted weekly (R. A. Williams et al., 2011). Other studies revealed that explaining to participants the benefits of the study and promising to send them a summary of the findings encouraged participation (Boydell et al., 2014; Herbert et al., 2013). Moreover, online research that employed short open-ended questions that can be completed quickly was better at retaining participants.

Recruitment Methods

Some studies disclosed that to prevent the impression of spamming or scamming, personal recruitment such as inviting participants in person, over the phone, or in combination with email can be used to recruit and retain participants (Barratt et al., 2015; King et al., 2014; Meho, 2006; Zwaanswijk et al., 2007; Zwaanswijk & van Dulmen, 2014). Another study opined that face-to-face recruitment may result in approached participants finding it difficult to refuse but leads to higher rates of attrition in online studies (Zwaanswijk et al., 2007). Regardless, bargaining with gatekeepers such as website administrators for access to online communities can be challenging. Placing advertisements on targeted or specialized websites may be expensive and should be included in the research budget (Boydell et al., 2014). Moreover, recruiting participants too early in the research process was shown to result in participant attrition (Boydell et al., 2014; Ferrante et al., 2016).

Reminders, Feedback, and Incentives

One study by Im and Chee (2012) advocated the use of feedback and reminders in online research with long duration to ensure participants' continued commitment to the study. Several studies reported that participants should be offered incentives to boost online participation in research (Boydell et al., 2014; Ferrante et al., 2016; Herbert et al., 2013; Im & Chee, 2012; Meho, 2006). Participants should receive the incentives quickly, anonymously, and without any difficulties via the Internet (Herbert et al., 2013; Watson et al., 2016). Nonetheless, (Boydell et al., 2014) suggested incentives may not be attractive enough for young participants and are less important than the perceived benefits of the study. The downside of offering incentives is that individuals who do not meet the selection criteria may enter a study fraudulently or complete the study more than once using different email addresses to obtain incentives.

Coverage Error

Many studies commented that online research requires participants who are comfortable with using a computer. This requirement may introduce a self-selection bias as only those from the middle and upper classes may be involved in research (Deggs et al., 2010; Fritz & Vandermause, 2018; Im & Chee, 2006; Miner et al., 2012; Stewart & Williams, 2005; S. Williams et al., 2012; Zwaanswijk et al., 2007). Conversely, studies suggest online studies recruit geographically diverse participants (Ferrante et al., 2016; Jervaeus et al., 2016; Stewart & Williams, 2005). To attract participants from lower social class, the problem of low literacy skills can be minimized in online studies by lowering the reading age of the questions to eighth-grade level, keeping the language aligned with that of participants, and including a text-to-speech service in research with a study website (Fritz & Vandermause, 2018; Wilkerson et al., 2014).

Topic Guide and Iteration Process

One article by R. A. Williams et al. (2011) notes that conducting a literature review to draw up questions that will elicit the desired responses from participants is imperative in online research using open-ended questions. Repetitive questions were shown to discourage participants' engagement with online research topics. Several studies suggested that researchers should continue to review the quality of questions and responses and modify their topic guides as appropriate (Ferrante et al., 2016; Herbert et al., 2013; Hewitt, 2005; Im & Chee, 2012). Importantly, visibility and frequent reference to the research question and aims by researchers when responding to participants can ensure a disciplined iterative process (Wilkerson et al., 2014).

Moderator/Facilitator Role

Few studies reported that online data collection requires careful attention to detail by researchers, as it may involve balancing inadequate information and too much information. Good moderator/facilitator skills are needed to recognize the order in which the questions may be asked, when and how to use probes and prompts to clarify concepts, and elicit in-depth data (Im & Chee, 2012; Jervaeus et al., 2016). According to the studies by Wilkerson et al. (2014), Im and Chee (2012), and Sharkey et al. (2011), 3–6 research staff should facilitate OFG to obtain in-depth data. The first staff member serves as the moderator, the second as co-moderator taking notes and assisting the moderator to formulate probing questions; the third can assist with technical aspects such as verifying users' log-ins and resolving technical problems.

Visual and Verbal Cues

Two studies stated that online research can generate gross misunderstandings and misinterpretations of responses from participants owing to the textual nature of

data that do not contain verbal or paraverbal cues but may be rich with emotions (Ferrante et al., 2016; S. Williams et al., 2012). The study by Wilkerson et al. (2014) reported that online research does not have to include written text only. Multimedia systems can be added to collect data, or participants can be allowed to create visual representations of their experiences using photographs, video, and audio recordings. Employing photographs and allowing participants to use metaphors can enrich responses.

Written Protocol

According to some studies, online research should have a detailed written protocol to ensure all research staff approach communications thoughtfully and consistently. The protocol should contain well-defined procedures for responding to questions from participants and for identifying and providing adequate support to participants in distress (Townsend et al., 2011; Wilkerson et al., 2014).

Design of Study Website/Technical Issues

Five studies demonstrated that research study websites constructed to fit with the study design, research questions, and match participants' health conditions such as patients with dyslexia or visual impairments were better at eliciting rich responses (Boydell et al., 2014; Herbert et al., 2013;Nicholas et al., 2010; Stewart & Williams, 2005; Wilkerson et al., 2014). Websites with recognizable logos, such as those of universities and governments, contact details of researchers, and a combination of short, long, and eye-catching questions with bright colors were also advocated. To ensure quick access and updating of participants' responses, the website could be designed to include smartphone study applications. The graphical layout and hyperlinks in emails are sometimes mistaken for spam or fraudulent email by recipients' email filters, and in some cases result in automatic deletion. The literature suggested the study website should be set up so that recruitment emails are sent directly from referrers' email addresses rather than from the study email in research that adopted snowball sampling. Difficulties with log-in or a faulty computer or server problems on either the participant's or the service provider's end, or somewhere in between, could result in the study being inaccessible.

Usability and Pilot Testing for Online Applications

The qualitative study by Meho (2006) highlighted that usability testing of the web applications by researchers and web developers would give an idea of the time required to complete the study, locate confusing instructions or questions, and detect bugs (software incompatibility and connectivity issues). Piloting of online studies with real users helps improve the wording, sequencing, phrasing of the questions, and may reveal technical errors in the system. Two studies reported that data integrity checks to ensure participants' responses are recorded in the appropriate data fields should be conducted (Miner et al., 2012; Nicholas et al., 2010).

Instructions on the Study Website

Wilkerson et al. (2014) recommended allowing informal communication to create rapport between researchers and participants. In OFG, participants should be directed to guidelines (netiquette) for safe use of the website and a link for members to report concerns or abuse, which should be dealt with as soon as possible by the researcher. Information about the right to withdraw at any time without consequence may be indicated on the study website or interview email. A second study by Sharkey et al. (2011) revealed that participants could be debriefed before finally withdrawing. A withdrawal button may be included to encourage participation and trust in the study by respondents concerned about the sustainability of their participation. Also, some studies stated that participants should be made aware of the risks (if any) of participating, sources of support, and directed to the online consent form (Deggs et al., 2010; Ferrante et al., 2016; Sharkey et al., 2011).

Ethical and Security Issues

Meho (2006) reports on emphasizing to participants their data will be anonymized and kept confidential. Despite that, in online studies on sensitive topics that require anonymity, participants may doubt researchers can protect them because of government mass surveillance (Townsend et al., 2011). Five studies disclosed the risk of security breaches and hacking in online research. Allowing open access to an online research study provides the possibility that some participants responding to the research questions may provide false data (Boydell et al., 2014; Miner et al., 2012; Nicholas et al., 2010; Stewart & Williams, 2005; Wilkerson et al., 2014). The study by Miner et al. (2012) suggested online studies requiring registration with usernames or email addresses ensure researchers retain control of the composition of participants and gather relevant demographic information. However, there is a need to minimize complexity of registration to enhance the usability of study websites.

Trustworthiness

The research by R. A. Williams et al. (2011) and Jervaeus et al. (2016) noted data from online research lacked richness and details because participants provided few lines of text compared to traditional data collection methods. Nonetheless, several measures to ensure the validity and reliability (trustworthiness) of online research enhance the utility and quality of data obtained in online research (Im & Chee, 2012; Jervaeus et al., 2016; Nicholas et al., 2010; S. Williams et al., 2012). The ability to move iteratively between data collection and data interpretation produces a range of detailed findings. The use of different online data collection methods to triangulate findings increases the credibility of the study findings. Participants' responses are text-based and saved automatically, resulting in error-free transcripts. Trustworthiness is also enhanced in online asynchronous studies due to member checking of transcripts. Participants can access their responses at any time and make comments about their accuracy. Providing a thick description of the research process,

such as sampling, data collection methods, field notes, analysis, and interpretation enhances the confirmability of online studies that use open-ended questions. In addition, Im and Chee (2006) suggested content analysis was a suitable method for analyzing data from online studies with open-ended questions.

DISCUSSION

This study aimed to explore methodological issues affecting online research using open-ended questions to obtain health data utilizing prior research. The review revealed methodological issues that researchers using open-ended questions to asynchronously collect health data should be aware of. The review is timely in the context of the COVID-19 pandemic because of self-isolation, quarantine, and social distancing. Communicating via the Internet enables research participants to share opinions, feelings, and thoughts without face-to-face meetings. The review identified several methodological issues to be considered.

First, the review found a broad range of sample sizes employed in online asynchronous studies. The minimum was seven and ran to a maximum of 420 participants in multiple OFG with an attendance rate ranging from 14.4 to 96.7%. An online asynchronous interview survey that had 84 participants (34 midwives, 35 women, and 15 partners) in separate interview surveys obtained rich data but the attendance rate was between 2.7 and 56% (Ukuhor et al., 2017). The findings provide further evidence the sample size used in online research with open-ended questions depends on the nature and aim of the study and study design including methods of data collection.

A second issue identified was the evidence on retaining and fostering interactions among participants in an OFG is inconclusive. Existing studies revealed retention of participants in OFG could be achieved by allowing more social and off-topic interactions (Jamison et al., 2018; Ridings & Wasko, 2010). However, another study suggested online research lacked group interaction (Zwaanswijk & van Dulmen, 2014). Further work is needed to explore how to foster participants' interactions and interests in online asynchronous studies because other online programs or social media may compete with online health research.

A third issue identified was online research and study websites are at risk of security breaches and hacking (Barratt et al., 2015; Boydell et al., 2014; Nicholas et al., 2010). Therefore, the use of a password-protected computer and firewall backed-up server may ensure the website is inaccessible to nonparticipants. Requiring participants to register and log-in with a username and password or email address strengthens the trustworthiness of data obtained. Researchers could obtain consent from participants to not save data files or share them with others. Meanwhile, the inability to identify respondents in online studies has been noted. The issues of deception are not confined to online studies since traditional methods also rely on participants providing honest responses (Koo & Skinner, 2005). Researchers may never be sure of the identity of online participants, especially if the study inclusion criteria are based on age, ethnicity, and gender. The

team should consider the ethical implications of minors providing a false age and participating in research for adults. Irrationality or inconsistencies in responses from participants may point to impersonators responding to the study as genuine participants. Data obtained from the same Internet Protocol addresses could be examined for inconsistent answers across similar research questions and unrealistically short response times.

Concerns were also raised about data from online research lacking richness and details when compared to traditional data collection methods. Previous work by Fairweather et al. (2012) and Norman et al. (2016) revealed that traditional data collection methods using open-ended questions produced rich data with more words compared to online methods, however, the underlying themes found within the responses for each method were the same. Importantly, researchers should take into account the high anticipated attrition rates in online studies and overrecruit to compensate for no-shows. Instructions on the webpage for participants on how to contribute to the study may be used to generate high-quality data. Participants may be instructed to think carefully before responding to the open-ended questions and provide as many details as possible. Also, participants may be informed there are no wrong or right answers and their contributions are helpful (Rezabek, 2000).

There is a strong argument for well-constructed website study/survey design in online research. A well-constructed interview email or survey should include a courteous salutation, orienting participants to the current stage of the conversation, and finally, open-ended questions (Norman et al., 2016). Employing photographs, when feasible, in online research with open-ended questions has been shown to elicit rich responses from participants (Ukuhor et al., 2017). Existing research suggests designing the study website to enable participants to access and modify their responses at any time may generate rich data (Cantrell & Lupinacci, 2007; Fox et al., 2007; Kenny, 2005; Klein et al., 2007; Oringderff, 2004; Reid & Reid, 2005; Rezabek, 2000; Tates et al., 2009). This is a satisfactory argument as the participants would have reflected on their experiences when they respond at their convenience. The anonymity of the online environment tends to reduce inhibitions, subsequently decreasing social responses and facilitating open and honest responses. Moreover, the physical space afforded by the Internet served to reduce the unequal power relations between participants and researchers based on visible differences such as age, ethnicity, and gender that exist in traditional research (Griffiths, 2005; Montoya-Weiss et al., 1998; Tates et al., 2009). Even when the differences are known, the lack of a physical presence creates equality between researchers and participants in online studies.

Finally, Draucker et al. (2009) work agrees with the findings of this review that the burden of taking part in research may aggravate participants' medical conditions. Therefore, sources of support should be provided to participants in online healthcare research. A drawback of online healthcare research is the issue of recruiting a representative sample to enable findings to be generalized to the population of interest (Im & Chee, 2006). On the contrary, the goal of studies that used open-ended questions to collect health data is not to achieve generalizability, but to

better understand case(s) which are inductive studies (Chicca, 2020). The evidence of using incentives in online health research with open-ended questions is poorly synthesized (Bouchard, 2016; Watson et al., 2016). More research is required to explore the impact of incentives on the quality of data obtained in online research. Incentives such as awarding academic grades to students participating in research may be coercive and not a choice that is informed and voluntary. In addition, future research could explore methodological issues and data quality in combined asynchronous and synchronous data collection methods. A possible limitation of this study is that some literature may have been missed because it was not possible to identify relevant articles with asynchronous online methodological issues at the phase of appraisal.

IMPLICATIONS FOR PRACTICE

The benefits of using asynchronous online methods to collect health data are significant, as patients, healthcare providers, and other participants in self-isolation, quarantine, social distancing, and in diverse locations can choose when to share their opinions, feelings, and thoughts without face-to-face meetings. However, retention of participants and the quality of the data obtained depend on factors such as optimal group size, the nature and aim of the study, method of participant recruitment, technical issues, incentives, the role of the moderator, use of interview surveys that can be completed quickly, trustworthiness, and ethical and security issues. Online asynchronous data collection methods using open-ended questions are a useful tool to obtain rich data in health research, especially when researchers are aware of the identified methodological issues and ensure methodological rigor and application of ethical principles.

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