Exploring Gay Men's Use of People-Nearby Applications

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Acknowledgements

I would like to start by thanking the two people most responsible for ensuring that I saw this thesis work to completion. Since I cannot simultaneously write about both, I would like the reader to forget whom I have written about first and focus only on the kind things I write.

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Glossary

Apps: Refers to smartphone applications; software programs designed for use on a smartphone.

Bottom: Common term (slang) for receptive sexual partner in male-male sexual intercourse.

LGBT+: This abbreviation represents the spectrum of gender identities and sexual orientations including lesbian, gay, bisexual, transgender, and all those who identify as members of the community

People Nearby Applications (Also known as Geosocial Networking Applications, for example, Grindr, Tinder, *et cetera*): refers to a group of smartphone applications that use the Global Positioning System (GPS) to virtually identify and connect users who are in relatively close physical proximity, often for the purpose of identifying potential romantic or sexual partners (Phillips et al, 2014).

Stigma: The traditional Greek meaning of stigma refers to "bodily signs designed to expose something unusual and bad about the moral status of the signifier (Goffman, 1963, p. 1)". The more contemporary definition draws on the ancient use of the word, but is better understood as a social marker that may be visible, such as physical disability, or invisible, such as sexual orientation, that taints or discredits the reputation of the bearer (Goffman, 1963).

Top: Common term (slang) for insertive sexual partner in male-male sexual intercourse.

Thesis Abstract

Background: Gay men have adopted the use of people-nearby applications (PNA) to connect with members of the LGBT+ community. PNA uses global positioning system (GPS) data to locate other users in the area and facilitates communication between users through online profiles and instant messaging services.

Objectives: This thesis explored gay men's process of using PNA to connect with other users.

Methods: The thesis work was conducted in two phases. The first phase was a review of the existing literature with literature synthesised into major themes. The second phase was an original qualitative study that used group sessions within a qualitative descriptive method and used thematic analysis to explore experiences of PNA use.

Findings: The reviewed articles (n = 40) evolved into four major themes: risk, stigma, sexuality, and community. The theme of risk was overrepresented in the literature and comprised research that reviewed the sexual health risks of using PNA to meet partners. The review themes aligned closely with the four themes that emerged from participants' (n = 6) experiences that were revealed in the original qualitative study: community, hope, stigma, and doubt. The themes of hope and doubt were found to be driving forces in a cyclical pattern of use reported by the participants, wherein users will repeatedly experience cycling phases of app use and disuse.

Conclusion: Phase one of this thesis work exposed a gap in the knowledge related to the process of gay men using PNA. Phase two began to fill that gap by exploring the process of using PNA and furthering academic knowledge of how gay men interact and experience PNA use. The knowledge created in this thesis may assist nurses by providing them with improved cultural understanding of gay men and facilitate open communication between nurses and gay clients.

Chapter 1

Introduction

The use of the Internet for sexual purposes, including publishing erotic material, pornography, discussions of sexual practices, and locating sexual partners, has been documented since the early years of personal computing (Grov, Breslow, Newcomb, Rosenberger, & Bauermeister, 2014). At the forefront of this technological revolution are people-nearby applications (PNA) that broadcast the physical location of users for the purpose of identifying others in the area (Van De Wiele & Tong, 2014). In 2009, the advent of Grindr, a PNA designed to allow gay men to locate other men in their area, marked the beginning of gay men using mobile phones to locate sexual partners, in real time based on their location (Burrell et al., 2012). Other PNAs soon followed and included Growler, Scruff, Hornet, Jack'd, and Tinder. PNAs facilitate connections among users who can view profiles and send messages or photos for the purpose of meeting sexual partners. PNAs are widely used in the gay community. Grindr, alone, has over three million daily-users in 234 countries (Grindr, 2017a). PNAs play an important role in gay men's sexuality, but they remain relatively unstudied (Grov et al., 2014).

This study integrates the perspectives of gay men to understand the complexities of gay men's PNA use and their experiences with beginning use, using the apps, and discontinuing use. The knowledge generated in this study has begun to explore the how gay men use the applications to connect with other community members. While previous research has focused on the sexual health risks of gay men's online partnering practices, this study has explored the positive aspects of application use, in addition to aspects that bring users pain or discomfort. This study provides useable knowledge for preparing nurses to provide quality care for gay men by improving nurses understanding of the intricacies of gay men's lives and sexual practices. Exploration using a qualitative design moves away from disease focused

nursing care and allows nurses to begin providing care based on understanding and respect for the gay client as a person and valued member of society.

This nursing research will contribute to the healthcare system, as a whole, by allowing nurses to set a positive tone for future health interactions with gay men and by providing clients with the quality care they deserve. Gay men are adapting to the ever-changing technological environment. In an effort to provide the highest quality care, nurses and nurse researchers must adapt, too.

Research Purpose & Objectives

The purpose of this study was to explore gay mens' typical use of PNA to describe the process of becoming a user, using PNAs, and the decision to continue or cease PNA use. Knowledge generated from the study will inform nursing care related to clients who use PNAs. The study's overarching goal is to inform and improve the quality of nursing care practices with these men.

Research objectives:

The objectives of this study with gay men were to:

1. generate an understanding of the typical user of PNA;
2. describe the typical PNA users' process of use; and
3. describe any cycles or rhythms of use as experienced by the typical PNA user.

Significance of the Study

In nursing, there is limited knowledge related to the process of how gay men use PNAs to meet sexual partners. This knowledge gap among nurses may impede the therapeutic nurse-client relationship though lack of understanding regarding gay men's use of PNA. The extant research exploring PNA use and using the internet to find sexual partners has focused primarily on studies to reduce HIV transmission and education for HIV prevention (Grov et al., 2014). Grov et al. (2014) posit that this

public heath approach may be appropriate because this population has a higher prevalence of HIV than the general population. However, the disease focused literature has done little to describe the behaviours of using PNA to find sexual partners and the potential health effects of that practice (Grov et al., 2014). Previous research involving gay men's health has observed that nurses lack the cultural knowledge required to engage meaningfully with gay clients, that gay men are inappropriately assessed by health professionals, and that clients feel stigmatized by healthcare providers and the care process (Bosse, Nesteby, & Randall, 2015; Dorsen, 2012; Lorenc et al., 2011; O'Byrne & Watts, 2014). The purpose of this study is to explore the practices of the community of men who use PNA so that their experiences can be meaningfully incorporated into improved nursing care.

Design

I completed this thesis work in two phases. Phase one consisted of a literature review to explore themes in the literature related to PNA use among gay men. A literature review was required to provide a basic understanding of the extant knowledge related to use of PNA by gay men and for use in designing the qualitative study conducted in phase two. A detailed report of the literature review can be found in Chapter 2, which was submitted for publication in the *Journal of Homosexuality*.

Phase two consisted of an original study using a basic qualitative description method (Sandelowski, 2000). Data collection employed an innovative style of group experiential sessions to gather information (Gray, Brown, & Macanufo, 2010). Data was analyzed using thematic analysis to explore themes within and across groups (Braun & Clarke, 2006). The qualitative study was necessary to address a gap in the literature related to the process of using PNA by gay men. A detailed report of the qualitative study can be found in Chapter 3, which was submitted for publication in

the journal *Qualitative Health Research*. The instructions for authors (appendix L) required an abbreviated methods section, therefore a detailed account of the methods used in the qualitative study can be found in appendix D.

Background

This section focuses on describing the technical features of PNA to familiarize the reader with the general functions of the applications and provide a brief history of this technology. This section also introduces selected issues of importance for understanding gay men's PNA use and begins to describe a gap in the academic literature. The literature described in this section was retrieved during the literature review conducted in phase one of the study and a detailed description of the search strategy, and results, can be found in chapter two.

Description of People-nearby Applications

People-nearby applications (PNA) are a group of smartphone software applications (referred to as apps) that utilize global positioning system (GPS) data and smartphone internet capabilities to locate and display other users who are nearby (Brubaker, Ananny, & Crawford, 2014; Phillips et al., 2014). Although PNA has recently become popular among heterosexuals, I focused exclusively on PNA use among gay men, because of the health disparities experienced by gay men (Bruce & Harper, 2011; Conron, Mimiaga, & Landers, 2010; Saewyc, 2011) and the overemphasis of gay men in the HIV and sexually transmitted infection (STI)-focused literature on PNA use (Grov et al., 2014; Melendez-Torres, Nye, & Bonell, 2015). To use PNA, one must first download their chosen app and create a profile consisting of a screen-name, a few sentences, and a picture (Brubaker et al., 2014). The picture is particularly important because it is, visually, the largest component of the profile and is responsible for generating interest from other users (Brubaker et al., 2014). Profiles

are generally customizable and usually include age, ethnicity, relationship status, and a brief description of what the user is looking for (Brubaker et al., 2014). See figure 1 for an example of a profile picture and profile information from promotional materials for the PNA Grindr. Users also have an option to have their distance from other users displayed on their profile. Upon logging in to a PNA, users are typically greeted by a cascade (Screen of thumbnail-photos [figure 2] that can be scrolled through by the user). The cascade is organized by relative distance to other users, so users who are close-by appear at the top of the screen, and distance-to-user grows as the user scrolls through the thumbnails. The user can interact with a profile by tapping on the thumbnail to access the users full-profile [figure 1] and from the full-profile the user is able to interact with another user through instant messaging. The thumbnail is derived from the users chosen profile picture and username, highlighting the importance of choosing a profile picture that will attract the attention of other users (Brubaker et al., 2014).

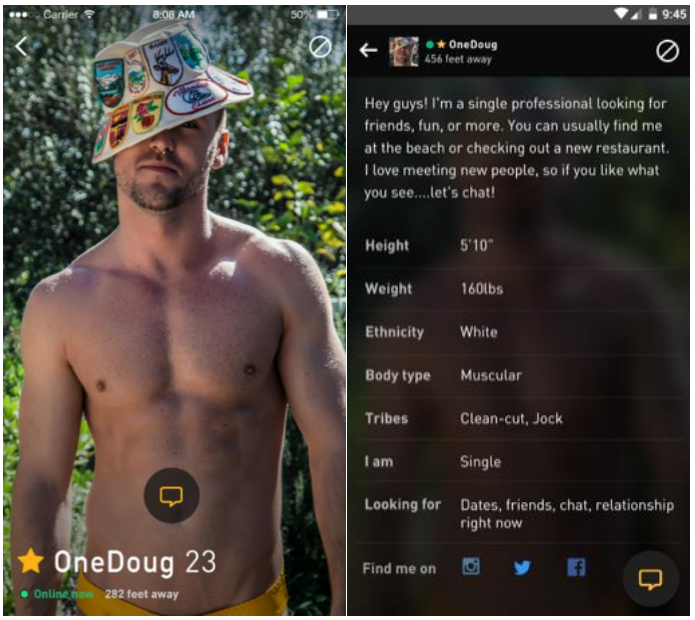

Figure 1: Example of Grindr profile picture and profile from advertising materials (Grindr, 2017b)

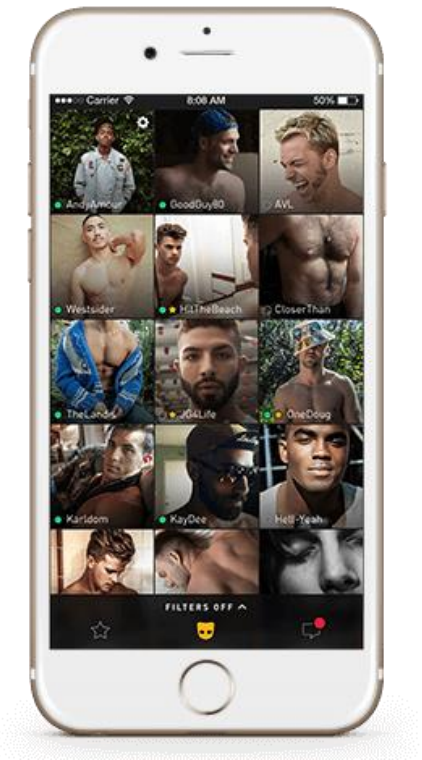

Figure 2: Screenshot of Grindr cascade from advertising materials (Grindr, 2017a).

Within the interface of the PNA, users can communicate with each other using built-in messenger tools that typically operate in real-time to send instant messages between users (Brubaker et al., 2014). Although these apps were designed to facilitate connections among users for the purpose of casual sex or romantic relationships, research into app use has reported other important uses (Holloway et al., 2014; Van De Wiele & Tong, 2014). The most commonly reported uses of PNA include entertainment, socializing, connecting with the LGBT+ community, meeting casual sex partners, and meeting romantic partners (Holloway et al., 2014; Van De Wiele & Tong, 2014). These multiple uses of PNA by gay men have likely contributed to its growing popularity in the LGBT+ community. In their study of men (n = 379) recruited from venues with at least 50% gay clientele in Washington, D.C., Phillips et al. (2014) reported that 63% of gay men used at least one PNA in the past 12 months.

This first major PNA exclusively marketed to gay men, Grindr, was made available for download onto smartphones in 2009 (Burrell et al., 2012). Following the success of Grindr, several other PNAs became available including Scruff, Jack'd, and Growler (Phillips et al., 2014). PNA users create a profile that allows them to see and communicate with other users who are in close physical proximity. These profiles create a virtual representation of the physical space surrounding the user by creating an online map of people nearby (Brubaker et al., 2014). PNA use is especially popular among gay men because it emulates traditional partner-finding practices of the era prior to legalization and social acceptance of gay lifestyles in North America (Brubaker et al., 2014). For example, PNA allows gay men to return to invisible partnering practices by moving gay men's meeting places from largely hidden physical locations (such as cruising grounds) to the virtual community on PNA (Brubaker et al., 2014; Phillips et al., 2014).

Issues in Gay Men's Partnering Practices

Gay men's use of the Internet and smartphone technologies to find partners has continued to draw interest from the research community, largely in the form of attempting to expose sexual health risks of gay men's partnering practices (Grov et al., 2014). This section will briefly explore the issues of HIV and STIs and stigma as they relate to gay men's partnering practices. Although gay men certainly are at risk of acquiring STIs or HIV, the excessive focus in the literature on these issues may perpetuate stigmatization of the LGBT+ community (Grov et al., 2014). The continued health disparities between main stream society and the LGBT+ community must be addressed within the academic literature related to LGBT+ health, including ensuring that stigma is not perpetuated by heteronormativity (Conron et al., 2010).

HIV and sexually transmitted infections. The existing literature related to PNA use among gay men is primarily focused on exploring the sexual health risks of using PNA to find sexual partners (Grov et al., 2014). Although there are studies deemed by Melendez-Torres et al. (2015) to be high-quality works of research in that they used reliable research methods, the literature related to sexual health risks has not conclusively shown any difference in risk between partners met online compared to partners met offline. Furthering the argument that there is no difference in risk, research investigating condom use has found no difference in frequency of condom use regardless of whether sexual partners met online or offline (Bien et al., 2015; Chiu & Young, 2015; Lehmiller & Ioerger, 2014). In cases where PNA users choose to have condom less sex, Newcomb, Mongrella, Weis, McMillen, and Mustanski (2016) reported that they do so only after assessing perceived risk of HIV/STI transmission.

In assessing risk, PNA users discussed and, where applicable, disclosed HIV status using the online messaging tools built into the apps (Grov, Agyemang, Ventuneac, & Breslow, 2013). Although men who self-reported as having an unknown or negative HIV status were more likely to begin the conversation about HIV early in online messages, users reported greater comfort with discussing HIV online compared to in-person, regardless of HIV status (Chiu & Young, 2015; Grov et al., 2013). Further research is needed to determine the role of PNA in deflecting stigma surrounding HIV disclosure and improving comfort with disclosure for people living with HIV.

Stigma. The literature related to PNA use has begun to explore concepts related to stigma, although the term stigma is absent from much of the quantitative research focused on the sexual health risks attributed to PNA use. While concerns

about being 'outed' (having sexual orientation or other personal information shared inadvertently with others) remains a concern for LGBT+ people, PNA users have a double stigma because they are also concerned about being recognized as a PNA user (Corriero & Tong, 2016). From the perspective of Goffman (2009), users of PNA may be discredited by mainstream society for membership in the LGBT+ community, and further discredited by the LGBT+ community for being a PNA user. This process of becoming discredited refers to the notion that a person's perceived status in society becomes less credible or worthy as the person is associated with stigmatized groups (Goffman, 2009). Stigma within the LGBT+ community towards PNA users appears as a result of social judgment related to a perception that app users are promiscuous (Corriero & Tong, 2016). The stigma imposed on PNA users may have important health implications because fear of being associated with a stigmatized group may deter people from seeking healthcare (Link & Phelan, 2006).

Within the community of PNA users, there is mistrust related to the representations of self that other app users present. For example, Phillips (2015) reported that PNA users prefer amateur looking photographs because other users' profile pictures with amateur photos are perceived to be more accurate representations of the user's appearance. Furthermore, as a process of building trust when PNA users are messaging each other prior to an in-person meeting, users will send nude photos of themselves in an effort to attract continued attention and build trust (Phillips, 2015; Tziallas, 2015).

Need for qualitative research. The literature to date has focused heavily on quantitative methods exploring public health issues related to the risks of using PNA to find sexual partners. By comparison with quantitative methods, there is a dearth of literature utilizing qualitative approaches (Grov et al., 2014). Although the reliance on

quantitative methods may have been warranted given the importance of public health research to reduce the transmission of STIs (Grov et al., 2014). In spite of a lack of evidence, there may yet be a need for research using qualitative approaches (Melendez-Torres et al., 2015). Qualitative research into the use of PNA can provide an opportunity for exploration of user's experiences and use patterns to create health initiatives that are tailored to the needs of this community (Grov et al., 2014; Melendez-Torres et al., 2015).

Literature Gap

Although the literature has begun to acknowledge PNA use among gay men, the majority of the literature has focused on the sexual health risks of using PNA (Grov et al., 2014). The research into sexual health risks of using PNA has returned inconclusive results that do little to aid the academic community in understanding how or why men use PNA (Grov et al., 2014; Melendez-Torres et al., 2015). Grov et al. (2014) emphasised that there is a need for investigations using qualitative methods to fill gaps in the existing literature. This thesis work begins to address the lack of research using qualitative methods by investigating the process of using PNA by gay men using a basic qualitative description method.

LGBT+ Identity in Research

Historically, the label MSM was designed to be an all-inclusive term that described behaviour without attributing a sexual orientation label. In this thesis, I have chosen to use the label gay men because it most accurately represents the self-determined identities of the men who participated in the qualitative phase of the study. The decision to use MSM must be thoroughly reviewed in health literature because there is growing support for a return to labels such as gay man or lesbian woman (Young & Meyer, 2005). In discussions with the participants of this study, it

is abundantly clear that membership in the LGBT+ community is an important nuance of their PNA use. For example, the men discussed downloading PNA onto their first smart phone as a gay coming-of-age milestone that granted them unfettered access to the LGBT+ community through PNA use. Using the term MSM erases the ties to the LGBT+ community that exist for many men who identify as a gay man and use of MSM reduces the visibility of the LGBT+ community in academic literature (Young & Meyer, 2005).

Furthermore, multiple studies have reported that between 77-93% of PNA users self-identify as gay men (Gibbs & Rice, 2015; Goedel & Duncan, 2015; Holloway, Pulsipher, Gibbs, Barman-adhikari, & Rice, 2015). When counted together, gay and bisexual men account for 96%-99% of PNA users (Gibbs & Rice, 2015; Goedel & Duncan, 2015). With nearly all men who use PNA self-reporting their sexual orientation using an LGBT+ label, I believe that the use of the generic term MSM is inappropriate for reporting on the research that I have conducted. In addition to the high self-reports reported in the literature, 100% of the men who participated in this thesis work self-identified as a gay man.

Situating the Researcher

Before delving into the remaining chapters, I will attempt to share my personal experiences that may have coloured my implementation and description of this research process. I am a gay twenty-seven-year-old man who was born and raised in a blue-collar rural community within an hour's drive of a major Canadian city. In this rural setting, I faced mild to moderate homophobic attitudes from both family and acquaintances. I believe these experiences gave rise to some internalized homophobia and discomfort with public displays of affection.

I migrated to a major urban centre at eighteen years of age to pursue post-secondary education. My arrival into the city as a single, eighteen-year-old, gay man was nothing short of liberating. During my first year as an urban dweller and post-secondary student, I began a monogamous relationship that continues to the present day. I mention this relationship because it, rather importantly for the study, began in 2008; one year before Grindr would arrive on the smartphone application market (Grindr, 2017a). As a result of this relationship, I have little personal experience with the use of PNA and as such, had much to learn from the participants. The experience I did have was largely vicarious through friends whom, nearly all, used or use at least one application.

I gained some further exposure to PNAs in 2012 when I did a narrative inquiry mini-study with a single participant for a graduate-level qualitative methods course. That study underlined the importance of academic work to understand the process of using PNA as an important issue in the lives and health of gay men. The study also suggested that a cycle of use exists wherein users turn to the applications for excitement and a feeling of liberation, but ultimately leave the apps with a feeling of frustration. That mini-study did not have nearly the depth or breadth of the current investigation.

Before beginning the literature review and subsequent participant involvement, I believed that the apps were used primarily for finding sexual partners and that having the app on your smartphone necessarily meant that you occasionally met strangers from the Internet for sex. Furthermore, I believed that the apps were a new and exciting era of liberation for the gay community that would allow gay men of all social demographics, body shapes, sexual kinks, and the like, to meet

likeminded people. My pre-conceived notions of PNA use were largely debunked during the course of this investigation.

World View: Ontology and Epistemology

In addressing my worldview, it is important to note that I am in a period of rapid evolution in my understanding of knowledge and this normal maturation process creates some fluidity in my views. For the purpose of this study, I have remained most attached to the constructivist paradigm as described by Guba and Lincoln (1994). Of note, the only paradigm that poses any real competition to constructivism is my flirtation with critical theory. I believe the constructivist paradigm is flexible enough to allow a great deal of examination of historical structures without strict adherence to the historical realism that Guba and Lincoln (1994) posit as the ontological basis for critical theory.

The ontological stance of constructivism, that reality is socially constructed and has no one-true form, is useful in the current study as it respects the participants as generators of the research findings (Guba & Lincoln, 1994). The fundamental belief that the experience of the participants is composed of nebulous social constructions was an important factor in choosing a research method that describes the participant's experiences. The epistemological stance of constructivism, that building understanding is a transactional process with the researcher and the participants as equal partners in the knowledge generating relationship was useful to position the researcher within the community of men being studied and respects the participants as experts in their own lives (Guba & Lincoln, 1994). Further, Guba and Lincoln (1994) suggested that the methodology of constructivism must allow the researcher to work with the participants to examine individual constructions and come to a consensus on a more refined construction with all parties contributing to

the refining process. The method chosen for this study provides direct interaction with the participants and allows the opportunity for dialogue and moderated conflict of ideas to evolve towards a group consensus on the constructions of using PNA.

Thesis Organization

In the first chapter, I provided an introduction to the research issue explored in subsequent chapters. I introduced the issue of gay men's PNA use and exposed the dearth of qualitative methods research in this important area of men's health. I have introduced the literature related to gay men's PNA use and identified a gap in the literature. Chapter one also contains my statement of research purpose and lists the three research objectives. Chapter one is closed with a personal exploration of my position with regards to the research conducted during this study.

Chapter two contains a manuscript that has been submitted for publication to *The Journal of Homosexuality*. This manuscript is a review of literature related to gay men's use of PNA. The literature search and an analysis drawing from thematic analysis has been reported. The second chapter closes with a call for research into gay men's PNA use that utilizes qualitative methods to explore gay men's experiences and counter the trend of focusing on sexual health risks of PNA use.

The third chapter contains a manuscript that has been submitted for publication to *Qualitative Health Research*. This manuscript is based on data generated from the qualitative component of the thesis work. The study explored the process of using PNA for gay men. The purpose of this chapter was to generate an understanding of a typical PNA user and explore the typical process of using PNA for gay men. This chapter begins to fill a literature gap by utilizing a qualitative approach to explore the process of gay men's PNA use.

The final chapter, four, is an integrated discussion of the previous three chapters that draws connections between the existing academic literature and the findings of the qualitative study aspect of this thesis work. The fourth chapter also articulates the relevance of the findings of this study and their implications for nursing care of gay men. Additionally, it identifies implications for nursing administration, education, and research.

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Chapter 2

Exploring smartphones as a partnering tool: Review of literature regarding use of people-nearby applications by gay men

This chapter is pending submission for publication in a peer-reviewed journal.

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Abstract

Literature related to gay men continues to be dominated by exploration of the health and sexual health risks of these men. The goal of this review was to describe the existing literature related to the use of people-nearby applications by gay men. This review provides insights into some of the less investigated facets of gay men's lives and partnering practices. The articles (N = 40) reviewed were organized based on themes that emerged during the review. The four themes noted in the literature regarding people-nearby application (PNA) use by gay men, were risk, stigma, sexuality, and community. This review provides a pointed reminder that exclusively studying risks of gay men's sexual practices fails to capture the complexity of these men's lives and health needs. This review includes a call to action for researchers to conduct holistic studies with gay men that describe all facets of their PNA use.

Exploring smartphones as a partnering tool: Review of literature regarding use of people-nearby applications by gay men

In 2009, gay men greeted the first of what would become a long line of people-nearby applications (PNA) (Burrell et al., 2012). PNA are a group of applications that were designed to allow smartphone users to locate people near them in real-time and using the global positioning service (GPS) (Burrell et al., 2012). The first such application for gay men, Grindr, reports expansion to over three million active users in 234 countries (Grindr, 2017).

Reported PNA uses vary somewhat from study to study, but the most commonly reported reasons for use are entertainment, socializing or making friends, connecting with the gay community, meeting sex partners, and meeting romantic partners (Holloway, Rice, et al., 2014; Van De Wiele & Tong, 2014). Using a thematic analysis of open-ended survey questions, Van De Wiele and Tong (2014) reported that socializing was the most commonly reported reason for use. Despite the existence of studies suggesting that PNA have multiple uses for gay men, the literature in the area continues to be dominated by studies about the risks of having sex with people met using the Internet (Grov, Breslow, Newcomb, Rosenberger, & Bauermeister, 2014). In their recent review of literature related to gay men's use of the Internet, Grov et al. (2014) reported that attempts to focus on slowing sexually transmitted infections, including HIV, has created a dearth of literature focused on understanding the behaviors and processes that gay men use to find sexual partners on the Internet.

The goal of this review was to provide a basic understanding of the extant research related specifically to gay men's PNA use. The objective of the review was two-fold, to describe the community of men who use PNA and to synthesize existing

research based on major themes emerging from that literature. This review did not attempt to systematically examine or evaluate the quality of literature. Instead, it provides an overview of the themes that emerged in the literature focused on PNA use by gay men. This review is not focused exclusively on sexual risk-taking, nor will risk be ignored. The review examines major developments in the PNA literature drawing on thematic analysis (Braun and Clarke (2006) to organize the literature reviewed.

Terminology in Researching Marginalized Populations

Although the term men-who-have-sex-with-men (MSM) was used in much of the reviewed literature, I have chosen to use gay men and LGBT+ (the spectrum of gender identities and sexual orientations including lesbian, gay, bisexual, transgender, and all those who identify as members of the community). My decision to use the terms gay men and LGBT+ is based on my position that MSM emphasises only the behaviour of sexual contact and dismisses important contextual issues of living as a member of a marginalized population (Young & Meyer, 2005). Furthermore, men who use PNA designed for gay men and who do not identify as members of the LGBT+ community represent less than one percent of reported users (Gibbs & Rice, 2015).

Focus and Methods of Literature Review

A literature search was completed that aimed to explore the extant research involving PNA in an effort to identify gaps in the literature and discover methods for reaching the population of men who use PNA. The population of interest was men who use PNA for partner seeking and was not limited by geography. Relevant terms that were used for the search are documented in Table 1. Articles related to partnering practices that do not utilize PNA were excluded, for example: gay men's cruising

practices. Multiple health and social sciences related databases (Pubmed, CINAHL, Proquest Nursing and Allied Health Sciences, and OVID) as well as a general database (Google Scholar) were searched. OVID included Medline, Joanna Briggs Institute, AMED (Allied and Complementary Medicine), PsycINFO, and EBM Reviews – Cochrane Database of Systematic Reviews. The general database Google Scholar was searched to ensure a wide breadth of databases were searched. The database search strategy can be found in table 1, appendix B. Following the database search, I hand searched the journal of AIDS and Behavior from volume 13 (2009) to volume 20 (2016) and The Journal of Homosexuality from volume 56 (2009) to volume 63 (2016). No further references were identified.

Initial title and abstract screening of all returned results (N = 534) resulted in 66 peer-reviewed articles for full text review. Following full text review, 40 articles were deemed to be relevant to the study. Figure 3 is a graphic representation of the search sources and results. Each of the 40 articles was read and relevant data was extracted to a review table. Thirty-three of the articles reviewed were published by authors in the United States, one from Canada, three from Europe, and three from Asia. Twenty-nine of the reviewed articles included quantitative research approaches and eleven articles included qualitative research approaches. The literature returned in the search was reviewed by the first author and coded to a table in Microsoft Excel. From the table, four major themes were identified and the literature review was organized around those themes. The themes and review of the table were a collaborative process between the first (DJR) and second (JCP) authors, with review and feedback on the final paper by all authors.

Identifier Number	Search Terms
1	Grindr OR Tinder OR Scruff Or Growler OR Jack'd
2	Geosocial OR "Geo-spacial" OR Geospatial OR "People Nearby Application"
3	Gay OR Bisexual OR MSM OR "men who have sex with men"

Table 1: Key terms for search

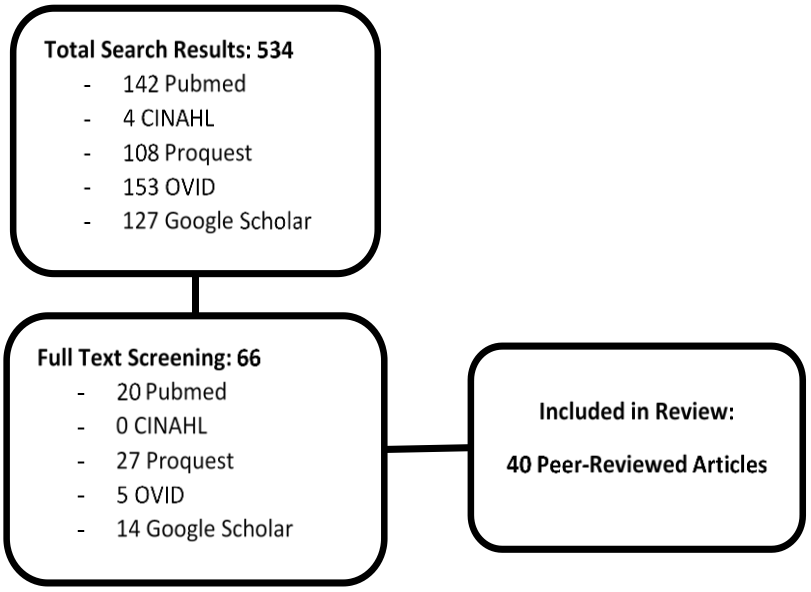

Figure 3: Literature search results, by source.

Findings

Demographic Characteristics Represented in Literature

Although little data exists to estimate the prevalence of PNA among gay men, initial reports suggest that 63% of all gay men have used at least one PNA in the past 12 months (Gregory Phillips et al., 2014). People recruited through PNA were more likely to be young, white, well educated, and identify as gay (Burrell et al., 2012; Delaney, Kramer, Waller, Flanders, & Sullivan, 2014; Duncan et al., 2016; Goedel & Duncan, 2015; Goedel, Halkitis, Greene, Hickson, & Duncan, 2015; Holloway, Pulsipher, Gibbs, Barman-adhikari, & Rice, 2015; G. Phillips, Grov, & Mustanski, 2015; Gregory Phillips et al., 2014). Although the demographic findings were similar across the studies reviewed, a hand-picked selection of studies was chosen to

represent the demographics of North American PNA users. These studies were selected because they reported on all of the following: age, ethnicity, sexual orientation, and education. After excluding any studies that did not report on all of the above demographic details, thirteen studies remained. A further seven studies were removed because the study methods included discrimination based on age (for example, only accepting young men into the study), or the studies were a secondary analysis of the same participant sample (duplicate demographics). Selected demographics from the remaining studies (*n* = 6) can be found in table 2.

Author	Country	Number of Participants	Age	Ethnicity	Sexual Orientation	Education
Duncan, Goedel, Stults, et al. (2016)	U.S.A.	N = 175	18-15 years 32.8% (n = 66) 26-30 Years 18.5% (32) 31-40 Years 28.3% (49) 41-50 Years 10.4% (18) 51-60 Years 4.6% (8)	White/Caucasian 39.9% (69) Black/African American 14.5 (25) Hispanic/Latino 28.9% (50) Asian/Pacific Islander 9.2% (16) Multiracial/Other 7.5% (13)	Gay 84.9% (146) Bisexual 10.5% (18) Other 4.6% (8)	High school diploma or less 11.5% (20) Some College 32.9% (57) Bachelors Degree or higher 55.5% (96)
Goedel, Duncan (2015)	U.S.A.	N = 92	Mean 31.73 (SD 10.77)	White 63% (58) Black/African American 19.6% (18) Latino/Hispanic 9.8% (9) Asian/Pacific Islander 3.3% (3) Multiracial 4.3% (4)	Gay 77.2% (71) Bisexual 21.7% (20) Other 1.1% (1)	Less than high school = 2.2% (2) Completed high school = 12% (11) Some college = 22.8% (21) Vocational School = 4.3% (4) Associates Degree = 7.6% (7) Bachelor's Degree = 35.9% (33) Masters Degree = 12% (11)

						Doctoral Degree = 3.3% (3)
Goedel, Halkitis, Green, Hickson, & Duncan (2015)	U.S.A.	N = 84	Mean 31.1 (SD 10.9)	White 63.1% (53) Black/African American 17.9% (15) Latino/Hispanic 10.7% (9) Asian/Pacific Islander 3.6% (3) Multiracial 4.8% (4)	Gay 76.2% (64) Bisexual 22.6% (19) Other 1.2% (1)	Less than high school = 2.4% (2) Completed high school = 11.9% (10) Some college = 35.7 (30) Bachelor's Degree = 35.7 (30) Masters Degree or higher = 14.3 (12)
Holloway, Pulsipher, Gibbs, Barman-Adhikari, &Rice (2015)	U.S.A.	N = 295	Mean 30.66 (SD 6.68)	White 68.86% (152) Black/African American 3.66% (13) Latino/Hispanic 10.26% (69) Asian/Pacific Islander 10.26% (30) Multiracial 4.76% (28) Other 1.83% (3)	Gay 93.01% (265) Bisexual 6.62% (22) Other 2.37% (7)	Less than high school = 0.73% (5) Completed high school = 4.03% (28) Some college = 25% (115) 4 Year Degree = 45.42% (112) Masters Degree = 20.15% (30) Doctoral Degree = 4.75% (5)
Phillips, Grov, Mustanki (2015)	U.S.A.	N = 1997	Median 33 (Interquartile range 26-44)	White 63.7% (1207) Black/African American 8.3% (157) Latino/Hispanic 19.1% (362) Other 8.9% (169)	Gay 83.6% (1668) Bisexual 11.5% (229) Other 4.9% (98)	Less than high school = 1.9% (37) Completed high school = 8.5% (170) Some college =30.2% (602) Completed graduate or more = 59.5 (1186)
Phillips, Magnus, Kuo, et al. (2014)	U.S.A.	N = 379	Mean 33.9 (SD 10.5, Range: 19-73)	White 47.5% (180) Black 30.1% (114) Other 22.4% (85)	Gay 88% (331) Bisexual 12% (45)	Less than high school = 1.1% (4) Completed Highschool = 16.4% (62)

						Some college or bachelor's degree = 52.8% (200) Post-graduate studies = 29.8% (113)

Table 2. Selected demographics of men who use PNA in North America

Themes Within the Literature

In analysing the literature related to gay men's use of PNA, it is immediately apparent that sexual health risks of using PNA have received much attention. For that reason, risk evolved into the first theme of the review. As the analysis progressed, the theme of stigma emerged as an important issue in understanding the context and uniqueness of gay men's lives and partnering practices. Finally, themes of sexuality and community were present in the existing research into gay men's use of PNA. These themes of risk, stigma, sexuality and community are outlined below.

Risk. The PNA related articles focusing on sexual health risk explored condom use, history of STIs, HIV testing and disclosure, and experiences of interpersonal violence. The literature investigating risk frequently used self-reports in anonymous surveys with recruitment through PNA or at venues frequented by gay men (Beymer et al., 2014; Holloway et al., 2015; Phillips et al., 2015; Rendina, Jimenez, Grov, Ventuneac, & Parsons, 2014; Rice et al., 2012). Although considerable resources have been expended in exploring PNA as a sexual health risk, the articles reviewed provided little evidence of differing risk between meeting partners through PNA versus other venues (Melendez-Torres, Nye, & Bonell, 2015).

Two studies focused on using PNA as a sexual health education and disease prevention tool. The first study proposed a human-computer interaction framework as an opportunity to improve designs of tailored online interventions (Winchester, Abel, & Bauermeister, 2012), while the second reported the results of a large survey (*n* =

457) of men who use PNA (Sun, Stowers, Miller, Bachmann, & Rhodes, 2015). In their study Sun et al. (2015) reported that PNA are a promising opportunity for health education and prevention efforts because 64% or respondents felt that apps are an acceptable source of health information and 26% of people who chatted with a health facilitator, through the app's messenger, asked for referral to local sexually transmitted infection (STI) testing centers.

The research into condom use among people who use PNA suggests that there is no difference in condom use regardless of whether the men met sexual partners through PNA or other venues (Bien et al., 2015; Chiu & Young, 2015; Lehmiller & Ioerger, 2014). A study by Goedel and Duncan (2015) found that the only difference in condom use was between people living with HIV and people who report unknown or HIV negative status. They found that people living with HIV had more condomless sex partners, but the authors attributed this difference to people living with HIV partnering with other people living with HIV and choosing not to use condoms together (Goedel & Duncan, 2015). One study observed that people who met partners through PNA were more likely to have condomless sex, but only if they had close friendships with people whom they had met through PNA (Holloway et al., 2015). When making a decision regarding condom use, PNA users do so only after performing a risk assessment that includes investigating biomedical intervention use, such as PreExposure Prophylaxis (PrEP; Newcomb, Mongrella, Weis, McMillen, and Mustanski (2016). Although condom use appears to be similar regardless of whether partners are met through PNA or traditional practices, one study reported that sexual risk taking, including increased condomless sex, may increase with longer history of PNA use (Winetrobe, Rice, Bauermeister, Petering, & Holloway, 2014). The

literature on condom use does little to suggest that there are differences in risk between partners met through PNA and those met through other online venues.

The articles reporting on STI history among app users contained mixed findings. In a study by Beymer et al. (2014) people who use PNA were found to be more likely to report having had an STI at some point in their lives, however they also found that young men were more likely than older men to report having had an STI in their lifetime. A study by Holloway et al. (2015) found that nearly 50% of all PNA users report being diagnosed with an STI during their lifetime. When the data from existing studies with risk as a central theme are synthesized, there is little clear evidence of a difference in risk profile for people who meet partners on apps compared to those who exclusively meet partners through other means.

An article exploring interpersonal violence within the population of PNA users by Duncan et al. (2016) found that 37.7% of PNA users have experienced at least one form of interpersonal violence. Of the forms of interpersonal violence that they reported on, violence of a sexual nature was associated with increased substance use in the past month. Substance use was also associated with an increase in condomless anal intercourse, in a study based in Hong Kong (Yeo & Ng, 2015). When considered in relation to Holloway (2015) finding that using apps for more than one year was associated with increased substance use, the association between substance use and experiences of violence as well as condomless intercourse becomes increasingly important. Furthermore, experiences of interpersonal violence, regardless of substance use, were associated with increased condomless anal intercourse with partners (Duncan et al., 2016). These findings suggest that factors such as interpersonal violence and substance use, ought to be considered when examining sexual health risk, and when interpreting condom use patterns.

Stigma. Stigma appeared as an important theme within the literature reviewed, however, the word stigma itself is noticeably absent from much of the quantitative literature. The qualitative literature more frequently addressed stigma and sources of stigma as important for understanding app use. Unfortunately, stigma is infrequently defined within the literature that explores this issue, complicating comparisons across studies. For the purpose of this study, quantitative articles involving HIV disclosure are understood to be discussing stigma as it is understood through Goffman (2009) *Stigma: Notes on the Management of Spoiled Identity*. Goffman's (2009) description of stigma as a mark of discredited social standing was furthered by conceptualization of stigma as a process of marking members of marginalized groups and distancing them from acceptance within mainstream society (Link & Phelan, 2001).

Within the reviewed works, the highly stigmatized issue of HIV within the community of gay men was frequently called upon as a facet of PNA use. The articles involving HIV testing and disclosure found that 80-95% of people who use PNA have been tested for HIV at some point in their lives (Bien et al., 2015; Goedel et al., 2015; Holloway et al., 2015; Landovitz et al., 2013). PNA use facilitated discussion of HIV status and increases the likelihood of disclosing HIV status to partners (Ko, Tseng, Huang, Chen, & Hsu, 2016; Noor, Rampalli, Rosser, & Simon 2014). People living with HIV felt less comfortable discussing their status than people who have unknown HIV status (Chiu and Young, 2015). PNA was reported as a helpful facilitator and increased the likelihood of discussing serostatus when compared to meeting partners offline (Chiu and Young, 2015).

Once trust has begun to be established through PNA, people discussed and disclosed HIV status through online messages (Grov, Agyemang, Ventuneac, and

Breslow, 2013). Two studies observed that HIV negative or status-unknown men were more likely to disclose negative status right away in a conversation, whereas people who are living with HIV preferred to wait until some trust had developed before disclosing their status (Grov et al., 2013; Ramallo et al., 2015). People who are not living with the experience of HIV-positive stigma find no difficulty in identifying themselves as not being a member of the marginalized community. An over abundance of articles exploring HIV transmission within the research literature is concerning because it may problematize gay men's sexual lives, even though the existing literature suggests that PNA facilitated open conversation about HIV among gay men.

Stigmatization of gay men who use PNA was also apparent in the literature reporting on gay men's perceptions of other PNA users. PNA users felt social stigma regarding casual sex partnering using PNA, with 7.6% of users identifying "slut-shaming" and social judgment related to PNA use (Corriero & Tong, 2016). Although this number appears low, it may not capture the true magnitude of stigmatization that PNA users experience related to the social shaming of casual sex because the same study found that a greater number of respondents (11.4%) were concerned about simply being recognized as an app user (Corriero & Tong, 2016). Furthermore, that study did not identify whether the source of stigma was from within the LGBT+ community or mainstream society. Concerns about recognition may be related to PNA users reporting they cannot trust that representations other PNA users present are true or accurate (Corriero & Tong, 2016; Phillips, 2015). PNA users are so attuned to inaccurate self-presentation by other users that they prefer amateur looking photographs that are interpreted as being more plausible representations of other users (Phillips, 2015). There is also a culture among PNA users of sharing photos,

including erotic or pornographic self-photos to build trust in the online relationship (Phillips, 2015; Tziallas, 2015). The rituals of using amateur photos and sending self-pornographic images to build trust furthers the argument that gay men who use PNA have been stigmatized for PNA use to the point that users do not immediately trust each other to be accurately representing themselves. Further research is needed to determine if issues of self-representation are a result of stigma, related to appearing more desirable to potential partners, or some combination of these or other factors.

Body-image also emerged as a source of stigmatization for gay men using PNA. Obese participants were significantly more likely to endorse increased body dissatisfaction and fewer sexual partners (Goedel, Krebs, Greene, & Duncan, 2016). PNA users who are overweight face a special stigmatization related to their bodies being perceived as undesirable by other PNA users (Goedel et al., 2016). Although that study was unable to conclusively link PNA use to changes in body satisfaction, it remains to be studied how using apps change perceptions of self and, ultimately, mental wellbeing.

The relative absence of discussions of stigma within the reviewed literature may be a cause for concern and reflection within the research community. Although a great deal of public health focused research has been conducted on PNA use among gay men, the importance of stigmatization as a public health issue has been overlooked by many of these studies (Grov et al., 2014; Phelan, Lucas, Ridgeway, & Taylor, 2014). Furthermore, researchers must reflect on their own studies and reporting to ensure that we do not further stigmatize these men. One particularly moving quote summarizes much of the research into PNA that has been conducted thus far: "Although Grindr is relatively new, the way it has so far registered in print,

on television, and in public health literature certainly recalls many characterizations of gay life as laughable, hyper-sexualized, or dangerous (Crooks, 2013, p. 2)." Moving forward, researchers and academics must endeavor to explicitly define and explore issues of stigma whenever working with marginalized populations, especially where the participants might experience multiple-stigmas, such as stigma related to being a gay man, stigma related to ethnicity, and further stigma related to being shamed for using PNA for casual sex (Corriero & Tong, 2016).

Sexuality. Surprisingly little of the reviewed research focused on motivations for using PNA. Although finding sexual partners may be the stereotyped motivation for use, sexual behaviour and sexuality were often addressed only in relation to risk. A recent study to assess Grindr as a recruitment tool and HIV prevention and education platform by Holloway, Rice, et al. (2014) assessed the uses of the PNA Grindr. They reported that users' number one reason for using Grindr was for finding casual sex partners. Interestingly, they reported that Grindr is also commonly used for entertainment, making new friends and connecting with other gay people. Perhaps the most notable finding from this study was that when comparing motivations for using Grindr to traditional dating sites, the authors found that 40% of users reported their primary motivation for using dating sites was casual sex, only 30% of users reported that they used Grindr for that purpose (Holloway, Rice, et al., 2014). The studies reviewed suggest that finding sexual partners represents only one facet of PNA use, yet sexual health risks have dominated the research exploring PNA. There is a need to explore motivations other than finding sexual partners, including using PNA to socialize, connect with LGBT+ people, make new friends, and for entertainment.

With regards to initiating casual sex relationships, PNA users have developed a linguistic strategy of using short and to-the-point messages (Licoppe, Rivière, and

Morel, 2015). These messages follow a nearly stereotyped pattern that removes human aspects of normal conversation and uses only the bare minimum to communicate the logistics of planning a meeting for sexual contact (Licoppe et al., 2015). Interestingly, this communication strategy may reduce perceived connections and decrease the likelihood of an uncomfortable attachment when ending a casual sexual relationship (Licoppe et al., 2015). More research is required to determine if PNA users modify their linguistic strategies and mannerisms for interacting with users whom they are interested in as friends, romantically, or for casual sex only.

Meeting partners through online social media, including PNA, was associated with an increased likelihood of exchanging sex for goods or food, having a greater number of new partners, and frequency of oral sex (Young, Szekeres, and Coates, 2013). This finding related to oral sex requires further investigation because it suggests that sexual activity between people who meet on PNA may not include anal intercourse. The public health focus on condom use and anal intercourse may not have captured the reality of the sexual experience for men who meet using PNA.

Community. The theme of community covered a range of issues from social cartography to defining gay communities and spaces. Four articles discussed PNA as an online gay space that transcends traditional boundaries for gay communities (Blackwell, Birnholtz, & Abbott, 2015; Crooks, 2013; Roth, 2014, 2015) One ethnographic study found that PNA acts as a virtual map of the gay community that has a complex interplay with physical locations and differing densities of PNA users (Roth, 2014). PNA acts as a new online gay community that allows for increased online-visibility of men to potential partners without the risk of identification within a traditional gay space such as a street associated with LGBT+ friendly business or bars (Roth, 2015). An autoethnography by Crooks (2013) suggested that while gay

villages remain an important part of gay culture and visibility, PNA allows men to seek partners unnoticed by the straight community within traditionally straight spaces. PNA represents a return to the period before gay rights movements improved gay visibility and allows gay men to return to invisibility while in traditionally heterosexual spaces (Crooks, 2013). PNA allows gay men to make any space a gay space, and people who use PNA manage their online impressions carefully to construct an attractive image not possible when meeting people for the first time in physical spaces, such as a gay village (Blackwell et al., 2015).

Within the theme of community, the process of leaving PNA was attributed with special meaning. The decision to leave PNA typically occurs over a period of time and was described as a process of slowly discontinuing use rather than a singular event (Brubaker, Ananny, & Crawford, 2014). Leaving typically results from four interrelated themes including: the behaviour of leaving, feeling the apps do not meet expectations, no longer enjoying the interpersonal interactions on the apps, and feeling that the apps consume too much of the user's time (Brubaker et al., 2014). Of note was the finding that for some users, leaving the app consisted only of making the profile blank, or simply discontinuing use without deleting the account or app from their smartphone (Brubaker et al., 2014). This finding suggests that return to the apps is likely for users who are not willing to delete their user accounts.

Discussion

The demographic review presented in this article addresses objective one of the review by beginning to describe 'who' PNA users are. It is interesting to note that in Atlanta, Caucasian men are overrepresented with almost 60% of reported users being Caucasian, while only 38.4% of Atlanta's general population were Caucasian (Delaney et al., 2014; United States Census Bureau, 2017). This finding requires

further investigation to determine the differences in demographic patterns between the general population of gay men and app using men. An overrepresentation of younger men on PNA could likely be explained by natural life course and changes in partnering practices (Bien et al., 2015; Delaney et al., 2014; United States Census Bureau, 2017). However, overrepresentation of an ethnic or cultural group is suggestive of an undercurrent of racism and the oppression of visible minorities.

The four major themes were risk, stigma, sexuality, and community. Evolution of the three latter themes within the literature suggested that there are multiple facets of PNA use that remain relatively unstudied, yet are critical to understanding gay men's PNA use. The abundance of research exploring risks associated with gay men's sexual behavior supports the need for focused inquiry into the process of using these apps that is not driven by epidemiology perspectives focused excessively on risk (Grov et al., 2014; Melendez-Torres et al., 2015).

Within the theme of risk, the findings regarding condom use are of particular interest because condoms have been the focus of many public health initiatives aimed at gay men. Multiple articles reviewed suggest that there is no difference in condom use regardless of meeting a partner through the Internet or more traditional partnering practices (Bien et al., 2015; Chiu & Young, 2015; Goedel & Duncan, 2015; Lehmiller & Ioerger, 2014). Among young gay men in West Hollywood who were meeting partners through the PNA Grindr, condom use was significantly higher for men meeting through PNA than for meeting anywhere else (Rice et al., 2012). They reported that 59. 8% of respondents reported condom use with partners met through PNA and only 41.9% reported condom use with partners met elsewhere (Rice et al., 2012). These findings suggest that further research focusing on condom use among gay men meeting men through the Internet may be redundant. Instead, research into

using apps to provide in-depth teaching and health resources may be a more useful public health initiative (Sun et al., 2015).

In their study in the United States, Grov et al. (2013) reported that participants were more comfortable discussing condom use online prior to meeting a potential sexual partner. Facilitating discussion of safer sex practices appears to be an emerging issue in PNA use that may assist public health efforts aimed at increasing awareness regarding condom use and discussion of condom use preferences with potential partners. The focus on risk that has been focal in PNA research may have inadvertently missed the protective factors that have evolved as gay men adopted technology into their partnering practices.

In choosing a PNA with which to engage potential participants, it is important for researchers to ensure a wide reach into the LGBT+ community. During the investigation that occurred for this review, we have found that the PNA Grindr appears to have a sufficiently wide reach to be considered as the app of choice if only one PNA is to be used (Lehmiller & Ioerger, 2014; Phillips, 2015). In their study in the United States, Lehmiller and Ioerger (2014) reported that 77% of participants used Grindr. A recent study by Goedel and Duncan (2015) reported that 100% of participants used Grindr, 52.5% also used Scruff, and 45.7% also use Jack'd. These findings should be considered with the caveat that recruitment was conducted through Grindr, so the finding that 100% of participants use Grindr has little meaning, what is of note is that the men reported far lower usage rates with regard to other apps (Goedel & Duncan, 2015). Further research is needed to determine if there are significant ethnic or age differences in the users recruited using different PNA. This information could be useful for public health units attempting to reach gay men from specific demographic groups. In their review, Holloway, Dunlap, et al. (2014) noted

that issues of confidentiality are particularly important when using social media for health promotion projects. Using PNA to facilitate health discussions may have special requirements related to encrypted storage of data from user interactions and documentation of interventions or health teaching when it is provided.

The implications of living with HIV and disclosing serostatus to sexual partners continues to be an important issue. PNA may become an important tool for people living with HIV to discuss and disclose their status to potential partners (Chiu & Young, 2015). The increased comfort that PNA users report with regards to disclosing their HIV status online may be useful for organizations aiming to normalize discussions of HIV and STI testing and disclosure. Furthermore, the as-of-yet unexplored implications of having an electronic record of disclosure could be useful in jurisdictions that continue to criminalize HIV non-disclosure. There is a need for research into the legal aspects of recording disclosure through in-app messaging and ensuring that those messages continue to be available to PNA users into the future, should the need arise.

Although not a theme of this review, the loss of LGBT+ spaces is an important consideration when discussing PNA. The nature of PNA is that it intersects physical geography and virtual space. A recent article by Roth (2015) invites the academic and LGBT+ community to consider the importance of having physical spaces that are dedicated to LGBT+ people and visibility of the community. The movement of LGBT+ people onto PNA and out of social spaces that had traditionally been specific to the community, for example gay-bars, may lead to a loss of LGBT+ visibility within mainstream society (Roth, 2015). Although online spaces are safe and comfortable for LGBT+ people, existence within virtual spaces do little to grow recognition of the LGBT+ community as important members of mainstream society.

PNA have functionally transitioned all spaces into LGBT+ spaces, but with the caveat that the LGBT+ presence remains invisible to mainstream society (Blackwell et al., 2015). While increasing virtual LGBT+ space offers promise in increasing the ability of LGBT+ members to reach the community, an overreliance on virtual space may lead to reduction in important physical spaces that continue to serve as a reminder to mainstream society that LGBT+ people are important contributors to shared communities.

Limitations

As with all reviews, the publication lag between conducting this review and publishing it almost certainly means that the review is out-of-date by the time it is published. With that caveat noted, the themes that we have reported on will continue to be relevant into the foreseeable future. The increasing publication of articles related to PNA use may translate into recently published articles having been missed in this review. Without systematic evaluation of the articles and their findings, it is difficult to compare findings across studies or firmly grasp the size or pervasiveness of effects reported in the literature.

Conclusion and Recommendations

This review suggests that a focus on quantitative research methods exploring sexual health risks has largely missed an opportunity for meaningful exploration of PNA use among gay men. The literature related to risk has returned inconsistent results, suggesting that there may be no meaningful difference in sexual health risk regardless of meeting partners through PNA or elsewhere. Few studies have begun the work of determining motivations for PNA use and patterns of use. The current literature suggests that PNA users are disproportionality white, young, and educated.

As suggested by Grov et al. (2014), there is limited qualitative research literature that explores the use of the Internet for sexual partnering by gay men. The findings of this review support the need for qualitative investigations into PNA use by members of the LGBT+ community. Of particular need are studies that explore topics related to the themes of stigma, sexuality, and community. Risk has been well researched, whereas the issues of stigma, sexuality, and community remain relatively unstudied. Without first developing a working understanding of how and why gay men use PNA, the research community risks continuing lines of investigation, such as sexual health risk, that have limited or no benefit to the community of PNA users.

Declaration of Conflicting Interest

We, the authors, declare no known potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Chapter 3

A gay bar on my phone: Exploring gay men's process of using people-nearby applications

This chapter is pending submission for publication in a peer-reviewed journal.

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Abstract

Gay men continue to lead the technological revolution in terms of adapting to new technology. Gay men have rapidly adopted people-nearby applications (PNA), such as Grindr, to facilitate connections. Although PNA has become a culturally important fixture in gay men's lives, little qualitative research has explored the process of using the apps. We conducted a qualitative description study using innovative data collection experiential sessions: Gamestorming, to explore the process of using PNA within the community of gay men. A persona of a typical gay user was created to further academic understanding of who is using PNA. Our thematic analysis evolved into four major themes that revealed a cyclical pattern of use and disuse. The themes community, hope, stigma, and doubt provide new understanding of how and why gay men are repeatedly turning to PNA during their search for love.

Keywords: Gay men community, PNA, risk, stigma, hope and doubt

A gay bar on my phone: Exploring gay men's process of using people-nearby applications

Smartphones and expansive technical capabilities, from high speed Internet access to accurate global positioning system (GPS) data have become an important component of humanity's eternal quest for companionship. Gay men have quickly adopted the smartphone and its associated applications for the purpose of meeting sexual and romantic partners (Grov, Breslow, Newcomb, Rosenberger, & Bauermeister, 2014). One such use of the smartphone was the advent of people-nearby applications (PNAs) that use GPS to triangulate a user's physical location and then display other users based on proximity (Burrell et al., 2012). In 2009, the first major PNA designed for gay men was released (Burrell et al., 2012). Since then PNA has exploded in popularity among gay men with estimates of use as high as 63% of gay men having used at least one PNA in the past 12 months (Phillips et al., 2014). The existing literature exploring gay men's use of PNA is predominantly quantitative with a focus on sexual health risk of using PNA to find sexual partners. The disease-focused quantitative literature has left a gap in knowledge related to gay men's process of using PNA that requires exploration using qualitative methods.

Research Purpose & Objectives

The purpose of this study was to explore typical PNA use by gay men to describe the process of becoming a user, using PNAs, and the decision to continue or cease use. This study used a basic qualitative description method in an effort to address the gaps identified in the literature related to gay men's use of PNA (Sandelowski, 2000). The study's objectives were to: (1) generate an understanding of typical PNA users, (2) describe typical users' process of using PNA, and (3) describe any cycles or rhythms of use as experienced by a typical PNA user.

Significance of Study

Men who use PNA are more likely to be white, young, and educated (Bien et al., 2015; Burrell et al., 2012; Delaney, Kramer, Waller, Flanders, & Sullivan, 2014; Goedel & Duncan, 2015). Although estimates of self-reported sexual orientation vary from study to study, 77-93% of users identify as gay (Goedel & Duncan, 2015; Holloway, Pulsipher, Gibbs, Barman-adhikari, & Rice, 2015) and Gay and Bisexual men account for 96-99% of PNA users (Gibbs & Rice, 2015; Goedel & Duncan, 2015). PNA users have an average of 3.11 ± 1.84 apps (Goedel and Duncan (2015) and check their accounts, on average, 6 to 8 times per day (Corriero & Tong, 2016; Goedel & Duncan, 2015).

There is limited research that describes motivations for PNA use. The available literature suggests that PNA have multiple important uses. PNA are used for meeting new friends, meeting casual sex partners, meeting romantic relationship partners, entertainment, finding people to use substances with, and connecting with other members of the LGBT+ community (Holloway, Rice, et al. (2014). PNA have been reported to be used as often for entertainment as for finding casual sex partners (Goedel & Duncan, 2015).

Risks of PNA Use

Research regarding substance use among PNA users suggests that there are important health risks for users who also use substances (Duncan et al., 2016). For example, methamphetamine use has been associated with a higher risk of having contracted chlamydia and gonorrhea (Beymer et al., 2014). Condomless sex, usually defined as condomless anal intercourse, has shown no meaningful difference in condom use when comparing sex with partners met on PNA compared to partners met elsewhere (Bien et al., 2015; Rice et al., 2012). In a recent study, condom use

was higher among men who met partners through PNA (Holloway et al., 2015). Research on PNA use by gay men has been dominated by epidemiology and public health studies that focus on the risk of using these technologies to find sexual partners (Grov et al., 2014). However, there is little evidence to suggest a difference in sexual health risk between sex with partners met through PNA and partners met elsewhere (Melendez-Torres, Nye, & Bonell, 2015).

HIV transmission and disclosure of HIV status remain a focus of research into gay men's health topics, including PNA use. Among PNA users, men who are living with HIV are less comfortable discussing STI's and HIV status during in-app interactions (Chiu & Young, 2015). However, despite the difference in comfort, the Internet remains a popular medium for disclosure because it is reportedly easier to disclose through the distance of cyber-space than during an in-person meeting (Grov, Agyemang, Ventuneac, & Breslow, 2013).

Beyond Risk of PNA Use

There are several promising aspects of PNA use that can be used to address potential sexual health challenges. PNA have been documented as effective teaching and research tools. PNA may also facilitate a sense of community among some LGBT+ persons.

PNA as a research and teaching tool. The possibility of reaching the LGBT+ community through PNA interventions and research projects have begun to gain interest from public health personnel. Many research groups across North America and Asia have begun to use in-app banner advertisements and researcher profiles to recruit research participants (Goedel & Duncan, 2015; Landovitz et al., 2013; Su et al., 2015; Sun, Stowers, Miller, Bachmann, & Rhodes, 2015). Although using PNA as a recruitment tool creates access to PNA users, the studies using PNA

as a recruitment tool have had consistently low response rates. Studies using PNA as their primary recruitment tool report response rates between 9% and 15% (Burrell et al., 2012; Goedel & Duncan, 2015; Holloway, Rice, et al., 2014; Landovitz et al., 2013). These low response rates represent a limitation of the recruitment medium, but may be justified based on the difficulty of reaching LGBT+ community members and the specificity of reaching active PNA users.

PNA also represents an opportunity to expand the reach of public health units into the virtual world. PNA is of particular interest because the profiles that users are exposed to are in relatively close proximity. Social networking through the Internet, including PNA, represents an opportunity for expansion of health promotion programs (Holloway, Dunlap, et al., 2014). In one study, PNA users felt that in-app health facilitators were an acceptable source of health information and facilitators referred 26% of all contacts to local healthcare services (Sun et al., 2015). The literature regarding using PNA as a healthcare tool suggests that users may benefit from increased attention to their online lives when new health promotion initiatives are being created.

Transformation of LGBT+ space. The rapid adoption of PNA by gay men has had important implications for LGBT+ visibility. PNA makes any space into an LGBT+ space (Blackwell, Birnholtz, & Abbott, 2015). Although PNA creates an online community of gay men that can exist within any physical geography, this newly created space is invisible to mainstream society (Roth, 2015). The protection of identity as a member of the LGBT+ community may sometimes be beneficial due to threats of violence or persecution. However, outside the context of persecution or violence, the creation of an invisible LGBT+ space may replace the need for traditional LGBT+ spaces, such as gay villages (Roth, 2015). The loss of such

physical spaces may serve to further remove the LGBT+ community from mainstream society by removing the visual reminder that LGBT+ people exist and occupy physical space (Roth, 2014).

Method

Fundamental Qualitative Description

This study used a basic, or fundamental, qualitative description as described by (Sandelowski, 2000). Fundamental qualitative description is a minimally interpretative description of an event, in this case a process, that provides a rigorous method for recording and presenting data without high-level theoretical abstraction (Sandelowski, 2000). This method provides a description of events, in a logical order, that can be understood and remains recognizable from the data collected for both researchers and participants (Maxwell, 1992). Descriptive and interpretive validity are required in a fundamental qualitative description (Maxwell (1992). Descriptive validity is the agreement of those present in the research sessions that the description is accurate and representative. Interpretive validity is the agreement of the research participants that the findings of the fundamental qualitative description accurately represent their experience (Maxwell, 1992).

The fundamental qualitative method does not require a strict procedure to remove the researcher's biases from the research findings. However, the researcher is expected to explicitly address known bias and remain as close to the data as possible (Sandelowski, 2000). Without the need for high level abstractions, research findings should be protected from some, but not all, researcher bias.

Participant recruitment

The inclusion criteria for the study were, a history of using a PNA for a period greater than one month at some point in the past five years or current use, self-

identification as gay, bisexual, or men who have sex with men (MSM), male gendered (including female-male transgender people), proficiency in spoken English language. All inclusion criteria were compulsory for the study. Potential participants were identified through an in-app profile and snowball sampling. A researcher profile was created for the gay men centric PNAs Grindr, Hornet, Jack'd, Growler, and Scruff. The researcher profile aligned with the profiles used in Holloway et al. (2015) and included the study institution's name, identified the profile as part of a research project, identified the recruiter as a researcher, and contained a profile picture of the researcher. The researcher traveled to major regions within the city and opened the applications to enable users in that area of the city to see the profile. A total of 137 responses were recorded with six participants joining the study (table 3). Any contacts during recruitment that were lewd, aggressive, or assaultive resulted in the researcher using the block function (n = 5) on the application to block contact from that user and ensure the safety of the researcher. For this study, convenience and snowball sampling were required because the LGBT+ community is notoriously difficult to access (Burrell et al., 2012). During recruitment, several potential participants declined to complete the study because of discomfort with group sessions. The majority of potential participants who did not complete the study simply stopped responding to messages after their initial inquiry about the study. Recruitment ceased following the second participant session as the iterative analysis suggested saturation of themes was achieved.

PNA	**Total Responses (n = 137)**	**Total Participants (n = 6)**
Grindr	90	3
Growlr	19	1
Hornet	15	0
Jack'd	0	0
Scruff	12	1
Snowball	1	1

Table 3. Participant recruitment sources by PNA

Data Collection

The data collection phase consisted of two experiential sessions with three participants per session. A total of six men participated in this study, contributing to a combined total of 18 participant hours. Experiential sessions were aligned with the data collection needs of the fundamental qualitative description and allow for a broad exploration of events or processes. The group size was adapted from the study by Phillips, Rowsell, Boomer, Kwon, and Currie (2016) that used gamestorming with a larger sample.

Experiential sessions were facilitated by the first author using the gamestorming process of persona creation to create a typical PNA user. Prior to starting the sessions, participants had an opportunity to read, ask questions about, and sign the informed consent for research participation form. The experiential sessions consisted of five major phases: (1) introductions and ice-breaker activity, (2) empathy map activity and persona creation, (3) campfire stories activity, (4) pains and gains of PNA use activity, and (5) participant check-in and session closing. Phases one, two, and five were drawn from a conference tutorial session conducted by Currie, Phillips, Ronquillo, and Rowsell (2016). Phase three was adapted to address the research aims of the current project from the process described by Phillips and colleagues (2016). Phase three and four were adapted from Gray, Brown, and Macanufo (2010) and piloted as a health related research tool in the current study. See figure 4 for a photograph of the artifact created by participants during phase three: campfire story.

Figure 4. Photograph of poster board and sticky-notes created during Campfire game.

This study used an innovative style of group sessions to engage participants as co-creators of knowledge and data. The use of personas to generate knowledge about a process, such as PNA use, focuses attention of the research project on the people who use the product, rather than the product itself (Gray et al., 2010). This approach offers superior protection to privacy of participants who are members of vulnerable populations by allowing them to create personas and describe the behaviour of the persona, thereby decreasing the emotional risks of disclosing personal information to a group (Kwon, Phillips, & Currie, 2014; Phillips et al., 2016).

Data Analysis

Two personas were generated through subjective analysis of data created with the participants. Empathy maps created during the sessions were used to generate a narrative that described the persona of a typical user. The narratives drew directly

from participant responses with everything from persona names to the apps they use coming directly from the participants. Two personas were developed for this study, *Neil* and *Alexandro*, and their characteristics are described in table 4. The persona's generated during the experiential sessions and the narratives that the men created for the personas formed the basis for thematic analysis.

Braun and Clarke's (2006) guide to thematic analysis was used to guide our within-group, and between-group comparison of the unfolding participant narrative related to the process of use of people nearby apps. The approach was iterative with coding and theme generation moving between phases as the first author (DJR) conducted the analysis. The completed analysis was reviewed in detail by a second researcher (JCP) and all disagreements at the level of code or theme were discussed using a dialectical format until consensus was reached. During data analysis, the researcher made every attempt to maintain the flexibility of thematic analysis while maintaining the credibility advocated for by Braun and Clarke (2006).

Findings

Demographic Profile: Meeting the Participants

Participants in the experiential sessions were all Caucasian men between 25 and 49 years of age. They all self-identified as gay during research sessions. Among the men, first PNA use occurred between 2011 and 2015. Grindr was the only PNA that all of the men reported having used, four of them used Scruff, two of them used Tinder and Hornet, and one of them used Growlr. Four participants reported using three or more PNAs and only one participant reported exclusively using Grindr. Participants reported educational achievement that ranged from completing high school to completion of a Master's degree.

Meeting the Personas

Neil
Neil is a 23-year-old man who lives in the downtown core of a major Canadian city. Like many other young men and women in his city, Neil works in a downtown office, not far from his home. Neil is single and looking to meet new people. He has been using people nearby applications on his cell phone for the past four years. Neil cycles through the apps he uses, but generally uses Grindr, Tinder, and Hornet. When he uses the apps, he is looking to make new friends, start a new relationship, meet a friend with benefits, and occasionally to have sex right now. Neil uses the apps at various times of day, including when he is at work or out with friends, and he frequently checks his phone for new messages. Neil feels a wide range of emotions that are generally linked to the type and frequency of responses he is getting from other users, when he uses the apps. Although meeting new people through the apps sometimes makes Neil feel anxious, the hope of finding a partner makes the less appealing aspects of app-use worthwhile for him.
Alexandro
Alexandro is a 28-year-old man living in a major Canadian city. He identifies as a gay-man and is out to most of his friends and colleagues. He works in the public service in a downtown office, and has worked there for some time. Alexandro was in a ten year long monogamous relationship that recently ended. He has been using PNA for the past year, but he has not yet identified a specific goal for using the apps. He likes to try new apps as they become popular. He currently uses Grindr, Surge, and Hornet. Alexandro usually checks the apps a few times a day when he is bored or horny. When he logs on, he tends to hear the same few tag lines (for example, "sup", "looking?", or "not here to hook-up") from everyone

who messages him. Alexandro isn't really sure what he should expect from people on the apps, so he tries to remain open minded.

Table 4. Persona's developed by participants

Findings of the Thematic Analysis

Following experiential thematic analysis sessions, four themes that met the three research objectives were named. The first theme is an overarching sense of community that encompasses both a sense of social place and the personas' physical geography. The overarching theme contains the remaining three themes: hope, doubt, and stigma. These themes are believed, by the researchers, to have a time orientation to each other in that the themes of hope and doubt have differing importance depending on the persona's trajectory and narrative regarding the PNA use process. In describing personas' lives, participants referred to a cyclical use pattern. Figure 5 is a graphic representation of relationships between the themes and table 5 exhibits the themes and subthemes. Within the graphic, the location of hope, stigma, and doubt relates to those themes existing within the overarching theme of community. It is important to note that although those themes exist within the umbrella of community, they are distinct major themes and should not be regarded as sub-themes of community. The themes of stigma and doubt share physical space within the diagram because we believe those themes have some meaningful conceptual interaction. The dashed lines indicate permeability of the themes. Although we believe the themes to be bound concepts, there appears to be interactions across and between all of them.

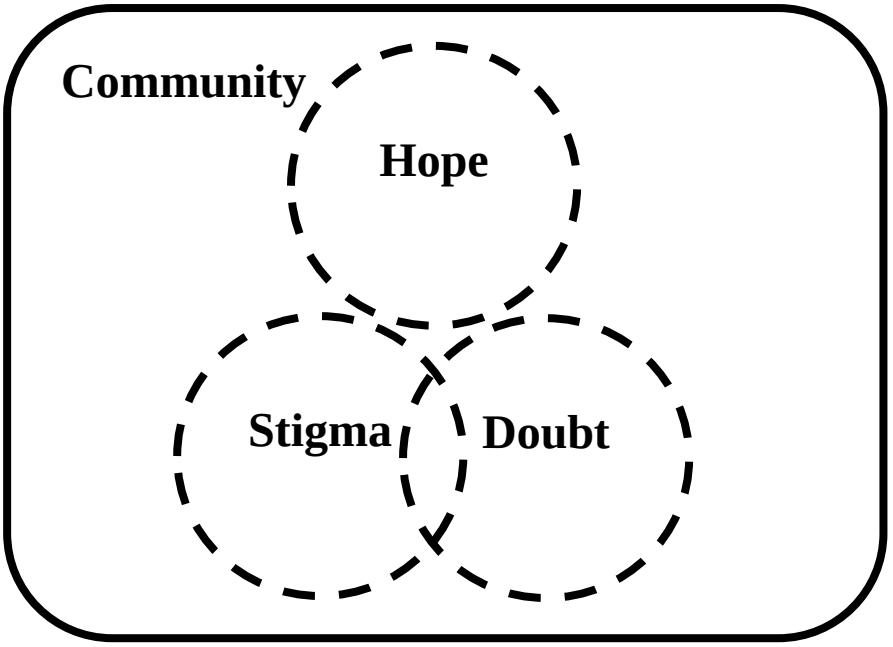

Figure 5. Graphic representation of themes

Theme	Subthemes
Community	Curiosity about PNA
	Creating a PNA profile
	Voyeurism in PNA use
	Determining intention for use
	Disclosing personal location
	Socializing with LGBT+ community members
	Navigating in-person meetings
Hope	Ego boost
	Meeting other users
	Returning to PNA
Stigma	Recognition
	Sexuality shaming
	HIV disclosure

	STI testing
Doubt	Negative interactions
	Discontent with PNA use
	Leaving

Table 5. Themes and subthemes generated through thematic analysis.

Community.

Curiosity about PNA. Participants defined the narrative of their respective personas as beginning with a sense of curiosity about the LGBT+ community surrounding them. For the persona Alexandro, when he downloaded his first PNA he was awash with excitement from the opportunity to connect with other LGBT+ men. He mused "will I be popular," "will I actually meet people," and "what do the guys in my area look like?" For most young gay men, getting their first smartphone was exciting because they were already aware of the availability of PNAs and perceived that getting their first smartphone translated into gaining access to the online community of LGBT+ people around them. The participants' discussion of this curiosity suggests that the apps are important to gay men before they are even old enough to use the apps. First app usage appears to be a coming-of-age milestone as a LGBT+ community member.

Creating a PNA profile. The basic profile across PNAs usually includes a "selfie" photo in addition to a free text self-description. Participants reported the picture is the most important part of the profile because it is the first impression that attracts interest from other users. Profile photos identify the user as an LGBT+ man, therefore some men choose not to show their faces in photos, a phenomenon discussed within the theme of stigma. The profile gives the user an opportunity to situate themselves within the community. For example, the user might write their

kinks (slang term for unusual sexual practice), sexual preferences, or permissiveness with regards to substance use. Everything written in the profile can become a "double-edged sword," because other app users may decide they are not interested in contacting you because of something written in your profile. For some users, less-is-more when it comes to profile creation.

Voyeurism in PNA use. PNA profiles create opportunities for users to engage in a voyeuristic tour of other men in their area. Participants reported that, especially as a new user, people want to see the "flesh" (bodies, faces, and genitals of other users) around them. One participant stated he "wants to see dicks and other flesh" of the men near him. Sharing nude pictures (nudes) is a normal and important part of interacting online. Sharing nudes was transaction-like and "you want to know what you'll get." Personal sharing allows men to feel comfortable within the community. "It's almost an in and of itself, you may not even want to hook-up." The normalization of sharing nudes was an important part of being a member of the PNA community. Despite how normal the men described the process of sending nudes, they identified that users are selective about with whom they share nudes. Nudes are usually only exchanged after trust begins to build within the conversation between app users. Sharing nudes too early could end a conversation; not everyone online wants to share this type of information.

Determining intention for use. Participants noted that intentions can change slowly over time or as quickly as each time a user opens the apps. Users have to determine why they are using the apps, what they want from the apps, and how they will get what they want. The persona Alexandro wanted to "make friends and chat" with people nearby when he created his profile. Participants noted friends of users are important in determining how the user will ultimately use the apps. For example, if

friends of the user are primarily interested in using the app to meet sex partners, so too will the user be. Conversely, if a user's friends are more interested in "chatting" with other users, the social aspect of PNA became more important and the user was less likely to be engaged in using the apps to meet sex partners.

Disclosing personal location. The men reported that the persona Neil would have debated about allowing the apps to disclose his approximate location to other users. As a technical note: most PNA offers to show other users how far away any other user is using a numerical value such as meters or feet, this feature can be turned off and other users will not be given a numeric value for proximity. Allowing the apps to display distance away from other users created a sense of vulnerability for the user, but increases the utility of the app when looking for people very close to your location. Participants reported that for Alexandro, the most important aspects of location were related to knowing who was around him, he "wants to know who is gay without having to ask and without having to resort to using stereotypes." Desire to know who is a member of the LGBT+ community was so important to Alexandro that "sometimes he will check if someone who appears gay is on the apps to reinforce stereotypes he holds and to identify other gay men." Discussion of location with participants highlighted the importance of physical geography of PNA use because people exploit the GPS-based technology to verify perceived sexualities of people with whom they are already in contact. Furthermore, the apps offer the ability to reach out to the LGBT+ community regardless of physical geography in which the user is located. A user can log in and an invisible community of LGBT+ community members nearby is accessible.

Socializing with LGBT+ community members. As a user becomes more comfortable using PNA, socializing with community members on the apps becomes

important for meeting people and making friends. When users become more comfortable with their online friends, they may begin to take on their unique vocabulary and online behaviour. Socializing on the apps allows users to learn about new locations, especially when they travel. Users can log on and ask other (local) users questions about the area. One participant described the apps as "grabbing at random in society" as users come from "all walks of life, so you never know who you're going to talk to." In this way, the apps provide unique opportunities to talk to members of the LGBT+ community from outside their usual social circle. The apps create a sense of belonging because users can socialize with like-minded people regardless of physical geography. Users can find "friends" through the apps within a relatively short period of time after arriving in a new city or country.

Navigating in-person meetings. PNA users who decide to meet in-person typically do so in a public place such as a coffee shop that is perceived to increase safety. At the meeting, users have an opportunity to verify that the live person is congruent with their online personality and determine the next step in the relationship. Participants reported that meeting is always for one of two reasons: the first being sex, and the second being anything "more than sex." Participants reported that sex is the most basic reason for meeting and appeared to place a negative connotation on this reason for meeting. Meeting for anything other than sex usually means the users are interested in becoming off-line friends or they are interested in starting a romantic relationship. If either user decides they are not interested in the other during the meeting, that person generates a generic excuse, such as "My friend just text me and I need to go meet them" for leaving and then blocks or discontinues online contact with the other user.

Hope. The theme of hope appears to be a driving force in the cyclical use pattern that emerged from our analysis. Participants' responses during experiential sessions and through narratives created for each persona suggest hope is necessary for continued use of, or return to, PNA use. Although hope appeared as a component in most narratives shared by participants, the focus of this section of the report is dedicated to moments wherein hope was the most prominent theme.

Ego-boost. The first encounter of hope participants reported was an ego boost when they were new to PNA. New users are "fresh meat" and are typically very popular. This ego boost occurs not only when a user first starts using PNA, but also when they change cities or locations within a city and appear "fresh" to local people. During this period, users typically receive a high volume of messages coming from other users. Although this popularity is short lived, the feeling generated helps to explain why users stay on the apps, or return to them, despite some negative aspects of app use. This ego boost often coincides with sending the first message as a new user. Participants reported that sending the first message is a special part of the process of use because the user feels "excited and nervous" about reaching out to a community member for the first time.

Meeting other users. Hope also emerged from participants during a discussion about users meeting to have sex. If a user decides that they want to meet someone for sex, they use the code "right now" as a question to other users. PNA users, reportedly, understand this phrase to mean that the person saying it is interested in meeting immediately for sex. Although this code is used, participants reported that PNA users are more likely to meet with people from apps without explicitly indicating their interest in having sex. PNA users typically meet in a public place and then "see where it goes." If, after meeting, the consenting parties decide to have sex,

the participants reported that anal intercourse is unusual for a first sexual encounter. They reported that oral-sex and cuddling are much more likely for the first sexual encounter with other users. The first sexual encounter with a new partner creates a sense of vulnerability, and therefore PNA users are more likely to engage in sexual behaviours that are perceived to be less intimate and reserve anal sex, perceived to be more intimate, for encounters with a repeat sexual partner.

Following sexual activity, participants reported that the next step in the process of use was to navigate sleeping over or leaving. Asking sex-partners to leave post-sexual-contact was a common practice, to the point that it was expected. One participant recounted, "I was hooking up with an ex-boyfriend of mine, and when it was over I said to him in a joking but also serious way 'I can't wait for you to leave.'" After the person has left, participants reported that people who they would sleep with again are marked using the "favorite" function that commonly appears in many PNAs. If they didn't enjoy the experience, PNA users stop responding to that person or block them in the apps. Despite the common practice of "kicking-out" partners after sex, sleeping over fits within the theme of hope because participants report that having a sleep-over is a major step towards a possible romantic relationship.

Participants reported that the hope of finding a romantic relationship is a major reason to continue app use, or to return to apps after a period of disuse. Some PNA users will mark their profiles as "looking for a relationship" to advertise to other users that they are interested in meeting a romantic partner. PNA can cause some discord if a user finds a romantic relationship because "it's hard to give up the apps and the access to new partners to just be with one person." As a result of this struggle to 'give-up' the apps, many users are looking for an open-relationship in which they can continue app use. Participants reported there are many couples who are on PNA

looking for a third person to date or for sex. When it comes to forming a romantic relationship, participants reported that people who became friends through PNA, as opposed to meeting for sex, are more likely to become romantic partners.

Returning to PNA. As a natural component of the cyclical use pattern of PNA, participants reported that hope eventually brings previous users back to the apps after a period of disuse. This coming back process is marked by downloading the apps and reopening old profiles. The profile picture is usually changed to a more recent photo and the profile may be updated. Participants recounted "you always come back" and "it's too convenient." One participant stated "I don't see myself without it [the app]." These sentiments were consistent across both experiential sessions, supporting the notion that leaving is merely a "break" until the hopeful aspects of app use draw users back. Participants identified the feeling of belonging to a community, the ego boost feeling, and the desire to meet new partners as the most important reasons to return to PNAs.

The final component of the theme of hope within the process of PNA use was described by one participant as a "crutch." The participant described PNA as a crutch gay men can use to carry themselves toward a long-term romantic partner. One participant recounted an anecdote to describe how important this hope was for him.

> When I was young, I remember watching a sad documentary that included a gay man ironing his pants, or maybe his shirt–it doesn't matter which–alone, in his apartment. And I remember this because I didn't ever want to be him. And now I am.

This participant's revelation revealed the importance that PNA use holds in participants' lives and the need to understand the benefits that PNA use brings these men, including hope.

Stigma.

Recognition. Stigma colours the majority of gay life and it is not surprising that it was named by participants who disclosed they believed PNA use is inherently stigmatized based on the stereotyped understanding that apps are exclusively used for casual sex. Further, they reported that some apps are more stigmatized than others because they are perceived by the LGBT+ community to be more focused on casual sex. For example, a participant reported that on "Grindr you can say what you're looking for, so you can say [that you are looking for] friends, and then actually use it to hook-up. [The app] Squirt is automatically for sex." Within the LGBT+ community, including the app using community, there is stigma related to casual sex. Although participants did not discuss why they feel that casual sex is stigmatized, it is important to note that this stigma is sometimes derived from other people who also use PNA.

As discussed previously, the profile picture is an important component of the process of using PNA. Participants reported putting a recognizable profile picture was risky because it identifies them as promiscuous and engaging in casual sex. Furthermore, being recognizable sometimes results in people messaging on the apps and reporting that they have seen the user in public, despite the fact that the two people are strangers. These messages are regarded as intrusive and violate privacy.

Sexuality shaming. The emoji codes for top and bottom emerged as a symbol of stigmatization in a discussion with participants. When a person displays their sexual positioning preference on their profile, that person tends to be perceived through stereotypical patterns attributed to positioning preferences. For example, a man who displays the down arrow emoji (bottom; receptive anal sex partner), is expected to be submissive and wanting to please. Participants reported that app use

appears to socialize men to behave according to stereotypes if they are engaging in casual sex. Stigmatization of receptive partners may be problematic within the LGBT+ community, especially considering ongoing work to reduce stigmatization of male-male sexual activity and LGBT+ people in mainstream society.

Participants reported that some men will write "NO HOOK-UPS" in their profiles on PNAs. This phrase is meant to alert other users that the user is not interested in engaging in casual sex. However, participants report that people who have this written on their profile are often still engaging in casual sex. The underlying reason for having "no hook-ups" on a profile is to avoid stigmatization related to being a PNA user. Placing this phrase on a user's profile allows the user to mitigate the stigmatization of being a PNA user by suggesting that they do not engage in the most stigmatized aspects of PNA use, casual sex. This phrase reflects the idealized notion that a person should strive to have a single monogamous partnership and should not engage in sexual activity outside that partnership. Participants implied that being a single person who is sexually active is less morally esteemed than being coupled with a long-term partner.

HIV disclosure. A reality of modern gay life is the inevitability of HIV becoming a part of discussions of gay men's health. Before examining this facet of the theme of stigma, we would like to disclose that we did not inquire about the HIV status of participants and do not know if the experiences of positive men were represented. Participants reported that discussions about HIV are important to the process of meeting people through PNA and the discussion of HIV status usually occurs before any in-person meeting. One participant stated "it's not worth it for poz [HIV-infected] guys to risk a blow out if the person finds out after or if they tell them in person." Instead, PNA users opt to discuss HIV status within the app messenger.

The men felt it was easier to disclose online so that "the neg [HIV-negative] person will just stop talking to you if they are not okay with it. Or they will come up with some excuse not to meet." Participants unanimously supported the notion that HIV-positive status remains stigmatized within the gay community, including among PNA users. They suggested that many users intend to be accepting of poz men, but fear of transmission makes practicing status equality difficult. Participants revealed that physical attractiveness of a poz person is the determining factor in decisions to have sexual contact. Participants also noted that the more out-poz men that a person has in their lives, the more likely they are to react in an appropriate and supportive manner when a user disclosed a poz status to them.

STI testing. Participants reported that sexually transmitted infections (STI) testing is an important component of PNA use if the user is engaging in sexual contact with other users. The first STI check usually occurs as the result of a "scare" after the user was at a "good party" or made a "spur of the moment decision" to not use a condom because the "guy was hot." PNA users typically plan to go in for testing "every three months," but most do not actually get tested that frequently. They often feel guilty about not getting tested as often as they feel they should. The reported feelings of guilt may represent social stigma related to not fulfilling a duty to keep oneself healthy. This stigma is important because it is related to an already stigmatized behaviour of having sex outside of a relationship. It is possible that these stigmas compound creating increased discomfort for PNA users who are seeking healthcare outside of the socially accepted frequency (defined by the participants as completing an STI check-up every three months).

Doubt. Doubt can be the force that pushes users to discontinue PNA use. Participants reported a cyclical pattern of use and disuse, in which PNA users cycle

through use and disuse depending on the relative importance of hope and doubt. Doubt appeared to be a more important theme for the participants in the first session, which was composed of more mature men, than it was for younger men in the second session.

Negative interactions. Participants reported a creeping sense of doubt related to PNA use that first appeared in the form of negative interactions on the apps. Participants reported that this may happen early in the process of use, but becomes relatively more important if they have negative interactions repeatedly, suggesting a cumulative effect. They reported it is inevitable that a user will block, or be blocked, from contacting another user for unwanted interactions. For example, a participant recounted a user, who had no profile picture, saying "horrible pic" as his opening greeting. Participants discussed relative anonymity of the online experience as allowing users to "say things that would never [be said] in person." When experiencing negative interactions, participants reported occasionally taking screenshots of negative comments or unwanted conversations and sending those screenshots to friends for comic relief. Although reaching out to friends was identified by the participants as a pain mitigation strategy, the men reported that these interactions can be emotionally scaring.

The PNA use process sometimes involved negative in-person meetings. Participants described occasionally interacting with other users who "turned out to be crazy," in that the other user was eccentric or excessively attached romantically. These negative in-person meetings were described as being occasionally frightening and causing the user to question if the risk of emotional or physical harm was worth continued use. They also described meeting other users in-person only to find that the other user did not look like the photos they had online, creating issues of lack-of-trust

during future online interactions with new people. The participants also reported instances of seeing profiles that contained photographs of their off-line friends, whom they know do not have PNA profiles. This misrepresentation contributed to participants' doubts about meaningful PNA experiences.

Discontent with PNA use. There comes a point in the process of use that PNA users become bored of logging on and answering messages. Participants reported that PNA takes a significant amount of time and eventually they felt it is not worth the time expenditure. They also reported that apps begin to feel repetitive with the same users appearing across the various apps. When they become bored from using the apps they will have casual sex with people whom they already know to avoid needing the apps for finding partners. When boredom drives men to be less interested in checking the apps, they begin to doubt the need to have PNAs on their phones and in their lives.

Immediately before discontinuing use, men reported a period of loneliness occasionally occurred. This period was marked by a desire to connect with other men, but marred by a sense of hopelessness about meeting a romantic partner. This period was frustrating because they "joined the apps to feel connected," but "can't even meet people on the apps." Although they are meeting people through the apps, they are no longer satisfied with them. At this point in the PNA use process, the only reason users continued to log onto apps was a "fear-of-missing-out." Not participating in app use left them anxious they may be missing out on talking to the man whom they could spend the rest of their life. During this period, the theme doubt may be better represented as despair. The users may have experienced some emotional trauma from negative interactions, but now feel that they need the apps to have any hope of connecting with other gay men and meeting romantic partner.

Leaving. Finally, PNA users decide to leave the PNA. Leaving may be forced on them by starting a romantic relationship, but more commonly it results from the cumulative doubt about finding what they were looking for on the apps. Participants reported that apps become "too all-consuming" because "checking and chatting all the time interferes with other aspects of life." Eventually a "fed-up feeling" emerges where users have "had-enough." This feeling grows to the climax of discontinuing use and deleting the apps. However, in support of the cyclical pattern of use, one participant mused that "leaving is more 'shelfing the apps' than it is deleting them." He stated, "you can always come back and take them off the shelf when you need them again."

Discussion

More than a "peep show:" The daily life of gay men

During thematic analysis, we encountered an issue during initial coding and again when naming the themes as there appeared to be a set of data that did not meaningfully contribute to the narrative unfolding in the analysis. When we examined further and engaged in a didactic discussion of why there was no apparent meaning to some of the data, we concluded that the data represented the activities of daily human life. For example, the participants reported that PNA users would sometimes be "watching Netflix" while using PNA. Although this datum suggests that PNA users like to log in while relaxing at home, it does not directly contribute to the narrative or major themes. The men also reported that PNA users think about "passion" because it is "exciting to have sex and feel sexually attractive." This example of something a user thinks while using the apps is more an example of a natural component of being a social creature than it is associated with the very clear narrative of hope, stigma, and doubt, within a theme of community that emerged during the sessions and analysis.

Being allowed to explore more intimate aspects of PNA use presented special ethical considerations for the research and reporting process. Much of the data that did not fit into the major themes, because it was a normal part of human existence, was related to the sexual/romantic lives of PNA users. Although the participants felt comfortable enough to discuss some aspects of their sexual lives, the scientific community has a duty to ensure that we do not pry unnecessarily or report on findings in a way that is not sensitive, lest the research become a work of voyeurism (James & Platzer, 1999). The use of a qualitative descriptive method has allowed us to reflect the voices of the participants within the narrative that unfolded during thematic analysis. Every attempt has been made to ensure that we did not reinforce stereotypes related to gay men or misrepresent their stories. James and Platzer (1999) warned that research involving minority populations, including gay men, can inadvertently further pathologize gay life. We assert that the abundance of research related to risk of PNA use reported by Grov et al. (2014) and Melendez-Torres et al. (2015) are examples of pathologizing the lives of gay men.

Limitations

The current study had 100% Caucasian participants who identified as gay. Although we expected more Caucasian people, based on the available literature, there was little ethnic diversity within the participant group (Bien et al., 2015; Burrell et al., 2012; Delaney et al., 2014; Goedel & Duncan, 2015). A further limitation of the current study was the use of PNA to recruit users resulted in a participant group that were all active users. Snowball sampling allowed non-users to join the study, but the one participant who was recruited through snowball sampling was a current user.

The group style of experiential sessions used to explore the research issue and create the data to be analyzed may have created a barrier to joining the study. People

who were not comfortable joining group sessions were not offered individual sessions. The gamestorming approach used in this study is not designed for individual use, nor were we able to meaningfully adapt the process so it could have been used in individual interviews.

Conclusion

To our knowledge, this article is the first to report PNA use as a cyclical process of joining and leaving. While we have begun to introduce this cyclical-process view, there is a need for research that examines and refines the motivations and phases of this pattern of behaviour. The major themes of the cycle of PNA use were the overarching theme of community, within community was hope, stigma, and doubt. Hope and doubt are the driving forces that create a cyclical PNA use pattern wherein gay men cycle through periods of use and disuse. The theme stigma overlaps with doubt and permeates into all themes.

Our study did not include any men who were previous users and whom have not returned to the apps. These men may offer insights into why they left permanently, and offer a challenge to our assertion that use is cyclical with an unknown end-point. In the future, qualitative methods investigations are needed to explore the cyclical nature of PNA use and must include participants who have left the apps indefinitely.

Declaration of Conflicting Interest

We, the authors, declare no known potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Chapter 4 – Integrated Discussion

This thesis project was completed in two phases, a review of existing literature and a descriptive qualitative study to explore the process of using PNA for gay men. Phase one was a review of the literature that was necessary to determine what knowledge existed and identify gaps in the literature. Phase two was an original qualitative study that used fundamental qualitative description with a thematic analysis to explore the process of using PNA for gay men. The original study was designed to fill gaps identified in the existing literature.

This chapter provides an integrated discussion of the literature review and the original qualitative study. This integrated discussion allowed for a comparison of the findings of the literature review and the qualitative study. The comparison allowed further exploration of the themes from both the literature review and the qualitative study, and positions the original work conducted for this thesis within the literature gap identified in the review.

Thesis Summary

The purpose of this thesis project was to explore the use of PNA by gay men. Phase one, the literature review, began the work of meeting the first objective of the study: generating an understanding of the typical user. Demographic data from across studies was drawn together to describe the gay men who use PNA and have participated in research studies. The literature review also began to describe some uses that gay men had reported for PNA, but had significant gaps in explaining the process of using PNA. The literature review closed with a call for qualitative work that examines how gay men interact with PNA.

Phase two, the original qualitative study, provided first person narratives/stories of PNA experience and additional credibility for the demographic data presented in phase one as an accurate representation of gay men who use PNA.

The original study also addressed the objective of describing the process of use through an innovative data collection method in which participants co-created a narrative describing how typical gay men use PNA. The narrative created during the experiential research sessions also addressed objective three: describing cycles or rhythms of use, through the narratives. The original study concluded with a call for qualitative methods research that confirms the findings of the current study and includes men who are not current users of PNA.

Summary of Thesis Findings

PNA use by gay men: literature review. The purpose of the literature review was to determine what knowledge existed related to gay men's use of PNA and identify gaps in the literature. Articles (n = 40) included in the review were published between 2011 and 2016. Literature underwent full-text review and pertinent data was extracted to a Microsoft Excel spreadsheet. Men who use PNA were reported to consist disproportionately of young, gay, white, and well-educated men. Reviewed literature was organized into themes that emerged during review. Themes that evolved during review were risk, stigma, sexuality, and community. A considerable body of research was found that examined the sexual health risks of gay men's use of PNA to find sexual partners. Although many studies explored sexual health risks, there was little conclusive evidence that gay men were at any greater risk if they chose to meet partners using PNA when compared to traditional practices fore meeting partners. Literature exploring stigma was sparse and infrequently was the concept of stigma defined and explored in the literature. The theme of sexuality explored the use of PNA for finding sexual partners and revealed that finding casual sex partners is only one facet of the larger phenomena of PNA use. The theme of community explored a return to invisibility for the LGBT+ community as a result of PNA's

ability to move gay men from traditional gay spaces, such as a gay village, into virtual spaces that are invisible to mainstream society. A literature gap was identified related to qualitative research that explored the process of using PNA.

Qualitative study. The second phase of this thesis project was designed to address the identified literature gap by using a fundamental qualitative description method to explore gay men's process of using PNA. The study used a unique group-style approach that created a sense of playfulness within the research sessions while participants worked through three gamestorming data collection phases (Currie, Phillips, Ronquillo, & Rowsell, 2016; Gray, Brown, & Macanufo, 2010; Phillips, Rowsell, Boomer, Kwon, & Currie, 2016). The study allowed the researchers to work with participants to co-create a narrative related to the process of using PNA for gay men. The narrative created by the gay men was analyzed using thematic analysis (Braun & Clarke, 2006). The themes were community, hope, stigma, and doubt. The theme of community evolved to be understood as an overarching theme that encompassed the themes of hope, stigma, and doubt. Community addressed components of the process of using PNA as well as the PNA users' sense of belonging to the greater LGBT+ community. Hope was discovered to be a driving force of a cyclical pattern of periods of PNA use and disuse. Hope included positive feelings and experiences generated from PNA use related largely to the desire to eventually find a romantic partner. Stigma was explicitly described and defined, beginning to fill a gap in existing literature. Stigma related to being recognized as a person who uses PNA and a corresponding stigmatization of casual sex, HIV, and STIs. Finally, doubt was a major driving force for the process of discontinuing PNA use. Doubt was exposed as a cumulative effect of negative interactions and growing discontent with PNA use that culminated in leaving PNA. Discontinuing use was conceptualized as leaving because

the narratives suggested that there are real and important community aspects of app use that are lost during periods of disuse.

The original study addressed all three objectives of the thesis project. The first objective, generating understanding of the typical user, was addressed by the participants co-creating personas that described a typical user of PNA. The personas created lend credibility to the demographic findings from the literature review. The second objective, describing a typical user's process of use, was addressed through the co-creation of narratives that described the persona's (typical user) use of PNA from the time of deciding to download the app, to leaving, and eventual return to use. The third objective, describing cycles or rhythms of use, was addressed though narratives, in which participants described a cycle of leaving and returning to apps as a normal component of the process of using PNA.

Integration of Literature Review and Qualitative Thematic Analysis Findings

Integrated Discussion of Methods

Response rate. Previous research on the use of PNA as a recruitment tool suggested that the creation of a profile clearly indicating the intent to recruit participants for research had been successful in accessing the hard to reach population of PNA users (Burrell et al., 2012; Holloway et al., 2014; Rendina, Jimenez, Grov, Ventuneac, & Parsons, 2014; Sun, Stowers, Miller, Bachmann, & Rhodes, 2015). Researchers who have used PNA as a recruitment tool reported low study completion rates of only 9%-15% of people who contacted or were contacted by researchers going on to complete the study (Burrell et al., 2012; Goedel & Duncan, 2015; Holloway et al., 2014). The original study in phase two of this thesis had a completion rate of 4.3% of all contacts who eventually joined the study. Although the completion rate for this study was low, it should not necessarily be viewed as a failure of

recruitment through PNA. The studies that reported higher completion rates typically used online surveys that require less commitment when compared to the current study. Furthermore, as mentioned in the limitations for the original study, the group sessions may have decreased the completion rate because not all PNA users are comfortable being recognised as a PNA user. Further complicating the assessment of completion rate for this study, the PNA Grindr suspended the recruitment profile during the recruitment phase of the original study. The suspension occurred following the first research session and during the third month of recruitment. Prior to the loss of Grindr as a recruitment tool, it had garnered the most responses and participants who completed the research sessions. Although Grindr did not respond to email communications requesting clarity on why the suspension occurred, it was assumed that the research profile may have been determined to violate terms of service, which state the app is only for personal use (Grindr, 2017). Recruitment continued for three more months using the remaining PNAs (Scruff, Growler, Hornet, and Jack'd).

Addressing credibility.

Descriptive validity. In evaluating the current study, fundamental qualitative description recommends addressing issues of descriptive validity and interpretive validity (Braun & Clarke, 2006). Maxwell (1992) asserts that descriptive validity refers to accuracy of factual events reported in a research study. These events may be reported by participants, but the events should be theoretically verifiable if there was sufficient data, such as a video or audio recording of the events (Maxwell, 1992). The current study has two separate aspects of descriptive validity.

The first is that the description of behaviours related to PNA use, as reported by the men, must be an accurate and factual description of their experiences, and not marred by presentation bias or difficulty in remembering events (Maxwell, 1992). The

data collection method used for this study addresses this facet of descriptive validity in three ways: (1) the use of a group, (2) participants who are current PNA users, and (3) the use of gamestorming for data collection. Using a group session allowed didactic responses from participants with group members asking each other probing questions and coming to consensus on their reports of PNA use behaviour. Using participants who are current PNA users reduced the issue of difficulty accurately remembering and reporting the behaviours of PNA use. Finally, the gamestorming method, allows participants to ascribe behaviours to the persona generated during the session, effectively limiting self-presentation bias (Kwon, Phillips, & Currie, 2014)

The second aspect of descriptive validity is the factual reporting of the behaviours and participant reports that were observed during the participant sessions (Maxwell, 1992). This facet of descriptive validity is related to ensuring that what was heard and seen in participant sessions has been reported accurately, without distortion or falsification. Our study addressed this issue by having two facilitators present at all participant sessions and both facilitators reviewed all quoted material. Further, one facilitator wrote notes on the back of the sticky-notes generated by the participants to capture the participants' discussion, while the other facilitator independently recorded field notes. These separate reports of field observations were compared to ensure that all reported data is a factual representation of participant sessions.

Interpretive validity. Interpretive validity refers to the accurate reporting of the meaning attached to participants' experiences (Maxwell, 1992). This process is inherently subjective and Maxwell (1992) reports that elimination of all threats to interpretive validity is not possible. In our study, we addressed interpretive validity by encouraging didactic dialogue among participants so the research team could learn the meanings attributed to events and processes that the participants described. During the

sessions, the facilitators frequently asked probing questions regarding the meaning of events that were reported. Prior to closing the participant sessions, the facilitators performed a complete review of the narrative that had evolved during the session and asked participants to verify that the events, processes, and meanings had been accurately understood by the researchers. Following the sessions, the research team reviewed the meanings associated with the reported events and processes to ensure consensus within the researcher team. In reporting the meanings associated with processes or events, we have used direct quotes whenever possible.

Voyeurism of researchers. In working with marginalized peoples, including members of the LGBT+ community, researchers must maintain a high degree of reflexivity to ensure that their work does not further marginalize the participants' community (James & Platzer, 1999). As a research project, the original study for this thesis work included aspects of gay men's lives that have largely occurred in an invisible online community or in private spaces. This type of project invites voyeurism in the form of potential prying into private details of men's sexual lives, for which there may be no justification. This research project was conceived, conducted, and reported by self-identified members of the LGBT+ community. Membership in the LGBT+ community offers us, as researchers, special cultural sensibilities, including access to specific cultural knowledge, language, and ways of being (James & Platzer, 1999). However, we acknowledge that as researchers we are afforded a privileged position in the researcher-participant relationship, creating a power difference that may disrupt the sharing of participants' unique experiences, including their experiences with PNA use.

In reporting on the daily lives of gay men who use PNA, researchers must consider how their reports will shape public opinion of the LGBT+ community,

especially regarding reports that may be used as a confirmation of negative stereotypes (James & Platzer, 1999). The original research study conducted for this thesis work was reported in such a way as to minimize the support of stereotypes and to report on gay men's lives as fulfilling, nuanced, and of equal importance to non-LGBT+ lives. Furthermore, we have attempted to report on gay men's daily activities, such as PNA use, without fetishizing the process of using technology to find partners. The existing literature on gay men's use of PNA has focused excessively on the sexual health risks of using PNA to find sexual partners (Grov, Breslow, Newcomb, Rosenberger, & Bauermeister, 2014; Melendez-Torres, Nye, & Bonell, 2015). This focus on sexual health risk is likely representative of the research community inadvertently pathologizing gay men's normal and healthy lives (James & Platzer, 1999). Future research involving LGBT+ community members must ensure that the research and reporting are fair and accurate representations of the phenomena, without pathologizing or fetishizing normal components of LGBT+ lives.

One notable area in which pathologizing gay men's lives may occur is in reports of sending self-pornography, nude photos, through PNA. The original study of this thesis work has reported on sending nude photos as a personal choice that is considered normal and appropriate, if the users so desire. Sharing nude photos of oneself is a relatively new phenomena, made possible by recent technological advancements in smartphone capabilities (Phillips, 2015). This behaviour could be easily pathologized if reported as a unique and problematic phenomenon within the community of gay PNA users. However, sending nude photos is neither unique to the gay community, nor has it been found to have any major negative outcomes (Dir & Cyders, 2015). Researchers examining potentially stigmatized behaviours must ensure

that their work is a fair representation of the phenomena that does not reinforce negative stereotypes attributed to marginalized communities.

PNA Use and Gay Men's Health

Disclosure of HIV status on PNA. Discussions about HIV status remain an important issue in gay men's health, evidenced by the persistent discussion of HIV in the literature and the findings of the original study (Bien et al., 2015; Chiu & Young, 2015; Goedel, Halkitis, Greene, Hickson, & Duncan, 2015; Holloway, Pulsipher, Gibbs, Barman-adhikari, & Rice, 2015; Ko, Tseng, Huang, Chen, & Hsu, 2016; Landovitz et al., 2013; Noor, Rampalli, Rosser, & Simon, 2014). Confirming the findings of the literature review, the men in the original study supported the stance that disclosure of HIV-positive status is easier to do through the Internet than in person. This finding suggests that PNA have become an important vehicle for mediating discussions about the stigmatized issue of HIV status. Not only do PNA facilitate the discussion of HIV status, they may actually increase the likelihood of HIV being discussed at all (Chiu & Young, 2015).

Despite the increase in comfort with disclosing HIV status online, people who are living with HIV remain less comfortable disclosing their status when compared with people whose HIV status is unknown (Grov, Agyemang, Ventuneac, & Breslow, 2013; Ramallo et al., 2015). There is a need for exploration of effective tools to assist people living with HIV to feel safe and comfortable sharing their status with sexual partners, where such disclosure is warranted or required. PNA has the potential to change the disclosure landscape by increasing control and comfort in when and how HIV-infected individuals chose to disclose. Because HIV non-disclosure remains a criminal offence in some jurisdictions, including Canada, further research is needed to

determine the legal implications of having HIV disclosure recorded in messages sent between men prior to a sexual contact (UNAIDS, 2012).

Gay men's sexual behaviour. Although this study did not specifically explore sexual behaviours of the participants, some discussion of sexual behaviour occurred during research sessions. Of note, the men reported that anal sex is not the most common sexual activity that gay men are engaging in when meeting casual sex partners through PNA. Instead, gay men are more likely to cuddle and engage in oral sex during one-time sexual encounters, reserving anal sex for partners with whom a trusting relationship has been established. This aligns with the finding that app use was associated with an increase in oral sex partners (Young, Szekeres, & Coates, 2013). Further research is needed to determine the actual sexual activities that gay men are engaging in when meeting partners through PNA and how they navigate risk assessment and harm reduction.

Defending the absence of theory. Early iterations of the proposal for this project suggested a complex theoretical framework, intersectionality, as the basis of organizing the growing project. Upon recommendation by my thesis committee, I chose to remove the theoretical basis and adopted basic qualitative description as the method. Basic qualitative description does not encourage a complex theoretical framework underpinning the study as the description is closely tied to the participant's responses without high-level abstraction (Braun & Clarke, 2006). Members of the thesis committee felt that post-hoc application of queer theory may advance academic understanding of gay men's use of PNA. I have chosen not to integrate queer-theory, post-hoc, as it encourages high-level abstraction that is not supported by the chosen method (Braun & Clarke, 2006; Green, 2002). Queer-theory is complex, multifaceted, and highly abstract (Green, 2002); although it may present an opportunity for

continued academic discussion of gay men's PNA use, I believe that a discussion based within queer-theory is too large for a master's of science level project.

In addition to the relative complexity of queer-theory, my ontological and epistemological stance within the constructivist paradigm may not be congruent with the historical-realism of queer-theory (Creswell, 2013). Furthermore, integration of queer-theory requires a thorough examination of threats to the theory that goes beyond the requirements of a master's project. For example, one would have to address the argument that queer-theory erases socially-constructed notions of sexual-orientation, despite the participants in the current study self-labeling, and shifts focus from the experiences being reported by the participants to abstract notions of historical power imbalances (Green, 2002). In future research, it may be useful to chose a theoretical framework around which to organize the project.

Integrated Discussion of Study Themes

The integration of the themes across the two studies that contribute to this thesis work has allowed for an examination of the relationship of my original study with the existing literature. The four themes from the original qualitative study, community, hope, stigma, and doubt will be used to organize this section and will be compared to the themes from the literature review: risk, stigma, sexuality, and community (table 6).These themes have been chosen because community and stigma emerged in both phases, hope has intersections with the theme sexuality, and doubt intersects with the theme risk. Although the themes have much in common, each of the themes identified in the original qualitative work contribute new knowledge to the existing literature.

Literature Review Theme	Original Study Theme
Community	Community
Stigma	Stigma
Sexuality	Hope
Risk	Doubt

Table 6. Corresponding themes from literature review and original study

Community. The conceptualization of PNA as a social cartography of gay men in the users vicinity was supported in both the literature and original study (Roth, 2015). Although not discussed in the literature, the decision to allow PNA to display location is an important component of the process of using the apps. Understanding that gay men are consciously deciding if they want to have location displayed intersects with the notion that gay men are managing what private information they are willing to share online. The management of online information sharing may increase the sense of security garnered by PNA's ability to make any space into an invisible gay space (Blackwell, Birnholtz, & Abbott, 2015; Crooks, 2013). The return to invisibility through the use of PNA requires further exploration because this may represent a transformation process, wherein traditional gay spaces (gay villages) become obsolete (Crooks, 2013; Roth, 2015). Transformation of gay spaces from physical locations to virtual communities has the potential to create LGBT+ presence in any area, but at a cost of visibility of the LGBT+ community to members of mainstream society. The establishment of physical spaces occupied by the LGBT+ community was a hard-fought victory by previous generations of LGBT+ peoples with great cost in the form of harassment and sometimes violence against LGBT+ people (Roberts, 2013). Loss of physical LGBT+ spaces may be particularly damaging for young gay men as they have not yet reached the rite-of-passage of

downloading PNA and entering the online LGBT+ community. The findings of the literature review and original study highlight transformation of LGBT+ spaces as an important issue that must be addressed in research and healthcare provision.

Determining intention for using the apps was found to be an important component of the process of using PNA. The original study reported that an individual's use pattern is strongly influenced by how their peers use the apps. For example, if a user's friends prefer to use PNA to meet one-time casual sex partners, so too will the user. The influence of peers was also noted in a study that found people who considered a PNA-met friend to be one of their top five closest friends were more likely to be having sex with people met through PNA (Holloway et al., 2015). Peer influence in app-use behaviour suggests that the social aspects of using PNA may have greater importance than is currently reported in the literature.

The process of leaving the apps has significant meaning within the theme of community based on the literature review. Leaving was better conceptualized within the theme of doubt in the original article, because leaving the apps was found to be a process that included return to the apps, with continued membership in the community. Leaving will be discussed in more detail later in this chapter.

Stigma. Findings from the literature review demonstrate the importance of defining stigma and explicitly discussing the importance of stigma in marginalized people's lives. Both the literature review and the original study supported stigma related to being recognized as a user of PNA. Although the literature reported that only 11.4% of users are concerned with being recognized, the participants in the original study reported that the threat of recognition is widespread (Corriero & Tong, 2016). Participants in the original study elaborated on this finding by reporting that the use of PNA is stigmatized for its association with casual sex. They also reported

that sex outside relationships is stigmatized with the LGBT+ community because it represents a moral failing related to not being capable of maintaining a relationship. So called slut-shaming is of importance because it also comes from within the community of PNA users, men who are also using PNA and likely struggling with internalized stigmatization of their own use (Corriero & Tong, 2016). Discussion of the experience of internalized stigmatization was absent in the literature review and this thesis work highlights the importance of future research to explore this issue.

Stigmatization of sexuality related to positioning preferences was also raised in the original study, but absent from the literature review. The original study reported that gay men who disclose their positioning preference (top [insertive partner] or bottom [receptive partner]) become entrapped in stereotyped expectations for that preference. The participants reported that men who identify as a bottom are expected to be submissive and eager to please a top. This stereotyped behavioural expectation requires further exploration within the PNA community because participants reported that they believe app use may socialize men to accept these stereotyped roles and conform to stereotypes when meeting other users for sex. Given the finding that gay men are more likely to be engaging in only oral sex or cuddling during casual sex, it is interesting that positioning preferences related to anal sex, which is often absent, dictate the behavioural expectations for in-person meetings (Young et al., 2013).

Although HIV and STI testing are important components of the theme stigma for both the literature review and the qualitative study, the literature on STI testing frequently attempted to link PNA use to sexual health risks, such as STI infection rates (Grov et al., 2014; Melendez-Torres et al., 2015). The qualitative study supports the reported findings that there is no difference in sexual health risks for partners met

online. Participants reported that discussion of HIV risk, actively deciding to use a condom or not, and regular STI testing are typical for PNA users.

Hope. I have chosen to discuss the themes of hope (qualitative study) and sexuality (literature review) together because they explore similar issues with notably different tone and emphasis. The theme sexuality emphasises the behaviour of having casual sex with multiple different partners as the main use of PNA, whereas hope emphasises the use of PNA as a series of experiences with the end-goal being finding a committed romantic relationship. The experience of an ego boost for PNA users was understood to be an important positive experience for users that can be experienced each time the user changes locations. In the literature review receiving an ego boost appeared as an aside, and did not garner significant attention for describing the experience (Holloway et al., 2014).

The process of initiating a meeting for the purpose of sex was reported to have special codes in both the literature review and qualitative study. A special linguistic strategy using short codes with specific meaning are used to quickly and efficiently communicate that a meeting will be solely for the purpose of sex (Licoppe, Rivière, & Morel, 2015). The original study supported this finding, the men reported that the code "right now?" signals that the users are interested in meeting as soon as possible for the sole purpose of having sex. The findings related to linguistic strategies for casual sex were reported to assist users in the mutual understanding that a romantic bond is not an expectation of the meeting, and may even protect the users from becoming attached as the linguistic codes are short and do little to support genuine communication (Licoppe et al., 2015). The need for linguistic codes to minimize emotional attachment when engaging in strictly-sexual relationships exemplifies the findings of the qualitative study related to the goal of eventually finding a romantic

relationship. Existence of this protective mechanism suggests that PNA users appreciate the dual use of PNA, where it meets short term goals of immediate gratification and long-term goals of finding a romantic partner.

Doubt vs Despair. The relationship between the review theme risk and qualitative study theme doubt is perhaps the least well established of the four themes discussed. The research into risk does not fit well within any one of the themes from the qualitative study themes, because it does not appear to be of high importance to men who use PNA. The qualitative study revealed that PNA users are aware that sexual contact always has some degree of risk, but they do not appear to espouse the view that PNA is particularly risky. The men reported that regular (defined by the men as every three months) STI testing is an important healthcare process for gay men, but that was an expectation of anyone who had new sexual partners, regardless of how they met.

The theme of risk may be more closely related to doubt if this research project had conceptualized the theme of doubt as 'despair'. Although we have chosen to continue to use doubt in reporting on the original study, we acknowledge that doubt may actually be despair. The emotional pain that is sometimes inflicted by using PNA, especially through negative interactions, may create a sense of despair for the participants. At this point, the participants have not expressed the level of pain or discomfort that would strongly support movement to conceptualizing the theme as despair. Although we chose to use gamestorming during the experiential sessions to decrease response bias (Kwon et al., 2014), it is possible that the participants were not comfortable doing into great depth about the pain of PNA use. Furthermore, all of the participants in the original study are current users and may not have progressed to a point at which doubt becomes despair. Future research must remain sensitive to the

possibility that negative experiences and effects of PNA use are being understated by participants, and continue to create safe space for dialogue about negative aspects of use.

The use of PNA as a health education tool overlaps with the theme of doubt as doubt precedes the process of leaving the apps, and this may be an important time to connect gay men with healthcare providers. The qualitative study revealed that a growing sense of frustration and disappointment with PNA drive men to discontinue their use. Prior to leaving, men reported seeking connection with other users. This connection seeking phase could be capitalized on if health promotors were available to refer users to appropriate health services, including STI testing facilities and mental health care, as needed. Health promotors who have profiles on PNA have been found to be an acceptable source of health information, and could connect with men to guide them to appropriate healthcare as they transition out of PNA use (Sun et al., 2015; Winchester, Abel, & Bauermeister, 2012). Further research and pilot projects are needed to explore how PNA can assist healthcare providers to connect with gay men.

Cycles of PNA use. Participants in this study clearly articulated that leaving PNA was part of a process that included, later, returning to the apps. A cyclical pattern of use exists wherein users will leave and return to the apps during the life-cycle of their personal app usage. This cyclical pattern is driven by the themes hope and doubt. Although participants did not discuss stigma as directly related to motivations for the cyclical use pattern, it should not be excluded from the explanation for leaving, nor returning. In their study, Corriero and Tong (2016) reported that 11.4% of respondents were concerned about being recognized as PNA users. Fear of recognition is an example of the interplay between stigma and doubt, and likely contributes to a user's decision to leave app use. As another example of the

interplay between stigma and doubt, Corriero and Tong (2016) reported that 7.6% of respondents were concerned about shame and social judgment related to being perceived as promiscuous because of PNA use.

Interestingly, the participants in the current study explored the permeability between stigma and hope. Participants reported a sense of stigma related to being a single man and the belief that being single is a stigmatized state-of-being. They endorsed the belief that mainstream society stigmatizes gay men who are single while simultaneously stigmatizing the use of PNA to find a partner. These reports suggest that social stigma related to being a single gay man likely influences the theme of hope as it furthers the drive to connect with other LGBT+ men.

Cycles as Social Networking Addiction. Description of the cyclical nature of PNA use led to discussion within the thesis committee of a possible link to addiction. Although the participants did not endorse addiction to PNA as a driving force in the cycle, addiction may warrant further research. Although online social networking has many positive aspects, some people may experience social networking addiction (Karaiskos, Tzavellas, Balta, & Paparrigopoulos, 2010; Turel & Serenko, 2012). Social networking addiction is not yet a recognized disorder in the *Diagnostic and Statistical Manual Fifth Edition*, yet mounting evidence suggests that social networking may be addictive (Andreassen, 2015). Addiction to social networking sites may present with symptoms of tolerance, withdrawal, changes to mood, interference with daily life, and relapse (Andreassen, 2015). The participants in the original study certainly endorsed ideas of relapsing back to PNA use following periods of disuse. The participants description of fear of missing out when not using PNA may constitute withdrawal type symptoms, but requires further investigation. Where links to addiction become weak is in the area of tolerance and mood changes. The

participants described becoming bored of app use and eventually stopping use, rather than requiring increased app use to feel satisfied. The participants did not directly address mood changes as being effected by PNA use. An ego boost was noted by the participants, but this was not explored in the context of addiction or lasting effects on mood. Finally, interference with daily life was noted by some participants as the apps become too "time-consuming", leading some participants to endorse discontinuing use. Although this project has not addressed addiction directly, the findings suggest that addiction may have a role in some men's PNA use, and require assessment.

Leaving. For gay men, leaving PNA is a process, rather than a distinct event (Brubaker, Ananny, & Crawford, 2014). The qualitative study findings support the assertion that leaving PNA is a process of becoming doubtful and eventually slowing or discontinuing use for a period. Participants reported that leaving the apps does not have finality about it as a return to PNA use is expected, so much so that participants are reluctant to delete the profiles lest they have to make a new profile when they return. Brubaker et al. (2014) reported that few participants in their qualitative study actually deleted their accounts when they left PNA. Instead, participants would delete the app (but the account remains intact on the company servers), anonymize the profile (remove the photo and written profile but the account remains intact), or simply discontinue use (the app remains on smartphone and the profile is intact but the user no longer logs on; (Brubaker et al., 2014). Both the literature review and original study supported the finding that leaving PNA is sometimes a transactional experience for a new romantic relationship in which ending PNA use is negotiated during discussions about becoming monogamous (Brubaker et al., 2014). Leaving is the result of cumulative doubt that PNA will deliver what users want from it, but eventually that doubt is forgotten and hope brings users back to PNA.

Member Checking

Following the completion of the analysis and production of the written report for chapter 3, the participants who selected that they would like to be contacted (n = 6) received the entirety of chapter 3 as a pdf document for their review. Half of the participants (n = 3) responded to provide feedback on the research work. Two participants engaged with the researcher through a phone interview and the third sent detailed notes via email, but declined an interview. The participants provided feedback that the most important finding, from their perspectives, was the presence of a cyclical pattern of use. When asked if anything stood out in the findings of the study, one participant stated: "the cycle. It was spot on." All three participants supported the four themes of community, hope, doubt, and stigma as important and communicated that the data were well described. The men suggested that the study could be improved by having sessions in other cities to compare across locations.

Nursing Implications

Implications for Nursing Practice

This thesis work sought to improve the quality of nursing care that gay men receive by exploring the complexity of PNA use. By improving clinician's awareness and knowledge related to this important facet of gay men's lives the quality of nursing care these men receive may be improved. Increased knowledge and awareness of the process of using PNA by gay men may improve interactions with nurses. For example, nurses who are aware of a cyclical pattern of use may continue to assess PNA use in visits following disclosure that the client is not currently using PNA. Nurses who were unaware of this cycle might assume that the client will never return and fail to adequately assess in future visits. This thesis work has provided useable knowledge for preparing nurses to provide quality care for gay men by improving

understanding of the intricacies of gay men's daily lives. This study has begun to de-mystify gay men's lives by presenting their experiences as variations on normal human existence.

Where previous research has focused on disease and sequelae of gay men's online partnering practices (Grov et al., 2014), this thesis work sought to explore and report on PNA use in such a way as to present strengths of gay men's use of technology, in addition to noting the harms. Exploration using qualitative designs allows greater departure from disease focused nursing research and by fostering understanding and respect for the gay client as a person with a complex history and lived experience. Knowledge generated from this thesis may assist nurses to set a positive tone for future health interactions with gay men by encouraging the nurse to broach the subject of PNA during assessments, communicating to the gay client that the nurse has an interest in his life and is aware that many gay men use PNA.

Although further research is needed, nurses should consider assessing for addiction when encountering a client who reports heavy use of PNA. Social networking addiction could be harmful to PNA users who may become dependent on PNA use, as PNA is a form of social networking. (Andreassen, 2015). Although most available scales to identify social networking addiction are specifically for Facebook, the Generalized Problematic Internet Use Scale or Addictive Tendencies Towards SNS scale may be useful for clinicians (Andreassen, 2015). In the absence of reliable scales, nurses can use their awareness of the potential for addiction to PNA to ensure that they are appropriately assessing individual clients use to ensure that the client is satisfied with their own level of use and dose not require addictions support.

The emotional pain and scaring resulting from negative PNA use should be assessed on an individual basis when nurses are discussing PNA with clients. Gay

men may be experiencing emotional trauma as a result of their PNA use that should be addressed by nurses. Although no participants disclosed physical or sexual trauma, nurses should be aware that PNA users may experience trauma of emotional, physical, or sexual nature; similar to domestic violence. Nurses must create opportunities for gay clients to disclose trauma history and be connected with appropriate services.

Given the health disparities that exist for LGBT+ people when compared to heterosexuals (Bruce & Harper, 2011), it is critical that nurses continue to educate themselves about the needs of LGBT+ clients. LGBT+ people continue to suffer from negative attitudes, both real and perceived, from nurses (Dorsen, 2012). Negative attitudes towards LGBT+ people from nurses threatens to maintain or widen health disparities effecting LGBT+ people. Fortunately, education about LGBT+ people has been repeatedly demonstrated to improve nurses attitudes towards this marginalized group (Dorsen, 2012). This thesis work created knowledge that can be used to continue nurses' education about the LGBT+ community.

The finding that LGBT+ physical spaces are being transformed into invisible online spaces has important implications for nursing practice. Nurses have responded to the LGBT+ community's need for safe space in healthcare with the creation of LGBT+ spaces such as community health centres. In Ottawa, gay men have a sexual health clinic, known as Gay Zone, dedicated to their health needs. These spaces may become more important as gay spaces are transformed and traditional spaces (gay villages) disappear. Furthermore, nurses must continue the trend of transforming any space into an LGBT+ space by adding visual cues, such as rainbow flags or declarations of LGBT+ support, to healthcare facilities that already exist.

Further transformation of nursing practice for gay men is the possibility of providing nursing care and advice through PNA. The use of PNA for health

promotion has received preliminary support in the academic literature (Sun et al., 2015; Winchester et al., 2012). Nurses are well placed, as regulated health professionals with a diverse skill set, to be at the forefront of the adoption of technology into the provision of community healthcare services.

Implications for Research

This thesis work has begun to describe a cyclical use pattern driven by hope and doubt. Further research and refinement is needed to explore how living within a phase of the cycle effects patterns of PNA use. As discussed in the limitations of the original study, there is a need to explore PNA use with past users who have left the apps and not returned. Research including men who have left the apps forever may reveal information about the relative importance of doubt verses hope for these men.

The research method used an innovative style of group sessions to engage participants as co-creators of knowledge and data. This approach offers superior protection to the privacy for participants who are members of vulnerable populations by allowing them to generate personas and describe the behaviour of the persona, thereby decreasing the emotional risks of disclosing personal information to a group (Kwon et al., 2014). Furthermore, the research style used supports participants as co-creators of the knowledge produced (Phillips et al., 2016). Research involving LGBT+ people must continue to innovate to support and empower participants during the research process. As discussed above, reporting on research must ensure that LGBT+ people are represented appropriately and reporting does not pathologize normal behaviour or reinforce stereotypes (James & Platzer, 1999).

Implications for Policy

The findings of this study suggest that a balance of qualitative and quantitative studies provides a richer understanding of gay men's lives. Much research, and

presumably, has utilized quantitative methods to examine the sexual health risks of using PNA, with relatively little attention to qualitative methods that explore LGBT+ experiences with using PNA (Grov et al., 2014; Melendez-Torres et al., 2015). Increased institutional support for qualitative studies may translate into an improved state-of-science and increased quality of knowledge generated by researchers.

Healthcare institutions, including hospitals and other facilities, must address the transformation of LGBT+ spaces by publicly declaring their support for LGBT+ clients. These institutions must become early adopters of knowledge created from works such as this thesis. Furthermore, as the facilities that house much of nursing practice, institutions must dedicate funding to improve nurses attitudes toward LGBT+ people, including providing education to healthcare team members (Dorsen, 2012).

Conclusion

The use of PNA by gay men remains a relatively understudied phenomenon considering PNA's widespread adoption by gay men. Phase one of this thesis work, the literature review in chapter two, revealed that the majority of literature exploring gay men's use of PNA utilized quantitative methods to expose the potential sexual health risks of PNA use. Literature focused on risk returned inconclusive results, suggesting that there is no meaningful difference in sexual health risk for men who meet sexual partners through PNA compared to traditional partnering practices or venues. I identified a gap in the literature related to investigations that used qualitative methods to describe gay men's process of using PNA. Phase two, the original qualitative study in chapter three, used a descriptive qualitative method to begin describing the process of using PNA, from downloading the app to leaving and coming back. We used an innovative group style of experiential research session to

facilitate co-creation of new knowledge with the participants. From this study, we analyzed data using thematic analysis to identify four interrelated themes that drive a cyclical use pattern. To the best of my knowledge, this is the first attempt to engage gay men who use PNA in describing the process of initiating, using and, eventually, discontinuing use. This study highlighted the need for qualitative work that values LGBT+ people as knowledgeable about their own experiences and lives. Phase one and two provide important information for nurses who serve LGBT+ clients. The knowledge generated in this thesis is a stepping stone for future research that uses innovative methods to continue leaning about LGBT+ people and their experiences.

Contribution of Collaborators

Co-Authorship

Several authors contributed to the various aspects this thesis. Derek J. Rowsell, RN, BScN (DJR) conceived, participated in, and directed all aspects of this research project in partial fulfillment of the requirements for a Master's Degree in Nursing at the University of Ottawa. DJR is a registered nurse in Ottawa, Ontario.

Four thesis committee members, Dr. J. Craig Phillips, PhD, LLM, RN, ARNP, ACRN, FAAN (JCP) (supervisor), Dr. Josephine Etowa, PhD, RN, (JE), Dr. Thomas Foth, PhD, RN (TF), and Dr. Terry Trussler, PhD (TT) also were involved in several stages of the thesis including development of the thesis proposal, regular consultation throughout the research process, editing and revising the thesis for important intellectual content, and approving the final thesis (see Table 7).

Summary of collaborator contributions

Table 7

	Chapter 1 General Introduction	**Chapter 2 Literature Review**	**Chapter 3 Qualitative Descriptive Study**	**Chapter 4 Integrated Discussion**
Conception and Study Design	DJR	DJR JCP	DJR JCP JE	DJR JCP
Collect Data	DJR	DJR	DJR JCP	DJR
Analyze and Interpret Data	DJR JCP	DJR JCP	DJR JCP JE TT TF	DJR JCP
Draft Manuscript	DJR	DJR	DJR	DJR
Edit and Revise for Important Intellectual Content	DJR JCP	DJR JCP	DJR JCP JE TT TF	DJR JCP JE TT
Approve Final Version to be Published	DJR JCP	DJR JCP JE TT TF	DJR JCP JE TT TF	DJR JCP
Responsible for Overall Content	DJR	DJR JCP JE TT TF	DJR JCP JE TT TF	DJR

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Appendices

Appendix A: Study Information Sheet

uOttawa

Université d'Ottawa
Faculté des sciences
de la santé

École des sciences
infirmières

University of Ottawa
Faculty of Health
Sciences

School of Nursing

Invitation to Participate: You are being invited to participate in a research study conducted by Derek Rowsell under the supervision of Dr. J. Craig Phillips in partial fulfillment of the requirements of the Masters of Science in Nursing, at the University of Ottawa.

Purpose of the Study: The purpose of this study is to gain a rich understanding of men- who- have-sex-with-men's (MSM) use of people nearby applications to improve nursing care for this population. Participation will consist of participation in a group session with 5-11 other participants about my experiences and cultural knowledge related to using people nearby applications, such as Grindr, Scruff, Hornet, Jack'd, Growlr etc. The time needed for this is approximately three hours. This focus group will take place at the University of Ottawa in a private room. Participation in this study may risk exposure of details related to my use of people nearby applications, if you so choose. You may experience discomfort with discussing issues of personal nature. You may decide to leave the focus group or study at any time without risk of repercussions.

Participants for this study will be selected on a first-come-first-served basis. After sessions are full, those interested will be placed on a first-come-first-served waitlist and contacted only if a spot becomes available.

Unfortunately, there is no honorarium or reimbursement for expenses related to the study. This master's level study if not funded by an external funding partner, and therefore funds are not available for distribution to participants.

If you would like to discuss becoming a participant or ask any questions, please contact me using the information below.

Thank you,

Derek Rowsell

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[redacted phone number]

[redacted email address]

Appendix B: Search Strategy

Identifier Number	Search Terms
1	Grindr OR Tinder OR Scruff Or Growler OR Jack'd
2	Geosocial OR "Geo-spacial" OR Geospatial OR "People Nearby Application"
3	Gay OR Bisexual OR MSM OR "men who have sex with men"

Table 1: Key terms for search

Data Source	Key terms	Results	Included	Duplicates	Reasons for Exclusions
Pubmed	1	118	15	0	Articles excluded did not include PNA or similar concepts in title or abstract. All articles that mentioned PNA were included.
	2 AND 3	24	5	10	
CINAHL	1	4	0	4	
	2 AND3	0	0	0	
Proquest Nursing and Allied Health Science	1	41	22	5	
	2 AND 3	67	5	11	
OVID	1	31	5	3	
		122	0	17	
Google Scholar	1	127	14	6	
	2 AND 3				Google Scholar not suitable for searching using these terms

Table 8: Peer reviewed literature search results

DataSource	Keyterms	Results	Included	Duplicates	Reasons for Exclusions
Google Scholar	1	127	26	0	Did not meet inclusion criteria
	2 AND 3				Google Scholar not suitable for searching using these terms

Table 9: Grey literature search results

Appendix C: Original Qualitative Study Inclusion/Exclusion Criteria and Justification

Inclusion criteria: history of using a PNA for a period greater than 1 month at some point in the past 5 years or current use, identify as gay, bisexual, or MSM, male gendered (including female-male transgendered people), proficiency in spoken English language. All inclusion criteria must be met for the participant to be included.

Justification: Participants must be able to accurately describe and explore the process of using PNA. Discontinuing use greater than 5 years ago suggest that the participant may not have current knowledge of the process of using apps and would damage the credibility of the study. Proficiency in spoken English was necessary as the primary author is English-unilingual.

Exclusion criteria: female gendered people.

Justification: Male gender is necessary as this study is focusing on men's use of PNA. Women's use of PNA is outside the scope of this research.

Every effort will be made to meet any accessibility needs of potential participants, including using an accessible space for experiential sessions.

Appendix D: Extended Explanation of Qualitative Study Design

Qualitative Study – Fundamental Qualitative Description

This study used a basic, or fundamental, qualitative description as described by Sandelowski (2000). Fundamental qualitative description is a minimally interpretative description of an event, in this case a process, that provides a rigorous method for recording and presenting data without high-level theoretical abstraction (Sandelowski, 2000). This method provides a description of events, in a logical order, that can be understood and is recognizable from the data collected for both researchers and participants (Maxwell, 1992). Maxwell (1992) insists that two types of validity are required in a fundamental qualitative description. The first is descriptive validity, which refers to the agreement of those present in the research sessions that the description is accurate and representative of the events. The second is interpretive validity, which refers to the agreement of the research participants that the findings of the fundamental qualitative description accurately represent their experience of the event or phenomena (Maxwell, 1992).

The fundamental qualitative method does not require a strict procedure to remove the researcher's biases from the research findings; however, the researcher is expected to explicitly address known bias and remain as close to the data as possible (Sandelowski, 2000). Without the need for high level abstractions, the research findings should be protected from some, but not all, researcher bias.

Sandelowski (2000) claims that fundamental qualitative description is one of the most used research methods in the practice disciplines, such as nursing, but is often integrated into another method for the rhetorical purpose of appearing more rigorous.

Qualitative Study – Participant recruitment

The inclusion criteria for the study were, a history of using a PNA for a period greater than one month at some point in the past five years or current use, self-identification as gay, bisexual, or men who have sex with men (MSM), male gendered (including female-male transgendered people), proficiency in spoken English language. All inclusion criteria were compulsory for the study. Exclusion criteria include: female gendered people (including male-to-female transgender). Every effort was made to meet any accessibility needs of potential participants, including using an accessible space for experiential sessions. No accessibility accommodations were requested or required for participants.

Potential participants were identified through an in-app profile and snowball sampling. Previous research on the use of PNA as a recruitment tool suggested that the creation of a profile clearly indicating the intent to recruit participants for research had been successful in accessing this hard to reach population (Burrell et al., 2012; Holloway et al., 2014; Rendina et al., 2014; Sun et al., 2015). A researcher profile was created for the LGBT+ centric PNAs Grindr, Hornet, Jack'd, Growler, and Scruff. The researcher traveled to major regions within the city and opened the applications to enable users in that area of the city to see the profile. The researcher remained at each location for a period of at least one hour per location and answered questions or requests to participate during that time. A total of 137 responses were recorded with six participants joining the study, see figure 6 for a breakdown of responses by application. The fundamental qualitative method, used for this study, allows great flexibility in sampling, with the caveat that the sampling method must be defendable (Sandelowski, 2000). For this study, convenience and snowball sampling were required as the LGBT+ community is notoriously difficult to access (Burrell et al.,

2012). The recruitment method used in this study attempted to reach gay men who use PNA in geographic regions across the city where the study was conducted.

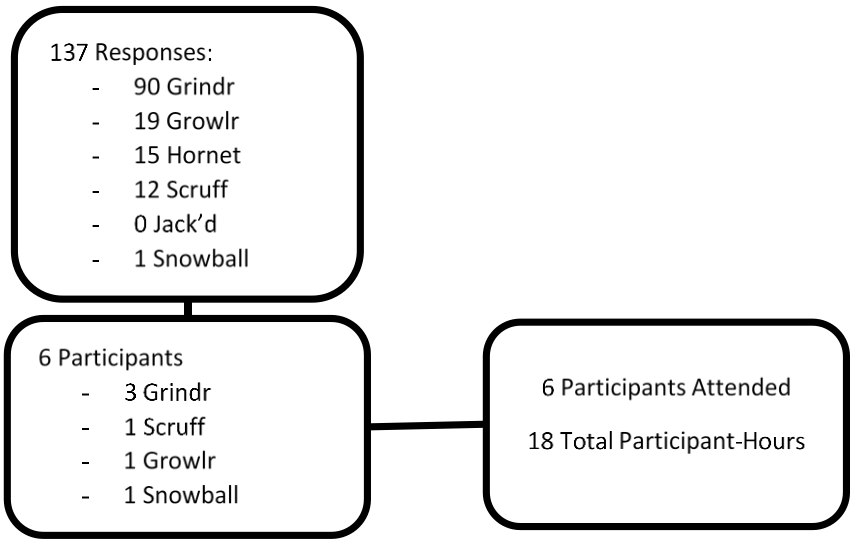

Figure 6. Study Recruitment

The researcher profile aligned with the profiles used in Holloway et al. (2015) and included the study institution's name, identified the profile as part of a research project, identified the recruiter as a researcher, and contained a profile picture of the researcher. All participants who contacted the researcher and agreed to participate were encouraged to invite friends to contact the researcher using the contact information on the informed consent form. Participants were asked to participate in one experiential session lasting three hours. For the safety of the participants and researcher, the researcher did not meet with any respondents outside of the research sessions.

Participants were accepted into the study on a first-come basis. Any contacts during recruitment that were lewd, aggressive, or assaultive resulted in the researcher using the block function on the application to block contact from that user and ensure the safety of the researcher. A total of five users were blocked during recruitment, blocking was an important tool in stopping inappropriate contact by application users.

Recruitment ceased following the second participant session as the iterative analysis suggested saturation of themes was achieved.

Qualitative Study – Data Collection

The data collection phase consisted of two experiential sessions with three participants per session. A total of six men participated in this study, contributing to a combined total of 18 participant hours. Experiential sessions were aligned with the data collection needs of the fundamental qualitative description and allow for a broad exploration of events or processes. "Data collection…[in fundamental qualitative description] is typically directed towards discovering *who, what,* and *where* of events or experiences, or their basic nature and shape" (Sandeloiwski, 2000, p. 338, italics as they appear in original work). The proposed group size was based on the study by Phillips et al. (2016) that used gamestorming with a larger sample. Difficulty in recruiting participants and scheduling sessions required adapting to smaller groups and a smaller sample size for this study.

Experiential sessions were facilitated by the author (DJR) using the gamestorming process of persona creation to create a typical PNA user. Prior to the commencement of the sessions, the participants had an opportunity to read, ask questions about, and sign the informed consent for research participation form. The experiential sessions consisted of five major phases: (1) introductions and ice-breaker activity, (2) empathy map activity and persona creation, (3) Campfire Stories, (4) Pains and Gains of PNA use, and (5) participant check-in and closing of session. Phases one, two, and five were drawn from a conference tutorial session conducted by Currie et al. (2016). Phase three was adapted to address the research aims of the current project from the process described by J. C. Phillips et al. (2016). Phase four

was adapted from Gray et al. (2010) and piloted as a health related research tool in the current study.

In phase one, introductions and ice-breaker, the researcher led introductions by introducing himself and opening the floor for participants to introduce themselves. The researcher then facilitated the creation of a participant-driven communication charter of safe space rules for the participants to describe what rules of communication would ensure that every individual was able to participate fully. This communication charter presented the researcher with an opportunity to ensure that a rule related to the maintenance of privacy, for example 'do not ask personal questions of individual co-participants', and confidentiality, for example 'all content from these sessions remains within the session and is not discussed once the session is complete', were included (Currie et al., 2016). The icebreaker used for this session was a simple game involving a list of possible dichotomous groupings (such as has a pet, or not) that allow the participants to self-identify with one group. For each grouping, members of the smallest group received a point on a self-scored card. Upon completion of the game, the player with the most points won. For these sessions, a prize of little monetary value was awarded (for example, a prize of candy). The similarities game was suggested by Currie et al. (2016) to facilitate a sense of playfulness that is aligned with the gamestorming process while allowing the participants to feel more comfortable with each other and bond as a group.

In phase two, empathy maps were created by each session to visually and linguistically depict a typical PNA user. Empathy maps are a gamestorming tool that involves drawing a representation of a person and then dividing the drawing into Think, Feel, See, Saying, Doing, and Hearing sections (Gray et al., 2010; Phillips et al., 2016). The participants then used sticky notes to write responses that represent a

typical user and placed the sticky notes on the map in the quadrant where they felt the note belonged (Phillips et al., 2016). See figure 7 for a photograph an empathy map created during a participant session. The participants were given fifteen to twenty minutes to independently create and post sticky notes on the empathy map before coming together as a group to review the notes (Gray et al., 2010; Phillips et al., 2016). During this review process, duplicate notes were discussed and stacked to create a visual representation of the repetition of the note content. The researcher and participants then co-created a narrative representation of the empathy map content as a persona to represent a typical PNA user. Personas created though the empathy map process were used in phase three.

Figure 7. Gamestorming empathy map for persona creation.

In phase three, participants engaged in facilitated discussion of the process of the typical user's progression from being a non-user of PNA to becoming a user and their decision to continue or stop use. The discussion was co-facilitated between the

researcher and participants, as they became more comfortable asking questions and exploring content. The facilitated discussion followed the gamestorming 'Campfire' game (Grey et al, 2010). The Campfire game involves telling the story of a person, group, or persona, as a series of narrative stories as though the participants are sitting around a campfire sharing anecdotes (Grey et al, 2010). Stories cues, written on sticky notes, were created based on a literature search (described in chapter 2 of the thesis) and were posted on the wall for participants to select and use to tell a story about the selected cue. See figure 8 for a photograph of a campfire storyboard created during participant session. Participants were encouraged to, and did, create their own cue words for which they told a story. Each story was recorded in point form, on the back of the sticky note cue, before the cue was placed on a board representing the evolving story. The persona created in phase two was used to guide all discussion and the Empathy Map created in phase two was posted on the wall as a visual reminder of the persona that was created (Gray et al., 2010). Participants discussed the meaning of each story and determined how that story fit into the narrative of the persona's process of using PNA. When participants determined that they had completely discussed the process from first use of PNA to leaving PNA, the researcher retold the story as he understood it and allowed participants to provide feedback and clarify information that had been misinterpreted by the researcher. Hand-written field notes were drafted by the researchers to record discussions that occurred during the session, but were not a part of a single story recorded on the sticky note cues.

Figure 8. Gamestorming campfire storyboard.

In phase four, participants engaged in a game designed to reveal motivations for using PNA. The 'Pain-Gain' game allowed the participants to write on sticky notes and then post the notes on a board divided into the 'Pains' and 'Gains' of using PNAs. The notes were then reviewed and discussed with participants and repeated notes were stacked to create a visual representation of the repetition.

In phase five, participant check-in and session closing, participants were invited to review the content of the session and provide feedback to the researcher. During this period, the participants were invited to speak candidly about any issues related to the project that they felt should have been discussed, but were not yet discussed (Currie et al., 2016). The participants were also invited to complete an anonymous paper-based evaluation of the sessions. The participants were thanked for their participation before leaving and reminded to take a copy of their informed consent form with them.

This study used an innovative style of group sessions to engage participants as co-creators of knowledge and data. The use of personas to generate knowledge about a process, such as PNA use, focuses the attention of the research project on the people who use the product, rather than the product itself (Gray et al., 2010). This approach offers superior protection to the privacy of participants who are members of vulnerable populations by allowing them to generate personas and describe the behaviour of the persona, thereby decreasing the emotional risks of disclosing personal information to a group (Kwon, Phillips, & Currie, 2014; Phillips et al., 2016). This innovative approach has begun to be described in peer-reviewed health literature and this study contributed to refining and further describing this innovation in qualitative research methods.

Qualitative Study – Data Analysis Procedure

Data were analyzed using thematic analysis as described by Braun and Clarke (2006). The analysis followed the six phases of thematic analysis: (1) familiarizing yourself with your data, (2) generating initial codes, (3) searching for themes, (4) reviewing themes, (5) defining and naming themes, and (6) producing the report (Braun & Clarke, 2006). Although the analysis is presented as a series of phases, this analysis utilized an iterative approach, as recommended by Braun and Clarke (2006), which allowed for analysis to move in a non-liner fashion.

In phase one, familiarizing yourself with your data, all hand-written notes from the experiential sessions were transcribed to an electronic format. Each of the empathy maps was transcribed to electronic format using a spreadsheet to organize the participant responses based on the six sections of the empathy map. The personas generated during the empathy map sessions were written into a narrative form within an electronic document. Following transcription to electronic formats, a complete

read-through of all data was conducted to facilitate researcher immersion in the data (Braun & Clarke, 2006).

In phase two, generating the initial codes, the electronic transcripts were reviewed within and across sessions to identify codes. The coding process followed an inductive approach without a pre-existing coding framework in an effort to provide a rich description of the overall data (Braun & Clarke, 2006). The work of coding began with a complete work-though of all data to identify points of interest in the data and was followed with a second-reading once an initial set of codes had been established (Braun & Clarke, 2006). Coding was recorded electronically on a spreadsheet that included the code, the data related to the code, and any key contextual information surrounding the coded data. Braun and Clarke (2006) suggest retaining context to the greatest extent possible with coding and to ensure that the researcher searches for and codes any data that contradicts or creates tension within the story of the analysis.

In phase three, searching for themes, the researcher made subjective judgments about what constitutes a theme based on the research purpose and objective. In alignment with Braun and Clarke (2006), the subjective nature of theme generation was explicit in the research project and within the determination of the relative importance of the emerging themes. Braun and Clarke (2006) suggest that the importance of a theme should not necessarily be based on the number of times a theme emerges in the data, but instead should be driven by the research objectives. During this phase, the spreadsheets containing the codes were processed electronically and organized into themes. The themes were subjectively assessed by the researcher to identify main themes and sub-themes and organized according to the researcher's understanding of the theme's relationships with other themes (Braun & Clarke, 2006).

Any codes that were not placed in a theme during this phase were held in a miscellaneous pile for review in the next phase.

In phase four, the themes produced in phase three were reviewed in accordance with Braun & Clarke's (2006) two level analysis. In level one, the themes were analysed individually to ensure that all coded data fit within the theme and that the theme had robust support for its existence as a single theme without being so large that it would better represent the data as two or more themes (Braun & Clarke, 2006). In level two, the themes were analysed for their overall fit with the data and with regards to the research objectives (Braun & Clarke, 2006). Level two analysis involved a complete reading of all data to ensure that the themes represented the data and that no codes within the identified themes were missed in earlier coding (Braun & Clarke, 2006). Analysis continued until the researcher subjectively believed that no new codes or themes were emerging and that the story emerging from the analysis fits with the data (Braun & Clarke, 2006).

In phase five, defining and naming themes, the themes were considered in relation to the overall research purpose and given concise names that clearly identify the contents of the theme (Braun & Clarke, 2006). Any sub-themes were named and articulated within the main themes. The main themes were structured using narratives drafted with the original data and codes to tell the story of the theme and relate back to the overall story of the analysis (Braun & Clarke, 2006). The themes were reworked until the researcher could clearly articulate the scope of the theme in no more than two sentences.

Finally, in phase six, the findings were presented using narratives to present a rich understanding of the analysis and to clearly articulate the meaning of the themes and their relationships (Braun & Clarke, 20060. Braun and Clarke (2006) suggest a

mix of descriptive and interpretive analysis, in the report, to ensure that the analysis is meaningful, but remains true to the data collected. The report provided an opportunity to report limitations of the study and suggest future directions within the research field.

The use of thematic analysis for a master of science project is supported by Braun and Clarke (2006), who stated "… thematic analysis should be seen as a foundational method for qualitative analysis. It is the first qualitative method of analysis that researchers should learn, as it provides core skills that will be useful in conducting many other forms of qualitative analysis. During data analysis for this project the researcher made every attempt to maintain the flexibility of thematic analysis while maintaining the credibility advocated for by Braun and Clarke (2006).

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Appendix E. Original Qualitative Study Themes and Subthemes

Theme	Subthemes	Brief Description
Community	Curiosity about PNA	Exciting period of intense interest in joining the PNA. Marked by downloading selected app to smartphone for the first time. Downloading PNA is a rite-of-passage for young gay men.
	Creating a PNA profile	Creating a PNA profile required decisions about how to present self in the online community. The photo chosen for the profile picture is immensely important for attracting attention.
	Voyeurism in PNA use	Sharing and viewing nude photos of men in the area is navigated by learning when it is acceptable to send or ask for nude photographs.
	Determining intention for use	Process of becoming aware of what a user wants from their own use of the apps and leaning to use the apps to meet the desired ends. Usually mediated by how the user's friends chose to use PNA.
	Disclosing personal location	Period of determining if giving up a measure of privacy, by disclosing location, is worth the utility of other users knowing exactly how far away the users is.
	Socializing with LGBT+ community members	Sense of belongings to an online community facilitates increased socialization within the apps. This socialization connects the users and allows access to important information about the local LGBT+ community. Socializing is especially important when traveling to new locations.
	Navigating in-person meetings	First meetings usually occur in a public space to increased sense of security. Casual sex is considered the most basic reason to meet with a user offline. All other contacts, including dates or to build friendship, are considered more worthy uses of PNA.
Hope	Ego boost	Users who are new, or new to the area, experience increased popularity and more messages than when they have been in the area for some time. This high volume of messages feels good for the user.
	Meeting other users	Meeting is perceived to be an exciting opportunity that may result in casual sex or romantic relationship. If casual sex occurs on the first meeting, it usually consists of oral sex and cuddling, anal sex is reserved for more intimate repeat sexual partners. If sexual contact occurs, sleeping over must be navigated, with a common practice being not sleeping over with casual partners and reserving sleeping over for partners

		with whom one has a romantic attachment. Hope for a romantic relationship is a major reason for using PNA.
	Returning to PNA	A normal component of the process of use is returning to PNA after a period of disuse. Hope that they might find a romantic partner draws gay men back to PNA.
Stigma	Recognition	Being recognised as a PNA users carried a negative connotation related to the stigmatization of casual sex relationships. Stigma related to casual sex comes from mainstream society, the LGBT+ community, and other app users.
	Sexuality shaming	Disclosing sexual positioning preferences (top and bottom) generates stereotypical beliefs about the user. Casual sex is stigmatized. Some users display codes on their profiles to appear to not engage in casual sex, and decrease stigmatization of their personal PNA use.
	HIV disclosure	HIV status is usually discussed online to avoid potential in-person confrontation. Although social norms are acceptance, HIV remains stigmatized.
	STI testing	STI testing usually occurs for the first time as the result of a potential STI transmission event. PNA users feel guilty if they are not going for testing every three months, even though few maintain that timeline.
Doubt	Negative interactions	PNA users inevitably will have negative interactions that require them to block other users from contacting them, or they will be blocked. In-person negative interactions usually include the other person not being who they appeared to be during online interactions.
	Discontent with PNA use	PNA users begin to feel that PNA use takes too much time with too little reward. A sense of loneliness and hopelessness about meeting a romantic partner creates doubt about app use ever meeting the users needs.
	Leaving	Leaving the apps is sometimes the result of meeting a romantic partner, but is more commonly the result of cumulative doubt that PNA will ever meet the needs of the user. Leaving a normal part of the cycle of use and users eventually return to PNA use.

Table 10. Themes and subthemes with a brief description of subthemes.

Appendix F: Ethics Approval Certificate

File Number: H08-16-23 **Date (mm/dd/yyyy):** 09/06/2016

Université d'Ottawa University of Ottawa
Bureau d'éthique et d'intégrité de la recherche Office of Research Ethics and Integrity

Ethics Approval Notice

Health Sciences and Science REB

Principal Investigator / Supervisor / Co-investigator(s) / Student(s)

First Name	Last Name	Affiliation	Role
Craig	Phillips	Health Sciences / Nursing	Supervisor
Derek	Rowsell	Health Sciences / Nursing	Student Researcher

File Number: H08-16-23

Type of Project: Master's Thesis

Title: Exploring The Use of People Nearby Applications by Gay Men

Approval Date (mm/dd/yyyy)	Expiry Date (mm/dd/yyyy)	Approval Type
09/06/2016	09/05/2017	Approved

Special Conditions / Comments:
N/A

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File Number: H08-16-23 **Date (mm/dd/yyyy):** 09/06/2016

Université d'Ottawa University of Ottawa
Bureau d'éthique et d'intégrité de la recherche Office of Research Ethics and Integrity

This is to confirm that the University of Ottawa Research Ethics Board identified above, which operates in accordance with the Tri-Council Policy Statement (2010) and other applicable laws and regulations in Ontario, has examined and approved the ethics application for the above named research project. Ethics approval is valid for the period indicated above and subject to the conditions listed in the section entitled "Special Conditions / Comments".

During the course of the project, the protocol may not be modified without prior written approval from the REB except when necessary to remove participants from immediate endangerment or when the modification(s) pertain to only administrative or logistical components of the project (e.g., change of telephone number). Investigators must also promptly alert the REB of any changes which increase the risk to participant(s), any changes which considerably affect the conduct of the project, all unanticipated and harmful events that occur, and new information that may negatively affect the conduct of the project and safety of the participant(s). Modifications to the project, including consent and recruitment documentation, should be submitted to the Ethics Office for approval using the "Modification to research project" form available at: http://www.research.uottawa.ca/ethics/forms.html

Please submit an annual report to the Ethics Office four weeks before the above-referenced expiry date to request a renewal of this ethics approval. To close the file, a final report must be submitted. These documents can be found at: http://www.research.uottawa.ca/ethics/forms.html

If you have any questions, please do not hesitate to contact the Ethics Office at extension 5387 or by e-mail at: ethics@uOttawa.ca.

Signature:

[redacted signature]

Riana Marcotte
Protocol Officer for Ethics in Research
For Daniel Lagarec, Chair of the Health Sciences and Sciences REB

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Appendix G: Consent Form

Project title: Exploring The Use of People Nearby Applications by Gay Men
Consent Form for Research – Individual Session: Member Checking

Names of researchers and contact information:

Derek Rowsell, RN Graduate Student School of Nursing Faculty of Health Sciences University of Ottawa Tel: [redacted phone number] Email: [redacted email]

J. Craig Phillips, LLM, PhD, RN Associate Professor School of Nursing Faculty of health Sciences University of Ottawa Tel: [redacted phone number] Email: [redacted email]

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Invitation to Participate: I have been invited to participate in a research study conducted by Derek Rowsell under the supervision of Dr. J. Craig Phillips in partial fulfillment of the requirements of the Master of Science in Nursing, at the University of Ottawa.

Purpose of the Study: The purpose of this study is to gain a rich understanding of men-who-have-sex-with- men's (MSM) use of people nearby applications (PNA) to improve nursing care for this population.

Participation: My participation will consist of participation in an individual session with the researcher, during which I will be presented with findings from the analysis of participant data and I will have the opportunity to comment on the findings presented. The time needed for this is approximately one hour. This session will take place at the University of Ottawa in a private room. During the session, the researcher will be taking notes. I understand that no audio/visual recording devices will be used, but the researcher may write down verbatim quotes from my feedback that could be anonymized and used in the written report of the research.

Assessment of risks: My participation in this study may involve some risk, including risk of psychological or emotional harm from potentially recalling trauma related to their past use of PNA or be traumatized by unexpected disclosure of trauma using PNA. I may experience psychological or emotional discomfort in the form of anxiety, stress, or regret for disclosing personal information during sessions. I may experience other inconveniences, such as, sessions consuming 1 hour of my time, uncompensated. I may decide to leave the session at any time without risk of repercussions.

Risk mitigation strategies: Prior to the commencement of the session, I have had the opportunity to read, ask questions about, and sign the informed consent for research participation form. If I am not willing or able to give informed consent, for example I appear inebriated, I be asked to leave. The reason for my exclusion, for example, appearing inebriated, will be reported to me. Personas are being used in this research project to reduce personal discomfort when discussing stigmatized issues. The use of personas also acts as a tool to minimize direct disclosure of personal information and improve privacy and confidentiality for participants. Further, the consent form contains contact information for the institutional ethics review office and a short list of community resources for participants. The list of community resources is provided so that people who would like a community support or a healthcare service are aware of such services in the community.

Benefits: By participating in this session, I have an opportunity to provide feedback to the research team about the analysis they have performed using data from a study in which I participated. My participation will allow me to have increased control of the research in which I participated in that I can voice any concerns about the analysis to the research

team. My participation will benefit the community of gay/men who have sex with men by improving nursing care for this population through dissemination of study findings.

Community Resources:

KIND Ottawa: A Space for LGBTTQ+ communities (613) 563-4818, http://kindspace.ca/

Gay Zone Gaie: Community Health Centre Clinic, (613) 580-2610, http://www.aco-cso.ca/gayzonegaie/english.html

Privacy of participants: The information I share will remain confidential within the research team. The data collected during sessions will be anonymized before presentation or dissemination to provide confidentiality of participants.

Confidentiality and conservation of data: All notes, persona images, and other research items will be kept in a secure manner at the University of Ottawa in the supervisor's office. The data will be kept for a conservation period of 5 years following thesis defense. Following the conservation period, all material data will be shredded and electronic data will be erased.

Voluntary Participation: I am under no obligation to participate and if I choose to participate, I can withdraw from the study at any time and/or refuse to answer any questions, without suffering any negative consequences. Following the session, I may contact Derek Rowsell and request that my data not be used in the study. Should I choose to withdraw. I will suffer no negative consequences for withdrawing.

Acceptance: I, _____[*Name of participant*], agree to participate in the above research study conducted by Derek Rowsell in partial fulfillment of his Master of Science in Nursing at the School of Nursing, Faculty of Health Sciences, University of Ottawa under the supervision of Dr. J. Craig Phillips.

If I have any questions about the study, I may contact either Derek Rowsell or Dr. J. Craig Phillips.

If I have any questions regarding the ethical conduct of this study, I may contact the Office of Research Ethics and Integrity, University of Ottawa, Tabaret Hall, 550 Cumberland Street, Room 154, Ottawa, ON K1N 6N5
Tel.: [613) 562-5387
Email: ethics@uottawa.ca

There are two copies of the consent form, one of which is mine to keep.

_____ Please initial here if you consent to be contacted for any future iterations of this project and provide contact information below. You may choose at any time to withdraw from future contacts. Choosing not to be contacted in the future does not affect your ability to participate in this session.

Contact Name (optional): _____

Contact Number or Email (optional): _____

Participant's name	Signature:	Date:

Researcher's name	Signature:	Date:

Appendix H: Demographic Questionnaire

Demographic Questionnaire

Please leave any questions you are not comfortable answering blank.

1. Age: _____
2. Gender Identity: _____
3. Highest Education Level: _____
4. Ethnicity: _____
5. Religion: _____
6. Apps Used (Grindr, Jack'd, Hornet, Tinder):
   _____
7. Year of first ever app use: _____
8. On which app did you contact the researcher for this study?
   _____

Appendix I: Empathy Map Directions

Empathy Map

OBJECT OF PLAY

The object of this game is to quickly develop a customer or user profile.

NUMBER OF PLAYERS

3–10

DURATION OF PLAY

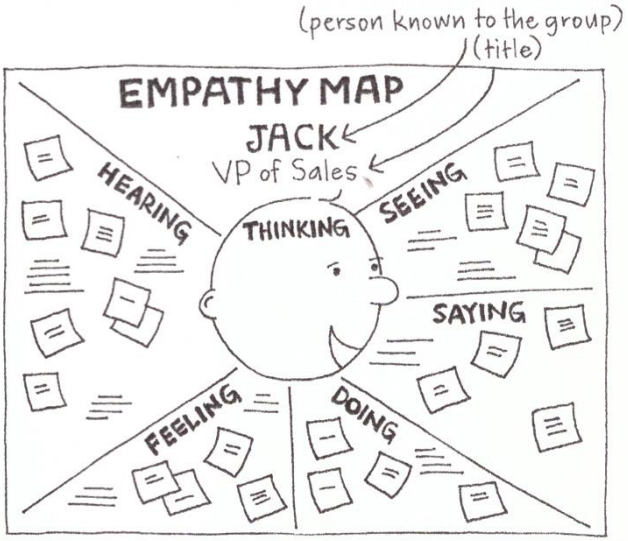
10–15 minutes

HOW TO PLAY

Personas help focus a group's attention on the people involved in a project—often the customer or end user. Although creating an empathy map is not the rigorous, research-based process that is required for developing personas, it can quickly get a group to focus on the most important element: people.

In this exercise, you will be creating a study of a person with the group. Start by drawing a large circle that will accommodate writing inside. Add eyes and ears to make it into a large "head."

1. Ask the group to give this person a name.
2. Label large areas around the head: "Thinking", "Seeing", "Hearing", and "Feeling".



3. Ask the group to describe—from this person's point of view—what this person's experience is, moving through the categories from seeing through feeling.
4. The goal of the exercise is to create a degree of empathy for the person with the group. The exercise shouldn't take more than 15 minutes. Ask the group to synthesize: What does this person want? What forces are motivating this person? What can we do for this person?

STRATEGY

The group should feel comfortable "checking" each other by referring back to the empathy map. When this happens, it will sound like "What would so-and-so think?" It's good to keep the empathy map up and visible during the course of the work to be used as this kind of focusing device.

The Empathy Map game was developed by Scott Matthews of XPLANE.

Retrieved from: Gray, D., Brown, S., & Macanufo, J. (2010). *Game Storming: A Playbook for Innovators, Rulebreakers, and Changemakers* Sebastopol, CA: O'Reilly Media Inc.

Appendix J: Campfire Directions

Campfire

OBJECT OF PLAY

Employees spend hours sitting in training sessions, sifting through orientation manuals, and playing corporate e-learning games to learn the know-how for their new positions. But the reality is that the bulk of employee knowledge is gained through storytelling. Employees train each other by sharing their personal and professional experiences. Campfire leverages our natural storytelling tendencies by giving players a format and a space in which to share work stories—of trial and error, failure and success, competition, diplomacy, and teamwork. Campfire is useful not only because it acts as an informal training game, but also because it reveals commonalities in employee perception and experience.

NUMBER OF PLAYERS

8–20

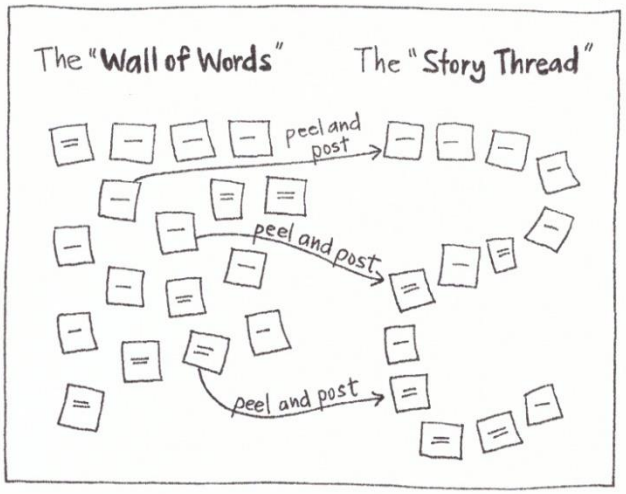
DURATION OF PLAY

30–45 minutes

HOW TO PLAY

1. Before the meeting, brainstorm 10–20 words or phrases you can use as trigger words to start the storytelling session. Write them on sticky notes. Keep the ideas positive or neutral: partnership, venture, first day, work travel, fun project, opportunity, and so forth.
2. Post the sticky notes in the meeting room in a space visible to all the players and give them access to markers and more sticky notes. Tell them that this is a workplace "campfire" and the only thing they're invited to do is share stories back and forth as an informal "company training program." Show them the "wall of words" and ask them to take 1–3 minutes to look them over and recall a story associated with one of them. To help the group warm up, start the storytelling session yourself by removing one of the words on the wall and posting it in a space nearby. Then tell your introductory story.
3. Ask for a volunteer to continue what you started by peeling another word from the wall and posting it next to yours. This begins the sticky-note "story thread."
4. Before the first player begins his story, ask him to read aloud the word he chose and then instruct the other players to listen carefully to his story and to jot down a word or phrase on a sticky note that reminds them of another work-related story. If no words in the player's story jumped out at them, they are welcome to pull a sticky note from your original "wall of words."

5. After the player concludes the first story, ask for another volunteer to approach the wall and to either post her own sticky note or take one from the "wall of words." Ask her to read her word aloud and to then share her story.
6. Repeat this process until the players have created a snake-like "story thread" which acts as an archive of the campfire conversation. Use your best judgment to determine when to end the storytelling session. Before you "put out" the fire, ask the players if there are any lessons learned or final thoughts they want to add.



STRATEGY

Your role as the meeting leader is simply to encourage the sharing of work-related stories. If you find a lull in the storytelling thread, refer the employees back to the "wall of words" or ask someone to throw out a "wildcard" story. You can also share work-related stories of your own that are triggered by stories from the players. You can let the stories drift toward less positive or neutral topics if you think the players need some catharsis, but be prepared to manage what may come up and don't let the meeting conclude on a sour note.

The point of Campfire is simple but powerful. It encourages sharing, shows the many things employees have in common, and leverages the natural tendency of employee training to take place through informal dialogue. Humans want to tell stories; you'll likely find that the players linger to share experiences even after the meeting ends.

This game was inspired by Tell Me a Story: Narrative and Intelligence (Rethinking Theory), by Roger Schank and Gary Saul Morson and is credited to Sunni Brown.

Retrieved from: Gray, D., Brown, S., & Macanufo, J. (2010). *Game Storming: A Playbook for Innovators, Rulebreakers, and Changemakers* Sebastopol, CA: O'Reilly Media Inc.

Appendix K: Pains and Gains Directions

Pain-Gain Map

OBJECT OF PLAY

The object of this game is to develop an understanding of motivations and decisions.

NUMBER OF PLAYERS

3–10

DURATION OF PLAY

10–15 minutes

HOW TO PLAY

Many decisions often boil down to one's basic choices between benefit and harm. By capturing these specifics for a key person, your group may uncover the most relevant points to bring up in presenting or influencing the key person's decision.

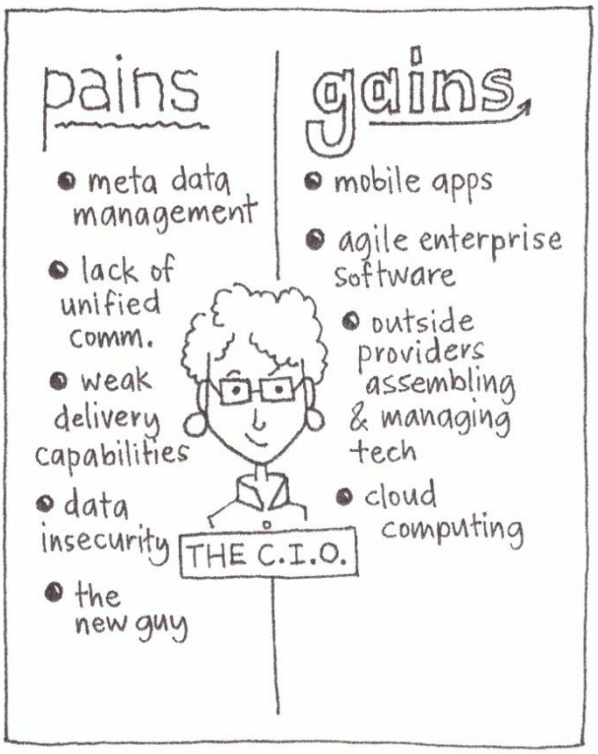
This key person may be the ultimate user of a product or may be the leader of an organization whose approval is sought.

Start by writing the key person's name or creating a quick sketch of him on a wall. Ask about this person's pains first by prompting the group to step inside his mind and think and feel as he does. Capture the answers on one side of the person:

- What does a bad day look like for him?
- What is he afraid of?
- What keeps him awake at night?
- What is he responsible for?
- What obstacles stand in his way?

A persona's gains can be the inversion of the pain situation—or can go beyond. Capture these on the opposite side by asking:

- What does this person want and aspire to?
- How does he measure success?
- Given the subject at hand, how could this person benefit?
- What can we offer this person?



STRATEGY

Summarize and prioritize the top pains and gains from the exercise. Use them when developing presentations, value propositions, or any other instance where you are trying to influence a decision.

The Pain-Gain Map game is credited to Dave Gray.

Pain-Gain Map | 191

Retrieved from: Gray, D., Brown, S., & Macanufo, J. (2010). *Game Storming: A Playbook for Innovators, Rulebreakers, and Changemakers* Sebastopol, CA: O'Reilly Media Inc.

Appendix L: Instructions for Authors

Journal of Homosexuality

Instructions for authors

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Manuscript Submission. Address manuscripts to the Editor: Dr. John P. Elia, jpelia@sfsu.edu

Prospective authors are to send the following items as e-mail attachments: (1) a cover letter indicating that the manuscript is not under consideration for publication elsewhere; (2) a blinded (i.e., with no references or indications as to the author's name) electronic copy of the manuscript; (3) an unblinded copy (complete with author's name, academic degree, professional affiliation, contact information, and any desired acknowledgment of research support or other credit) of the manuscript; and (4) a free-standing abstract of no more than 150 words excluding the title of the manuscript, which is to appear at the top of the page, and 5-7 key words. Also, manuscripts are to be submitted in English using Microsoft Word (in 12-point font, *Times New Roman*, double-spaced (with headers bearing the title or partial title

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FIT TO TEACH: SAME-SEX DESIRE, GENDER, AND SCHOOL WORK IN THE TWENTIETH CENTURY. Jackie M. Blount. *Albany, NY: State University of New York Press, 2005. 229 pp.* $32.95

References. References, citations, and general style of manuscripts should be prepared in accordance with the APA Publication Manual, 6th ed. (2010). Cite in the text by author and date (Lee, 2009) and include an alphabetical list at the end of the article. *Examples:*

Journal: Boehmer, U., & Case, P. (2006). Sexual minority women's interactions with breast cancer providers. *Women & Health, 44*(2), 41–58.

Book: Kinsey, A. C., Pomeroy, W. B., Martin, C. E., & Gebhard, P. H. (1953). *Sexual behavior in the human female.* Philadelphia, PA: W. B. Saunders Company.

Contribution to a Book : Kimmel, M. S. (1994). Masculinity as homophobia: Fear, shame, and silence in the construction of gender identity. In H. Brod & M. Kaufman (Eds.), *Theorizing masculinities* (pp. 119–141). Thousand Oaks, CA: Sage.

Illustrations. Illustrations submitted (line drawings, halftones, photos, photomicrographs, etc.) should be clean originals or digital files. Digital files are recommended for highest quality reproduction and should follow these guidelines:

- 300 dpi or higher
- Sized to fit on journal page
- EPS, TIFF, or PSD format only
- Submitted as separate files, not embedded in text files

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Qualitative Health Research

Author Guidelines: *Qualitative Health Research* (QHR)

Please read the guidelines below then visit the Journal's submission site http://mc.manuscriptcentral.com/qhr to upload your manuscript. Please note that manuscripts not conforming to these guidelines may be returned.

Only manuscripts of sufficient quality that meet the aims and scope of QHR will be reviewed.

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QHR asks authors to make their own decision regarding the fit of their article to the journal. Do not send query letters regarding article fit.

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- Note the sections: General articles, critical reviews, articles addressing qualitative methods, commentaries on conceptual, theoretical, methodological, and ethical issues pertaining to qualitative inquiry.
- QHR accepts qualitative methods and qualitatively-driven mixed-methods, qualitative meta-analyses, and articles addressing all qualitative methods.
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- ***Ethics:*** Include a statement of IRB approval and participant consent. Present demographics as a group, not listed as individuals. Do not link quotations to particular individuals unless essential (as in case studies) as this threatens anonymity.
- ***Results:*** Rich and descriptive; theoretical; linked to practice if possible.
- ***Discussion:*** Link your findings with research and theory in literature, including other geographical areas and quantitative research.
- ***References:*** APA format. Use pertinent references only. References should be on a separate page.

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- Please do not refer to your manuscript as a "paper;" you are submitting an "article."
- The word "data" is plural.

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Preferred formats for the text and tables of your manuscript are Word DOC or PDF. The text should be double-spaced throughout with standard 1 inch margins (APA formatting). Text should be standard font (i.e., Times New Roman) 12 point.

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- Figures: Should clarify text.
- Include figures, charts, and tables created in MS Word in the main text rather than at the end of the document.
- Figures, tables, and other files created outside of Word should be submitted separately. Indicate where table should be inserted within manuscript (i.e., INSERT TABLE 1 HERE).
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2. Theoretical orientation and evaluation: Is it theoretically clear and coherent? Is there logical progression throughout?
3. Methodological assessment: Appropriate to question and/or aims? Approach logically articulated? Clarity in design and presentation? Data adequacy and appropriateness? Evidence of rigor?
4. Ethical Concerns (Including IRB approval and consent):
5. Data analysis and findings: Does the analysis of data reflect depth and coherence? In-depth descriptive and interpretive dimensions? Creative and insightful analysis? Linked with theory? Relevant to practice/discipline?
6. Data analysis and findings: Does the analysis of data reflect depth and coherence? In-depth descriptive and interpretive dimensions? Creative and insightful analysis? Linked with theory?

7. Discussion: Results linked to literature? Contribution of research clear? Relevant to practice/discipline?
8. Manuscript style and format: Please evaluate writing style: Length (as short as possible], organization, clarity, grammar, appropriate citations, etc.); presentation of diagrams/illustrations?

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7. Further information

Any correspondence, queries or additional requests for information on the manuscript submission process should be sent to the QHR editorial office as follows:

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