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ORIGINAL ARTICLE

Postpartum depression among visible and invisible sexual minority women: a pilot study

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Abstract
Purpose Significant numbers of sexual minority women are choosing to parent. Despite this, there is limited research on postpartum depression (PPD) with sexual minority mothers and less research considering differences within sexual minority women in the experience of PPD. This research examines two questions to address this gap in research: (1) Do experiences of PPD symptoms vary between different subgroups of sexual minority women, and (2) Which recruitment strategies effectively address the challenge of recruiting sexual minority women who are pregnant?
Methods Two Canadian studies recruited participants via consecutive or convenience sampling from midwifery clinics and hospital sites. Participants completed prenatal and postnatal measures of PPD symptoms, social support, and perceived discrimination.
Results Considering our first question, we found an interaction effect between past sexual behavior and current partner gender. Women currently partnered with men reported higher scores on the Edinburgh Postpartum Depression Scale when their sexual history included partners of more than one gender, whereas this effect was not found among women who were currently partnered with women or not partnered. Regarding our second question, most sexual minority participants recruited through convenience sampling were partnered with women and identified as lesbian or queer, while most participants recruited through consecutive sampling were partnered with men and identified as bisexual.
Conclusions Women whose sexual histories include more than one gender and are currently partnered with men may be at a higher risk for PPD symptoms. Recruitment method may influence the type of sample recruited for perinatal mental health research among sexual minority women.

Keywords Postpartum depression · Bisexual · Lesbian · Sexual minority · Consecutive sampling

Introduction

Research on postpartum depression (PPD) among sexual minority women is limited. A systematic literature review on the demographic information of participants included in PPD risk factor research found that none of the 143 observed studies reported on the sexual orientation of participants (Ross et al. 2006a). In a more recent review, Maccio and Pangburn (2011) found only seven results when searching eight academic and medical databases for postpartum depression among lesbian women. The neglect of sexual minority women in PPD research is significant as researchers have found substantial numbers of lesbian and bisexual women are parents. Data from the National Survey of Family Growth indicate that 34.9 % of lesbian women and 44.8 % of bisexual women have given birth (United United States Department of Health and Human Services. National Center for Health Statistics 2002). These rates, combined with the finding that the rate of PPD among childbearing women is 13–19.2 % (Gavin et al. 2005,

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O'Hara and Swain 1996), suggest that a large number of sexual minority women may experience PPD.

Even fewer researchers have investigated possible differences in the experience of PPD between different subgroups of sexual minority women (i.e., lesbian and bisexual women). The majority of health researchers has not examined bisexual people and gay/lesbian people as separate groups (Kaestle and Ivory 2012). For mental health researchers, conceptualizing all sexual minority people as a homogenous group is problematic since recent studies have identified significant differences in mental health outcomes between bisexual and lesbian women, with bisexual women reporting poorer mental health (Bostwick et al. 2010; Kerr et al. 2013; Steele et al. 2009). Given that past experience of poor mental health is a strong predictor of PPD, it is important to not assume homogeneity of PPD among all sexual minority women (Leigh and Milgrom 2008; Silverman and Loudon 2010).

One reason that researchers have often combined different subgroups of sexual minority women concerns recruitment challenges (Kaestle and Ivory 2012). Sexual minority populations can be difficult to recruit in large numbers due to their relatively low prevalence among the general population, thus, leading to the tendency to collapse subgroups of sexual minority people (Hartman 2011) and making statistical comparisons only between this diverse "sexual minority" group and a heterosexual comparison group. Another approach to address recruitment challenges has been to rely on non-probability (i.e., convenience) samples, which leads to sampling bias. Not only does sampling bias result in the overrepresentation of healthier, lower risk members of the population (Froom et al. 1999), specific to research on sexual minorities, it could contribute to lower representation of certain groups, such as bisexual women in monogamous relationships with men (Hartman 2011). In light of these concerns, one goal of the present study is to assess the effectiveness of two separate sampling strategies, convenience and consecutive sampling, in reaching diverse sexual minority women.

Postpartum depression among sexual minority women

While there is limited research on PPD among sexual minority women, existing research demonstrates that rates may be higher among LB women in comparison to heterosexual women. For example, Ross and colleagues found that LB biological mothers reported significantly higher scores on the Edinburgh Postpartum Depression Scale (EPDS) than did a similar sample of heterosexual mothers (Ross et al. 2007). Further, a later paper noted that bisexual women may be at a higher risk for PPD compared to other sexual minority women as bisexual mothers have reported poorer mental health and social support (Ross et al. 2012). Lesbian parents have also reported an increase in anxiety across the transition into parenthood (Goldberg and Smith 2008).

Ross et al. (2007) found that known risk factors for PPD among heterosexual women, such as lack of social support and relationship satisfaction, did not explain the elevated risk for PPD among LB women. The researchers suggested that other factors, like social exclusion, might influence PPD among sexual minority mothers. Trettin et al. (2006) also hypothesized that lesbian mothers are at a heightened risk for PPD due to experiences of minority stress as a result of living with a stigmatized identity. In support of this hypothesis, Goldberg and Smith (2011) found that internalized homophobia was associated with higher rates of depression and anxiety among LG adoptive couples transitioning to parenthood, whereas when couples lived in neighborhoods they perceived as gay-friendly, they reported lower rates of depression symptoms.

Other potential risk factors particular to LB women include dissatisfaction with healthcare services, which can lead to less effective treatment or reduced access to healthcare services (Dahl et al. 2013; Ross et al. 2006b; Spidsberg and Sorlie 2011; Trettin et al. 2006; Yager et al. 2010), receiving lower levels of support from families of origin (Goldberg and Smith 2011; Maccio and Pangburn 2012; Ross 2005; Ross et al. 2005), legal issues surrounding parenthood (Ross et al. 2005), and experiences of heterosexism, meaning prejudice toward sexual minority people (Dahl et al. 2013; Khajahei et al. 2012; Ross 2005; Trettin et al. 2006).

Bisexual mothers may experience additional risk factors that lesbian mothers do not experience, which could contribute to the poorer rates of mental health during the perinatal period. For instance, bisexual women have reported higher rates of depression and anxiety than lesbian women (Bostwick et al. 2010). Ross et al. (2012) hypothesized that the added stressor of managing an invisible minority identity and heightened social exclusion may contribute to this difference. Society tends to define the sexual identity of others based on the gender of their partner, and, as few people are simultaneously and visibly in relationships with people of more than one gender, bisexual identity is often rendered invisible. This invisibility makes it difficult for bisexual people to find and form community with other bisexual people. Combined with facing discrimination in heterosexual and sexual minority communities, it may lead to heightened social exclusion.

The current research

The present research addresses gaps in existing knowledge by examining the following research questions: (1) Do experiences of PPD symptoms vary between different subgroups of sexual minority women? and (2) Which sampling strategies are most effective in recruiting large numbers of pregnant sexual minority women? These questions are addressed with data from two sequential studies. The first study included data from women of all sexual orientations, while the second study

recruited specifically sexual minority women. Data are combined from Study One and Study Two in order to generate a large enough sample size to examine potential differences in PPD symptoms among subgroups of sexual minority women. Participants in both studies were recruited from the same geographical area, assessed at the same time points, and received the same measures.

Methods and materials

Defining "Sexual Minority Women"

Health researchers have categorized groups within sexual minority samples in a variety of ways. Some researchers have relied on participant self-identification, whereas other studies use behavioral definitions to categorize participants. As this was an exploratory study aimed at understanding whether subgroups of sexual minority women are similar or not, in their experiences of perinatal mental health, we implemented multiple categorization methods. Both self-identification and orientation determined by behavior are associated with health outcomes for sexual minority people (Cochran et al. 2003). We therefore measured participants' self-identification and we asked participants to report upon their sexual behavior over the last 5 years. Although a 1-year time frame is often used in studies of sexual behavior, we anticipated that women's sexual activities over the prior year may have been influenced by their pregnancy status. As such, in this study applied a 5-year time frame, which is also widely used in population-based studies of sexual behavior (e.g., Mercer et al. 2007). We primarily focus on participants' sexual behavior in the last 5 years, including their current partner, in this paper.

Study One

Study One assessed PPD symptoms among heterosexual and sexual minority women who were all recruited via consecutive sampling.

Sample

Participants were recruited through consecutive sampling at selected midwifery clinics and hospitals providing prenatal care from across Ontario. Women of all sexual identities were eligible to participate if they were currently pregnant, had telephone access, were older than 16 years of age, and were sufficiently fluent in either English or Spanish. A total of 87 women participated in the study.

Recruitment

All women receiving prenatal care at select midwifery clinics and hospitals in Ontario from December 2007 to January 2009 received a screening questionnaire at 25–35 weeks gestation. People interested in participating provided contact information, and eligible women were contacted by a research coordinator. Since recruitment targets were a priori set for each recruitment region (see Ross et al. 2011 for details), a large proportion of women who provided contact information were not followed up by the research coordinator. However, all sexual minority women who provided contact information were followed up. In total, 135 women were asked to participate, 119 of whom consented. Twenty-five women became ineligible, mostly due to giving birth prior to the baseline assessment, and seven withdrew from participation. A total of 87 women completed the baseline assessment, 70 of which also completed the postpartum assessment.

Data collection

Research staff contacted participants at approximately 36 weeks gestation for the baseline assessment and at approximately 6 weeks postpartum for the follow-up assessment. The participants completed demographic questionnaires, the Edinburgh Postnatal Depression Scale (EPDS; Cox et al. 1987), and measures on social support and social capital. The EPDS is a 10-item screening measure for perinatal depression. Scores range from 0–30, where a score of >12 indicates probable clinical depression. Data from this study were previously published (masked for review).

Study Two

Study Two assessed PPD symptoms among only sexual minority women, who were recruited via a combination of consecutive and convenience sampling methods.

Sample

Participants were recruited through select midwifery clinics and one hospital in Ontario, Canada. Eligibility requirements were the same as Study One, with the exception that they (a) were English-speaking and (b) self-identified as lesbian, bisexual, or queer or reported any same-sex sexual behavior in the past 5 years. A total of 20 women participated.

Recruitment

Consecutive sampling All women receiving prenatal care at select midwifery clinics and one hospital in Ontario received a screening questionnaire at 25–32 weeks gestation. The screening form included questions about sexual identity and

behavior. Of the women who completed the demographic questionnaire and gave permission to be contacted, eligible participants were contacted within 1 week in order to receive detailed information about the study and asked for consent to participate. Those who consented were mailed consent forms to be returned in an enclosed stamped and addressed envelope; all participants provided written informed consent. A total of 147 women of all sexual identities and histories completed screening questionnaires through the consecutive sampling. Of those women, 9 were eligible to participate.

Convenience sampling Study advertisements were distributed widely through programs and services targeting LB women and/or pregnant women in the same geographic area as the consecutive sampling recruitment sites. Advertisements included instructions to contact research staff directly to learn more about the study, at which point the research coordinator screened them for eligibility, and, if eligible, asked them for their consent to participate. All other procedures were identical to those for participants recruited through consecutive sampling.

We recruited 13 women, all lesbian/bisexual/queer (LBQ)-identified or with a history of same-sex behavior, through the convenience sampling methods. Combined with the 9 women recruited through consecutive sampling, a total of 22 women were eligible to participate. Two women did not complete the baseline measure, resulting in 20 participants who completed the first assessment, 19 of which completed the second assessment.

Data collection

Research staff telephoned participants at 36 weeks gestation to complete the baseline assessment, and placed one follow-up telephone call at 4–6 weeks postpartum to complete the primary outcome data. Study Two used all of the measures from Study One.

Data analysis

To address the first research question (comparing outcomes between subgroups within the population of LBQ women and women who had past or current sexual relationships with women), we combined the data collected from Studies One and Two. Using this combined data set, we used Analysis of Covariance (ANCOVA) to examine EPDS scores at the primary outcome (postpartum) assessment, treating baseline (prenatal) EPDS scores as a covariate. As our analyses were exploratory, we analyzed the data using several potential categorizations of the sexual minority categories. We were interested in examining potential effects of sexual orientation as defined both by sexual behavior and sexual identity. In this report, we focus primarily on our analysis including the following independent factors: partner gender (male, female, or no partner) and reports of sexual activity with more than one gender within the past 5 years. We then conducted an exploratory ANCOVA with the same outcome variable of postpartum EPDS and the same covariate of prenatal EPDS, this time using the following independent factors: partner gender (male, female, no partner) and a reported sexual identity other than lesbian or heterosexual, such as bisexual. We also conducted a series of other exploratory analyses to examine potential differences in EPDS scores between various "subgroups" of LBQ women and women who have past or current sexual relationships with women.

We used data from Study Two to assess the second research question regarding sampling technique. We used descriptive statistics and frequencies to summarize the demographic characteristics of participants and scores on the standardized measures administered and chi-square tests to compare the demographic characteristics of participants recruited through consecutive versus convenience sampling methods.

Results

To address our first research question, we conducted a two-way ANCOVA using the data from both studies to evaluate the relationships between sexual activity history, partner gender, and postpartum depression scores, while controlling for prenatal depression scores. We found no significant main effects on the postpartum EPDS scores of either "sexual activity with partners of more than one gender in the past five years" or "partner gender" (controlling for prenatal EPDS scores). However, there was a significant interaction effect of these two variables on the EPDS scores, F (2, 79)=3.90, p=0.02. Controlling for prenatal EPDS scores, women currently partnered with men who reported sexual activity with partners of more than one gender, had significantly higher EPDS scores than women partnered with men who reported sexual activity with only one gender (mean difference=4.67, p= 0.001). However, there was no significant effect of having recent sexual activity with more than one gender of partner among women who were either partnered with women (mean difference=0.81, p=0.63) or not partnered at all (mean difference=1.01, p=0.79). Figure 1 depicts this interaction effect. For, women who reported sexual activity only with one gender, there was no significant effect of having a male rather than a female partner.

When we ran an ANCOVA to test the effects of a corresponding identity-based definition of sexual orientation (i.e., identifying as bisexual, queer, or other, as opposed to either lesbian or heterosexual), there were no significant main or interaction effects on EPDS scores (while controlling for prenatal scores).

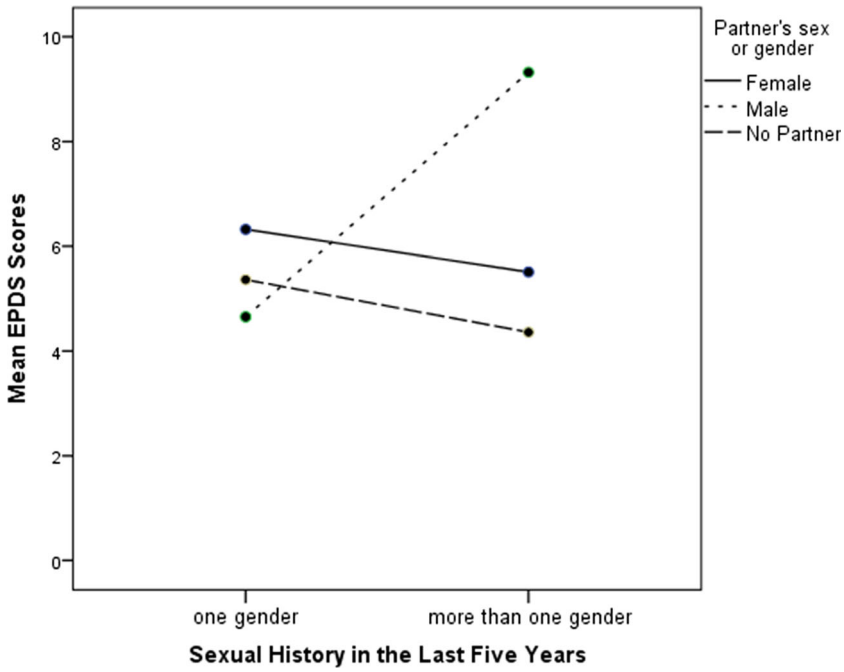

Fig. 1 The interaction effect between participants' sexual history and current partner gender

Considering the second research question regarding recruitment of sexual minority women, there were important differences between those women recruited through the consecutive versus convenience sampling methods. Convenience sampling was not effective in recruiting bisexual-identified women or sexual minority women currently partnered with men. Specifically, sexual orientation identity differed between the two sampling groups. Women recruited through convenience sampling more often identified as either lesbian or queer, compared to the women recruited through consecutive sampling. Current partner gender also differed between groups. Table 1 reports these results. There were also some significant differences in demographic characteristics between the two sampling groups: women recruited through convenience sampling were significantly more likely to have at least some postgraduate education (75 vs. 25 %, $p<0.05$) and more likely to report full-time employment (83 vs. 25 %, $p<0.05$). There were no significant group differences in household income or parity, and all women in both sampling groups reported that the index pregnancy was planned.

With respect to depression scores, there were no significant differences between sampling groups in either prenatal or postnatal EPDS scores, although mean scores were higher in the consecutive sampling group at both time points (prenatal, 7.1 vs. 4.7; postnatal, 8.9 vs. 5.4).

Discussion

The results of the current research indicate that invisible sexual minority women (i.e., women with sexual histories that included more than one gender but who were currently partnered with men) may have different experiences of perinatal mental health in comparison to other women. Specifically, women who had sex with individuals of more than one gender in the past 5 years, but were currently partnered with a man, reported higher EPDS scores than women partnered with men who had only had sex with men in the last 5 years. However, this effect was not found among women currently partnered with women or women who were not partnered. This finding suggests that sexual minority women may not be homogenous enough to be considered as a single entity in postpartum well-being research and that sexual history and current partner gender may be important considerations among sexual minority women. In particular, invisible sexual minority women with sexual

Table 1 Demographic information for consecutive and convenience sampled participants

Variable	Consecutive	Convenience	
	n (%)	*n* (%)	*p*
Sexual identity			
Lesbian	1 (14.3 %)	6 (85.7 %)	059
Bisexual	4 (80.0 %)	1 (20.0 %)	180
Queer	1 (16.7 %)	5 (83.3 %)	102
Heterosexual	2 (100.0 %)	0 (0.0 %)	[a]
Current partner gender			
Male	6 (100.0 %)	0 (0.0 %)	[a]
Female	2 (14.3 %)	12 (85.7 %)	008

Note: [a] Chi-square test cannot be performed as there is a complete association with one level

histories that include people of more than one gender may be at a higher risk for postpartum depression in comparison to visible sexual minority women with similar sexual histories. This finding is in line with non-perinatal health research that has found bisexual women to be at high risk for negative mental health outcomes (Bostwick et al. 2010). Yet we know little about these women and why they are at risk for poor mental health, pointing to the need for additional research on this understudied population.

The results of the current research also indicate that there are differences in the demographics of perinatal sexual minority participants based on whether they were recruited via consecutive or convenience sampling. In Study Two, the majority of participants who were recruited through consecutive sampling identified as bisexual, while most of the convenience sample participants identified as lesbian or queer. Further, most participants in the consecutive sample were partnered with men, and the majority of convenience sample participants were partnered with women. This difference indicates that visible sexual minority women (or women who are visible as sexual minorities based on the gender of their partner) may be more readily recruited through convenience sampling for research on postpartum well-being, while invisible sexual minority women (or women who appear to be heterosexual based on the gender of their partner) may be more easily recruited through consecutive sampling.

Implications for research and clinical practice

There are implications for research practice and perinatal health provision based on the findings of this study. First, since sampling procedure (i.e., consecutive versus convenience) may significantly influence the type of participants likely to be recruited into a sample, researchers looking to recruit invisible sexual minority women and/or bisexual women may consider utilizing consecutive sampling in comparison to more traditional convenience sampling methods. Convenience sampling may yield a sample that is not representative of the broader group of sexual minority women (e.g., volunteer participants are potentially more likely to be lower risk, employed, and educated). Further, how researchers categorize sexual minority groups could affect results, as in this case sexual identity and sexual behavior resulted in different findings. In terms of service provision, clients' past sexual histories combined with current partner gender may be relevant considerations in perinatal health care, as invisible sexual minority women may be at an elevated risk for PPD symptoms. This means that providers may need to ask questions regarding sexual history and/or not assume all their clients with male partners are heterosexual.

Limitations and future research

One limitation to the present research is that gender of past sexual partners is confounded with having multiple partners. Specifically, it is possible that it is not the factor of having partners of different genders that leads to elevated PPD symptoms for women currently partnered with men but that having multiple partners regardless of gender could lead to higher rates of PPD symptoms when currently partnered with a man. As the current research did not assess number of past partners for any of the participants, this factor cannot be controlled for. Future research should consider this aspect of sexual history. Future research should also further investigate what social factors, such as exposure to discrimination that results in minority stress, or lack of social support, contributes to higher risk of PPD symptoms of sexual minority women partnered with men.

Conclusion

The current research demonstrates the importance of sampling methodology in the recruitment of different "subgroups" of sexual minority women in perinatal health research, specifically the differences between using consecutive or convenience sampling. The finding that invisible sexual minority women reported higher rates of PPD symptoms as measured by the EPDS indicates that sexual minority women may not be a homogenous group when it comes to postpartum well-being. This finding is consistent with other recent research on the general mental health of sexual minority women that has found greater levels of negative mental health among bisexual women (who are more likely to be invisible) in comparison to lesbian women (Bostwick et al. 2010; Kerr et al. 2013; Steele et al. 2009). As such, it will be important for future perinatal mental health research with sexual minority women to not consider all sexual minority participants as a homogenous group. Further, service providers should remember that not all of their patients with male partners are heterosexual and that sexual identity and behavior could have important implications for perinatal mental health.

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Conflicts of interest The authors declare that they have no competing interests.

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