



Breast Cancer Risk Factors among Lesbians:

A literature review

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1 Introduction

Whether or not lesbians are at higher risk for breast cancer than heterosexual women is an issue for debate (Grindel, McGehee, Patsdaughter, & Roberts, 2006). Studies have shown that certain factors such as advancing age, family history of breast cancer and reproductive health-related risk factors including early onset of menstruation, nulliparity or older age at first childbirth called risk factors for developing breast cancer (AIHW, 2006; Bernhard, 2001; Brandenburg, Matthews, Johnson, & Hughes, 2007; Case et al., 2004; Cochran et al., 2001). There is also some individual specific life style risk factors including alcohol consumption, use of hormonal replacement therapy, decreased physical activity, obesity, and smoking that increase the likelihood of developing breast cancer among women (Fish & Anthony, 2005; McTiernan et al., 2001). Although none of these risk factors is exclusive to lesbians, however studies have found that the possible concentration of some of the risks among lesbians is unique (Brandenburg et al., 2007; Cochran et al., 2001; Grindel et al., 2006).

Studies have shown that lesbians are less likely to undergo routine screening procedures, such as mammograms and self breast examinations (SBE) (Boehmer & Case, 2004; Case et al., 2004; DeHart, 2008; Diamant, Wold, Spritzer, & Gelberg, 2000). They also face barriers including negative experiences with health care practitioners and mistrust of the health care community that prevent them from early detection of breast cancer (DeHart, 2008; Lauver et al., 1999). DeHart (2008) also reported that perceptions of heterosexism and homophobia in health care settings significantly contributed, beyond routine health beliefs, to women's use of breast self-exams, visitation to health care providers, and use of complementary/alternative care.

The current document is an attempt to review studies on breast cancer risk factors to determine whether risks for developing breast cancer among lesbians are higher than heterosexual women.

2 Methodology

This document reviews the literatures on breast cancer among lesbians published between the years 1994 and 2009. A systematic search was conducted through PubMed (NLM) using 'breast cancer' and 'lesbians' as two search terms and then combined. The search found 54 articles, most of the studies are US studies but none from Australia, reporting breast cancer among lesbians or same sex attracted women. Literature search was expanded by using terms related to life style factors such as 'smoking', 'alcohol' 'obesity', 'body mass index' in order to quantify in more detail the nature of the associations with these lifestyle risk factors and their contribution to the over all attributable risk for developing breast cancer among lesbians. To find out relationship between lesbians and health care access and utilisation, few additional terms such as 'access', 'health screening' 'homophobia' and 'health provider' are also included in the literature search. Furthermore, web pages of organisations such as the Australian Institute of Health and Welfare, the National Breast Cancer Centre Australia, the National Breast Cancer Coalition, USA and the International Lesbian and Gay Association, Belgium were also searched. Out of the 54 studies, 45 studies and 2 reports were included in this review. Of which 14 reported about the risk factors among lesbians.

3 Extent of the problem in Australia

Breast cancer is the most common invasive cancer among Australian women as well as the most common cause of cancer related deaths in women in Australia (AIHW, 2009). In 2006, 12,614 new cases of breast cancer were diagnosed among Australian women (AIHW, 2006). The Australian Institute of Health and Welfare and the National Breast Cancer Centre (2009) estimated that 14,800 and 15,409 new cases of breast cancer will be diagnosed in 2011 and in 2015 respectively in Australia. This equates to an estimated 40 women in 2011 and 42 women in 2015 being diagnosed with breast cancer every day in Australia. It is also projected that by 2015, the number of new breast cancer cases among women will be 22% higher than in 2006 (AIHW, 2009). However, it is unknown how many of these women will be lesbians. One population-based study (n=19,307) in Australia has revealed that 2.3% to 15.1% of women reported either same sex attraction or sexual experience and 0.8% identified as lesbians or homosexual and 1.4% as bisexual (Pitts, Smith,

Mitchell, & Patel, 2006). Assuming 0.8% of lesbians, among 10,056,038 Australian women (2006 Census of Population and Housing, Australian Bureau of Statistics), there are at least 80,448 lesbians in Australia. Based on data for 2006, approximately one in eight women are at risk of developing breast cancer during her life time; therefore, prevalence of breast cancer among lesbians is approximately 8,938 in Australia.

There is dearth of research which identified the overall risk of breast cancer among lesbians in Australia. For instance, however, the comprehensive reviews on breast cancer conducted by the Australian Institute of Health and Welfare and the National Breast Cancer Centre in 2006 and 2009 made comparisons of incidence, prevalence and risk factors for breast cancer according to gender (male and female), geography, country of origin and other socio-economic indicators; but they did not acknowledge the risk in terms of sexual orientation. Therefore, the prevalence and incidence of breast cancer and associated risk factors specific to lesbians have not been established. This is perhaps due to data about sexual orientation not been collected in these registries.

4 Risk factors for developing breast cancer

4.1 Hormonal factors

Reproductive and hormonal factors have long been linked to breast cancer risk (Brandenburg et al., 2007). The well known factors include early age at menarche and late age at menopause, or a late age at the first full term pregnancy (Cochran et al., 2001; Dibble, Roberts, & Nussey, 2004). This includes women with menarche before 12 years old, menopause after the age of 55, nulliparous women, and women who defer childbearing until after the age of 30 (Cochran et al., 2001; Dibble et al., 2004). Women, who experience extended years of uninterrupted menstrual cycling, and thereby increased exposure to ovarian hormones, appear to have an elevated risk of developing breast cancer (Rankow, 1995). Multiple hormonal or pregnancy related factors have been shown to influence the risk of developing breast cancer (Rankow, 1995). Hormonal stimulation of the ductal epithelium makes it more susceptible to replication errors during mitosis and more vulnerable to carcinogenic

agents (Rankow, 1995). There is no study which revealed that early menarche and late menopause are specific to lesbians; however, there is evidence to suggest that some lesbians may have higher incidence of nulliparity and delayed childbearing. A US study comparing breast cancer risk between lesbians and their heterosexual sisters found that lesbians and their heterosexual sisters did not differ on onset of menses (lesbians = 12.8 versus sister = 12.7; $p=.28$) and age at menopause (lesbians = 48.6 versus sister = 48.2; $p=.55$) but they did differ significantly on all pregnancy-related variables. Lesbians had significantly fewer pregnancies ($p < .0001$), children ($p < .0001$), abortions ($p < .0001$), and miscarriages ($p < .0001$) than their heterosexual sisters (Dibble et al., 2004). Similar findings were observed in two US studies on cancer related risk indicators among lesbians where lesbians being significantly less likely to have ever been pregnant or to have had a live birth than national estimates for women ($p<.05$) (Cochran et al., 2001; McTiernan et al., 2001). Although the findings differed between the lesbians and the heterosexual women related to reproductive outcomes, however, the finding was not particularly surprising because of less amount of sexual exposure with men among the lesbians.

4.2 Familial and genetic factors – why they are important for lesbians?

A family history of breast cancer is perhaps the best known risk factor. Recent pooling of data from 52 epidemiologic studies indicate that women with no affected first-degree relatives (mother, sister or daughter) have a 7.8% probability of developing breast cancer by age 80, whereas those with a history of breast cancer in one first-degree relative have a risk of 13.3%; and the risk increases to 21.1% for those with two first-degree relatives (McPherson, Steel, & Dixon, 2000). Despite this, several genetic mutations also have been associated with increased risk of development of breast cancer in a small group of women (King, Marks, & Mandell, 2003). The most common of these genetic mutations are called Breast Cancer Associated Genes: BRCA1 and BRCA2 (King et al., 2003). In the general population the incidence of BRCA1 mutation is between 1 in 500 and 1 in 800 (MedicineWorld.Org). The incidence of BRCA2 mutation is even lower. An individual with Ashkenazi Jewish background has an increased incidence of BRCA1 and BRCA2 mutations (Antoniou, Pharaoh, & McMullan, 2002; Bryant, 2004). One in forty

individuals with Ashkenazi Jewish background may be affected with BRCA1 or BRCA2 mutation. About 35% of women with BRCA1 and gene defect and 50% of those with a BRCA2 defect would be expected to develop breast cancer by the age 70 (Antoniou et al., 2002; Fish & Anthony, 2005; Friedenson, 2000). However, the association of both genetic and hormonal risk factors with the development of breast cancer needs careful interpretation as the majority of women diagnosed with breast cancer has not exhibited any risk factors other than age (Rankow, 1995).

Although genetic factors and family histories of breast cancer are non-modifiable risk factors but they carry important role for early diagnosis of breast cancer among any women. As most of the lesbians who get separated from their families because of their sexual orientation may not have access to accurate information about their family's medical records, including breast cancer history (Rankow, 1995) this heightens the risk of poor outcomes resulting from delayed diagnosis and treatment. Therefore, the need for counselling on genetic testing of all women with family histories of breast cancer has paramount importance for early diagnosis and treatment (McTierman et al., 2001)

5 Behavioural risk factors

As previously mentioned, certain behavioural risk factors are associated with the diagnosis of breast cancer. Research indicates that lesbians are more likely to smoke, more likely to engage in harmful alcohol consumptions and perhaps obese (Abbott, 1998; Gruskin, Hart, Gordon, & Ackerson, 2001; Tang et al., October, 2004). A report by the International Lesbian and Gay Association (*Lesbian and Bisexual Women's Health Report, Women's Health, Common Concerns, Local Issues.*, March 2006) stated that lesbians have the richest concentration of lifestyle related risk factors for breast cancer than any subset of women in the world. The following sections of the literature review describes behavioural risk factors including obesity, increased body mass index (BMI), smoking and excess use of alcohol which may be interlinked with developing breast cancer among lesbians.

5.1 Obesity

Several studies have found that lesbians and bisexual women's levels of overweight and obesity are at far higher prevalence than similar heterosexual women (Cochran et al., 2001; Dibble et al., 2004). The National Health Interview Survey (NHIS) and the Third National Health and Nutrition Examination Survey (NHANES III) in the United States indicated that a significantly greater percentage of lesbians were obese ($P < .05$ for both comparisons). Another study data from a snowball sample ($n = 1209$) of lesbians/bisexual women living in Los Angeles County suggested that the majority of lesbian and bisexual women surveyed were overweight (Body Mass Index between 25 to 30 kg/m²) or obese (Body Mass Index was greater than 30 kg/m²) (Yancey, Cochran, Corliss, & Mays, 2003). There are some tentative evidences suggesting that lesbians are more likely than heterosexual women to engage in binge eating resulting in greater consumption of "comfort foods" that are generally high in fat and calories (Karen, 1996). High intake of fat is associated with higher biomedical markers such as serum lipids i.e. total cholesterol (TC), Low Density Lipoprotein (LDL) and Triglycerides (TGs) (Karen, 1996). A study conducted by Lane et al found that serum lipid and apolipoprotein components of LDL were increased in women with fibrocystic disease and in early-stage breast cancer (Lane, Bootman, & McConatty, 1995). Similarly another study found that a higher levels of TC and TGs have been reported in the tissue of malignant breast tumours as compared with benign tumours (Mady, 2000).

Dibble et al (2004) also reported in their study on comparing breast cancer risk between lesbians and their heterosexual sisters that the body composition of the lesbians as measured by BMI was significantly higher than their heterosexual sisters ($p = .016$) as well as their hip-to-waist ratios ($p < .0001$). Similarly, in a population-based, retrospective study of 145 black women and 177 white women in Connecticut who were diagnosed with breast cancer between January 1987 and March 1989 found that severe obesity was associated with both race and stage at diagnosis. Severe obesity was significantly associated with diagnosis at TNM1 stage II or greater (multivariate-adjusted odds ratio = 3.10, 95% confidence interval (CI) 1.28-

7.52) (Hunter et al., 1996). Another population-based data from the 2002 National Survey of Family Growth to compare population estimates of overweight and obesity across sexual orientation groups found that lesbian women have a higher prevalence of overweight and obesity than all other female sexual orientation groups. Adjusted multinomial logistic regression analyses showed lesbians have more than twice the odds of overweight (odds ratio [OR] =2.69; 95% confidence interval =1.40, 5.18) and obesity (OR=2.47; 95% CI=1.19, 5.09) as compared to heterosexual women (U. Boehmer, Bowen, & Bauer, 2007). The *Private Lives Survey* (2006) among the GLBTI community in Australia also found that 47.5% lesbian and bisexual women (n=1387) were either overweight or obese (Pitts et al., 2006). While the National Health Survey (2008) showed that the prevalence of obesity or overweight among general Australian women was 38%.

5.2 Alcohol use

Several epidemiological studies have observed the relationships between alcohol consumption and breast cancer, with uneven findings, some reported positive association to moderate to high levels of alcohol consumptions, while others have found no relationships (Ellison, Zhang, McLennan, & Rothman, 2001; Kinney, Millikan, Lin, Moorman, & Newman, 2000; Longnecker, 1994). However, a meta-analysis of six prospective cohort studies in Canada, the Netherlands, Sweden and the United States which included a total of 322,647 women and 4335 participants with a diagnosis of invasive breast cancer and followed up for up to 11 years identified that alcohol consumption is associated with a linear increase in breast cancer (Smith-Warner et al., 1998). The exact patho-physiology of the association of alcohol consumption and breast cancer is not known, but some have been hypothesised. These include alterations in endogenous hormone (Androstenedione) production (Dorgan et al., 1994), an increase in cell permeability to carcinogens and direct damage to cells by metabolites of alcohol (Arthur & Matthew, 1994).

¹ 'TNM Staging' takes into account the size of the tumour (T), whether the [lymph glands](#) (lymph nodes) are affected (N) and whether the tumour has spread anywhere else in the body (M for metastases).

Alike most breast cancer risk factors, little is known on the relationships between alcohol intake and breast cancer among lesbian populations. In NHANES III survey in the US, women were asked whether there had ever been a period in their lives when they drank heavily (5 or more drinks almost every day). The Survey reported that there was a greater prevalence of current alcohol use among lesbians ($P < .05$). Comparisons of these somewhat different definitions of dysfunctional alcohol use suggested that the prevalence of alcohol use problems in the lesbian sample was far greater than heterosexual women either unstandardized or standardized national estimates ($P < .05$ for both comparisons) (Cochran et al., 2001). Another US research on the pattern of alcohol use among lesbians and bisexual women found that lesbians and bisexual women had significantly higher level of heavy drinking and the heterosexual women (9.2% vs 2.6%, $P < .001$) with higher prevalence among younger age groups of lesbians and bisexual women than the older groups (>50 years) (23.3% vs 7.1%, $P < .001$) (Gruskin et al., 2001). On contrary, Valanis et al found that lesbians and bisexual women older than 50 years drank heavily compared with heterosexual women (Valanis et al., 2000). Some literatures also suggested that higher level of alcohol use among this particular group are associated with effect of stress, depression, socialisation more through 'bar culture' as well as external and internalised homophobia and heterosexism and in due course increased the risk for developing breast cancer (Abbott, 1998; Gruskin et al., 2001).

5.3 Cigarette smoking

There is scientific evidence that cigarette smoking is an important risk factor for developing breast cancer among post menopausal women who are 'slow acetylators'. Slow acetylators detoxify smoke more slowly (Ambrosone et al., 1996). The incidence of breast cancer increases with age, with three quarters of cases occurring in women over 50 (Henderson, 1993). Since cigarette smoking is proven to be a risk factor for some women, older lesbians would be at risk as there is strongest evidence to date that lesbian and bisexual females have significantly higher cigarette smoking prevalence rates than their heterosexual counterparts (Roberts, et al. 2004). A study on the pattern of cigarette smoking among lesbian and bisexual women reported that overall the lesbians and bisexual women were more likely to smoke than the heterosexual women (29% vs 14%; $P = .002$). The study also found that these women were also significantly more likely than the heterosexual women to

report high levels of stress (19.5% vs 13%, $P=.02$) and depression (28.3% vs 16.3%, $P<.001$) (Gruskin et al., 2001).

Cochran et al found that in comparison with the US women in general, lesbians appeared less likely to report being current smokers than expected from national estimates ($P<.05$) but more likely ($P<.05$) to indicate a history of smoking. Notably, however, after standardization, both current and previous smoking prevalence rates among lesbians greatly exceeded national norms for women ($P<.05$ for both comparisons) (Cochran et al., 2001). Another population-based health surveys reported that Lesbians' smoking rate (25.3%), was about 70% higher than that of heterosexual women (14.9%). After controlling for demographic variables, logistic regression analysis showed that lesbians and bisexual women were significantly more likely to smoke compared to heterosexual women (OR = 1.95 and OR = 2.08, respectively)(Tang et al., October, 2004)

Similarly, the *Private Lives* sample also depicted that cigarette smoking among lesbians and bisexual women were higher (36.6%)(Pitts et al., 2006) compare to the survey findings from the Australian National Health Survey 2008, where, 22% females mentioned that they have had history of smoking in the past six months.

6 Health Screening and Breast Cancer Prevention Behaviors

Little has been reported materially about same sex attracted women's utilization of health care for breast cancer screening and treatment (Boehmer & Case, 2006). Although available studies suggested that life style risk factors for developing breast cancer is higher among same sex attracted women, but they are less likely than their heterosexual counterpart to utilize routine screening services (Bernhard, 2001; Diamant et al., 2000; Roberts, Patsdaughter, Grindel, & Tarmina, 2004). A state-wide, self-administered survey among the members of a lesbian community organization in the US found that out of 324 respondents, only 22% reported seeking care without symptoms (preventive care), and 23% reported waiting until symptoms are at their worst or never seeking care (White & Dull, 1997). The reasons for these

delays were associated with difficulty in communicating with the primary care provider, discomfort in discussing depression, and some degree of discomfort in discussing menopause (White & Dull, 1997).

Similarly, some studies report that lesbians are less likely than heterosexual women to have had a recent mammogram (Brandenburg et al., 2007; Cochran et al., 2001; Grindel et al., 2006). Findings from the *Private Lives* survey (2006) suggests that although 65.9% of the females seek some sorts of health services in the past twelve months, however, seeking services for sexual health and obstetrics and gynecology services were only 6.3% and 10.9% respectively (Pitts et al., 2006). However, *Private Lives* survey did not revealed whether lesbians and bisexual women are less likely than heterosexual women to have had mammogram or self breast screening in the past twelve months, although, 39.5% reported having had a Pap test within last year.

Furthermore, lesbians often have concerns about disclosing sexual orientation which restrict lesbian women accessing health care services until the medical condition become intolerable (Boehmer & Case, 2004). Not disclosing sexual identity, which means medical history often misses information relevant to treatment for this hidden subgroup of population (Fish & Wilkinson, 2003). In a study among sexual minority women with a diagnosis of breast carcinoma who lived in New England conducted by the Boehmer and Case (2004) found that providers did not inquire about sexual orientation and sexual minority patient-provider relationships were marked by apprehension and distrust.

On the other hand, health care providers' stereo-typed views about the health needs of lesbians are well established; for instance, lesbians are not at risk of sexually transmissible infection screening, do not require cervical cancer screening, may lead to suboptimal screening and treatment options for this group of population (DeHart, 2008). Furthermore, it is reported that same sex attracted women encounter overt discrimination and homophobia by the health care professionals in the settings of western healthcare systems (DeHart, 2008). Similar findings were also found in the study conducted by Dibble et al (2004) where lesbians with breast cancer found coming out to a health care provider challenging and frightening because of risk of

getting discriminatory treatment. Mathews (1998) reported that fear of stigmatization and the possibility of compromised care contributed to anxiety about disclosure of sexual orientation (Mathews, 1998). In *Private Lives survey* majority of the respondents, particularly those who had accessed gynecology/obstetric and sexual health services (N=229), mentioned that their recent contacts with the health providers were either positive (44%) or neutral (34%). Nevertheless, those who have had neutral experiences, perhaps because of the sexual identity were not told to the health provider by the respondents (Pitts et al., 2006). A Canadian study on lesbians diagnosed with cancer also reported instances of isolation and disconnection linked to fear of cancer and homophobia in the broader community (Sinding, Grassau, & Barnoff, 2006). Hetero-normative concept i.e. all women are heterosexual, that exists in the societal norms often makes same sex attraction invisible (Zavestoski, McCormick, & Brown, 2004). Therefore, Brown and Tracy (2008) argued in their study that identifying social inequalities that affect lesbians need to be addressed for eliminating the root causes of social disparities in cancer treatment and providing support to the sexual minorities (Brown & Tracy, 2008)

7 Conclusion

This literature review reports increased prevalence of risky health behaviours apparently exhibited by the lesbians. In addition, their decreased acceptance of health care services for various reasons exerts 'double sword' effect on the overall access for early diagnosis of breast cancer and subsequent treatment. This review also identifies a dearth of literature focused on Australian lesbians with breast cancer. Therefore, further studies need to be carried out to increase the understanding of Australian lesbians' experiences with breast cancer. Possibly large cohort studies on women's health assessing sexual orientation can determine the true excess risk for breast cancer in this population.

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