This is an accepted manuscript of an article published by Taylor & Francis Group in International Review of Psychiatry, available online:

http://dx.doi.org/10.3109/09540261.2015.1083949

Mental Health of Sexual Minorities. A Systematic Review

Martin Plöderl[1,2,4], Pierre Tremblay[3]

[1]Dept. of Suicide Prevention, University Clinic of Psychiatry and Psychotherapy, Christian Doppler Clinic, Paracelsus Medical University, Ignaz-Harrer-Str. 79, 5020 Salzburg, Austria

[2]Department of Clinical Psychology, Christian Doppler Clinic, Paracelsus Medical University, Ignaz-Harrer-Str. 79, 5020 Salzburg, Salzburg, Austria

[3]Faculty of Social Work, University of Calgary, Suite 444-11044 82 Ave, Calgary, Alberta, AB T6G 0T2, Canada

[4]To whom correspondence should be addressed at:
Sonderauftrag für Suizidprävention
Christian-Doppler-Klinik
Ignaz-Harrer Str. 79
5020 Salzburg
Austria;
Phone: +43 662 4483 56679
Fax: +43 662 4483 4454
e-mail: m.ploederl@salk.at

Abstract

Many studies, reviews, and meta-analyses reported elevated mental health problems for sexual minority (SM) individuals. This systematic review provides an update by including numerous recent studies and also explores if SM individuals are at increased risk across selected mental health problems as per dimensions of sexual orientation (SO), genders, life-stages, geographic regions, and in higher-quality studies. A systematic search in PubMed produced 199 studies appropriate for review. A clear majority of studies reported elevated risks for depression, anxiety, suicide attempts or suicides, and substance related problems for SM males and females, as adolescents or adults from many geographic regions and with varied SO dimensions (behavior, attraction, identity) especially in more recent and higher quality studies. One notable exception is alcohol related problems, where many studies reported zero or reversed effects, especially for SM males. All SM subgroups were at increased risk, but bisexual individuals were at highest risk in the majority of studies. Other subgroup and gender differences are more complex and are discussed. The review supports the longstanding mental health risk proposition for SM individuals, overall and as subgroups.

Keywords: mental health disorders, suicide, depression, anxiety, alcohol, substance, drug, sexual orientation, homosexuality, bisexuality, sexual minority, systematic review

Mental Health of Sexual Minorities. A Systematic Review

Introduction

Many studies have reported elevated mental health problems for sexual minority (SM) individuals, including lesbian, gay, bisexual (LGB), mostly heterosexual, or questioning individuals, compared to heterosexual counterparts. These findings have been replicated, but it is only since the 1990s that SM individuals were sampled within the general population as opposed to LGB communities, the latter possibly producing biased results (Kuyper, Fernee, & Keuzenkamp, 2015).

A few meta-analyses reported statistically significant disparities for SM compared to heterosexual individuals for most assessed mental health disorders, substance use problems, and suicidality (King et al., 2008; Marshal et al., 2011; Marshal et al., 2008; Plöderl, Sauer, & Fartacek, 2006). However, these meta-analyses often collapsed SM into one group because older studies did not report results for SM subgroups, or to increase statistical power, nonetheless blurring the differences between subgroups (Savin-Williams, 2008). For example, bisexual individuals commonly have higher levels of mental health problems than homosexual individuals (Marshal, et al., 2011; Marshal, et al., 2008) and this could distort estimations of other SM subgroups. Studies have often also used different dimensions of sexual orientation (SO) (identification, behavior, attraction) that impacts the SO differences (Bostwick, Boyd, Hughes, & McCabe, 2010). Moreover, SO differences have varied with gender and type of mental health problem (Marshal, et al., 2008; Plöderl, et al., 2006).

Most importantly, a substantial number of studies were published since the mentioned analyses, thus necessitating an update. Because of the studies' methodological diversity, we opted for a systematic review without meta-analytic aggregation. The review is organized

according to these questions: Is the often reported increased risk for mental health problems of SM individuals apparent

- in light of recent studies?
- within subgroups of SM (e.g., gay, lesbian, bisexual, questioning)?
- for males and females?
- for adolescents and adults?
- across dimensions of SO?
- for different types of mental health problems?
- in higher quality studies?

Method

PubMed was searched with two sets of keywords combined with the AND operator. The first set included SO key words (gay, lesbian, homosexual, homosexuality, sexual orientation, same-sex sexual) and the second set had mental health key words (suicide, self-harm, mental health, mental disorders, depression, anxiety, drug use, alcohol use, drug abuse, alcohol abuse, drinking problems), all separate by OR. We used the results of an existing search (Plöderl, et al., 2006) with publications to August 31, 2005, producing 2508 hits. We complemented this with a publication search from September 1, 2005, to December 2014, producing 1942 hits, for a total of 4450 results.

The study titles and abstracts were screened using a dual selection criteria: First, only studies that did not selectively recruit SM individuals but used pre-specified, defined populations such as countries, states, counties, districts, cities, regions, schools, universities, birth-cohorts, large occupational groups (nurses, veterans), and registers of general practitioners. Studies from social networking sites (facebook groups, online newspaper readers etc.) were excluded because

the sample was not pre-specified. Only studies with a comparison heterosexual group were included.

Second, we included studies reporting on depression or depressive mood, distress, anxiety and anxiety disorders, alcohol and substance use (and related disorders), suicide attempts and suicides. If other psychiatric disorders or indicators of mental distress were reported, results were only reported in the supplemental table. For the behavior dimension of SO, we did not report the results for sexually inactive individuals.

In the text and the table, "effects" refer to SO-differences, with heterosexuals always as the reference group. Similarly, for subgroups (e.g., males, older groups, etc.), the reference group is always the heterosexual counterpart within the subgroup (e.g., male heterosexual, older heterosexuals). For example, when we compare homosexual and bisexual SM subgroups, we compare the SO-differences of homosexual vs. heterosexual with the SO-difference bisexual vs. heterosexuals. Reported effect sizes (odd ratios, risk ratios, hazard ratios, Cohen's d) were used when the control variables were not problematic (e.g., age, education). When variables were known to differ crucially by SO (partnership status, marriage, health related variables etc.), we either used the unadjusted effect sizes or, if possible, they were calculated (see the footnote to the table for details). We used the following interpretations of effect sizes for ORs and RRs: Zero/close to zero difference (1.0-1.2), small (1.3-2.0), medium (2.1-3.5), and large (> 3.5). These interpretations follow conventions (Breaugh, 2003; Ferguson, 2009; Haddock, Rindskopf, & Shadish, 1998), except that we categorized very small effects as "zero or close to zero" difference ($OR/RR \leq 1.2$, $d \leq 0.1$). To formulate summarizing statements, we tabulated the effect sizes, avoiding using multiple studies on the same data-set (as marked in the supplementary table). This way we could calculate the fraction of the study findings with certain effect sizes, allowing an approximation of the overall effect size. One study could produce several entries in

the table, for example when results for different dimensions of SO or for SM subgroups were reported.

Results

A total of 199 studies fulfilled review-criteria, 95% published in the new millennium, 82% since 2006 and 53% since 2011. The tabulated study descriptions and outcomes are available as an online supplemental. Two longitudinal studies from adolescence to young adulthood are reported separately. The results for different assessment methods (clinical interview, questionnaire, single items, diagnosis/treatment by doctor) are separated.

Description of the Studies

Twenty-six studies (13%) are of higher quality, defined as representative national studies using clinical interviews. Twenty-seven percent of studies are of special importance because results were separated by sex and by homosexual/LG and bisexual status. Only one study provided separate analyses for transgender individuals (Rath, Villanti, Rubenstein, & Vallone, 2013), but small sample size precluded reliable results only reported in the online supplemental. Most studies (76%) were from the US or Canada, 15% from Europe, 6% from Australia or New Zealand, and 2% from Asia or Mexico.

Depression

Adults: A clear majority of study results (89%) indicated elevated levels/rates of depression in general or across SM subgroups in all dimensions of SO (behavior, attraction, identity), for both genders, age groups, regions, and in more recent studies These findings were replicated using varied assessment methods: structured clinical interviews or medical chart (Booth et al., 2012; Chakraborty, McManus, Brugha, Bebbington, & King, 2011; Cochran & Mays, 2000a, 2000b; Cochran, Sullivan, & Mays, 2003; Fergusson, Horwood, & Beautrais, 1999;

Fergusson, Horwood, Ridder, & Beautrais, 2005; Frisell, Lichtenstein, Rahman, & Langstrom, 2010; Gattis, Sacco, & Cunningham-Williams, 2012; Gilman et al., 2001; Hatzenbuehler, Keyes, & Hasin, 2009; Mattocks et al., 2013; Said, Kypri, & Bowman, 2013; Sandfort, de Graaf, Bijl, & Schnabel, 2001), questionnaires (Bagley & Tremblay, 1997; Cochran & Mays, 2009; Frisell, et al., 2010; Grant et al., 2014; Grella, Cochran, Greenwell, & Mays, 2011; Jorm, Korten, Rodgers, Jacomb, & Christensen, 2002; McNair, Szalacha, & Hughes, 2011; Rath, et al., 2013; Said, et al., 2013; Schauer, Berg, & Bryant, 2013; Skegg, Nada-Raja, Dickson, Paul, & Williams, 2003; Wang et al., 2014; Wang, Hausermann, Wydler, Mohler-Kuo, & Weiss, 2012), single items (Diamant & Wold, 2003; Gruskin & Gordon, 2006; Kerr, Ding, Burke, & Ott-Walter, 2015; Kerr, Santurri, & Peters, 2013; Lhomond, Saurel-Cubizolles, & Michaels, 2014; Oswalt & Wyatt, 2011; Rothman, Sullivan, Keyes, & Boehmer, 2012; Sandfort, Bakker, Schellevis, & Vanwesenbeeck, 2009; Skegg, et al., 2003), and treatment/diagnosis by professionals, as reported by participants (Brennan, Ross, Dobinson, Veldhuizen, & Steele, 2010; Burgess, Tran, Lee, & van Ryn, 2007; Diamant & Wold, 2003; Grant, et al., 2014; Hughes, Szalacha, & McNair, 2010b; Lytle, De Luca, & Blosnich, 2014; Matthews & Lee, 2014; McNair, et al., 2011; Oswalt & Wyatt, 2011; Pakula & Shoveller, 2013; Pelts & Albright, 2014; Steele, Ross, Dobinson, Veldhuizen, & Tinmouth, 2009; Tjepkema, 2008).

Few study results (11%) indicated close to zero differences or reversed effects in specific subgroups, with no clear-cut pattern (see supplemental table) (Bostwick, et al., 2010; Cheng, Gipson, Perez, & Cochran, 2014; Cochran & Mays, 2009; Cochran, Mays, Alegria, Ortega, & Takeuchi, 2007; Gattis, et al., 2012; McNair, Kavanagh, Agius, & Tong, 2005; McNair, et al., 2011; Sandfort, et al., 2009; Schauer, et al., 2013; Skegg, et al., 2003). Overall, most of the effects were medium for men and small for women (39% and 50% of study results, respectively).

Adolescents. A clear majority of studies (97%) reported elevated levels of depression in general or across SM subgroups, and across dimensions of SO (identity, behavior, attraction). These findings were replicated using questionnaires (Almeida, Johnson, Corliss, Molnar, & Azrael, 2009; Bos, Sandfort, de Bruyn, & Hakvoort, 2008; Denny et al., 2014; Hatzenbuehler, McLaughlin, & Nolen-Hoeksema, 2008b; Johnson et al., 2011; Lucassen et al., 2014; Marshal et al., 2013a; Marshal et al., 2012b; Martin-Storey & Crosnoe, 2012; Pesola, Shelton, & van den Bree, 2014; Poteat, Aragon, Espelage, & Koenig, 2009), and single items (including items on core symptoms, i.e., sadness/hopelessness) (Birkett, Espelage, & Koenig, 2009; Hatzenbuehler, Pachankis, & Wolff, 2012; Jiang, Perry, & Hesser, 2010; Kann et al., 2011; Lampinen, McGhee, & Martin, 2006; Mustanski, Andrews, Herrick, Stall, & Schnarrs, 2014; Seil, Desai, & Smith, 2014; Shields, Whitaker, Glassman, Franks, & Howard, 2012; Zhao, Montoro, Igartua, & Thombs, 2010). Reversed or close to zero differences were reported only in specific subgroups in the Add Health/GUTS studies (see below) and for white LGB males in one study (Poteat, et al., 2009). Most of the effects were small (37%) or medium (40%).

Add Health and GUTS-Study. In the Add Health Study, elevated depression among SM adolescents was reported in Wave I (adolescence) across subgroups (Russell & Joyner, 2001; Ueno, 2010b; Williams & Chapman, 2011) and for all assessed subgroups (Marshal, et al., 2013a). No/reversed effects were reported for LG, mostly LG, bisexual individuals, but not for mostly heterosexuals (Cardom, Rostosky, & Danner, 2013). In Wave II (adolescence), significant effects were reported overall (Teasdale & Bradley-Engen, 2010; Ueno, 2010b) and for all assessed subgroups (Marshal, et al., 2013a). In Wave III (young adulthood), elevated depression levels were reported overall (Ueno, 2010b), and for all assessed subgroups (Marshal, et al., 2013a; McLaughlin, Hatzenbuehler, Xuan, & Conrond, 2012; Needham & Austin, 2010). In two

studies, there were only significant effects or effects with substantial evidence for bisexual and mostly heterosexual individuals (Loosier & Dittus, 2010; Savin-Williams, Cohen, Joyner, & Rieger, 2010). In Wave IV (young adulthood), elevated depression levels applied for all subgroups (Marshal, et al., 2013a; Strutz, Herring, & Halpern, 2015). No/reversed effects for LG and mostly LG but effects for bisexuals and mostly heterosexuals were reported in one study (Cardom, et al., 2013), and close to zero effect only for male youth with attraction and some other SO indicator (Strutz, et al., 2015). More complex patterns were reported in one study where significant effects applied only for women identified as mostly heterosexual, bisexual, and mostly lesbian, but not lesbians; for bisexual but not same-sex attracted, only for mostly heterosexual behavior and, among men, only for mostly heterosexual identity and behavior (Lindley, Walsemann, & Carter, 2012)

In the GUTS study, elevated levels of depression applied for all identity subgroups (LG/mostly LG, bisexual, mostly heterosexual) except questioning individuals (Rosario et al., 2014a; Rosario et al., 2014b)

Lifetime vs. past year. The results are mixed: some studies had comparable effects for lifetime and past year depression (Frisell, et al., 2010; Gilman, et al., 2001; Sandfort, et al., 2001) while others reported larger lifetime effects (Barnes, Hatzenbuehler, Hamilton, & Keyes, 2014), with some having mixed results, depending on subgroups (Bostwick, et al., 2010; Cochran, et al., 2007).

(Hughes, McCabe, Wilsnack, West, & Boyd, 2010a; Hughes, et al., 2010b)

Subgroup differences. Bisexual individuals had larger effects than homosexual individuals in a slight majority of studies (Bagley & Tremblay, 1997; Bostwick, et al., 2010; Cardom, et al., 2013; Denny, et al., 2014; Hughes, et al., 2010b; Jorm, et al., 2002; Kerr, et al., 2013; Loosier & Dittus, 2010; Marshal, et al., 2013a; McLaughlin, et al., 2012; McNair, et al.,

2011; Roberts, Rosario, Slopen, Calzo, & Austin, 2013; Rosario, et al., 2014b; Said, et al., 2013; Savin-Williams, et al., 2010; Schauer, et al., 2013; Steele, et al., 2009; Tjepkema, 2008). Larger effects for bisexuals than homosexuals were sometimes reported only among women but not men (Cochran & Mays, 2009; Ziyadeh et al., 2007), or reversed (Needham & Austin, 2010). Bisexuals had comparable or smaller effects than homosexuals in several other studies (Brennan, et al., 2010; Cochran & Mays, 2000b; Diamant & Wold, 2003; Lhomond, et al., 2014; McNair, et al., 2005; Mustanski, et al., 2014; Rath, et al., 2013; Rosario, et al., 2014a; Sandfort, et al., 2009; Skegg, et al., 2003; Wang, et al., 2014). In the adolescent YRBS, bisexuals had larger effects than homosexuals for the behavior dimension but not for the identity dimension (Kann, et al., 2011), noting that the risk may vary by SO for sexually inactive individuals.

Mostly heterosexuals had larger effects than homosexuals in some studies (Cardom, et al., 2013; Lindley, et al., 2012; Loosier & Dittus, 2010; Marshal, et al., 2013a), or only among women (Ziyadeh, et al., 2007), or only among men (Cochran & Mays, 2009). In contrast, more studies reported that mostly heterosexuals had comparable or smaller effects than homosexuals (Bloomfield, Wicki, Wilsnack, Hughes, & Gmel, 2011; Fergusson, et al., 2005; Lhomond, et al., 2014; McNair, et al., 2005; McNair, et al., 2011; Wang, et al., 2014; Zhao, et al., 2010).

Questioning individuals, compared to homosexuals, had larger SO differences in some studies (Birkett, et al., 2009; Poteat, et al., 2009; Rath, et al., 2013), but the reversed was reported in other studies (Kann, et al., 2011). Heterosexual identified individuals with same-sex attraction or behavior had somewhat smaller effects than gay/lesbian identified with concordant behavior/attraction (Gattis, et al., 2012).

Gender. A weak majority of studies reported larger effects for men then for women. Comparable effects for SM males and females were reported in some studies (Almeida, et al., 2009; Cheng, et al., 2014; Frisell, et al., 2010; Grella, et al., 2011; Lhomond, et al., 2014;

Lucassen, et al., 2014; Matthews & Lee, 2014; Needham, 2012; Pearson & Wilkinson, 2013; Pesola, et al., 2014). More studies reported larger effects among SM men (Bostwick, et al., 2010; Cochran & Mays, 2000b, 2009; Cochran, et al., 2003; Fergusson, et al., 2005; Gruskin & Gordon, 2006; Pakula & Shoveller, 2013; Remafedi, French, Story, Resnick, & Blum, 1998; Sandfort, et al., 2001; Skegg, et al., 2003), fewer reported larger effects among SM women (Cochran, et al., 2007; Gilman, et al., 2001; Lindley, et al., 2012; Needham, 2012; Ueno, 2010b). There were occasional mixed findings, depending on age or SO subgroups (Bostwick, et al., 2010; Gattis, et al., 2012; Sandfort, et al., 2009).

Higher quality studies. A clear majority of high quality studies reported elevated levels of depression (Chakraborty, et al., 2011; Cochran & Mays, 2000a, 2000b; Cochran, et al., 2003; Fergusson, et al., 1999; Frisell, et al., 2010; Gattis, et al., 2012; Gilman, et al., 2001; Hatzenbuehler, et al., 2009; Sandfort, et al., 2001), with only few exceptions among men (Cochran, et al., 2007) or women for past year depression (but not lifetime) (Sandfort, et al., 2001), or among heterosexual identified women with homosexual experience (Cochran & Mays, 2009).

Other mood disorders. The majority of studies reported elevated bipolar disorder incidences for SM individuals (Cochran & Mays, 2000a; Mattocks, et al., 2013; Pelts & Albright, 2014; Sandfort, et al., 2001) except Bipolar I in one study with all other mood disorders elevated – thus perhaps a false positive result (Cochran & Mays, 2000a); dysthymia (Bostwick, et al., 2010; Cochran & Mays, 2000a; Hatzenbuehler, et al., 2009; Sandfort, et al., 2001), or mania (Bostwick, et al., 2010; Hatzenbuehler, et al., 2009), and for any mood disorder (Barnes, et al., 2014; Bolton & Sareen, 2011; Hatzenbuehler, et al., 2009). However, a very complex pattern emerged where elevated levels were reported across SO dimensions among men and women

except unsure identified women, and homosexually attracted or behaving women (Bostwick, et al., 2010).

Summary. A great majority of studies reported elevated levels of depression for all SM subgroups in all dimensions of sexual orientation (behavior, attraction, identity), for both genders, age groups, regions, and in more recent studies. Most effects were small or medium. Regarding subgroups, compared to homosexuals/LG individuals, the majority of studies reported the largest effects for bisexual individuals, whereas results for mostly heterosexual and questioning individuals are mixed. For SO identities, LG and bisexual individuals were comparable. More studies reported larger SO differences for males rather than the opposite, but several studies had comparable male and female effects. Studies of higher quality are in line with other studies. The few findings for other mood disorders (bipolar, dysthymia, etc.) are similar to depression.

Attempting Suicide / Suicides

Adults. Nearly all study results (98%) indicated elevated attempted suicide rates in general or across SM subgroups, genders, dimensions of SO (identity, behavior, attraction), regions, and in more recent studies. This outcome applied for lifetime suicide attempts (Bagley & Tremblay, 1997; Blosnich, Mays, & Cochran, 2014b; Chakraborty, et al., 2011; Cochran & Mays, 2000a; Cochran, et al., 2007; de Graaf, Sandfort, & ten Have, 2006; Fergusson, et al., 1999; Gilman, et al., 2001; Herrell et al., 1999; Husky, Guignard, Beck, & Michel, 2013; Lhomond & Saurel-Cubizolles, 2006; Oswalt & Wyatt, 2011; Pelts & Albright, 2014; Skegg, et al., 2003; Wang, et al., 2012; Wichstrom & Hegna, 2003), attempting suicide in the past 12 or 6 months (Blosnich & Bossarte, 2012; Cochran, et al., 2007; Gilman, et al., 2001; Hughes, et al., 2010b; Kerr, et al., 2013; Lhomond & Saurel-Cubizolles, 2006; Lian, Zuo, Lou, Gao, & Cheng,

2015; Lytle, et al., 2014; McNair, et al., 2005; Oswalt & Wyatt, 2011; Reed, Prado, Matsumoto, & Amaro, 2010; Wang, et al., 2014; Wang, et al., 2012), or in the past five years (Fergusson, et al., 2005). Most of the effects were large (58%).

Adolescents. Similarly, nearly all study results (98%) indicated elevated attempted suicide rates for SM adolescents for lifetime suicide attempts (Button, O'Connell, & Gealt, 2012; Eisenberg & Resnick, 2006; McMahon, Reulbach, Keeley, Perry, & Arensman, 2012; O'Connor, Rasmussen, & Hawton, 2014; O'Connor, Rasmussen, Miles, & Hawton, 2009b; Remafedi, et al., 1998; Wang, et al., 2012), past year attempts (Almeida, et al., 2009; Bostwick et al., 2014; Denny, et al., 2014; DuRant, Krowchuk, & Sinal, 1998; Faulkner & Cranston, 1998; Fleming, Merry, Robinson, Denny, & Watson, 2007; Garofalo, Wolf, Kessel, Palfrey, & DuRant, 1998; Hatzenbuehler, 2011; Hatzenbuehler, Birkett, Van Wagenen, & Meyer, 2014; Jiang, et al., 2010; Kann, et al., 2011; Lucassen, et al., 2014; Madge et al., 2011; Marshal et al., 2013b; Marshal, et al., 2012b; Mustanski, et al., 2014; Olshen, McVeigh, Wunsch-Hitzig, & Rickert, 2007; Pinhey & Millman, 2004; Robin et al., 2002; Saewyc et al., 2007; Seil, et al., 2014; Shields, et al., 2012; Stone, Luo, Lippy, & McIntosh, 2014a; Stone et al., 2014b; Taliaferro & Muehlenkamp, 2014; Wang, et al., 2012; Zhao, et al., 2010), in a 6 month follow up period (O'Connor, Rasmussen, & Hawton, 2009a), and in one study without a given timeframe (Lampinen, et al., 2006).

Reversed or close to zero differences were uncommon (2%) and only reported in specific subgroups (see supplemental table) (Olshen, et al., 2007; Saewyc, et al., 2007; Skegg, et al., 2003; Zhao, et al., 2010), and in the Add Health studies for certain waves and subgroups (see below). Overall, most of the effects were large (47%) or medium (33%).

Add Health study. In the Add Health Wave I study, SM youth had elevated rates of past year suicide attempts, overall (Russell & Joyner, 2001; Williams & Chapman, 2011), for all subgroups (mostly heterosexual, bisexual, mostly LG), except for LG depressed youth in one

study (Cardom, et al., 2013). Similar effects applied (no subgroup analysis) in Wave II (Fried, Williams, Cabral, & Hacker, 2013) and Wave III (Fried, et al., 2013; Silenzio, Pena, Duberstein, Cerel, & Knox, 2007). In Wave IV, elevated attempted suicide rates were reported for minority women but reversed effects existed for all dimensions among men (Almazan, Roettger, & Acosta, 2014). In one study of men and women combined, a negative effect was reported only for mostly LG, not for all other SM subgroups (mostly heterosexuals, bisexuals, LG) (Cardom, et al., 2013).

Lifetime vs. past year. There are mixed findings: larger effects for lifetime compared to past year attempts were reported in some studies, (Hidaka et al., 2008; Wang, et al., 2012), but not in others (Cochran, et al., 2007; Lhomond & Saurel-Cubizolles, 2006), with comparable effects sometimes reported (Gilman, et al., 2001; Oswalt & Wyatt, 2011).

Subgroup differences. The majority of studies reported the largest effects for bisexual individuals, compared to homosexuals (Bagley & Tremblay, 1997; Blosnich & Bossarte, 2012; Denny, et al., 2014; Hatzenbuehler, 2011; Hatzenbuehler, et al., 2014; Hughes, et al., 2010b; Kerr, et al., 2013; Olshen, et al., 2007; Robin, et al., 2002; Wang, et al., 2014), with only a few studies reporting comparable or smaller effects among bisexual compared to homosexual individuals, sometimes only in subgroups (Button, et al., 2012; McNair, et al., 2005; Saewyc, et al., 2007) However, the dimension of SO is crucial, as bisexuals had elevated risk only for the behavioral dimension but not the identity dimensions in adolescents (Kann, et al., 2011; Stone, et al., 2014b), a detailed description being available elsewhere (Ramsay & Tremblay, 2015).

Many studies reported that mostly heterosexuals had comparable or smaller effects than homosexual individuals (Fergusson, et al., 2005; McNair, et al., 2005; Saewyc, et al., 2007; Wang, et al., 2014), and one study reported the opposite (Hughes, et al., 2010b). Those

questioning their identity had smaller effects than homosexuals (Hatzenbuehler, et al., 2014; Kann, et al., 2011; Stone, et al., 2014b; Zhao, et al., 2010)

Gender. A clear majority of studies reported larger effects among men, compared to women (Almeida, et al., 2009; Cochran, et al., 2007; de Graaf, et al., 2006; Hidaka, et al., 2008; Husky, et al., 2013; Lucassen, et al., 2014; O'Connor, et al., 2014; O'Connor, et al., 2009b; Olshen, et al., 2007; Pinhey & Millman, 2004; Remafedi, et al., 1998; Saewyc, et al., 2007; Skegg, et al., 2003); only one study reported an opposite effect (Almazan, et al., 2014). Comparable effects among men and women were reported in a few studies (Bostwick, et al., 2014; Eisenberg & Resnick, 2006; Russell & Joyner, 2001; Stone, et al., 2014a; Stone, et al., 2014b)

Higher quality studies. All higher quality studies reported increased risks for attempting suicide among SM individuals, with exceptions for suicides.

Suicides. Only few studies about death by suicide are available. In the Danish registry data, same-sex-registered partners had higher rates of suicides compared with heterosexual married individuals. This difference was of medium size in the first study (men and women combined) (Qin, 2005). In a second study, the effect was large for men and small for women (Mathy, Cochran, Olsen, & Mays, 2011) but medium effect for men and large for women in a third study (Frisch & Simonsen, 2013). The latter study also reported higher suicide rates for long-term same-sex cohabiting compared to opposite-sex cohabiting individuals (medium effect among men, small for women). No suicide occurred in the male NHANES study among the 85 males who had sex with males at least once in life (Cochran & Mays, 2011) but the study is underpowered and thus highly inconclusive (Plöderl et al., 2013). Furthermore, the study sample is likely compromised given that 98% of homosexually oriented suicide attempters (lifetime) were in the 17-29 age group, and essentially none in the 30 to 39 age group, whereas the

heterosexual suicide attempter percentages were not significantly different in both age groups. Thus, a significant proportion of at-risk SM males may not have participated in the study (Tremblay, n.d.). In the General Social Survey, SM status was based on any lifetime sexual behavior and SM males had nonsignificant lower suicide rates (medium effect), SM women had significantly higher rates (large effect) (Cochran & Mays, 2015). In two psychological autopsy studies with living control groups, SM youth were overrepresented in deaths by suicide (Renaud, Berlim, Begolli, McGirr, & Turecki, 2010; Shaffer, Fisher, Hicks, Parides, & Gould, 1995). In the original study, a no-difference effect was reported, but this is incorrect, and the effect size is large (Plöderl, et al., 2013)

Summary. Nearly all studies reported elevated rates of suicide attempts in general or across SM subgroups in all dimensions of sexual orientation (behavior, attraction, identity), for both genders, age groups, regions, and in more recent studies. Most effects were large. Regarding subgroups, compared to homosexuals/LG individuals, the majority of studies produced larger effects for bisexuals, comparable or smaller effects for mostly heterosexuals and smaller effects for questioning individuals. With respect to SO identity, the differences between bisexual and LG individuals were less pronounced or absent. The majority of studies had larger SO differences for males than females. Studies of higher quality are in line with other studies. Only few studies of SM suicide exist. The youth autopsy studies had an SM overrepresentation and the Danish data produced elevated rates of suicide for same-sex registered partners or households with long-term cohabiting same-sex adults. Of two US follow-up studies, one is too underpowered and inconclusive, and the other reported an increase of suicide rates among same-sex active women but not men.

Anxiety Disorders

Adults. A majority of study results (83%) indicated elevated levels of anxiety or rates of anxiety disorders [panic attacks (PD), generalized anxiety disorders (GAD), phobias] in general or across SM subgroups in all dimensions of SO (behavior, attraction, identity), for both genders, age groups, regions, and in more recent studies.

These findings were replicated for varied assessment methods: structured clinical interviews or medical charts (Barnes, et al., 2014; Bolton & Sareen, 2011; Bostwick, et al., 2010; Chakraborty, et al., 2011; Cochran & Mays, 2000b, 2009; Cochran, et al., 2007; Cochran, et al., 2003; Fergusson, et al., 1999; Fergusson, et al., 2005; Frisell, et al., 2010; Gattis, et al., 2012; Gilman, et al., 2001; Hatzenbuehler, et al., 2009; Sandfort, et al., 2001), questionnaires (Jorm, et al., 2002; Rath, et al., 2013; Said, et al., 2013), single items (Kerr, et al., 2013; McNair, et al., 2005; Oswalt & Wyatt, 2011; Sandfort, et al., 2009), and treatment/diagnosis by professionals, as reported by participant (Brennan, et al., 2010; Burgess, et al., 2007; Grant, et al., 2014; Hughes, et al., 2010b; McNair, et al., 2005; McNair, et al., 2011; Oswalt & Wyatt, 2011; Pelts & Albright, 2014; Tjepkema, 2008).

Some study results (17%) indicated close to zero differences or reversed effects among women (Cochran, et al., 2007) or for more specific SM subgroups, anxiety disorders, age groups, or period or of assessment. However, no specific pattern emerged (see supplemental table) in these studies (Bolton & Sareen, 2011; Bostwick, et al., 2010; Cochran & Mays, 2009; Gilman, et al., 2001; McNair, et al., 2005; Oswalt & Wyatt, 2011; Sandfort, et al., 2009; Sandfort, et al., 2001). Most of the effects were small (35%) or medium (39%) sized.

Adolescents. All of the few studies reported elevated levels of anxiety among SM youth, either assessed by questionnaires (Hatzenbuehler, et al., 2008b; Marshal, et al., 2013b; Marshal, et al., 2012b; Williams & Chapman, 2011) or via diagnosis by health professionals, as reported by the youth (Strutz, et al., 2015). The effects were mostly medium sized.

Lifetime vs. past year. The results were comparable for lifetime and past year assessments (Barnes, et al., 2014; Bostwick, et al., 2010; Cochran, et al., 2007; Gilman, et al., 2001; Sandfort, et al., 2009; Sandfort, et al., 2001).

Subgroup differences. For bisexuals, the findings are mixed. Bisexuals had larger effects than homosexual/LG in several studies (Hughes, et al., 2010b; Jorm, et al., 2002; Kerr, et al., 2013; McNair, et al., 2005; McNair, et al., 2011; Said, et al., 2013; Tjepkema, 2008), or only among women (but reversed for men) (Bolton & Sareen, 2011; Bostwick, et al., 2010). In several other studies bisexuals had comparable or smaller effects than homosexual / LG individuals (Brennan, et al., 2010; Fergusson, et al., 2005; Oswalt & Wyatt, 2011; Rath, et al., 2013; Sandfort, et al., 2009) or only among the older women (McNair, et al., 2005). Mostly heterosexuals had comparable or smaller effects than homosexuals (Hughes, et al., 2010b; McNair, et al., 2005; McNair, et al., 2011) and there was a complex pattern in one study (Bostwick, et al., 2010). Questioning individuals had smaller or comparable effects than homosexuals (Bolton & Sareen, 2011; Bostwick, et al., 2010; McNair, et al., 2005; Oswalt & Wyatt, 2011; Rath, et al., 2013)

A complex pattern occurred for panic attacks and generalized anxiety disorder for LG, bisexual, and mostly heterosexual men and women (Cochran & Mays, 2009). In one study, men and women identified as heterosexual, but with some homosexual behavior or attraction, scored between behavior concordant heterosexuals and homosexuals for GAD, except for heterosexual women with homosexual behavior who had lower levels than concordant heterosexual women (Gattis, et al., 2012)

Gender. Most studies reported larger effects among men than women (Cochran & Mays, 2000b; Cochran, et al., 2007; Frisell, et al., 2010; Sandfort, et al., 2001), but this was only for homosexual and not bisexual men in one study (Bolton & Sareen, 2011). One study had

comparable effects for men and women (Strutz, et al., 2015) and some reported mixed findings, depending on SO subgroup (Bostwick, et al., 2010; Tjepkema, 2008) or type of anxiety disorder (Cochran, et al., 2003).

Higher quality studies. The results of high-quality studies are in line with the other studies. A majority reported elevated anxiety problems/disorders for SM men and women (Barnes, et al., 2014; Bolton & Sareen, 2011; Chakraborty, et al., 2011; Cochran & Mays, 2000a; Cochran, et al., 2003; Fergusson, et al., 1999; Fergusson, et al., 2005; Frisell, et al., 2010; Hatzenbuehler, et al., 2009), and many studies reported negative findings for women (Bostwick, et al., 2010; Cochran & Mays, 2009; Cochran, et al., 2007; Gattis, et al., 2012; Gilman, et al., 2001; Sandfort, et al., 2001) or men (Gilman, et al., 2001).

Summary. A clear majority studies on adults and all studies on adolescents reported elevated SM anxiety levels/rates in general or across different dimensions of SO (identity, behavior, attraction), genders, age groups, regions, and in more recent studies. Zero or reversed effects were reported in some studies, mostly for female adults, and for some subgroups of SM. Most effects were small or medium. Regarding subgroups, compared to homosexuals/LG individuals, bisexuals had elevated levels/rates in several studies but comparable in others. Mostly heterosexual and questioning individuals had comparable or smaller differences than homosexuals. The majority of studies reported larger effects for males than females. Studies of higher quality are in line with other studies.

Alcohol and Drug Use

To reduce complexity, only recent binge/risky drinking, alcohol dependency (AD), drug dependency (DD) and recent use of illicit drugs (including marijuana) are summarized. For drug use/disorder, the majority of study results (93% for adults and 94% for adolescents) indicated an

increased risk among SM individuals in general or across SM subgroups in all dimensions of SO (behavior, attraction, identity), for both genders, age groups, regions, and in more recent studies. For alcohol abuse/disorder, the results were mixed, and the majority of study findings for adults indicated no/reversed effects (31%) or small effects (32%) especially for males and certain SM subgroups (for adolescents, 35% of effects were zero/reversed and 52% were small, respectively).

Adults. SM adults had higher levels/rates in studies with structured clinical interviews or medical chart: alcohol (Barnes, et al., 2014; Booth, et al., 2012; Chakraborty, et al., 2011; Cochran & Mays, 2009; Cochran, et al., 2003; Drabble, Midanik, & Trocki, 2005; Farmer, Jabson, Bucholz, & Bowen, 2013b; Fergusson, et al., 2005; Frisell, et al., 2010; Gilman, et al., 2001; Grella, et al., 2011; Hatzenbuehler, et al., 2009; Hughes, et al., 2010a; McCabe, Hughes, Bostwick, West, & Boyd, 2009; Midanik, Drabble, Trocki, & Sell, 2007; Sandfort, et al., 2001); drugs (Bolton & Sareen, 2011; Chakraborty, et al., 2011; Cochran & Mays, 2009; Cochran, et al., 2003; Fergusson, et al., 1999; Fergusson, et al., 2005; Gilman, et al., 2001; Grella, et al., 2011; Hatzenbuehler, et al., 2009; Hughes, et al., 2010a; McCabe, et al., 2009; Rath, et al., 2013; Sandfort, et al., 2001); with questionnaires for alcohol (Ericksen & Trocki, 1994; King & Nazareth, 2006; Lhomond, et al., 2014; Mattocks, et al., 2013; Said, et al., 2013), with single items for alcohol (Balsam, Beadnell, & Riggs, 2012; Blosnich, Bossarte, Silver, & Silenzio, 2013; Blosnich, Farmer, Lee, Silenzio, & Bowen, 2014a; Boehmer, Miao, Linkletter, & Clark, 2012; Bowring, Vella, Degenhardt, Hellard, & Lim, 2015; Burgard, Cochran, & Mays, 2005; Burgess, et al., 2007; Case et al., 2004; Cochran, Grella, & Mays, 2012; Diamant, Wold, Spritzer, & Gelberg, 2000; Dilley, Simmons, Boysun, Pizacani, & Stark, 2010; Drabble, et al., 2005; Ford & Jasinski, 2006; Fredriksen-Goldsen, Kim, Barkan, Muraco, & Hoy-Ellis, 2013; Gruskin & Gordon, 2006; Hughes, et al., 2010b; Julien, Jouvin, Jodoin, L'Archeveque, & Chartrand, 2008; Lhomond & Saurel-Cubizolles, 2006; Mercer et al., 2007; Pope, Ionescu-Pioggia, & Pope, 2001;

Przedworski, McAlpine, Karaca-Mandic, & VanKim, 2014; Reczek, Liu, & Spiker, 2014; Reed, et al., 2010; Rhodes, McCoy, Wilkin, & Wolfson, 2009; Rothman, et al., 2012; Sandfort, Bakker, Schellevis, & Vanwesenbeeck, 2006; Schauer, et al., 2013; Steele, et al., 2009; Talley, Hughes, Aranda, Birkett, & Marshal, 2014) and drugs (Bowring, et al., 2015; Cochran, et al., 2012; Conron, Mimiaga, & Landers, 2010; Hughes, et al., 2010b; Julien, et al., 2008; Kerr, et al., 2015; Lhomond, et al., 2014; McCabe, Boyd, Hughes, & d'Arcy, 2003; McCabe, Hughes, Bostwick, & Boyd, 2005; McCabe, Hughes, Bostwick, Morales, & Boyd, 2012; Mercer, et al., 2007; Pope, et al., 2001; Reed, et al., 2010; Rhodes, et al., 2009; Ridner, Frost, & LaJoie, 2006; Rothman, et al., 2012; Skegg, et al., 2003; Ueno, 2010a) and with treatment/diagnosis by professionals, as reported by participants for drugs (Pelts & Albright, 2014).

For alcohol, close to zero differences or reversed effects were reported overall (Bloomfield, 1993; Blosnich & Silenzio, 2013; McCabe, et al., 2003; McCabe, et al., 2012; Reed, et al., 2010; Rhodes, et al., 2009) or for specific subgroups, but without a clear-cut pattern (see supplemental table) (Bloomfield, et al., 2011; Boehmer, et al., 2012; Brennan, et al., 2010; Cochran & Mays, 2000a; Cochran, et al., 2007; Conron, et al., 2010; Dilley, et al., 2010; Eisenberg & Wechsler, 2003; Ericksen & Trocki, 1994; Farmer, Bucholz, Flick, Burroughs, & Bowen, 2013a; Farmer, et al., 2013b; Gilman, et al., 2001; Jorm, et al., 2002; Kerr, et al., 2015; Kerr, Ding, & Chaya, 2014; King & Nazareth, 2006; Lhomond, et al., 2014; Matthews & Lee, 2014; McCabe, et al., 2005; McCabe, et al., 2009; Midanik, et al., 2007; Ridner, et al., 2006; Sandfort, et al., 2001; Schauer, et al., 2013; Talley, et al., 2014).

Zero/negative effects for drugs were reported in certain subgroups, and again, no specific pattern emerged (see supplemental table) (Cochran & Mays, 2000b; Eisenberg & Wechsler, 2003; Ford & Jasinski, 2006; Gattis, et al., 2012; Hughes, et al., 2010a; Hughes, et al., 2010b;

Kerr, et al., 2015; Kerr, et al., 2014; McCabe, et al., 2005; McCabe, et al., 2012; McCabe, et al., 2009; Rath, et al., 2013; Sandfort, et al., 2001; Schauer, et al., 2013).

The effect sizes for alcohol were mostly near zero or reversed for men (53%) and small (30%) or medium (33%) for women. For drugs, most effects were small (39%) or medium (39%) for men and medium (31%) or large (45%) for women. Generally, it seemed that the effects sizes for marijuana were generally smaller than for other illicit drugs and especially harder drugs.

Adolescents. A number of studies reported elevated levels/rates using questionnaires: alcohol (Marshal, et al., 2013b; Marshal, et al., 2012b; Pesola, et al., 2014; Russell & Joyner, 2001), drugs (Birkett, et al., 2009; Marshal, et al., 2013b; Marshal, et al., 2012b); and single items: alcohol (Button, et al., 2012; Faulkner & Cranston, 1998; Garofalo, et al., 1998; Hagger-Johnson et al., 2013; Konishi, Saewyc, Homma, & Poon, 2013; Ortiz-Hernandez, Tello, & Valdes, 2009), drugs (Button, et al., 2012; Duncan & Hatzenbuehler, 2014; DuRant, et al., 1998; Faulkner & Cranston, 1998; Garofalo, et al., 1998; Kann, et al., 2011; Konishi, et al., 2013; Lampinen, et al., 2006; Newcomb, Birkett, Corliss, & Mustanski, 2014; Orenstein, 2001; Poteat, et al., 2009; Seil, et al., 2014; Shields, et al., 2012; Tucker, Ellickson, & Klein, 2008; Zhao, et al., 2010).

For alcohol, zero/reversed effects were reported overall (Hatzenbuehler, et al., 2012; Lucassen, et al., 2014), or for certain subgroups: gay/homosexuals but not bisexuals (Mustanski, et al., 2014; Robin, et al., 2002); bisexual men but not gay men and lesbian or bisexual women (Hagger-Johnson, et al., 2013), questioning individuals (Button, et al., 2012), or for less severe alcohol problems (Faulkner & Cranston, 1998; Tucker, et al., 2008). Some studies reported complex patterns, depending on gender/SM subgroup and SO dimension, with lacking/reversed effects especially for the behavioral dimension (Hatzenbuehler, Corbin, & Fromme, 2008a; Kann,

et al., 2011; Matthews, Blosnich, Farmer, & Adams, 2014; Ortiz-Hernandez, et al., 2009; Talley, et al., 2014), and, prospectively, for older youth (Pesola, et al., 2014).

For drug use/disorders, only few studies reported negative/reversed effects, and only in certain subgroups: gay/homosexual but not bisexual individuals (Robin, et al., 2002), questioning individuals (Button, et al., 2012), or for marijuana (at least for certain subgroups) but not for harder drugs (Faulkner & Cranston, 1998; Kann, et al., 2011; Mustanski, et al., 2014; Orenstein, 2001).

The effect sizes for alcohol were mostly near zero or reversed for males (50%) and mostly small for females (55%), whereas for drug related problems, most effects were small (29%) to medium (43%) for men and medium (50%) for women.

Add-Health and GUTS studies. Similar patterns appeared in the two longitudinal studies. Add Health study: Wave I studies reported elevated levels of alcohol use/abuse among girls (Marshal et al., 2012a) and overall (Russell & Joyner, 2001). Wave II studies reported no/reversed effect for binge drinking for both SM males and females (Hahm, Wong, Huang, Ozonoff, & Lee, 2008). For Wave I and II combined, binge drinking was elevated among SM girls but not SM boys, illicit drug use was significantly elevated for SM girls and boys but with near-zero magnitude for boys (Pearson & Wilkinson, 2013). In studies on Wave III, binge drinking was elevated among LG but not B participants, but drug use was elevated in all groups (McLaughlin, et al., 2012). Another study using identity reported elevated binge drinking rates for lesbian and bisexual females but not among their male counterparts, whereas hard-drug use was elevated among all subgroups (Needham & Austin, 2010). In Wave IV, close to zero effects were reported for binge drinking among gay men but not for bisexual men/women and lesbian women, whereas for drug use, there were elevated levels in all subgroups (Almazan, et al., 2014; Marshal, et al., 2008).

In the GUTS Wave I study, binge drinking effects were reported for LGB adolescents, but there were reversed effects for questioning adolescents (Ziyadeh, et al., 2007). In waves I-III, complex alcohol abuse patterns appeared, depending on variables, gender, and SM subgroups, and some close to zero effects were reported for gay and lesbian adolescents (Corliss, Rosario, Wypij, Fisher, & Austin, 2008). Binge drinking was elevated in lesbian/gay and mostly heterosexual but not in bisexual participants (Rosario, et al., 2014a). In contrast, for marijuana and other illicit drugs, there were SO differences in all subgroups (Corliss et al., 2010; Rosario, et al., 2014a).

Lifetime vs. past year. Studies reporting lifetime vs. current problems had comparable effects (Gilman, et al., 2001; Kerr, et al., 2014; Sandfort, et al., 2001)

Subgroup differences. In contrast to other mental health problems, there was not a clear majority of studies reporting elevated levels of alcohol/drug abuse/dependency for bisexuals compared to homosexuals (Balsam, et al., 2012; Brennan, et al., 2010; Burgard, et al., 2005; Button, et al., 2012; Dilley, et al., 2010; Ford & Jasinski, 2006; Jorm, et al., 2002; Kerr, et al., 2015; Kerr, et al., 2014; Loosier & Dittus, 2010; Mercer, et al., 2007; Mustanski, et al., 2014; Newcomb, et al., 2014; Robin, et al., 2002). Sometimes this was only among women but not men (Conron, et al., 2010; McCabe, et al., 2009). Several studies reported that bisexuals had comparable or smaller risk than homosexual individuals (Blosnich, et al., 2014a; Boehmer, et al., 2012; Bolton & Sareen, 2011; Cochran & Mays, 2009; Diamant, et al., 2000; Drabble, et al., 2005; Hughes, et al., 2010a; McLaughlin, et al., 2012; Przedworski, et al., 2014; Rosario, et al., 2014a; Said, et al., 2013; Schauer, et al., 2013; Steele, et al., 2009), and there were mixed findings depending on the substance (Corliss, et al., 2010; Hughes, et al., 2010b) or on SM subgroups (Hagger-Johnson, et al., 2013; Kann, et al., 2011; Matthews, et al., 2014; McCabe, et al., 2012; Midanik, et al., 2007; Needham & Austin, 2010).

Mostly heterosexuals had comparable or smaller effects compared to homosexuals in the majority of studies (Corliss, et al., 2010; Hughes, et al., 2010b; Rosario, et al., 2014a; Ziyadeh, et al., 2007) and larger effects in one study (Cochran & Mays, 2009). Questioning individuals were, compared to homosexuals, at lower risk in the majority of studies (Bolton & Sareen, 2011; Button, et al., 2012; Hughes, et al., 2010a; Kann, et al., 2011; McCabe, et al., 2009; Zhao, et al., 2010; Ziyadeh, et al., 2007). They had comparable risk (Newcomb, et al., 2014), higher risk (Birkett, et al., 2009), or comparable risk only among women but higher risk among men (Poteat, et al., 2009), always compared to homosexual individuals.

Gender. Larger effects among women than men were reported in the majority of studies (Bloomfield, et al., 2011; Boehmer, et al., 2012; Bolton & Sareen, 2011; Cochran, et al., 2007; Cochran, et al., 2003; Corliss, et al., 2010; Dilley, et al., 2010; Drabble, et al., 2005; Eisenberg & Wechsler, 2003; Farmer, et al., 2013a; Farmer, et al., 2013b; Frisell, et al., 2010; Grella, et al., 2011; Gruskin & Gordon, 2006; Hughes, et al., 2010a; Kerr, et al., 2014; King & Nazareth, 2006; McCabe, et al., 2003; Needham & Austin, 2010; Ortiz-Hernandez, et al., 2009; Pearson & Wilkinson, 2013; Ridner, et al., 2006; Sandfort, et al., 2001; Schauer, et al., 2013). Comparable effects among men and women were reported in fewer studies (Balsam, et al., 2012; Blosnich, et al., 2014a; Cochran & Mays, 2009; Fredriksen-Goldsen, et al., 2013; Hagger-Johnson, et al., 2013; Lucassen, et al., 2014; Pesola, et al., 2014; Skegg, et al., 2003) and some reported mixed findings, depending on SO subgroups (Conron, et al., 2010; Ford & Jasinski, 2006; Matthews, et al., 2014; McCabe, et al., 2012; Midanik, et al., 2007; Poteat, et al., 2009) or changing effects over time (Hatzenbuehler, et al., 2008a), or type of dependency or drug (Gilman, et al., 2001; Orenstein, 2001). Only one study reported larger effect for men (Ericksen & Trocki, 1994).

Higher quality studies. By our definition, studies with higher quality are those using clinical interviews that assess disorders of substance abuse or dependency. For alcohol, the

majority of studies (83%) reported increased levels/rates of alcohol disorders for SM individuals (Bolton & Sareen, 2011; Chakraborty, et al., 2011; Cochran & Mays, 2000b, 2009; Cochran, et al., 2003; Fergusson, et al., 2005; Frisell, et al., 2010; McCabe, et al., 2009). Few studies reported reversed effects in some subgroups, for example in bisexual men (Drabble, et al., 2005), among men but not/less among women (Cochran, et al., 2007; Gilman, et al., 2001; Sandfort, et al., 2001) (but effect for lifetime in the Gilman study), or no effects only among bisexual identified men and for behavior (but not identity) among HO women (Midanik, et al., 2007).

For drug disorders, nearly all studies reported increased rates for SM individuals (Barnes, et al., 2014; Bolton & Sareen, 2011; Chakraborty, et al., 2011; Cochran & Mays, 2000b, 2009; Cochran, et al., 2003; Fergusson, et al., 1999; Fergusson, et al., 2005; Gilman, et al., 2001; McCabe, et al., 2009). Rarely, zero/reversed SO differences occurred in some SM subgroups or for men but not women (Cochran, et al., 2007; Sandfort, et al., 2001)

Summary. For alcohol related problems, a majority of studies reported small, near zero, or reversed effects, whereas for drug related problems most studies reported elevated SM levels in general or across dimensions of SO (identity, behavior, attraction), genders, age groups, regions, and in more recent studies. The absent/reversed effects for alcohol were mostly reported for SM males, whereas for females, there were mostly small SO differences for alcohol related problems. For drugs, the effect sizes were small or medium for males and medium or large for females, and they were larger for other illicit drugs than marijuana, especially hard drugs. Regarding subgroups, compared to homosexual/LG individuals, bisexuals did not have larger effects in the majority of studies, but mostly heterosexual and questioning individuals had comparable or smaller effects. The majority of studies reported larger effects among females than males. In contrast to lower quality studies, studies with higher quality reported elevated levels of alcohol and drug problems among all SM subgroups.

Other Disorders

For other mental disorders, increased levels/rates also applied for SM individuals: for bulimia/anorexia higher for gay and bisexual males, less so for bisexual women, and not for lesbian women (Matthews-Ewald, Zullig, & Ward, 2014; Pelts & Albright, 2014), eating disorders for women but not men (Cochran, et al., 2007), OCD for SM veterans (Pelts & Albright, 2014), PTSD, with some subgroup exceptions (Gattis, et al., 2012; Gilman, et al., 2001; Grella, et al., 2011; Hatzenbuehler, et al., 2009), ADHD (Frisell, et al., 2010; Pelts & Albright, 2014; Strutz, et al., 2015; Wang, et al., 2014), schizophrenia or psychotic symptoms (Bolton & Sareen, 2011; Chakraborty, et al., 2011; Pelts & Albright, 2014), personality disorders, with scattered zero/reversed effects in some subgroups (Bolton & Sareen, 2011), oppositional defiant disorder and borderline personality in LB identified girls (Marshal, et al., 2012b). Antisocial Personality Disorder was not elevated among young mostly gay or bisexual men in Switzerland, but elevated levels (small effect) existed for mostly heterosexuals and mostly gay individuals (Wang, et al., 2014).

Older Versus Newer Studies.

Recently published studies are in line with older studies. Of importance are the YRBS, which have been replicated often and continue reporting elevated mental health risks among SM adolescents. A related replication study from New Zealand had comparable or even increasing effects from 2001 to 2012 for adolescent suicide attempters (Lucassen, et al., 2014), and a replication study from the Netherlands (not in this review) reported results similar to those in 1996 (Sandfort, de Graaf, ten Have, Ransome, & Schnabel, 2014).

Discussion

A majority of reviewed studies reported elevated levels/rates of mental health problems for SM individuals, including depression, anxiety, suicide attempts/suicides, and drug related mental health problems, compared to heterosexuals. The only exception was alcohol related mental health problems, where the majority of studies reported negative or near zero effect for males. However, in the majority of higher quality studies that used clinical diagnoses of alcohol dependency, SM individuals again had increased rates. SO differences were largest for attempting suicides/suicides, where most of the effect sizes were large, and they were smallest for alcohol related mental health problems. The increase of risk varied in magnitude and existed across SM subgroups in all dimensions of sexual orientation (behavior, attraction, identity), for both genders, age groups, regions, and in more recent studies. Thus, the main results of this review that included more recent studies are in line with older meta-analytic reports and reviews. However, given that most studies appeared only recently, there is now much more weight of evidence supporting the conclusions. Older studies and reviews have been criticized because they ignored result differences for gender or SO subgroups and dimensions, which could lead to distorted views about mental health problems for subgroups, for example overestimations among gay-identified individuals (Savin-Williams, 2008) Our review included several recent studies that used different dimensions of SO and with separate SO subgroup analysis. Indeed, there are differences, such that in the majority of studies, effects are larger for bisexuals and comparable or smaller for mostly heterosexuals and questioning individuals compared to homosexual individuals for most mental health problems. However, our review concludes that elevated risk, with varying degree, exists within all SM subgroups in the majority of studies. For example, among gay identified or homosexual attracted/behaving males, most studies nonetheless reported elevated rates/levels of depression and anxiety (mostly medium effects), suicide attempts (mostly

large effects), and drug abuse/disorder (mostly small effects). Only for alcohol abuse were there many studies reporting lower levels of alcohol abuse disorder, but not in the majority of higher quality studies. Thus, the assumption that certain SM subgroups are not at increased risk for mental health problems is not supported by the available data.

The review also supports the previously reported larger effects for males than females for all disorders except substance related disorders, where the majority of studies reported larger effects for females.

Methodological Considerations

Only studies that did not recruit SM individuals from gay/lesbian organizations were chosen for this review, based on the common assumption that this avoids biases inherent in convenience samples. Only one meta-analysis reported that SO differences are comparable or even smaller in random samples than in convenience samples (Meyer, 2003), but a recent single study found small opposite effects (Kuyper, et al., 2015). Both sampling approaches have their strengths and weaknesses (Meyer & Wilson, 2009), and an updated meta-analytical comparison would be fruitful. Until then, results from convenience samples - not included in our analysis - should be taken seriously.

Another critical issue in several studies is adjustment and weighing procedures. It is standard practice to adjust for sociodemographic variables to increase the validity of group differences. However, in several studies, this included variables such as marriage status, which is known to be associated with better mental health but only few SM individuals are married. Adjustment for such a variable may thus be inappropriate. In the same line, several studies used sampling weights to achieve representativeness. However, it remains an open issue if it is appropriate to use similar sampling weights for SM and heterosexual individuals given different population distributions. Furthermore, the number of SM individuals in the studies is rather

small and weighing may lead to grossly different percentage of SM individuals (Grella, et al., 2011) or SO differences (Husky, et al., 2013). The Cochran et al. 2000 NHANES study results were likely compromised given that the homosexually oriented small subsample of 108 males became 78 males (weighted, a 28% reduction), while the large sample of 3,208 heterosexual men became 3,212 (little change). For this reason, the CDC warned against using weighing procedures for small samples (CDC, 2015).

There is an ongoing debate about the validity of studies, especially for suicides and suicide attempts as outcomes (Plöderl, et al., 2013). Some SM individuals may refuse to participate, as in one study where three times (16.8 vs. 5.1%) more SM men were among those who initially refused to participate in a household survey (CDC, 1991). The associated bias remains unknown. A gold standard to assess mental health disorders are clinical interviews. However, fewer SM members disclose their homosexual behavior to interviewers compared with computer based methods (Villarroel et al., 2006). It is possible that non-disclosed SM individuals or those who refuse study participation may be at increased risk for mental health problems, a reasonable hypothesis given the negative psychological impact of a concealed stigma (Pachankis, 2007). On the other hand, those who report their SM status may also be more willing to report mental health problems than those not disclosing their SM status, leading to inflated estimation of SO differences. Furthermore, for suicidality, one study reported that gays and lesbians over-report mental health problems due to a suffering script (Savin-Williams, 2001) but other studies did not replicate these findings (Plöderl, Kralovec, & Fartacek, 2010; Plöderl, et al., 2013). Similarly, SO differences may be inflated by mischievous responses. However, as demonstrated in a study on adolescents SO disparities remained significantly after controlling for biases (Robinson-Cimpian, 2014) and it seems unlikely that such biases are influential in the studies on adults or when using clinical interviews.

These methodological caveats could lead to overestimations or underestimations of the actual SO differences and more research on biases would be helpful. However, by nature, research on hidden populations will never achieve top quality level. Unfortunately, this will leave room for those wanting to downplay or overstate the problem for other than scientific reasons. Following the principle of Ockham's razor, we recommend not including additional unproven assumptions but to let the data speak for itself.

Despite the increase of mental health risk for SM people, it is important to acknowledge that the majority of SM individuals do not have a mental health problem. Furthermore, SO differences may be explained, in great part, by increased minority stressors (Hatzenbuehler, 2009; Meyer, 2003; Stall, Friedman, & Catania, 2008).

Limitations

As with all restricted search strategies, some studies are missed, for example, probability samples without a control group (Catania et al., 2001), unpublished data, studies in other data-bases, or those where the SO results are given as aside results. Given that PubMed covers a wide range of studies, similar conclusions would apply. For attempting suicide, we are certain about it, because the most exhaustive collection of international studies (Ramsay & Tremblay, 2015) is in line with our findings. In addition, the weight of the evidence in our review is strong, and it would take many studies with opposite findings to undermine the conclusions.

We tried to summarize subgroup and gender differences. However, only a meta-analysis could precisely quantify the differences but, as most studies vary in methodology, it will take more studies to accomplish this. In addition, there are certainly some more or less strong effects of race, education, or age that may have gone unnoticed in our review.

Conclusion

Our review includes more recent studies and supports the proposition that SM individuals are at increased risk for mental health problems. The risks vary within SM subgroups and gender and they are, as a rule, elevated in all subgroups.

Disclosure of Commercial Interests

Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

References

Almazan, E. P., Roettger, M. E., & Acosta, P. S. (2014). Measures of Sexual Minority Status and Suicide Risk among Young Adults in the United States. *Archives of Suicide Research, 18*(3), 274-281.

Almeida, J., Johnson, R. M., Corliss, H. L., Molnar, B. E., & Azrael, D. (2009). Emotional Distress Among LGBT Youth: The Influence of Perceived Discrimination Based on Sexual Orientation. *Journal of Youth and Adolescence, 38*(7), 1001-1014.

Bagley, C., & Tremblay, P. (1997). Suicidal behaviors in homosexual and bisexual males. *Crisis, 18*(1), 24-34.

Balsam, K. F., Beadnell, B., & Riggs, K. R. (2012). Understanding Sexual Orientation Health Disparities in Smoking: A Population-Based Analysis. *American Journal of Orthopsychiatry, 82*(4), 482-493.

Barnes, D. M., Hatzenbuehler, M. L., Hamilton, A. D., & Keyes, K. M. (2014). Sexual orientation disparities in mental health: the moderating role of educational attainment. *Social Psychiatry and Psychiatric Epidemiology, 49*(9), 1447-1454.

Birkett, M., Espelage, D. L., & Koenig, B. (2009). LGB and questioning students in schools: the moderating effects of homophobic bullying and school climate on negative outcomes. *Journal of Youth and Adolescence, 38*(7), 989-1000.

Bloomfield, K. (1993). A comparison of alcohol consumption between lesbians and heterosexual women in an urban population. *Drug and alcohol dependence, 33*(3), 257-269.

Bloomfield, K., Wicki, M., Wilsnack, S., Hughes, T., & Gmel, G. (2011). International differences in alcohol use according to sexual orientation. *Substance abuse, 32*(4), 210-219.

Blosnich, J., & Bossarte, R. (2012). Drivers of disparity: differences in socially based risk factors of self-injurious and suicidal behaviors among sexual minority college students. *Journal of American college health : J of ACH, 60*(2), 141-149.

Blosnich, J., Bossarte, R., Silver, E., & Silenzio, V. (2013). Health Care Utilization and Health Indicators Among a National Sample of US Veterans in Same-Sex Partnerships. *Military Medicine, 178*(2), 207-212.

Blosnich, J. R., Farmer, G. W., Lee, J. G. L., Silenzio, V. M. B., & Bowen, D. J. (2014a). Health Inequalities Among Sexual Minority Adults: Evidence from Ten U.S. states, 2010 (vol 46, pg 337, 2010). *American Journal of Preventive Medicine, 47*(1), 103-103.

Blosnich, J. R., Mays, V. M., & Cochran, S. D. (2014b). Suicidality Among Veterans: Implications of Sexual Minority Status. *American journal of public health, 104*, S535-S537.

Blosnich, J. R., & Silenzio, V. M. B. (2013). Physical health indicators among lesbian, gay, and bisexual US veterans. *Annals of Epidemiology, 23*(7), 448-451.

Boehmer, U., Miao, X., Linkletter, C., & Clark, M. A. (2012). Adult health behaviors over the life course by sexual orientation. *American journal of public health, 102*(2), 292-300.

Bolton, S. L., & Sareen, J. (2011). Sexual orientation and its relation to mental disorders and suicide attempts: findings from a nationally representative sample. *Canadian journal of psychiatry. Revue canadienne de psychiatrie, 56*(1), 35-43.

Booth, B. M., Davis, T. D., Cheney, A. M., Mengeling, M. A., Torner, J. C., & Sadler, A. G. (2012). Physical health status of female veterans: contributions of sex partnership and in-military rape. *Psychosomatic medicine, 74*(9), 916-924.

Bos, H. M., Sandfort, T. G., de Bruyn, E. H., & Hakvoort, E. M. (2008). Same-sex attraction, social relationships, psychosocial functioning, and school performance in early adolescence. *Developmental psychology, 44*(1), 59-68.

Bostwick, W. B., Boyd, C. J., Hughes, T. L., & McCabe, S. E. (2010). Dimensions of sexual orientation and the prevalence of mood and anxiety disorders in the United States. *American journal of public health, 100*(3), 468-475.

Bostwick, W. B., Meyer, I., Aranda, F., Russell, S., Hughes, T., Birkett, M., & Mustanski, B. (2014). Mental Health and Suicidality Among Racially/Ethnically Diverse Sexual Minority Youths. *American journal of public health, 104*(6), 1129-1136.

Bowring, A. L., Vella, A. M., Degenhardt, L., Hellard, M., & Lim, M. S. (2015). Sexual identity, same-sex partners and risk behaviour among a community-based sample of young people in Australia. *The International journal on drug policy, 26*(2), 153-161.

Breaugh, J. A. (2003). Effect size estimation: Factors to consider and mistakes to avoid. *Journal of Management, 29*(1), 79-97.

Brennan, D. J., Ross, L. E., Dobinson, C., Veldhuizen, S., & Steele, L. S. (2010). Men's sexual orientation and health in Canada. *Canadian journal of public health = Revue canadienne de sante publique, 101*(3), 255-258.

Burgard, S. A., Cochran, S. D., & Mays, V. M. (2005). Alcohol and tobacco use patterns among heterosexually and homosexually experienced California women. *Drug and alcohol dependence, 77*(1), 61-70.

Burgess, D., Tran, A., Lee, R., & van Ryn, M. (2007). Effects of perceived discrimination on mental health and mental health services utilization among gay, lesbian, bisexual and transgender persons. *Journal of LGBT health research, 3*(4), 1-14.

Button, D. M., O'Connell, D. J., & Gealt, R. (2012). Sexual Minority Youth Victimization and Social Support: The Intersection of Sexuality, Gender, Race, and Victimization. *Journal of Homosexuality, 59*(1), 18-43.

Cardom, R., Rostosky, S., & Danner, F. (2013). Does "It Get Better" for Depressed Sexual Minority Youth in Young Adulthood? *Journal of Adolescent Health, 53*(5), 671-673.

Case, P., Austin, S. B., Hunter, D. J., Manson, J. E., Malspeis, S., Willett, W. C., & Spiegelman, D. (2004). Sexual orientation, health risk factors, and physical functioning in the Nurses' Health Study II. *Journal of women's health, 13*(9), 1033-1047.

Catania, J. A., Osmond, D., Stall, R. D., Pollack, L., Paul, J. P., Blower, S., . . . Fisher, L. (2001). The continuing HIV epidemic among men who have sex with men. *American journal of public health, 91*(6), 907.

CDC. (1991). Pilot study of a household survey to determine HIV seroprevalence. *MMWR. Morbidity and mortality weekly report, 40*(1), 1.

CDC. (2015). Behavioral Risk Factor Surveillance System. Survey Data & Documentation. Retrieved April 16, 2015, from http://www.cdc.gov/brfss/data_documentation/index.htm

Chakraborty, A., McManus, S., Brugha, T. S., Bebbington, P., & King, M. (2011). Mental health of the non-heterosexual population of England. *The British journal of psychiatry : the journal of mental science, 198*(2), 143-148.

Cheng, C. H., Gipson, J. D., Perez, T. L., & Cochran, S. D. (2014). Same-Sex Behavior and Health Indicators of Sexually Experienced Filipino Young Adults. *Archives of Sexual Behavior*.

Cochran, S. D., Grella, C. E., & Mays, V. M. (2012). Do Substance Use Norms and Perceived Drug Availability Mediate Sexual Orientation Differences in Patterns of Substance Use? Results from the California Quality of Life Survey II. *Journal of Studies on Alcohol and Drugs, 73*(4), 675-685.

Cochran, S. D., & Mays, V. M. (2000a). Lifetime prevalence of suicide symptoms and affective disorders among men reporting same-sex sexual partners: results from NHANES III. *American journal of public health, 90*(4), 573-578.

Cochran, S. D., & Mays, V. M. (2000b). Relation between psychiatric syndromes and behaviorally defined sexual orientation in a sample of the US population. *American journal of epidemiology, 151*(5), 516-523.

Cochran, S. D., & Mays, V. M. (2009). Burden of psychiatric morbidity among lesbian, gay, and bisexual individuals in the California Quality of Life Survey. *Journal of abnormal psychology, 118*(3), 647-658.

Cochran, S. D., & Mays, V. M. (2011). Sexual orientation and mortality among US men aged 17 to 59 years: results from the National Health and Nutrition Examination Survey III. *American journal of public health, 101*(6), 1133-1138.

Cochran, S. D., & Mays, V. M. (2015). Mortality risks among persons reporting same-sex sexual partners: evidence from the 2008 General Social Survey-national death index data set. *American journal of public health, 105*(2), 358-364.

Cochran, S. D., Mays, V. M., Alegria, M., Ortega, A. N., & Takeuchi, D. (2007). Mental health and substance use disorders among Latino and Asian American lesbian, gay, and bisexual adults. *Journal of Consulting and Clinical Psychology, 75*(5), 785-794.

Cochran, S. D., Sullivan, J. G., & Mays, V. M. (2003). Prevalence of mental disorders, psychological distress, and mental health services use among lesbian, gay, and bisexual adults in the United States. *Journal of Consulting and Clinical Psychology, 71*(1), 53-61.

Conron, K. J., Mimiaga, M. J., & Landers, S. J. (2010). A population-based study of sexual orientation identity and gender differences in adult health. *American journal of public health, 100*(10), 1953-1960.

Corliss, H. L., Rosario, M., Wypij, D., Fisher, L. B., & Austin, S. B. (2008). Sexual Orientation Disparities in Longitudinal Alcohol Use Patterns Among Adolescents Findings From the Growing Up Today Study. *Archives of pediatrics & adolescent medicine, 162*(11), 1071-1078.

Corliss, H. L., Rosario, M., Wypij, D., Wylie, S. A., Frazier, A. L., & Austin, S. B. (2010). Sexual orientation and drug use in a longitudinal cohort study of US adolescents. *Addictive Behaviors, 35*(5), 517-521.

de Graaf, R., Sandfort, T. G. M., & ten Have, M. (2006). Suicidality and sexual orientation: Differences between men and women in a general population-based sample from the Netherlands. *Archives of Sexual Behavior, 35*(3), 253-262.

Denny, S., Lucassen, M. F., Stuart, J., Fleming, T., Bullen, P., Peiris-John, R., . . . Utter, J. (2014). The Association Between Supportive High School Environments and Depressive Symptoms and Suicidality Among Sexual Minority Students. *Journal of clinical child and adolescent psychology : the official journal for the Society of Clinical Child and Adolescent Psychology, American Psychological Association, Division 53*, 1-14.

Diamant, A. L., & Wold, C. (2003). Sexual orientation and variation in physical and mental health status among women. *Journal of women's health, 12*(1), 41-49.

Diamant, A. L., Wold, C., Spritzer, K., & Gelberg, L. (2000). Health behaviors, health status, and access to and use of health care: a population-based study of lesbian, bisexual, and heterosexual women. *Archives of family medicine, 9*(10), 1043-1051.

Dilley, J. A., Simmons, K. W., Boysun, M. J., Pizacani, B. A., & Stark, M. J. (2010). Demonstrating the importance and feasibility of including sexual orientation in public health surveys: health disparities in the Pacific Northwest. *American journal of public health, 100*(3), 460-467.

Drabble, L., Midanik, L. T., & Trocki, K. (2005). Reports of alcohol consumption and alcohol-related problems among homosexual, bisexual and heterosexual respondents: results from the 2000 National Alcohol Survey. *Journal of studies on alcohol, 66*(1), 111-120.

Duncan, D. T., & Hatzenbuehler, M. L. (2014). Lesbian, Gay, Bisexual, and Transgender Hate Crimes and Suicidality Among a Population-Based Sample of Sexual-Minority Adolescents in Boston. *American journal of public health, 104*(2), 272-278.

DuRant, R. H., Krowchuk, D. P., & Sinal, S. H. (1998). Victimization, use of violence, and drug use at school among male adolescents who engage in same-sex sexual behavior. *Journal of Pediatrics, 133*(1), 113-118.

Eisenberg, M., & Wechsler, H. (2003). Substance use behaviors among college students with same-sex and opposite-sex experience: results from a national study. *Addictive Behaviors, 28*(5), 899-913.

Eisenberg, M. E., & Resnick, M. D. (2006). Suicidality among gay, lesbian and bisexual youth: the role of protective factors. *The Journal of adolescent health : official publication of the Society for Adolescent Medicine, 39*(5), 662-668.

Ericksen, K. P., & Trocki, K. F. (1994). Sex, Alcohol and Sexually-Transmitted Diseases - a National Survey. *Family Planning Perspectives, 26*(6), 257-263.

Farmer, G. W., Bucholz, K. K., Flick, L. H., Burroughs, T. E., & Bowen, D. J. (2013a). CVD risk among men participating in the National Health and Nutrition Examination Survey (NHANES) from 2001 to 2010: differences by sexual minority status. *Journal of epidemiology and community health, 67*(9), 772-778.

Farmer, G. W., Jabson, J. M., Bucholz, K. K., & Bowen, D. J. (2013b). A population-based study of cardiovascular disease risk in sexual-minority women. *American journal of public health, 103*(10), 1845-1850.

Faulkner, A. H., & Cranston, K. (1998). Correlates of same-sex sexual behavior in a random sample of Massachusetts high school students. *American journal of public health, 88*(2), 262-266.

Ferguson, C. J. (2009). An Effect Size Primer: A Guide for Clinicians and Researchers. *Professional Psychology-Research and Practice, 40*(5), 532-538.

Fergusson, D. M., Horwood, L. J., & Beautrais, A. L. (1999). Is sexual orientation related to mental health problems and suicidality in young people? *Archives of General Psychiatry, 56*(10), 876-880.

Fergusson, D. M., Horwood, L. J., Ridder, E. M., & Beautrais, A. L. (2005). Sexual orientation and mental health in a birth cohort of young adults. *Psychological Medicine, 35*(7), 971-981.

Fleming, T. M., Merry, S. N., Robinson, E. M., Denny, S. J., & Watson, P. D. (2007). Self-reported suicide attempts and associated risk and protective factors among secondary school students in New Zealand. *The Australian and New Zealand journal of psychiatry, 41*(3), 213-221.

Ford, J. A., & Jasinski, J. L. (2006). Sexual orientation and substance use among college students. *Addictive Behaviors, 31*(3), 404-413.

Fredriksen-Goldsen, K. I., Kim, H. J., Barkan, S. E., Muraco, A., & Hoy-Ellis, C. P. (2013). Health Disparities Among Lesbian, Gay, and Bisexual Older Adults: Results From a Population-Based Study. *American journal of public health, 103*(10), 1802-1809.

Fried, L. E., Williams, S., Cabral, H., & Hacker, K. (2013). Differences in Risk Factors for Suicide Attempts Among 9th and 11th Grade Youth: A Longitudinal Perspective. *Journal of School Nursing, 29*(2), 113-122.

Frisch, M., & Simonsen, J. (2013). Marriage, cohabitation and mortality in Denmark: national cohort study of 6.5 million persons followed for up to three decades (1982-2011). *International Journal of Epidemiology, 42*(2), 559-578.

Frisell, T., Lichtenstein, P., Rahman, Q., & Langstrom, N. (2010). Psychiatric morbidity associated with same-sex sexual behaviour: influence of minority stress and familial factors. *Psychological Medicine, 40*(2), 315-324.

Garofalo, R., Wolf, R. C., Kessel, S., Palfrey, J., & DuRant, R. H. (1998). The association between health risk behaviors and sexual orientation among a school-based sample of adolescents. *Pediatrics, 101*(5), 895-902.

Gattis, M. N., Sacco, P., & Cunningham-Williams, R. M. (2012). Substance Use and Mental Health Disorders Among Heterosexual Identified Men and Women Who Have Same-Sex Partners or Same-Sex Attraction: Results from the National Epidemiological Survey on Alcohol and Related Conditions. *Archives of Sexual Behavior, 41*(5), 1185-1197.

Gilman, S. E., Cochran, S. D., Mays, V. M., Hughes, M., Ostrow, D., & Kessler, R. C. (2001). Risk of psychiatric disorders among individuals reporting same-sex sexual partners in the National Comorbidity Survey. *American journal of public health, 91*(6), 933-939.

Grant, J. E., Odlaug, B. L., Derbyshire, K., Schreiber, L. R. N., Lust, K., & Christenson, G. (2014). Mental Health and Clinical Correlates in Lesbian, Gay, Bisexual, and Queer Young Adults. *Journal of American College Health, 62*(1), 75-78.

Grella, C. E., Cochran, S. D., Greenwell, L., & Mays, V. M. (2011). Effects of sexual orientation and gender on perceived need for treatment by persons with and without mental disorders. *Psychiatric services, 62*(4), 404-410.

Gruskin, E. P., & Gordon, N. (2006). Gay/Lesbian sexual orientation increases risk for cigarette smoking and heavy drinking among members of a large Northern California health plan. *Bmc Public Health, 6*, 241.

Haddock, C. K., Rindskopf, D., & Shadish, W. R. (1998). Using odds ratios as effect sizes for meta-analysis of dichotomous data: A primer on methods and issues. *Psychological Methods, 3*(3), 339-353.

Hagger-Johnson, G., Taibjee, R., Semlyen, J., Fitchie, I., Fish, J., Meads, C., & Varney, J. (2013). Sexual orientation identity in relation to smoking history and alcohol use at age 18/19: cross-sectional associations from the Longitudinal Study of Young People in England (LSYPE). *BMJ open, 3*(8), e002810.

Hahm, H. C., Wong, F. Y., Huang, Z. J., Ozonoff, A., & Lee, J. (2008). Substance use among Asian Americans and Pacific Islanders sexual minority adolescents: Findings from the National Longitudinal Study of Adolescent Health. *Journal of Adolescent Health, 42*(3), 275-283.

Hatzenbuehler, M. L. (2009). How Does Sexual Minority Stigma "Get Under the Skin"? A Psychological Mediation Framework. *Psychological Bulletin, 135*(5), 707-730.

Hatzenbuehler, M. L. (2011). The social environment and suicide attempts in lesbian, gay, and bisexual youth. *Pediatrics, 127*(5), 896-903.

Hatzenbuehler, M. L., Birkett, M., Van Wagenen, A., & Meyer, I. H. (2014). Protective School Climates and Reduced Risk for Suicide Ideation in Sexual Minority Youths. *American journal of public health, 104*(2), 279-286.

Hatzenbuehler, M. L., Corbin, W. R., & Fromme, K. (2008a). Trajectories and determinants of alcohol use among LGB young adults and their heterosexual peers: results from a prospective study. *Developmental psychology, 44*(1), 81-90.

Hatzenbuehler, M. L., Keyes, K. M., & Hasin, D. S. (2009). State-Level Policies and Psychiatric Morbidity In Lesbian, Gay, and Bisexual Populations. *American journal of public health, 99*(12), 2275-2281.

Hatzenbuehler, M. L., McLaughlin, K. A., & Nolen-Hoeksema, S. (2008b). Emotion regulation and internalizing symptoms in a longitudinal study of sexual minority and heterosexual adolescents. *Journal of child psychology and psychiatry, and allied disciplines, 49*(12), 1270-1278.

Hatzenbuehler, M. L., Pachankis, J. E., & Wolff, J. (2012). Religious climate and health risk behaviors in sexual minority youths: a population-based study. *American journal of public health, 102*(4), 657-663.

Herrell, R., Goldberg, J., True, W. R., Ramakrishnan, V., Lyons, M., Eisen, S., & Tsuang, M. T. (1999). Sexual orientation and suicidality - A co-twin control study in adult men. *Archives of General Psychiatry, 56*(10), 867-874.

Hidaka, Y., Operario, D., Takenaka, M., Omori, S., Ichikawa, S., & Shirasaka, T. (2008). Attempted suicide and associated risk factors among youth in urban Japan. *Social Psychiatry and Psychiatric Epidemiology, 43*(9), 752-757.

Hughes, T., McCabe, S. E., Wilsnack, S. C., West, B. T., & Boyd, C. J. (2010a). Victimization and substance use disorders in a national sample of heterosexual and sexual minority women and men. *Addiction, 105*(12), 2130-2140.

Hughes, T., Szalacha, L. A., & McNair, R. (2010b). Substance abuse and mental health disparities: comparisons across sexual identity groups in a national sample of young Australian women. *Soc Sci Med, 71*(4), 824-831.

Husky, M. M., Guignard, R., Beck, F., & Michel, G. (2013). Risk behaviors, suicidal ideation and suicide attempts in a nationally representative French sample. *Journal of affective disorders, 151*(3), 1059-1065.

Jiang, Y. W., Perry, D. K., & Hesser, J. E. (2010). Adolescent Suicide and Health Risk Behaviors Rhode Island's 2007 Youth Risk Behavior Survey. *American Journal of Preventive Medicine, 38*(5), 551-555.

Johnson, R. M., Kidd, J. D., Dunn, E. C., Green, J. G., Corliss, H. L., & Bowen, D. (2011). Associations Between Caregiver Support, Bullying, and Depressive Symptomatology Among Sexual Minority and Heterosexual Girls: Results from the 2008 Boston Youth Survey. *Journal of school violence, 10*(2), 185-200.

Jorm, A. F., Korten, A. E., Rodgers, B., Jacomb, P. A., & Christensen, H. (2002). Sexual orientation and mental health: results from a community survey of young and middle-aged adults. *The British journal of psychiatry : the journal of mental science, 180*, 423-427.

Julien, D., Jouvin, E., Jodoin, E., L'Archeveque, A., & Chartrand, E. (2008). Adjustment among mothers reporting same-gender sexual partners: a study of a representative population sample from Quebec Province (Canada). *Archives of Sexual Behavior, 37*(6), 864-876.

Kann, L., Olsen, E. O., McManus, T., Kinchen, S., Chyen, D., Harris, W. A., & Wechsler, H. (2011). Sexual identity, sex of sexual contacts, and health-risk behaviors among students in grades 9-12--youth risk behavior surveillance, selected sites, United States, 2001-2009. *Morbidity and mortality weekly report. Surveillance summaries, 60*(7), 1-133.

Kerr, D., Ding, K., Burke, A., & Ott-Walter, K. (2015). An Alcohol, Tobacco, and Other Drug Use Comparison of Lesbian, Bisexual, and Heterosexual Undergraduate Women. *Substance Use & Misuse, 50*(3), 340-349.

Kerr, D. L., Ding, K. L., & Chaya, J. (2014). Substance Use of Lesbian, Gay, Bisexual and Heterosexual College Students. *American Journal of Health Behavior, 38*(6), 951-962.

Kerr, D. L., Santurri, L., & Peters, P. (2013). A comparison of lesbian, bisexual, and heterosexual college undergraduate women on selected mental health issues. *Journal of American college health : J of ACH, 61*(4), 185-194.

King, M., & Nazareth, I. (2006). The health of people classified as lesbian, gay and bisexual attending family practitioners in London: a controlled study. *Bmc Public Health, 6*, 127.

King, M., Semlyen, J., Tai, S. S., Killaspy, H., Osborn, D., Popelyuk, D., & Nazareth, I. (2008). A systematic review of mental disorder, suicide, and deliberate self harm in lesbian, gay and bisexual people. *BMC psychiatry, 8*(1), 70.

Konishi, C., Saewyc, E., Homma, Y., & Poon, C. (2013). Population-level evaluation of school-based interventions to prevent problem substance use among gay, lesbian and bisexual adolescents in Canada. *Preventive Medicine, 57*(6), 929-933.

Kuyper, L., Fernee, H., & Keuzenkamp, S. (2015). A Comparative Analysis of a Community and General Sample of Lesbian, Gay, and Bisexual Individuals. *Arch Sex Behav*.

Lampinen, T. M., McGhee, D., & Martin, I. (2006). Increased risk of "club" drug use among gay and bisexual high school students in British Columbia. *The Journal of adolescent health : official publication of the Society for Adolescent Medicine, 38*(4), 458-461.

Lhomond, B., & Saurel-Cubizolles, M. J. (2006). Violence against women and suicide risk: the neglected impact of same-sex sexual behaviour. *Social Science & Medicine, 62*(8), 2002-2013.

Lhomond, B., Saurel-Cubizolles, M. J., & Michaels, S. (2014). A multidimensional measure of sexual orientation, use of psychoactive substances, and depression: results of a national survey on sexual behavior in france. *Archives of Sexual Behavior, 43*(3), 607-619.

Lian, Q., Zuo, X., Lou, C., Gao, E., & Cheng, Y. (2015). Sexual Orientation and Risk Factors for Suicidal Ideation and Suicide Attempts: a Multi-centre Cross-Sectional Study in Three Asian Cities. *Journal of epidemiology / Japan Epidemiological Association, 25*(2), 155-161.

Lindley, L. L., Walsemann, K. M., & Carter, J. W. (2012). The Association of Sexual Orientation Measures With Young Adults' Health-Related Outcomes. *American journal of public health, 102*(6), 1177-1185.

Loosier, P. S., & Dittus, P. J. (2010). Group Differences in Risk Across Three Domains Using an Expanded Measure of Sexual Orientation. *Journal of Primary Prevention, 31*(5-6), 261-272.

Lucassen, M. F., Clark, T. C., Denny, S. J., Fleming, T. M., Rossen, F. V., Sheridan, J., . . . Robinson, E. M. (2014). What has changed from 2001 to 2012 for sexual minority youth in New Zealand? *Journal of paediatrics and child health*.

Lytle, M. C., De Luca, S. M., & Blosnich, J. R. (2014). The Influence of Intersecting Identities on Self-Harm, Suicidal Behaviors, and Depression among Lesbian, Gay, and Bisexual Individuals. *Suicide and Life-Threatening Behavior, 44*(4), 384-391.

Madge, N., Hawton, K., McMahon, E. M., Corcoran, P., De Leo, D., de Wilde, E. J., . . . Arensman, E. (2011). Psychological characteristics, stressful life events and deliberate self-harm: findings from the Child & Adolescent Self-harm in Europe (CASE) Study. *European child & adolescent psychiatry, 20*(10), 499-508.

Marshal, M. P., Dermody, S. S., Cheong, J., Burton, C. M., Friedman, M. S., Aranda, F., & Hughes, T. L. (2013a). Trajectories of Depressive Symptoms and Suicidality Among Heterosexual and Sexual Minority Youth. *Journal of Youth and Adolescence, 42*(8), 1243-1256.

Marshal, M. P., Dermody, S. S., Shultz, M. L., Sucato, G. S., Stepp, S. D., Chung, T., . . . Hipwell, A. E. (2013b). Mental health and substance use disparities among urban

adolescent lesbian and bisexual girls. *Journal of the American Psychiatric Nurses Association, 19*(5), 271-279.

Marshal, M. P., Dietz, L. J., Friedman, M. S., Stall, R., Smith, H. A., McGinley, J., . . . Brent, D. A. (2011). Suicidality and depression disparities between sexual minority and heterosexual youth: a meta-analytic review. *The Journal of Adolescent Health, 49*(2), 115-123.

Marshal, M. P., Friedman, M. S., Stall, R., King, K. M., Miles, J., Gold, M. A., . . . Morse, J. Q. (2008). Sexual orientation and adolescent substance use: a meta-analysis and methodological review. *Addiction, 103*(4), 546-556.

Marshal, M. P., King, K. M., Stepp, S. D., Hipwell, A., Smith, H., Chung, T., . . . Markovic, N. (2012a). Trajectories of Alcohol and Cigarette Use Among Sexual Minority and Heterosexual Girls. *Journal of Adolescent Health, 50*(1), 97-99.

Marshal, M. P., Sucato, G., Stepp, S. D., Hipwell, A., Smith, H. A., Friedman, M. S., . . . Markovic, N. (2012b). Substance use and mental health disparities among sexual minority girls: results from the Pittsburgh girls study. *Journal of pediatric and adolescent gynecology, 25*(1), 15-18.

Martin-Storey, A., & Crosnoe, R. (2012). Sexual minority status, peer harassment, and adolescent depression. *Journal of Adolescence, 35*(4), 1001-1011.

Mathy, R. M., Cochran, S. D., Olsen, J., & Mays, V. M. (2011). The association between relationship markers of sexual orientation and suicide: Denmark, 1990-2001. *Social Psychiatry and Psychiatric Epidemiology, 46*(2), 111-117.

Matthews-Ewald, M. R., Zullig, K. J., & Ward, R. M. (2014). Sexual orientation and disordered eating behaviors among self-identified male and female college students. *Eating Behaviors, 15*(3), 441-444.

Matthews, D. D., Blosnich, J. R., Farmer, G. W., & Adams, B. J. (2014). Operational Definitions of Sexual Orientation and Estimates of Adolescent Health Risk Behaviors. *LGBT health, 1*(1), 42-49.

Matthews, D. D., & Lee, J. G. L. (2014). A Profile of North Carolina Lesbian, Gay, and Bisexual Health Disparities, 2011. *American journal of public health, 104*(6), E98-E105.

Mattocks, K. M., Sadler, A., Yano, E. M., Krebs, E. E., Zephyrin, L., Brandt, C., . . . Haskell, S. (2013). Sexual victimization, health status, and VA healthcare utilization among lesbian and bisexual OEF/OIF veterans. *Journal of general internal medicine, 28 Suppl 2*, S604-608.

McCabe, S. E., Boyd, C., Hughes, T. L., & d'Arcy, H. (2003). Sexual identity and substance use among undergraduate students. *Substance abuse, 24*(2), 77-91.

McCabe, S. E., Hughes, T. L., Bostwick, W., & Boyd, C. J. (2005). Assessment of difference in dimensions of sexual orientation: implications for substance use research in a college-age population. *Journal of studies on alcohol, 66*(5), 620-629.

McCabe, S. E., Hughes, T. L., Bostwick, W., Morales, M., & Boyd, C. J. (2012). Measurement of sexual identity in surveys: implications for substance abuse research. *Archives of Sexual Behavior, 41*(3), 649-657.

McCabe, S. E., Hughes, T. L., Bostwick, W. B., West, B. T., & Boyd, C. J. (2009). Sexual orientation, substance use behaviors and substance dependence in the United States. *Addiction, 104*(8), 1333-1345.

McLaughlin, K. A., Hatzenbuehler, M. L., Xuan, Z. M., & Conrond, K. J. (2012). Disproportionate exposure to early-life adversity and sexual orientation disparities in psychiatric morbidity. *Child Abuse & Neglect, 36*(9), 645-655.

McMahon, E. M., Reulbach, U., Keeley, H., Perry, I. J., & Arensman, E. (2012). Reprint of: bullying victimisation, self harm and associated factors in Irish adolescent boys. *Social Science & Medicine, 74*(4), 490-497.

McNair, R., Kavanagh, A., Agius, P., & Tong, B. (2005). The mental health status of young adult and mid-life non-heterosexual Australian women. *Australian and New Zealand journal of public health, 29*(3), 265-271.

McNair, R., Szalacha, L. A., & Hughes, T. L. (2011). Health Status, Health Service Use, and Satisfaction According to Sexual Identity of Young Australian Women. *Women's health issues : official publication of the Jacobs Institute of Women's Health, 21*(1), 40-47.

Mercer, C. H., Bailey, J. V., Johnson, A. M., Erens, B., Wellings, K., Fenton, K. A., & Copas, A. J. (2007). Women who report having sex with women: British national probability data on prevalence, sexual behaviors, and health outcomes. *American journal of public health, 97*(6), 1126-1133.

Meyer, I. H. (2003). Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: Conceptual issues and research evidence. *Psychological Bulletin, 129*(5), 674-697.

Meyer, I. H., & Wilson, P. A. (2009). Sampling Lesbian, Gay, and Bisexual Populations. *Journal of Counseling Psychology, 56*(1), 23-31.

Midanik, L. T., Drabble, L., Trocki, K., & Sell, R. L. (2007). Sexual orientation and alcohol use: identity versus behavior measures. *Journal of LGBT health research, 3*(1), 25-35.

Mustanski, B., Andrews, R., Herrick, A., Stall, R., & Schnarrs, P. W. (2014). A syndemic of psychosocial health disparities and associations with risk for attempting suicide among young sexual minority men. *American journal of public health, 104*(2), 287-294.

Needham, B. L. (2012). Sexual Attraction and Trajectories of Mental Health and Substance Use During the Transition from Adolescence to Adulthood. *Journal of Youth and Adolescence, 41*(2), 179-190.

Needham, B. L., & Austin, E. L. (2010). Sexual Orientation, Parental Support, and Health During the Transition to Young Adulthood. *Journal of Youth and Adolescence, 39*(10), 1189-1198.

Newcomb, M. E., Birkett, M., Corliss, H. L., & Mustanski, B. (2014). Sexual orientation, gender, and racial differences in illicit drug use in a sample of US high school students. *American journal of public health, 104*(2), 304-310.

O'Connor, R. C., Rasmussen, S., & Hawton, K. (2009a). Predicting deliberate self-harm in adolescents: a six month prospective study. *Suicide & life-threatening behavior, 39*(4), 364-375.

O'Connor, R. C., Rasmussen, S., & Hawton, K. (2014). Adolescent self-harm: a school-based study in Northern Ireland. *Journal of affective disorders, 159*, 46-52.

O'Connor, R. C., Rasmussen, S., Miles, J., & Hawton, K. (2009b). Self-harm in adolescents: self-report survey in schools in Scotland. *The British journal of psychiatry : the journal of mental science, 194*(1), 68-72.

Olshen, E., McVeigh, K. H., Wunsch-Hitzig, R. A., & Rickert, V. I. (2007). Dating violence, sexual assault, and suicide attempts among urban teenagers. *Archives of pediatrics & adolescent medicine, 161*(6), 539-545.

Orenstein, A. (2001). Substance use among gay and lesbian adolescents. *Journal of Homosexuality, 41*(2), 1-15.

Ortiz-Hernandez, L., Tello, B. L., & Valdes, J. (2009). The association of sexual orientation with self-rated health, and cigarette and alcohol use in Mexican adolescents and youths. *Social Science & Medicine, 69*(1), 85-93.

Oswalt, S. B., & Wyatt, T. J. (2011). Sexual Orientation and Differences in Mental Health, Stress, and Academic Performance in a National Sample of U.S. College Students. *Journal of Homosexuality, 58*(9), 1255-1280.

Pachankis, J. E. (2007). The psychological implications of concealing a stigma: a cognitive-affective-behavioral model. *Psychological Bulletin, 133*(2), 328-345.

Pakula, B., & Shoveller, J. A. (2013). Sexual orientation and self-reported mood disorder diagnosis among Canadian adults. *Bmc Public Health, 13*.

Pearson, J., & Wilkinson, L. (2013). Family Relationships and Adolescent Well-Being: Are Families Equally Protective for Same-Sex Attracted Youth? (vol 42, pg 376, 2013). *Journal of Youth and Adolescence, 42*(9), 1494-1496.

Pelts, M. D., & Albright, D. L. (2014). An Exploratory Study of Student Service Members and Veterans Mental Health Characteristics by Sexual Orientation. *Journal of American college health : J of ACH*, 0.

Pesola, F., Shelton, K. H., & van den Bree, M. B. (2014). Sexual orientation and alcohol problem use among U.K. adolescents: an indirect link through depressed mood. *Addiction, 109*(7), 1072-1080.

Pinhey, T. K., & Millman, S. R. (2004). Asian/Pacific Islander adolescent sexual orientation and suicide risk in Guam. *American journal of public health, 94*(7), 1204-1206.

Plöderl, M., Kralovec, K., & Fartacek, R. (2010). The relation between sexual orientation and suicide attempts in Austria. *Archives of Sexual Behavior, 39*(6), 1403-1414.

Plöderl, M., Sauer, J., & Fartacek, R. (2006). Suizidalität und psychische Gesundheit von homo- und bisexuellen Männern und Frauen. Eine Metaanalyse internationaler Zufallsstichproben. *Verhaltenstherapie & psychosoziale Praxis, 38*(2), 283-302.

Plöderl, M., Wagenmakers, E. J., Tremblay, P., Ramsay, R., Kralovec, K., Fartacek, C., & Fartacek, R. (2013). Suicide risk and sexual orientation: A critical review. *Archives of Sexual Behavior, 42*(5), 715-727.

Pope, H. G., Jr., Ionescu-Pioggia, M., & Pope, K. W. (2001). Drug use and life style among college undergraduates: a 30-year longitudinal study. *The American journal of psychiatry, 158*(9), 1519-1521.

Poteat, V. P., Aragon, S. R., Espelage, D. L., & Koenig, B. W. (2009). Psychosocial concerns of sexual minority youth: complexity and caution in group differences. *Journal of Consulting and Clinical Psychology, 77*(1), 196-201.

Przedworski, J. M., McAlpine, D. D., Karaca-Mandic, P., & VanKim, N. A. (2014). Health and health risks among sexual minority women: an examination of 3 subgroups. *American journal of public health, 104*(6), 1045-1047.

Qin, P. (2005). Suicide risk in relation to level of urbanicity - a population-based linkage study. *International Journal of Epidemiology, 34*(4), 846-852.

Ramsay, R., & Tremblay, P. (2015). Gay, Lesbian, Bisexual & Transgender "Attempted Suicide" Incidences/Risks. Suicidality Studies From 1970 to 2015 Retrieved April, 13, 2015, from http://people.ucalgary.ca/~ramsay/attempted-suicide-gay-lesbian-all-studies.htm#All-Studies

Rath, J. M., Villanti, A. C., Rubenstein, R. A., & Vallone, D. M. (2013). Tobacco Use by Sexual Identity Among Young Adults in the United States. *Nicotine & Tobacco Research, 15*(11), 1822-1831.

Reczek, C., Liu, H., & Spiker, R. (2014). A Population-Based Study of Alcohol Use in Same-Sex and Different-Sex Unions. *Journal of Marriage and Family, 76*(3), 557-572.

Reed, E., Prado, G., Matsumoto, A., & Amaro, H. (2010). Alcohol and drug use and related consequences among gay, lesbian and bisexual college students: Role of experiencing

violence, feeling safe on campus, and perceived stress. *Addictive Behaviors, 35*(2), 168-171.

Remafedi, G., French, S., Story, M., Resnick, M. D., & Blum, R. (1998). The relationship between suicide risk and sexual orientation: Results of a population-based study. *American journal of public health, 88*(1), 57-60.

Renaud, J., Berlim, M. T., Begolli, M., McGirr, A., & Turecki, G. (2010). Sexual orientation and gender identity in youth suicide victims: an exploratory study. *Canadian journal of psychiatry. Revue canadienne de psychiatrie, 55*(1), 29-34.

Rhodes, S. D., McCoy, T. P., Wilkin, A. M., & Wolfson, M. (2009). Behavioral risk disparities in a random sample of self-identifying gay and non-gay male university students. *Journal of Homosexuality, 56*(8), 1083-1100.

Ridner, S. L., Frost, K., & LaJoie, A. S. (2006). Health information and risk behaviors among lesbian, gay, and bisexual college students. *Journal of the American Academy of Nurse Practitioners, 18*(8), 374-378.

Roberts, A. L., Rosario, M., Slopen, N., Calzo, J. P., & Austin, S. B. (2013). Childhood Gender Nonconformity, Bullying Victimization, and Depressive Symptoms Across Adolescence and Early Adulthood: An 11-Year Longitudinal Study. *Journal of the American Academy of Child and Adolescent Psychiatry, 52*(2), 143-152.

Robin, L., Brener, N. D., Donahue, S. F., Hack, T., Hale, K., & Goodenow, C. (2002). Associations between health risk behaviors and opposite-, same-, and both-sex sexual partners in representative samples of Vermont and Massachusetts high school students. *Archives of pediatrics & adolescent medicine, 156*(4), 349-355.

Robinson-Cimpian, J. P. (2014). Inaccurate Estimation of Disparities Due to Mischievous Responders: Several Suggestions to Assess Conclusions. *Educational Researcher, 43*(4), 171-185.

Rosario, M., Reisner, S. L., Corliss, H. L., Wypij, D., Calzo, J., & Austin, S. B. (2014a). Sexual-Orientation Disparities in Substance Use in Emerging Adults: A Function of Stress and Attachment Paradigms. *Psychology of Addictive Behaviors, 28*(3), 790-804.

Rosario, M., Reisner, S. L., Corliss, H. L., Wypij, D., Frazier, A. L., & Austin, S. B. (2014b). Disparities in Depressive Distress by Sexual Orientation in Emerging Adults: The Roles of Attachment and Stress Paradigms. *Archives of Sexual Behavior, 43*(5), 901-916.

Rothman, E. F., Sullivan, M., Keyes, S., & Boehmer, U. (2012). Parents' Supportive Reactions to Sexual Orientation Disclosure Associated With Better Health: Results From a Population-Based Survey of LGB Adults in Massachusetts. *Journal of Homosexuality, 59*(2), 186-200.

Russell, S. T., & Joyner, K. (2001). Adolescent sexual orientation and suicide risk: Evidence from a national study. *American journal of public health, 91*(8), 1276-1281.

Saewyc, E. M., Skay, C. L., Hynds, P., Pettingell, S., Bearinger, L. H., Resnick, M. D., & Reis, E. (2007). Suicidal ideation and attempts in North American school-based surveys: are bisexual youth at increasing risk? *Journal of LGBT health research, 3*(2), 25-36.

Said, D., Kypri, K., & Bowman, J. (2013). Risk factors for mental disorder among university students in Australia: findings from a web-based cross-sectional survey. *Social Psychiatry and Psychiatric Epidemiology, 48*(6), 935-944.

Sandfort, T., de Graaf, R., ten Have, M., Ransome, Y., & Schnabel, P. (2014). Same-Sex Sexuality and Psychiatric Disorders in the Second Netherlands Mental Health Survey and Incidence Study (NEMESIS-2). *LGBT Health, 1*(4), 292-301.

Sandfort, T. G. M., Bakker, F., Schellevis, F., & Vanwesenbeeck, I. (2009). Coping Styles as Mediator of Sexual Orientation-Related Health Differences. *Archives of Sexual Behavior, 38*(2), 253-263.

Sandfort, T. G. M., Bakker, F., Schellevis, F. G., & Vanwesenbeeck, I. (2006). Sexual orientation and mental and physical health status: Findings from a Dutch population survey. *American journal of public health, 96*(6), 1119-1125.

Sandfort, T. G. M., de Graaf, R., Bijl, R. V., & Schnabel, P. (2001). Same-sex sexual behavior and psychiatric disorders - Findings from the Netherlands Mental Health Survey and Incidence Study (NEMESIS). *Archives of General Psychiatry, 58*(1), 85-91.

Savin-Williams, R. C. (2001). Suicide attempts among sexual-minority youths: Population and measurement issues. *Journal of Consulting and Clinical Psychology, 69*(6), 983-991.

Savin-Williams, R. C. (2008). Then and now: Recruitment, definition, diversity, and positive attributes of same-sex populations. *Developmental psychology, 44*(1), 135-138.

Savin-Williams, R. C., Cohen, K. M., Joyner, K., & Rieger, G. (2010). Depressive Symptoms Among Same-Sex Oriented Young Men: Importance of Reference Group. *Archives of Sexual Behavior, 39*(6), 1213-1215.

Schauer, G. L., Berg, C. J., & Bryant, L. O. (2013). Sex differences in psychosocial correlates of concurrent substance use among heterosexual, homosexual and bisexual college students. *American Journal of Drug and Alcohol Abuse, 39*(4), 252-258.

Seil, K. S., Desai, M. M., & Smith, M. V. (2014). Sexual Orientation, Adult Connectedness, Substance Use, and Mental Health Outcomes Among Adolescents: Findings From the 2009 New York City Youth Risk Behavior Survey. *American journal of public health, 104*(10), 1950-1956.

Shaffer, D., Fisher, P., Hicks, R. H., Parides, M., & Gould, M. (1995). Sexual orientation in adolescents who commit suicide. *Suicide & life-threatening behavior, 25 Suppl*, 64-71.

Shields, J. P., Whitaker, K., Glassman, J., Franks, H. M., & Howard, K. (2012). Impact of Victimization on Risk of Suicide Among Lesbian, Gay, and Bisexual High School Students in San Francisco. *Journal of Adolescent Health, 50*(4), 418-420.

Silenzio, V. M. B., Pena, J. B., Duberstein, P. R., Cerel, J., & Knox, K. L. (2007). Sexual orientation and risk factors for suicidal ideation and suicide attempts among adolescents and young adults. *American journal of public health, 97*(11), 2017-2019.

Skegg, K., Nada-Raja, S., Dickson, N., Paul, C., & Williams, S. (2003). Sexual orientation and self-harm in men and women. *American Journal of Psychiatry, 160*(3), 541-546.

Stall, R., Friedman, M., & Catania, J. A. (2008). Interacting epidemics and gay men's health: a theory of syndemic production among urban gay men. In R. J. Wolitski, R. Stall & R. O. Valdiserri (Eds.), *Unequal opportunity: Health disparities affecting gay and bisexual men in the United States* (pp. 251-274). New York: Oxford University Press.

Steele, L. S., Ross, L. E., Dobinson, C., Veldhuizen, S., & Tinmouth, J. M. (2009). Women's Sexual Orientation and Health: Results from a Canadian Population-Based Survey. *Women & Health, 49*(5), 353-367.

Stone, D. M., Luo, F., Lippy, C., & McIntosh, W. L. (2014a). The Role of Social Connectedness and Sexual Orientation in the Prevention of Youth Suicide Ideation and Attempts Among Sexually Active Adolescents. *Suicide & life-threatening behavior*.

Stone, D. M., Luo, F. J., Ouyang, L. J., Lippy, C., Hertz, M. F., & Crosby, A. E. (2014b). Sexual Orientation and Suicide Ideation, Plans, Attempts, and Medically Serious Attempts: Evidence From Local Youth Risk Behavior Surveys, 2001-2009. *American journal of public health, 104*(2), 262-271.

Strutz, K. L., Herring, A. H., & Halpern, C. T. (2015). Health Disparities Among Young Adult Sexual Minorities in the US. *American Journal of Preventive Medicine, 48*(1), 76-88.

Taliaferro, L. A., & Muehlenkamp, J. J. (2014). Risk and protective factors that distinguish adolescents who attempt suicide from those who only consider suicide in the past year. *Suicide & life-threatening behavior, 44*(1), 6-22.

Talley, A. E., Hughes, T. L., Aranda, F., Birkett, M., & Marshal, M. P. (2014). Exploring Alcohol-Use Behaviors Among Heterosexual and Sexual Minority Adolescents: Intersections With Sex, Age, and Race/Ethnicity. *American journal of public health, 104*(2), 295-303.

Teasdale, B., & Bradley-Engen, M. S. (2010). Adolescent Same-Sex Attraction and Mental Health: The Role of Stress and Support. *Journal of Homosexuality, 57*(2), 287-309.

Tjepkema, M. (2008). Health care use among gay, lesbian and bisexual Canadians. *Health reports, 19*(1), 53-64.

Tremblay, P. (n.d.). Info Source: Gay & Bisexual Male Suicide Problems (Part 4 of 6: Abstracts/Highlights) Retrieved April, 29, 2015, from http://www.youth-suicide.com/gay-bisexual/gbsuicide1.htm

Tucker, J. S., Ellickson, P. L., & Klein, D. J. (2008). Understanding differences in substance use among bisexual and heterosexual young women. *Women's health issues : official publication of the Jacobs Institute of Women's Health, 18*(5), 387-398.

Ueno, K. (2010a). Mental Health Differences between Young Adults with and without Same-Sex Contact: A Simultaneous Examination of Underlying Mechanisms. *Journal of Health and Social Behavior, 51*(4), 391-407.

Ueno, K. (2010b). Same-Sex Experience and Mental Health during the Transition between Adolescence and Young Adulthood. *Sociological Quarterly, 51*(3), 484-510.

Villarroel, M. A., Turner, C. F., Eggleston, E., Al-Tayyib, A., Rogers, S. M., Roman, A. M., . . . Gordek, H. (2006). Same-Gender Sex in the United States Impact of T-Acasi on Prevalence Estimates. *Public Opin Q, 70*(2), 166-196.

Wang, J., Dey, M., Soldati, L., Weiss, M. G., Gmel, G., & Mohler-Kuo, M. (2014). Psychiatric disorders, suicidality, and personality among young men by sexual orientation. *European Psychiatry, 29*(8), 514-522.

Wang, J., Hausermann, M., Wydler, H., Mohler-Kuo, M., & Weiss, M. G. (2012). Suicidality and sexual orientation among men in Switzerland: Findings from 3 probability surveys. *Journal of Psychiatric Research, 46*(8), 980-986.

Wichstrom, L., & Hegna, K. (2003). Sexual orientation and suicide attempt: A longitudinal study of the general Norwegian adolescent population. *Journal of abnormal psychology, 112*(1), 144-151.

Williams, K. A., & Chapman, M. V. (2011). Comparing Health and Mental Health Needs, Service Use, and Barriers to Services among Sexual Minority Youths and Their Peers. *Health & Social Work, 36*(3), 197-206.

Zhao, Y., Montoro, R., Igartua, K., & Thombs, B. D. (2010). Suicidal ideation and attempt among adolescents reporting "unsure" sexual identity or heterosexual identity plus same-sex attraction or behavior: forgotten groups? *Journal of the American Academy of Child and Adolescent Psychiatry, 49*(2), 104-113.

Ziyadeh, N. J., Prokop, L. A., Fisher, L. B., Rosario, M., Field, A. E., Camargo, C. A., & Austin, S. B. (2007). Sexual orientation, gender, and alcohol use in a cohort study of US adolescent girls and boys. *Drug and alcohol dependence, 87*(2-3), 119-130.