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Sexual Health Studies in Gay and Lesbian People: A Critical Review of the Literature

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ABSTRACT

Background: The subject of gay and lesbian sexual health seems to be highly understudied, at least partially due to general limitations inherent in the studies of sexuality as well as heteronormative bias and difficulties in reaching out to these populations.

Aim: To critically review the studies on gay and lesbian sexual health in order to identify the existing gaps and biases in the scope and general construction of the published research.

Methods: The dataset comprised 556 peer-reviewed articles identified through Medline search. Key studies characteristics were extracted according to the codebook developed for this study and analyzed descriptively.

Outcomes: The outcomes included: research methodology, study design, sampling, research topic and diversity inclusion in studied populations.

Results: The majority of the studies were quantitative (70.5%), cross-sectional (83.6%) and used convenience sampling (83.2%). Most papers focused on HIV/STI risk behaviors, vulnerabilities and risk navigation (26.3%). The least often found topic captured the sexual function of gay and lesbian participants in older age (0.5%). Over 68% of papers relied on male samples and studies on female-only samples comprised less than 13%. Most studies did not recruit a specific age group (77.7%) and included information about ethnicity of study participants (62%). Information about education (58.7%) or other indicators of socioeconomic status (52.8%) was less often reported.

Clinical Translation: The methodological limitations of prevailing study designs, sampling procedures and the composition of samples, as well as extensive areas of omission confine the clinical utility of existing research.

Strengths & Limitations: This study offers critical insights into the most significant challenges associated with studies on gay and lesbian sexual health. Medline-only database search, the inclusion of English-written papers exclusively and limited scope (gay and lesbian sexuality only) of the review constitute the most significant limitations.

Conclusions: Gay and lesbian sexual health is an understudied field characterized by primary focus on HIV/STI and paucity of higher quality research including diverse subpopulations. **Mijas M, Grabski B, Blukacz M, et al. Sexual Health Studies in Gay and Lesbian People: A Critical Review of the Literature. J Sex Med 2021;18:1012–1023.**

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Key Words: Gay; Lesbian; Sexual Health; Sexual Function; Sexual Satisfaction; Sexual Dysfunction

INTRODUCTION

Studies on sexual health entail numerous conceptual, methodological and ethical challenges.[1] Among issues raised at the conceptual level are inconsistent or even non-existent use of theory,[2] framing sexual health primarily in terms of prevention of adverse health outcomes or locating sexuality mainly within the context of procreation instead of exploring sexual pleasure and quality of sexual experience as crucial elements of sexual health in diverse populations.[3] Methodological issues are most often associated with a predominance of study designs which provide low-level empirical evidence such as cross-sectional research, the use of non-probability sampling and limited accuracy of measurement

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due to self-report, retrospective and non-validated instruments to measure the outcomes of interest.[4] Sexuality and sexual health are also intensely contextualized by culture, history and politics; this contributes to multiple ethical dilemmas and requires a critical approach not only when designing and conducting research exploring these phenomena but also when evaluating and incorporating their results into clinical practice.[5] All these issues are particularly salient in studies on sexual health in LGBTQ (lesbian, gay, bisexual, transgender and queer) individuals.

Theory Use and Methodological Diversity in Studies on Gay and Lesbian Sexual Health

Most scholars would agree that theories, by providing a framework for conceptualizing and interpreting research findings, provide an impetus for the advancement of scientific disciplines.[6,7] The problem of inconsistent or even absent theory use in sexuality studies associated with relatively little research being designed to test theoretical hypotheses and support the development of the theory[2] has surfaced repeatedly for several decades and has also been raised concerning LGBTQ studies criticized as predominantly atheoretical.[7] An additional challenge recognized in the literature on LGBTQ issues is the heteronormativity (the assumption that heterosexuality is the natural or default way of expressing sexuality[8]), heterosexism (prejudice privileging heterosexuality over sexual diversity[9]), cisnormativity (the assumption that gender identity congruent with assigned gender constitutes a natural or default way of experiencing gender[10]), and cissexism (prejudice privileging cisgender identities and gender expressions over gender diversities[11]) of various theories which result in biased or otherwise limited understanding of experiences of LGBTQ individuals.[7,12] In the realm of sexual medicine this leads for example to the reliance on conceptualizations of sexual problems derived from studies on heterosexual samples and application of sexual (dys)function measures which were neither validated nor intended for use in LGBTQ populations.[13]

Relatively few theories and conceptual frameworks provide tools to problematize and explore unique problems of sexually diverse populations such as coming-out or the impact of prejudice and discrimination on health. One such framework, explicitly designed to understand mental health inequalities affecting sexually diverse populations but later expanded to capture physical and sexual health disparities, is minority stress theory.[14] This theory emphasizes the impact of various internal (proximal) and external (distal) unique, chronic and socially based stressors, as well as protective factors such as social support, on the health of minority populations; it has quickly become one of the most crucial research frameworks in the field of LGBTQ health.[14] For example, a recent review focusing on theory use in studies on LGBTQ aging revealed that minority stress framework was the most often applied in this area of research.[15] The extent to which minority stress perspective inspires studies on gay and lesbian sexual health has not yet been explored.

Research on LGBTQ health has also historically focused on health risks and health inequalities affecting this population and mostly investigated individual-level determinants of health.[12] This approach has been criticized as obscuring both the role of social and structural factors in producing health inequalities and ignoring how members of LGBTQ communities maintain their health across the life course.[16] A similar primary interest in health adversities with a particular focus on HIV (Human Immunodeficiency Virus) and STI (Sexually Transmitted Infections) was described in applied sexual health research[17] which was also criticized for ignoring the role of socio-cultural contexts for sexual health and the construction of 'sexual risk' as residing in the individual.[18] Given that much of the contemporary knowledge on LGBTQ health has been produced in the context of the HIV epidemic, this area of research has been dominated by quantitative, cross-sectional investigations of HIV vulnerabilities and 'risk behaviors' which is particularly evident in studies on sexual minority men.[19] Although the production and application of knowledge depend on many factors, quantitative research often contributes to minimizing the voices of stigmatized and underpowered populations.[20] Qualitative studies, as they allow for more in-depth exploration of lived experience, seem to be better positioned to capture social inequalities.[20,21] Another issue, particularly important for clinicians assessing the strength and reliability of research findings is the level of evidence which largely depends on, but is not limited to, study design.[4] Both sexual medicine and research conducted in LGBTQ samples are dominated by low level evidence studies and most often employ cross sectional design.[4,7,19] Bringing more methodological diversity to the field, mixing research approaches and strategies (e.g. incorporating qualitative data in experimental studies which generate stronger empirical evidence[22]) seem vital for comprehensively addressing the complexities of LGBTQ sexual health.

Defining and Reaching the Population of Interest

Lesbian and gay individuals have been recognized in the literature as so-called hard-to-reach populations, which poses additional challenges associated with recruiting them to participate in research.[23] Hard-to-reach populations have been described as rare, hard to identify or hidden for instance due to social stigmatization.[24] Adequate sampling constitutes a crucial component of designing and conducting research with such populations.[25]

Most studies on LGBTQ samples, with sexual health research being no exception, employ non-probability sampling procedures such as convenience sampling.[19] To limit potential biases associated with non-probability sampling researchers apply various sampling techniques such as respondent-driven sampling (RDS) in which the researcher selects a small number of 'seeds' who participate in the study and then recruit other members of their social networks.[26] It is, however, important to emphasize that sampling procedures should be driven by the aims of the study and probability sampling, although crucial to correctly estimate the prevalence

of various phenomena in the studied population, is not mandatory to explore relationships between selected variables.[25]

Another critical issue associated with sampling gay and lesbian participants is defining the population of interest. Sexual orientation or sexualities, in general, are multidimensional constructs and can be conceptualized through various dimensions such as self-defined identity, sexual behavior, sexual fantasies or attraction to particular (if any) gender (or genders), as well as through various combinations of these dimensions.[27] Given that these aspects of sexuality are not always congruent, the way sexuality is conceptualized in research may have fundamental significance to obtained results and should be driven by research aims and hypotheses.[19,28] A recent snapshot review of studies on sexual minority men's health revealed that specific conceptualizations of sexual orientation are also more popular than others across studied health domains.[19] For instance, studies focused on the sexual health of sexual minority men most often defined sexual orientation behaviorally, and studies on their mental health relied predominantly on self-defined sexual identities.[19] Additionally, behavioral terms such as men who have sex with men (MSM) or women who have sex with women (WSW) have been coined and introduced to the sexual health literature to reduce the stigma associated with HIV and popularize the notion that certain behaviors but not identities are associated with higher HIV infection risk.[29] These categories have been, however, subject to critique as not only deflecting attention from social dimensions of sexuality, which are crucial to an understanding of sexual health and better reflected by self-defined sexual identities, but also as being used in a racialized way.[29] Ideally, studies aiming at enhancing our understanding of sexual health in sexually diverse populations should more comprehensively describe the socio-cultural background of study participants including questions on both sexual behaviors, self-identification and sociosexual affiliations.[29]

Aims

Our critical review was aimed at capturing methodological challenges and summarizing key trends in studies on the sexual health of gay and lesbian individuals. We focused on issues associated with employed methodologies, dominating study designs and preferred sampling protocols, as well as a thematic focus in this field of inquiry. We also explored the extent to which research on gay and lesbian sexual health employed stigma/minority stress perspective, whether they focused on resilience or health risks and disparities, and how categories defining the population of interest (such as 'gay', 'lesbian', 'heterosexual' and 'homosexual') were applied in reviewed studies. We were interested in (1) whether the study sample was characterized with categories referring to the sexualities/sexual orientations of study participants (such as 'gay', 'lesbian', 'bisexual', 'heterosexual'); (2) whether information on how they were conceptualized was provided in the paper and (3) on what these conceptualizations were based. Although our analysis was framed predominantly as focusing on gay and lesbian individuals, we also explored inclusivity referring to gender and sexual identities of study participants, as well as other intersecting statuses which are historically less represented in LGBTQ research such as ethnicity, education and other indicators of socioeconomic status.[7]

MATERIALS AND METHOD

Search Strategy and Study Selection

The literature on the sexual health of gay and lesbian people was searched using Medline database. The search strategy is depicted in Figure 1.

We included studies that focused on broadly defined sexual health and sampled gay and lesbian participants and papers on

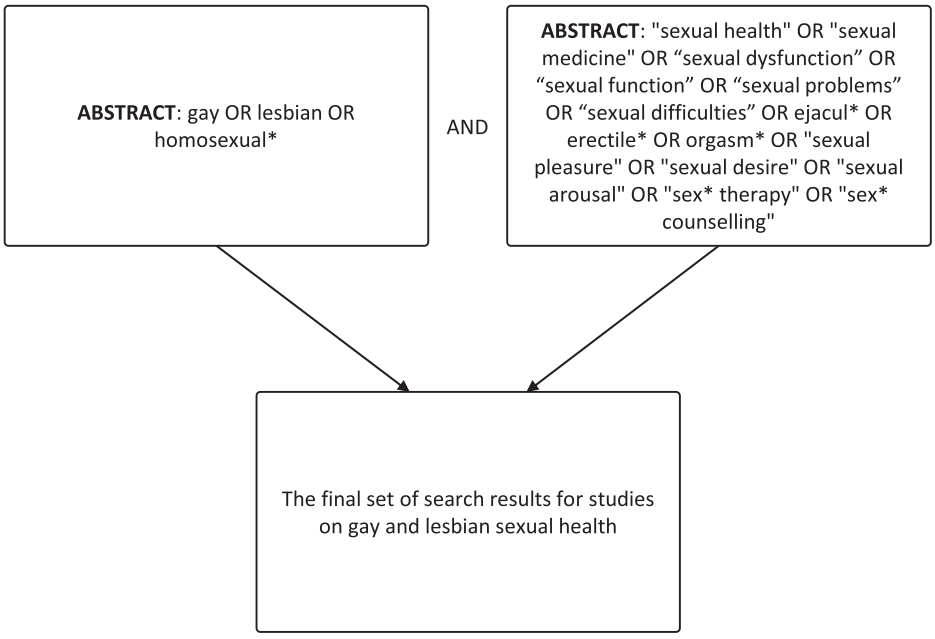

Figure 1. The search strategy used for the Medline database.

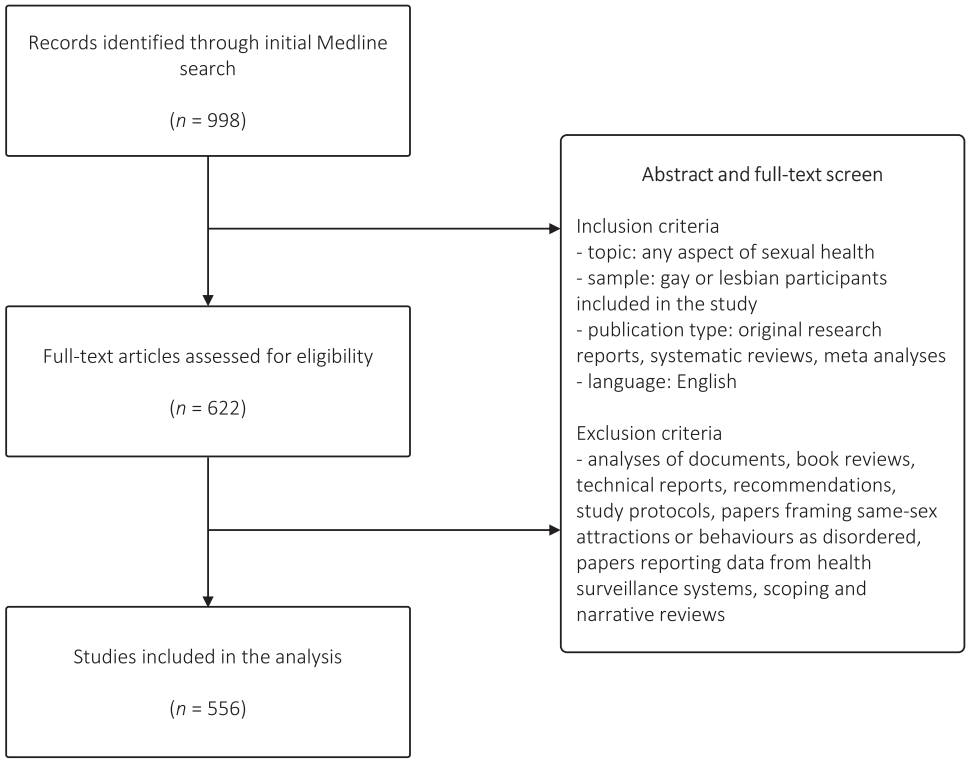

Figure 2. Search flow diagram.

the sexual health of gay and lesbian participants in the case of systematic reviews. Since gender identity is a construct separate from sexual identity, we did not exclude studies on transgender, and non-binary participants only as long as their sexual identities were reported. We included only papers written in English. Inclusion criteria, types of excluded texts and search flow are depicted in Figure 2. The initial search, performed on 2nd of March 2020, yielded 998 records, of which 376 were excluded using eligibility criteria during the title and abstract screen and further 66 during the full-text screen. The final study sample consisted of 556 papers, of which six papers were coded based on information available in the abstract as we were not able to access the full-text version of these papers.

Data Extraction Process

Two reviewers (M.M. and M.B.) performed data extraction independently for a randomly selected subsample of articles included in the review to compare if the results were consistent. Any inconsistencies were discussed and resolved by both reviewers at that point. Given satisfactory consistency of extracted data, one of the reviewers (M.M.) finished the data extraction for the rest of the papers included in the review. Since of interest were broadly defined methodological challenges associated with studies on sexual health of gay and lesbian participants the following key study characteristics were coded: type of research (qualitative, quantitative, mixed methods, reviews), study design (cross-sectional, cohort study, case-control study, randomized trial, intervention study, systematic review/meta-analysis), sampling (convenience, Respondent Driven Sampling, purposive sampling, random/probability sampling, stratified sampling and clustered sampling), application of minority stress theoretical framework in study design (study designed within the minority stress framework, study not designed within this framework but addressing stigma as one of the factors affecting sexual health, study with no significant references to the concept of stigma/minority stress) and focus on resilience and health maintaining strategies vs health risks and disparities (focus on resilience, focus on health risks/disparities, unclear/other). Also distinguished and coded were the following 19 research topics:

1. Studies on sexual health service access, barriers, needs and utilization (including HIV/STI testing utilization and comparisons of sexual health screening models)
2. HIV and other STI risk behaviors, vulnerabilities and risk navigation (e.g. studies on condom use)
3. Studies on clinical interventions aimed at preventing HIV and STI (e.g. vaccination, pre-exposure prophylaxis (PrEP), post-exposure prophylaxis (PEP), treatment as prevention (TasP))
4. Studies on prevalence and epidemiological trends for HIV and other STI
5. Studies on STI and HIV treatment (e.g. investigating treatment effectiveness)
6. Studies investigating the effectiveness of behavioral interventions to prevent HIV or STI
7. Studies on living with HIV, sexual function or quality of life of people living with HIV

8. Studies on chemsex and sexualized drug use
9. Studies on sexual education resources and knowledge about HIV/STI
10. Studies on sexual compulsivity, or sexual violence/abuse
11. Studies on intersections of general and sexual health (e.g. studies on chronic health issues and their associations with sexual health)
12. Cancer and sexual health (e.g. sexual function and sexual quality of life of breast cancer or prostate cancer survivors)
13. Studies on sexual dysfunctions and sexual problems
14. Studies on same-sex intimate relationships and love
15. Studies on psychosexual function and sexual practices among lesbian and gay participants
16. Studies on sexual function in the older age
17. Basic research on sexual health and sexual function (e.g. neural basis for sexual attraction)
18. Studies on the methodology of sex research, methods in sexual health studies
19. Other, not listed above or challenging to categorize as one topic.

A separate set of codes were dedicated to capturing characteristics of studied samples and sexual and gender diversity included in analyzed papers. A first variable captured the gendered composition of the study sample (men, women, mixed sample, not reported). A second variable indicated whether transgender or cisgender or both groups of participants were explicitly included in the study (transgender participants only, transgender and cisgender participants, study sample explicitly described as consisting of only cisgender participants, no information if study sample consisted of cisgender or transgender participants, unclear/other). For the studies including transgender participants, a separate code captured if transgender participants' sexual identities were included and explicitly described or not (yes, no, unclear/other). These were followed by codes depicting if study authors characterized study samples with categories commonly regarded as depicting sexual identities/orientations such as 'gay', 'bisexual', 'lesbian', 'homosexual', 'heterosexual' (yes, no, unclear) and if they provided any clues on how they had operationalized these concepts (yes, no, unclear/other). Information on how these categories were conceptualized in the study was also extracted (as sexual identity, sexual attraction, sexual behavior, sexual fantasies, composite of two or more, unclear/other). Another code illustrated if participants who revealed to, or were categorized by, study authors as having minority sexual identities/orientations were grouped in the analyses (yes, no, unclear/other) and if sexual identities other than bisexual, heterosexual and gay/lesbian (such as unlabeled, queer, pansexual, unsure, questioning, other) were included in the study design (yes, no, unclear/other).

Finally, information of ethnicity, education and other indicators of the socioeconomic status of study participants was extracted if it was reported in the paper (yes, no, unclear/other), what the percentage was of White/Caucasian participants in the sample (if applicable) and whether the paper was focused on any particular age groups (such as adolescents, young adults, both adolescents and young adults, older adult participants).

Data Analysis

Analysis of the data extracted from reviewed articles was performed and figures were created using STATA/SE 14.2. The data extracted from reviewed articles was analyzed descriptively.

RESULTS

Data on research methodology, study design, sampling, application of minority stress theoretical framework, and focus of each article are displayed in Table 1. The majority of studies (70.5%) were quantitative, cross-sectional (83.6%) and used convenience sampling (83.2%). Most of the reviewed papers did

Table 1. Description of type of research, study design and other characteristics of reviewed papers

	n	%
Type of research (n = 556)		
Qualitative	112	20.1
Quantitative	392	70.5
Mixed methods	43	7.7
Reviews	8	1.4
Other/unclear	1	.18
Study design (n = 555)		
Cross-sectional	464	83.6
Cohort study	47	8.5
Case-control study	7	1.3
Randomized trial	9	1.6
Intervention study	13	2.3
Systematic review/meta-analysis	8	1.4
Other/unclear	7	1.3
Sampling (n = 554)		
Convenience	461	83.2
Respondent driven sampling	15	2.7
Purposive sampling	15	2.7
Random/probability sampling	45	8.1
Stratified sampling	3	.54
Clustered sampling	5	.90
Other/unclear	10	1.8
Minority stress framework (n = 550)		
Designed within the minority stress framework	73	13.3
Addressing stigma as one of the factors affecting sexual health	120	21.8
No significant references to the concept of stigma or minority stress	356	64.7
Other/unclear	1	.18
The focus of the study (n = 556)		
Resilience	52	9.3
Health risks and disparities	387	69.6
Unclear/other	117	21.0

Table 2. Description of topics distinguished in reviewed papers

Topics distinguished (n = 556)	n	%
1. Sexual health service access, barriers, needs and utilization	67	12.0
2. HIV/STI risk behaviors, vulnerabilities and risk navigation	146	26.3
3. Clinical interventions aimed at preventing HIV/STI (e.g. PrEP, TaSP, vaccination)	35	6.3
4. HIV/STI prevalence and epidemiological trends	20	3.6
5. STI and HIV treatment	5	.90
6. Behavioral interventions to prevent HIV or STI	27	4.8
7. Living with HIV	9	1.6
8. Chemsex and sexualized drug use	39	7.0
9. Sexual education resources and knowledge about HIV/STI	16	2.9
10. Sexual compulsivity, or sexual violence/abuse	14	2.5
11. Intersections of general and sexual health	8	1.4
12. Cancer and sexual health	18	3.2
13. Sexual dysfunctions and sexual problems in sexual minority samples	35	6.3
14. Love and same-sex intimate relationships	10	1.8
15. Psychosexual function, sexual practices	49	8.8
16. Sexual function in the older age	3	.54
17. Basic research on sexual health and sexual function	29	5.2
18. Studies on the methodology of sex research	21	3.8
19. Other	5	.90

not significantly address stigma or minority stress as factors affecting sexual health (64.7%) and focused predominantly on health risks and health disparities (69.6%).

Additionally, nine studies were identified which were explicitly framed within the intersectionality perspective. Most of them explored intersections of sexuality with race/ethnicity which usually were accompanied by other characteristics as well, such as gender, HIV status, religion, cultural identity, geographical location or socioeconomic status. One study focused predominantly on intersections of age, sexuality and health status.

Table 2 summarizes topics distinguished in the reviewed sample of articles. Most papers focused on HIV/STI risk behaviors, vulnerabilities and risk navigation (26.3%), and sexual health service access, barriers and utilization (12.0%). The third most represented category included studies on the psychosexual function and sexual practices of gay and lesbian participants (8.8%). The least often coded topic captured the sexual function of gay and lesbian participants in the older age (0.54%).

Figure 3 depicts the median, lower quartile, upper quartile, minimum and maximum for the year of publication within each of the distinct thematic categories. The topics characterized by the highest median year of publication, reflecting most recent interest from scholars, are dedicated to clinical interventions aimed at preventing HIV/STI (median = 2018, IQR = 3 years), the sexual function of lesbian and gay participants in the older age (median = 2017, IQR = 5 years) and sexual health of cancer patients (median = 2016.5, IQR = 4 years). The shortest publication record also characterizes the topic of sexual function in older adult gay and lesbian individuals (understood as the number of years between the earliest and latest publication on the topic), i.e. five years. The thematic category with the least recent publications captures studies focused on STI and HIV treatment

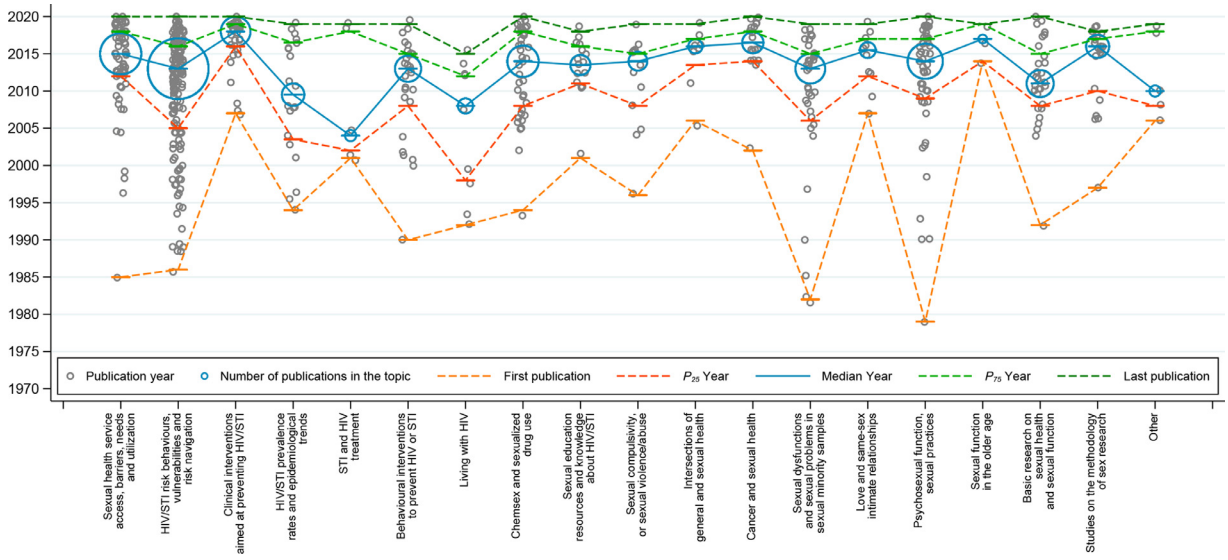

Figure 3. Topics and year of publication.
Note: Gray circle markers represent individual publications; blue circle markers represent the number of publications on the topic and are located at median publication year. (Figure 3 is available in color online at www.jsm.jsexmed.org.)

Table 3. Information on gender and sexual diversity in reviewed articles

	n	%
Gendered composition of the study sample (n = 547)		
Men	377	68.9
Women	68	12.4
Mixed sample	102	18.6
Gender diversity in reviewed articles (n = 543)		
Transgender participants only	6	1.1
Transgender and cisgender participants included	57	10.5
Cisgender participants only	67	12.3
No explicit information if the study sample included cisgender or transgender participants	403	74.2
Unclear/other	10	1.8
Sexual identities of transgender participants (n = 63)		
Included	42	66.6
Not included	14	22.2
Unclear/other	7	11.1
References to sexual orientations of participants (n = 542)		
Yes	506	93.4
No	36	6.6
Information about how sexual orientation is operationalized (n = 506)		
Yes	413	81.6
No	92	18.2
Unclear/other	1	.20
Operationalization of sexual orientation used (n = 413)		
Sexual identity	325	78.7
Sexual fantasies	3	.73
Sexual attraction	2	.48
Sexual behaviors	16	3.9
Composite of two or more dimensions	64	15.5
Unclear/other	3	.73
Grouped identities/orientations (n = 506)		
Yes	200	39.5
No	258	51.0
Other/unclear	48	9.5
Sexual diversity (n = 325)		
More than three basic orientations/identities	99	30.5
Three or less basic orientations/identities	222	68.3
Unclear/other	4	1.2

(median = 2004, IQR = 16 years) and various aspects of living with HIV in gay and lesbian people (median = 2008, IQR = 14 years).

Table 3 displays information on how gender and sexual diversities were captured in reviewed articles. Over 68.9% of reviewed papers relied on male samples, and studies on female samples comprised less than 13% of reviewed papers. Figure 4 displays the gendered composition of study samples across particular topics. Areas of research with the highest representation of studies focusing on women's sexual health or including mixed samples are sexual function in older age (100% of studies with women-only or mixed samples), intersections of general and sexual health (57.1% of studies with women-only or mixed samples), sex-ed resources and knowledge about HIV/STI (56.2% of studies with women-only or mixed samples), and psychosexual function and sexual practices (55.1% of studies with women-only or mixed samples). Among topics with a disproportionate percentage of male-only samples were: chemsex and sexualized drug use (97.4% of studies with male-only samples), behavioral interventions to prevent HIV/STI (88.0% of studies with male-only samples) and cancer and sexual health (83.3% of studies with male-only samples).

Most studies did not define whether studied samples included cisgender or transgender participants (74.2%) but of those which included transgender participants as much as 66.6% separately measured their sexual identity/orientation. Most studies described participants using categories that referred to their sexual orientations (93.4%), and defined how these constructs were conceptualized (81.6%). Categories such as 'gay', 'bisexual', 'lesbian', 'heterosexual' or 'homosexual' most often were conceptualized and measured as self-reported sexual identity (78.7%) or composite of two or more dimensions such as sexual attractions, behaviors or identities (15.5%). Finally, 30.5% of studies which relied on self-reported sexual identities) included more diverse sexual identities than heterosexual, homosexual and bisexual (even if they were simply described as 'other'). Half of the reviewed studies also did not combine participants with various sexual orientations into larger groups for data analysis (51%).

Only 62% of studies reported information about the ethnic composition of the study sample, and these studies relied predominantly on White/Caucasian samples (the median % of White participants was 68.5%).

Most studies did not recruit a specific age group (77.7%). Adolescents were recruited by 4.6% of studies, young adults by 3.5% of reviewed studies, combined adolescents and young adults were targeted by 8.1% of studies and older adult participants by 3.9% of research. Most studies reported information about the education of the sample (58.7%) but did not report additional information about the socioeconomic status of study participants (52.8%).

Additional analyses of topics investigated within two distinguished age groups which included adolescents are depicted in Figure 5. The most often investigated topic in studies sampling adolescents were HIV/STI risk behaviors, vulnerabilities and risk navigation (36.2%), sexual education resources and knowledge about HIV/STI (17.4%) and psychosexual function, sexual practices (10.1%). In case of studies sampling older gay and lesbian adult participants the most often investigated topic was cancer and sexual health (57.1%), HIV/STI risk behaviors, vulnerabilities and risk navigation (19%) and sexual function in the older age (14.3%).

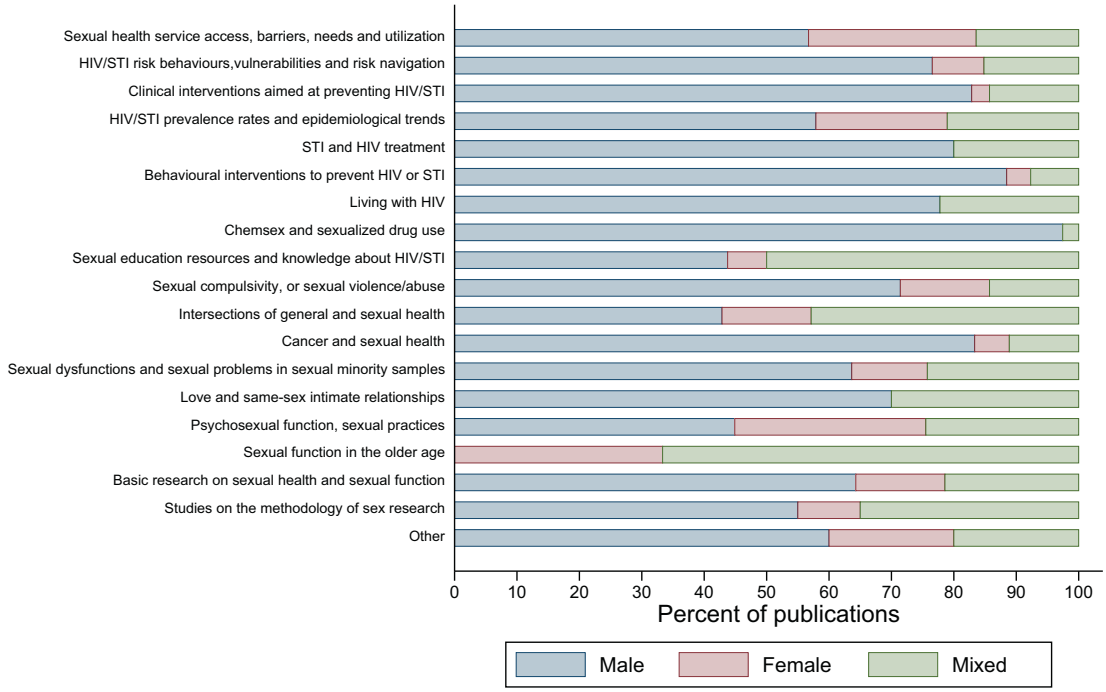

Figure 4. Gender composition of study samples across studied topics. (Figure 4 is available in color online at www.jsm.jsexmed.org.)

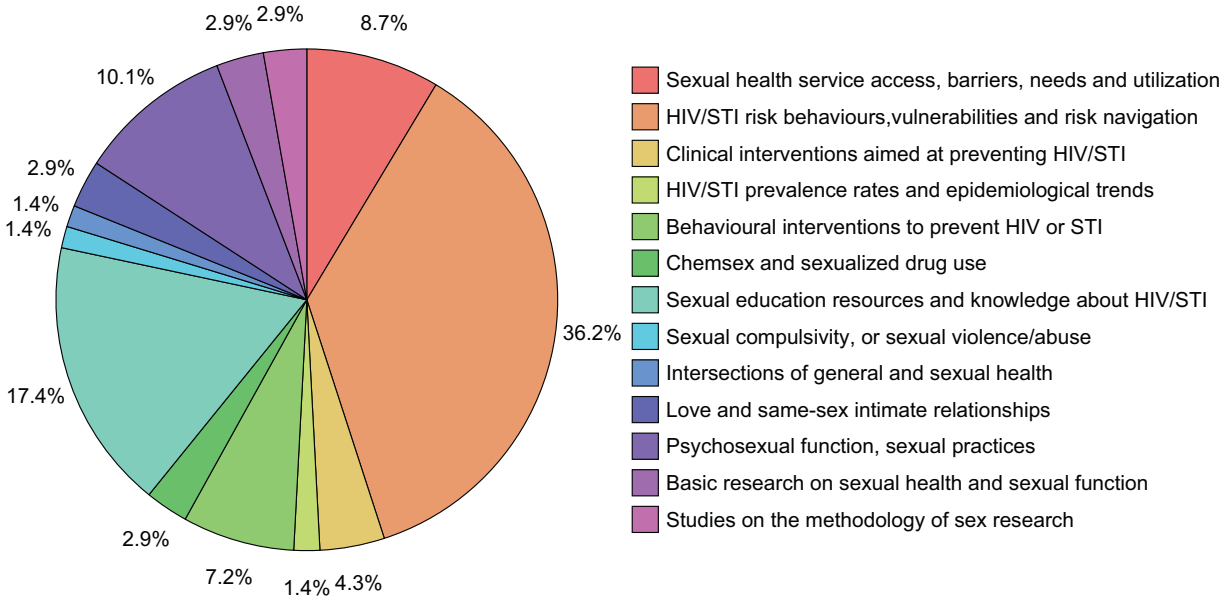

Figure 5. Frequency of topics investigated in studies sampling adolescents and both adolescents and young adults. (Figure 5 is available in color online at www.jsm.jsexmed.org.)

DISCUSSION

This paper aims to summarize the key trends and identify methodological challenges associated with studies on gay and lesbian sexual health. The focus was on both general characteristics of studies included in the review such as type of research, study design and sampling, as well as the extent to which research employed stigma/minority stress perspective and whether they emphasized resilience in this population or health risks and health disparities. Information about topics investigated in reviewed research, gender composition of studied samples, the inclusion of gender and sexual diversities and most often applied

conceptualizations of sexual orientation was also extracted. Finally, whenever possible, investigated were the age and ethnic composition of studied samples to reflect on other possible areas of exclusion.

The majority of investigated studies were cross-sectional (83.6%) followed by cohort studies (8.5%). Only 1.4% of studies were classified as systematic reviews or meta-analyses and 1.6% as randomized trials. Given that during initial assessment scoping reviews, case studies and clinical commentaries were excluded from the sample, these numbers do not represent precise estimates of the level of evidence for the literature on sexual health in gay and lesbian people which in fact could be smaller. Strength and reliability of evidence depend mainly on the study design which is reflected by systems for grading levels of evidence such as the Oxford Centre for Evidence-Based Medicine Levels of Evidence or the Grading of Recommendations Assessment, Development, and Evaluation system.[4] According to these systems single cross-sectional studies and observational studies, in general, constitute a relatively low level of evidence due to confounding, selection and recall bias.[30] Assessment of their results' validity also depends on additional factors such as the quality of methods of data collection, sampling procedure or magnitude of the observed effects. It is worth noting, that observational studies dominate the medical literature and form the basis not only for further investigations but also for therapeutic decisions.[31]

Most of the studies relied on convenience sampling (83.2%), leading to limited generalizability of their results. A recent comparison of sociodemographic and behavioral differences between men who have sex with men participating in convenience and national probability sample surveys revealed that convenience samples were younger, better educated and included a more substantial proportion of men identified as gay.[32] Men in convenience samples also reported a higher number of sexual partners and greater frequency of unprotected anal sex. They were more likely to report gonorrhea diagnoses and HIV testing during the year preceding research participation.[32] This suggests that our perception of health risks and health determinants in the population of men who have sex with men, which mainly rely on studies employing convenience sampling, may be biased.[32] Routine collection of data on sexual and gender diversities in national probability-based surveys may solve some of the issues discussed.

Reviewed studies on gay and lesbian sexual health predominantly focused on health disparities and risks (69.6%) such as sexual risk behaviors or prevalence of sexually transmitted infections, as opposed to only 9.3% of research investigating sources of resilience and strategies used to cope with challenges and barriers to sexual health. This result is consistent with the general trend in research on the health of LGBTQ populations which has been criticized as a predominantly deficit-focused.[16] Similar trends were observed by Brenan et al.[19] in their systematic review of quantitative research on the health of gay, bisexual and other men who have sex with men. More studies are needed to explore unique sources of resilience and factors protecting against adverse consequences of social stigmatization to inform both clinical practice and health promotion interventions in sexually diverse populations. Interestingly, although most of the reviewed studies focused on health risks and health disparities only a small proportion was explicitly framed within the minority stress research framework (13.3%) or discussed sexual stigma as one of the factors affecting sexual health of gay and lesbian populations (21.8%). A growing number of studies on health inequalities not only employs this perspective but also combine it with intersectionality framework which posits that various social statuses, such as sexuality, age or race/ethnicity, are not independent but they intersect and interact to create distinct personal realities.[33] According to this perspective attempting to understand health inequalities via a single analytical category such as sexual identity or orientation ignores the complex ways in which various disadvantaged social statuses interact to create health disparities.[33] This perspective was most often employed in the context of exploring how intersections of race/ethnicity and sexuality shape sexual health in men. It has been applied for instance, in research on Black men's sexualities demonstrating how intersections of racism, heterosexism and poverty shape both health risks and resilience.[34]

The domination of a deficit-focused approach in reviewed papers is also reflected by most the commonly studied topic, i.e. HIV/STI risk behaviors and vulnerabilities (26.3%), and a general focus on HIV/STI-related health disparities in the analyzed sample of articles. Codes for topics associated primarily with HIV/STI risk behaviors, testing, treatment or prophylaxis, were assigned to over 60% of reviewed articles. This result is consistent with a recent systematic review of studies on the mental, physical and sexual health of gay, bisexual and other men who have sex with men published in 2010, according to which over 56% of studies were primarily HIV-related and three most commonly reported health outcomes were: sexual risk behaviors, HIV or AIDS diagnoses and other sexually transmitted infections.[19] This calls for a targeted effort to broaden the area of research on gay and lesbian sexual health to include more diverse themes. Some possible directions for future studies include the least often studied issues in our sample, that is the sexual function of gay and lesbian persons in older age, intersections of general and sexual health (e.g. sexual function in diabetes or other chronic health issues), or love and same-sex relationships. These research areas are also characterized by the most recent history of publication as reflected by the earliest and median year of publication (Figure 3). Along with studies on clinical interventions aimed at preventing HIV/STI (dominated by studies investigating PrEP) and research on cancer in gay and lesbian people (focusing mostly on prostate cancer and sexual function in cisgender men) they constitute a group that recently has been receiving more attention from scholars working in the field of gay and lesbian sexual health. Still, more research is needed on structural, relational and individual determinants of sexual quality of life, determinants of sexual satisfaction and sexual resilience

in gay and lesbian persons, and particularly on intersections of sexuality, age, ethnicity and gender.

The analysis of the gender composition of samples included in reviewed papers indicated that the vast majority of studies focused on gay men with only 12.4% investigating lesbian, bisexual and other sexual minority women's sexual health and further 18.6% including mixed samples. This disproportion can be associated with prevalent focus on HIV/STI in reviewed papers and the fact that sexual minority women have been excluded from dominant discourses on HIV and STI. As a result, the sexual health of lesbian, bisexual and other sexual minority women is critically understudied, and high-quality, large-scale studies are needed.[35] Interestingly, among topics most often investigated in samples consisting of women or mixed samples, only one was related to HIV/STI, i.e. sexual education resources and knowledge about HIV/STI. The highest proportion of male-only studies was observed in case of research on chemsex and sexualized drug use, behavioral interventions to prevent HIV/STI, clinical interventions aimed at preventing HIV/STI, and cancer and sexual health. These topics constitute some of the most neglected areas of research in the sexual health of sexual minority women. Disproportion in studies on behavioral and clinical interventions aimed at preventing HIV/STI seems particularly alarming since these studies aim at informing sexual health promotion efforts.

Most of the reviewed papers provided no explicit information as to whether the study sample comprised of cisgender or transgender participants and some of those which included transgender participants confused their gender identity with sexual identity by listing 'transgender' as one of the available sexual identities/orientations. It was not uncommon to provide information about gender identities of study participants in a manner that was ambiguous and did not permit to determine whether the sample consisted of transgender/cisgender participants, e.g. in one study participants were asked only about their gender identity and were offered three response options ('man', 'woman' and 'other'). Authors of this particular study ignored the fact that a significant proportion of transgender people simply identify as 'man' or 'woman' and not as having 'other' gender identity. In studies which provided information about gender diversity inclusion, this information was often delivered in a less than ideal manner, i.e. participants were described as 'biologically male and self-identified as male' instead of as 'cisgender' or having gender identity consistent with their assigned gender. Authors of future studies should put more effort to both making their studies more inclusive towards transgender and gender diverse persons, describing their samples in a more precise manner and using more inclusive and trans-sensitive language.

The vast majority of authors described study participants using categories commonly regarded as depicting sexual orientations such as 'gay', 'bisexual', 'lesbian', 'homosexual' or 'heterosexual', and most of them provided clues as to how these categories were operationalized in their study. Some authors included detailed descriptions of how study participants' sexual orientation was measured and categorized, others simply indicated that they relied on self-reported sexual identity by stating that participants identified as gay/lesbian, bisexual or heterosexual. The most common operationalization of sexual orientation in reviewed papers was associated with sexual identity, followed by a composite of two or more dimensions such as sexual attractions or behaviors. This result is somewhat different from Brennan et al.,[19] who observed that sexual orientation in research on the health of sexual minority men was most often defined behaviorally (66.8%). This difference may be however related to the fact that the search criteria used relied on keywords such as 'gay', 'lesbian' and 'homosexual*' but did not include acronyms such as 'MSM' or 'WSW', and therefore favored studies which defined sexual orientation by identity instead of behavior.

Almost 40% of the reviewed studies grouped participants with various sexual orientations/identities together in the analysis. Given that various sexual identities are associated with unique challenges and health disparities,[36] this practice may severely limit our understanding of sexual health of individuals with diverse sexual identities. Less than one-fourth of reviewed articles also included sexual identity categories other than 'gay' / 'lesbian' / 'homosexual', 'heterosexual' or 'bisexual', such as 'queer', 'questioning' or at least 'other' sexual identity. Sexual identities provide information on social dimensions of sexuality and sexual behavior which are critical for the design of effective health promotion interventions.[29] Using multidimensional measures of sexual orientation, focusing on particular sexual practices but also respecting the sexual identities of studied populations and reporting on a full range of identities represented in studied populations is necessary to deepen the understanding of sexual health in sexually diverse populations.[29] This is particularly important when studying populations from diverse socio-cultural and ethnic backgrounds.

Almost 36% of reviewed articles did not report information about ethnicity/race of study participants, and 2.6% provided this information ambiguously or incompletely. Among papers that included this information, most relied on participants identified as White/Caucasian. Other characteristics important in the context of sexual health such as education or indicators of socioeconomic status (e.g. employment, income or health insurance) were even less often reported and controlled in analyses. This result calls for both greater scrutiny in reporting demographic characteristics which are crucial for sexual health, as well as for greater inclusion of non-White participants in sexual health studies.

Strengths and Limitations

The major strength of this critical literature review is that a large selection of literature on gay and lesbian sexual health was synthesized and analyzed and some of the most critical methodological challenges associated with this field of scientific inquiry were identified. The method of data extraction and analysis used gave a more systematized view of what are the thematic

challenges, i.e. gaps in the existing literature, as well as limitations associated with the most prevalent study designs or other aspects of research planning and execution.

The significant limitations of this paper are: the search limited to the Medline database only; the inclusion of only English-written papers; the papers were primarily devoted to gay and lesbian sexuality, which as a matter of fact, underrepresent data on individuals with other sexual identities; the emphasis on the identity aspect of sexuality, which may have resulted in the loss of some relevant data on gay and lesbian sexuality when a behavioral proxy of sexual orientation was employed, i.e. MSM or WSM.

CONCLUSIONS

The present analysis reveals that a comprehensive understanding of sexual health in gay and lesbian participants outside of the context of sexual risk and sexual health disparities is still lacking. Studies on the sexual health of sexually diverse men and women are primarily deficit-focused with little accompanying effort to interpret health disparities in the context of the stigma and systemic oppression experienced by gay and lesbian people. Studies on sexual health in sexually diverse samples explore even less often the intersections of sexuality and age, gender or ethnicity. They offer a relatively low level of empirical evidence and are characterized by limited generalizability.

It is particularly troubling from the everyday practical clinical perspective that there is limited data on topics which are not directly related to sexual risk, capturing sexual satisfaction, function and quality of life especially in older age cohorts of gay and lesbian individuals. Problems in sexual and relational functioning are the most common concerns in everyday clinical practice, and they increase with age, so this gap must urgently be filled.

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SUPPLEMENTARY MATERIALS

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