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# BMJ Open

## Understanding barriers and facilitators of stigma, accessibility, and confidentiality on STI/STD/HIV self-testing among college students: A protocol for a scoping review

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**Title: Understanding barriers and facilitators of stigma, accessibility, and confidentiality on STI/STD/HIV self-testing among college students: A protocol for a scoping review**

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## Abstract

**Introduction:** In 2019, there were 2.5 million reported cases of chlamydia, gonorrhoea, and syphilis<sup>7</sup>. The CDC reported in the United States, young people aged 15–24 made up 61% and 42% of chlamydia and gonorrhoea cases, respectively<sup>6</sup>. Moreover, the highest rates of STIs were reported among college-aged students<sup>5,7</sup>. In this paper, we outline our protocol to systematically review published literature on the use of STI/HIV self-test kits, increasing STI/HIV testing uptake, and barriers and facilitators of stigma, access, and confidentiality issues among young adult college students in the U.S.

### Methods and analysis:

This scoping review will be conducted according to the guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR). We will search electronic databases OVID Medline, OVID Embase, Web of Science, Cochrane Library, PubMed, and CINAHL from inception to August 31, 2022, with no restrictions. We will search other alternative sources such as ProQuest, GoogleScholar, and Google to identify grey literature. A two-step process will be used to identify eligible studies based on the defined inclusion criteria. First, we will screen each citation title and abstract to identify relevant articles and place them on a shortlist. Next, a team of reviewers will be assigned to the refereed publications to conduct a full-text review of the shortlisted articles and screen for inclusion. To maintain consistency, screening performed will be reviewed collaboratively to maintain consistency.

**Ethics and dissemination:** This study refers to a scoping review of the literature and therefore will not involve ethics approval. Our plan for the dissemination of findings includes peer-reviewed manuscripts, conferences, and webinars.

### Strengths and Limitations

- The study employed a robust search strategy conducted by an expert medical librarian and supplemented with grey literature for comprehensive coverage of existing literature.
- Considering the significance of research to surmount the increase in STI/STD/HIV infections among youth and young adults, this study will provide up-to-date insights and directions for research and interventions to increase HIV/STI uptake among youth and young adults, thus increasing the early detection of HIV and linkage to care, and or preventing the spread of HIV.
- The limitations of this review include its focus on the United States and manuscripts published in English, or on college campuses; this eliminates other studies that do not necessarily fit into the much more specific focus of this review.

**Keywords:** *sexual health, sexually transmitted diseases, infection control, prevention*

## INTRODUCTION

Sexually transmitted infections (STIs) and HIV infections remain a significant global and public health problem in the U.S.<sup>8</sup> (CDC, 2021). Per the Centers for Disease Control and Prevention (CDC), from 2015 through 2019, HIV diagnoses increased among persons aged 13 to 24 years old (CDC, 2021), and approximately 51 percent of youth living with HIV were unaware that they are infected<sup>13,14</sup>. It is more alarming that surveillance systems in the U.S. have recently found that more than 1 in 5 new HIV diagnoses were among youth between the age of 13 to 24 years old<sup>12</sup>. Moreover, many of these STIs do not show symptoms for a long time, therefore an individual could be transmitting an infection without even knowing it<sup>12</sup>. Although treatment is available for all STIs, not all are curable. There is no cure for viral STIs, such as genital herpes and HIV, but antiviral medication may be used for viral suppression and to treat symptoms<sup>6,11</sup>. However, if an infected individual goes untreated, it could cause long-term health consequences such as infertility, ectopic pregnancy, sterility, cancer of the vagina, penis, anus, or throat, and severe pelvic pain<sup>6,15</sup>.

Risky sexual behaviors can lead to negative outcomes including the occurrence of STIs, HIV, and unplanned pregnancies<sup>15,25</sup>. Risky sexual behaviors are defined as: (1) early sexual debut, before the age of 18 years old<sup>16,25</sup>, (2) having oral, vaginal, or anal sex without a condom (male, female or dental dam) or inconsistent condom use<sup>15,25</sup>, and (3) having multiple sex partners or a high-risk partner, such as one who engages in intravenous drug use<sup>15,17,25</sup>. Sexually active young adults should get tested at least once for HIV<sup>10</sup>. However, depending on their sexual behaviors, individuals who are at a higher risk of acquiring HIV should be tested annually<sup>10</sup>. The CDC recommends that all sexually active young adult women under the age of 25 should be tested yearly for gonorrhea and chlamydia<sup>10</sup>. Most young adults do not receive many of the recommended sexual health care services, including STI and HIV screenings or counseling services<sup>12, 20</sup>. According to other studies, national guidelines for STI and HIV testing among youth aged 15–25 are not regularly followed and STI testing is suboptimal<sup>21,22</sup>. In addition, young adults face multiple barriers to accessing proper sexual health and STI preventative services, such as a lack of health insurance, employment, and transportation<sup>18,19</sup>. Also, due to concerns of confidentiality, costs, embarrassment or shame, and other social factors, many young adults don't seek STI and HIV testing with their primary medical provider<sup>3,21</sup>. Although there seems to be a burgeoning interest in understanding the role of self-testing kits in increasing STI/STD/HIV testing, knowledge remains limited on acceptance and uptake of self-testing among young adults, especially among young adults on college campuses. In this paper, we outline our scoping review protocol to systematically review published literature specific to the use of STI/STD/HIV self-test kits, increasing testing uptake and reducing barriers of stigmas, lack of access, and confidentiality among young adult college students in the U.S. Findings of the scoping review will provide insights on the state of science around HIV and STI self-testing acceptance and uptake. It will also explain the factors that facilitate or hinder access, acceptance, and uptake of self-testing for STI and HIV among young adults on college campuses.

## METHODS AND ANALYSIS

We will adopt the scoping review framework approach proposed by Arksey and O'Malley and later advanced by Levac et al. The framework consists of five iterative steps: identifying the review topic, identifying relevant studies, selecting the studies, charting the data, and compiling, summarizing, and reporting the results<sup>2,24</sup>. The review will also follow recommendations from Peterson et al. to ensure that the review is executed such that it can inform practice, policy, education, and research. The protocol is drafted according to the reporting guidance provided in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR)<sup>4</sup>. We also compared the protocol with already published protocols using the same guidelines and incorporating other expectations of BMJ<sup>1,4</sup>. The

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2  
3 protocol, when reviewed and published, will ensure transparency, and sharing of the process  
4 with the wider scholarly society to prevent duplication of efforts<sup>1,4</sup>.  
5

### 6 **Identifying the research question**

7 In this scoping review, defining the research question is an essential first step that provides the  
8 rationale for decision-making in the scoping review design, conduct, and reporting (Levac,  
9 Colquhoun, O'Brien, 2014; Peters, et al., 2020). For this study we developed the following  
10 research questions:

- 11 1. Does STI/HIV self-test kits have the potential to increase testing rates among  
12 college students?
- 13 2. Does offering STI/HIV self-test kits improve testing rates among college students?
- 14 3. How do stigmas, lack of access, and confidentiality negatively impact STI/HIV  
15 testing rates among college students?
- 16 4. Does access to STI/HIV self-test kits reduce barriers of stigmas, lack of access,  
17 and confidentiality to STI/HIV testing among college students?  
18

### 19 **Ethics and Dissemination**

20 This study is a scoping review of the literature and therefore will not involve ethics approval. Our  
21 dissemination includes publishing scoping review results in a scientific, peer-reviewed journal.  
22 Findings will also be presented at scholarly conferences and webinars.  
23

### 24 **Patient and public involvement**

25 We will not engage college students in the process of conducting this scoping review. However,  
26 we foresee findings to be made public to people involved in STI/STD/HIV studies and practices  
27 to aid in decision-making in health care practice and policies.  
28

### 29 **Criteria for study inclusion**

30 For an article to be included in this scoping review, it must (1) discuss STI/STD/HIV kit and self-  
31 testing (2) be in English (3) talk about college students (4) include participants aged between 18  
32 and 26, and (5) be set in the USA. Review papers (scoping, systematic), book chapters, reports,  
33 opinions, commentaries, conference abstracts and papers not published in English will be  
34 excluded from this review.  
35

### 36 **Types of studies**

37 We will consider experimental (randomized or non-randomized), observational studies  
38 (longitudinal, cross-sectional), and qualitative or mixed-methods studies.  
39

### 40 **Search strategy**

#### 41 Identifying sources

42 The planned search strategy was formulated by an expert medical librarian (JB) from the  
43 Harvey Cushing/John Hay Whitney Medical Library at Yale University in consultation with the  
44 research team. The search will be translated using appropriate syntax and keywords for each  
45 database. The sample search strategy for OVID Medline is presented in Supplement 1.  
46  
47

### 48 **Electronic database searching**

49 Sources for relevant documents will include OVIDSP Medline, OVIDSP Embase, Web of  
50 Science, Cochrane Library, PubMed, and CINAHL from inception to August 31, 2022, with no  
51 limits. Citations will be imported and de-duplicated using EndNote20 (Clarivate, Philadelphia,  
52 PA) and then imported for screening into Covidence systematic review software (Veritas Health  
53 Innovation, Melbourne, Australia). Using the references from studies that are relevant to the  
54 final inclusion set forwards and backward citation chasing will be manually performed.  
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### Grey Literature Searching

For other relevant works such as reports and data not found within databases or references of published articles, we will search other alternative sources such as ProQuest for dissertations and thesis and conference papers. We will also search for possible reports from organizations such as NIH, CDC, and other identified HIV organizations. We will also use GoogleScholar and Google to identify any other sources that report HIV testing among young adults on college campuses.

### Data screening

A two-step process will be used to identify eligible studies. First, each citation title and abstract will be screened to identify those that are relevant. Next, the full text of relevant articles will be retrieved and screened for inclusion. Reviewers (PD, JR) will pilot screening with a sample of 100 abstracts to ensure consistency of use and clarity of the inclusion and exclusion criteria. A Cohen's kappa statistic will measure inter-rater reliability and screening will begin when more than 70% agreement is achieved<sup>23</sup>. Disagreements will be resolved by consensus. Consensus that cannot be reached will be resolved by a third author who will arbitrate (PD, JR, GRA).

### Data extraction

#### Content

The extraction of data will comprise various stages. The first will include extracting data on the publication information. This stage will involve extracting author names, year of publication, journal source, and funding sources. The second will comprise extracting data on the conceptualizations and the third extracting data on the methodology and results. This stage will include the research question(s), the hypothesis, concepts, and theoretical frameworks, and the variable studied. The final extraction stage will include sorting for information on study design, recruitment and sampling techniques, and data collection methods. Furthermore, attempts will be made to extract findings from the study on self-testing among college students, stigma, and accessibility options.

#### Process

To ensure a systematic and coordinated data extraction process, we will utilize a Google Form containing questions for each extractor to answer. At least two authors will extract data from each publication. Disagreements will be resolved by consensus. If the two authors are unable to reach a consensus, a third reviewer will resolve the disagreement. The authors will independently extract data on author names, publication years, journal of publication, and funding sources if applicable. We will also extract information on the research questions, theoretical or conceptual frameworks used, variables of interest (STI testing, HIV testing), the study design, method of data collection, and analytical techniques. For results, we will also extract the study population characteristics, the number of participants, main thematic areas, and statistical findings.

#### Analyses and reporting

Our findings will be reported according to the PRISMA-ScR guidelines<sup>4</sup>. We will be summarizing our findings narratively and using tables. Data will be grouped by outcomes, with the number of studies, their design, and their methodological quality. The key findings of each study will also be summarized using tables. We will conduct a narrative synthesis of the data to identify common themes and knowledge gaps. Extracted data based on the PRISMA-ScR checklist<sup>4</sup>.

### Outcomes

The primary outcome of this scoping review is to assess the state of science on STI/STD/HIV self-testing kits' potential to increase the rate of testing among college students in the United

States of America. The secondary outcome of this study will look into facilitators and barriers to STI/STD/HIV self-testing uptake among college students. Facilitators could include access, education, social support, etc. that encourage young adults to pick up testing kits and test for STI/STD/HIV. Barriers could include stigma, lack of confidentiality, and other factors that prevent access to testing kits and ultimately uptake of testing.

## DISCUSSION

Multiple challenges and roadblocks to proper sexual health and STI preventive services for young adults have been an ongoing pressing concern. These barriers range from the lack of health insurance and coverage to the lack of employment opportunities and transportation services<sup>18,19</sup>. Social factors related to cost, embarrassment and shame, and confidentiality have been attributed to poor testing habits among young adults when seeking STI/STD/HIV knowledge from health providers<sup>3,21</sup>. Despite researchers showing increasing interest in understanding the role of self-testing kits, knowledge on acceptance and uptake of self-testing remains limited among young college students in the U.S. In this scoping review, scholarly insight on the state of science around HIV/STI self-testing will be enhanced around acceptance and uptake. The review will also elucidate factors that facilitate or prevent access, acceptance, and uptake of self-testing among young college adults in the U.S.

### Ethical considerations

No members of the public will be involved in the conduct of this scoping review, so no ethical approval will be sought.

### Dissemination Plan

Our dissemination includes publishing scoping review results in a scientific, peer-reviewed journal. Findings will also be presented at scholarly conferences and webinars. Findings could also be available for relevant stakeholders to use in understanding ways to engage young adults on college campuses with HIV/STI self-testing.

### Conflict of interest

The authors declare no conflict of interest

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8. Priorities on Rights and Sexual Health - PORSH Accra – Ghana
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10. MAP Centre for Urban Health Solutions, Unity Health Toronto, Toronto, Canada.

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### Contributors

JR is the first and corresponding author; JR, PD, DD, JB, and LEN conceived the study; JR, PD, DD, JB, and GAF conducted the initial review, finalized the focus of the study, and designed the study; PD and JB established the search strategy; all authors contributed to drafting the manuscript; GRA, EZ, and OS performed critical revisions of the manuscript. All authors approved the final version of the manuscript.

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## REFERENCES

1. Abubakari GM, Dada D, Nur J, Turner D, Otchere A, Tanis L, et al. Intersectional stigma and its impact on HIV prevention and care among MSM and WSW in sub-Saharan African countries: a protocol for a scoping review. *BMJ Open* [Internet]. 2021;11(8):e047280. Available from: <http://dx.doi.org/10.1136/bmjopen-2020-047280>
2. Colquhoun HL, Levac D, O'Brien KK, Straus S, Tricco AC, Perrier L, et al. Scoping reviews: time for clarity in definition, methods, and reporting. *J Clin Epidemiol* [Internet]. 2014;67(12):1291–4. Available from: <http://dx.doi.org/10.1016/j.jclinepi.2014.03.013>
3. Griner SB, Reeves JM, Webb NJ, Johnson KC, Kline N, Thompson EL. Consumer-Based Sexually Transmitted Infection Screening Among Young Adult Women: The Negative Influence of the Social System. *Sexually Transmitted Diseases*. 2022 Sep 1;49(9):596-600.
4. Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA extension for Scoping Reviews (PRISMA-ScR): Checklist and explanation. *Ann Intern Med* [Internet]. 2018;169(7):467–73. Available from: <http://dx.doi.org/10.7326/M18-0850>
5. Johnson A, Jackson JB. Sexually Transmitted Infections Among College Students. *Microbiol Infect Dis*. 2021;5(1):1-4.
6. Sexual Risk Behaviors Can Lead to HIV, STDs, & Teen Pregnancy [Internet]. Cdc.gov. 2021 [cited 2022 Oct 4]. Available from: <https://www.cdc.gov/healthyouth/sexualbehaviors/index.htm>.
7. Reported STDs reach all-time high for 6th consecutive year [Internet]. CDC. 2021 [cited 2022 Oct 14]. Available from: <https://www.cdc.gov/media/releases/2021/p0413-stds.html>
8. Linley L, Johnson AS, Song R, Wu B, Hu S, Singh S, et al. Estimated HIV incidence and prevalence in the United States 2010–2015. 2018 [cited 2022 Oct 14]; Available from: <https://stacks.cdc.gov/view/cdc/60949>
9. Global progress report on HIV, viral hepatitis, and sexually transmitted infections. 2021. Available from: <https://www.who.int/publications/i/item/9789240027077>
10. Which STD tests should I get? [Internet]. Cdc.gov. 2022 [cited 2022 Oct 1]. Available from: <https://www.cdc.gov/std/prevention/screeningreccs.htm>
11. Special focus profiles [Internet]. Cdc.gov. 2021 [cited 2022 Oct 14]. Available from: <https://www.cdc.gov/hiv/library/reports/hiv-surveillance/vol-26-no-2/content/special-focus-profiles.html>
12. Adolescents and STDs [Internet]. Cdc.gov. 2022 [cited 2022 Oct 14]. Available from: <https://www.cdc.gov/std/life-stages-populations/stdfact-teens.htm>
13. CDC. HIV in the United States by age [Internet]. Centers for Disease Control and Prevention. 2022 [cited 2022 Oct 14]. Available from: <https://www.cdc.gov/hiv/group/age/youth/status-knowledge.html>
14. National Youth HIV & AIDS Awareness Day [Internet]. Cdc.gov. 2022 [cited 2022 Oct 14]. Available from: [https://www.cdc.gov/healthyouth/youth\\_hiv/resources.htm](https://www.cdc.gov/healthyouth/youth_hiv/resources.htm)
15. Sexually Transmitted Diseases [Internet]. Nih.gov. National Institute of Allergy and Infectious Diseases; [cited 2022 Oct 14]. Available from: <https://www.niaid.nih.gov/diseases-conditions/sexually-transmitted-diseases>
16. Lowry R, Dunville R, Robin L, Kann L. Early sexual debut and associated risk behaviors among sexual minority youth. *Am J Prev Med* [Internet]. 2017;52(3):379–84. Available from: <http://dx.doi.org/10.1016/j.amepre.2016.10.008>
17. Kieran E, Hay DP. Sexually transmitted infections. *Curr Obstet Gynaecol* [Internet]. 2006 [cited 2022 Oct 14];16(4):218–25. Available from: <https://www.hiv.gov/hiv-basics/staying-in-hiv-care/other-related-health-issues/sexually-transmitted-diseases>

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18. Moilanen, K. L., Crockett, L. J., Raffaelli, M., & Jones, B. L. (2010). Trajectories of sexual risk from middle adolescence to early adulthood. *Journal of Research on Adolescence*, 20(1), 114–139. <https://doi.org/10.1111/j.1532-7795.2009.00628.x>
  19. Cassidy C, Bishop A, Steenbeek A, Langille D, Martin-Misener R, Curran J. Barriers and enablers to sexual health service use among university students: a qualitative descriptive study using the Theoretical Domains Framework and COM-B model. *BMC Health Serv Res* [Internet]. 2018;18(1). Available from: <http://dx.doi.org/10.1186/s12913-018-3379-0>
  20. Hull S, Kelley S, Clarke JL. Sexually Transmitted Infections: Compelling Case for an improved Screening strategy. *Popul Health Manag* [Internet]. 2017;20(S1):S1–11. Available from: <http://dx.doi.org/10.1089/pop.2017.0132>
  21. Cuffe KM, Newton-Levinson A, Gift TL, McFarlane M, Leichliter JS. Sexually transmitted infection testing among adolescents and young adults in the United States. *J Adolesc Health* [Internet]. 2016;58(5):512–9. Available from: <http://dx.doi.org/10.1016/j.jadohealth.2016.01.002>
  22. Shannon CL, Klausner JD. The growing epidemic of sexually transmitted infections in adolescents: A neglected population. *Curr Opin Pediatr* [Internet]. 2018;30(1):137–43. Available from: <http://dx.doi.org/10.1097/mop.0000000000000578>
  23. McHugh ML. Interrater reliability: the kappa statistic. *Biochem Med (Zagreb)* [Internet]. 2012;22(3):276–82. Available from: <http://dx.doi.org/10.11613/bm.2012.031>
  24. Levac D, Colquhoun H, O'Brien KK. Scoping studies: advancing the methodology. *Implement Sci* [Internet]. 2010;5(1):69. Available from: <http://dx.doi.org/10.1186/1748-5908-5-69>
  25. Kann L, Kinchen SA, Williams BI, Ross JG, Lowry R, Grunbaum JA, et al. Youth risk behavior surveillance--United States, 1999. *MMWR CDC Surveill Summ*. 2000;49(5):1–32.

## Supplement 1

*Sample Search Strategy - OVID Medline ALL*

#	Query
1	exp HIV Infections/ or exp HIV/ (hiv* or hiv infect* or human immunodeficiency virus or human immunodeficiency virus or human immune deficiency virus or human immune deficiency virus or acquired immunodeficiency syndrome or acquired immunodeficiency syndrome or acquired immune deficiency syndrome).ti,ab.
2	1 or 2
3	exp sexually transmitted infections/ or exp hepatitis b/ or exp herpes genitalis/ or exp syphilis/ or exp gonorrhea/ or exp chlamydia trachomatis/ or exp calymmatobacterium/ or exp trichomonas vaginitis/ or exp Alphapapillomavirus/ or exp Human papillomavirus 6/ or exp Human papillomavirus 11/ or exp Human papillomavirus 16/ or exp Human papillomavirus 18/ or exp Human papillomavirus 31/ or exp Betapapillomavirus/ or exp Gammapapillomavirus/ or exp granuloma Inguinale/ (sexually transmitted disease* or sexually transmissible disease* or sexually transmitted infection* or sexually transmissible infection* or sexually transmitted infectious disease* or sexually transmissible infectious disease* or sexually transmitted disorder* or sexually transmissible disorder* or STI or STIs or STD or STIs or venereal disease* or venereal infection* or venereal disorder* or genital herpes or herpes genitalis or genital infection* or genital disorder* or herpes simplex or herpes virus or HSV*).ti,ab. or chancroid/ or chancroid*.ti,ab. or haemophilus ducreyi.ti,ab. or chlamydia infection*.ti,ab. or chlamydia trachomatis.ti,ab. or gonorrhoea*.ti,ab. or gonorrhea*.ti,ab. or syphilis.ti,ab. or syphillis.ti,ab. or condylomata lata.ti,ab. or chancre*.ti,ab. or lymphogranuloma venereum.ti,ab or lymphogranuloma venereum.ti,ab. or granuloma inguinale.ti,ab. or donovania.ti,ab. or donovanosis.ti,ab. or calymmatobacterium granulomatis.ti,ab. or klebsiella granulomatis.ti,ab. or klebsiella granulomatis.ti,ab. or treponema pallidum.ti,ab. or treponema pallidum.ti,ab. or genital wart*.ti,ab. or venereal wart*.ti,ab. or condylomata acuminata.ti,ab. or human papillomavirus 6.ti,ab. or hpv*.ti,ab. or hpv6.ti,ab. or human papillomavirus.ti,ab. or hepatitis b.ti,ab. or trichomonas vaginitis.ti,ab. or genital ulcer*.ti,ab. or anogenital ulcer*.ti,ab. or anorectal ulcer*.ti,ab. or anorectal ulcer*.ti,ab. or penile ulcer*.ti,ab. or human papillomavirus*.ti,ab. or hpv.ti,ab. or recurrent respiratory papillomatosis.ti,ab. or condyloma*.ti,ab.
4	4 or 5
5	3 or 6
6	exp Self-Testing/

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4 9 ((home adj testing) or self test\* or self sample or self sampling or rapid diagnostic  
5 test\*).tw,kf.

6  
7 10 (self collect\* or home-based HIV test\* or home-based STI test\* or home-based STD  
8 test\* or ((community-based or community-led or community-driven) adj3 test\*)).tw,kf.

9  
10 11 8 or 9 or 10

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12 12 7 and 11

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14 13 exp Students/ or exp Universities/

15  
16 14 exp Young Adult/ or exp Adolescent/

17  
18 15 (college student\* or higher education or teen\* or adolescen\*).tw,kf.

19  
20 16 13 or 14 or 15

21  
22 17 12 and 16

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## Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
<b>TITLE</b>			
Title	1	Identify the report as a scoping review.	
<b>ABSTRACT</b>			
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	
<b>INTRODUCTION</b>			
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	
<b>METHODS</b>			
Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.	
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	
Information sources*	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	
Selection of sources of evidence†	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	
Data charting process‡	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	
Critical appraisal of individual sources of evidence§	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).	
Synthesis of results	13	Describe the methods of handling and summarizing the data that were charted.	



SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
<b>RESULTS</b>			
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	
Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data were charted and provide the citations.	
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).	
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	
Synthesis of results	18	Summarize and/or present the charting results as they relate to the review questions and objectives.	
<b>DISCUSSION</b>			
Summary of evidence	19	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	
Limitations	20	Discuss the limitations of the scoping review process.	
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	
<b>FUNDING</b>			
Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	

JBI = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.

\* Where *sources of evidence* (see second footnote) are compiled from, such as bibliographic databases, social media platforms, and Web sites.

† A more inclusive/heterogeneous term used to account for the different types of evidence or data sources (e.g., quantitative and/or qualitative research, expert opinion, and policy documents) that may be eligible in a scoping review as opposed to only studies. This is not to be confused with *information sources* (see first footnote).

‡ The frameworks by Arksey and O'Malley (6) and Levac and colleagues (7) and the JBI guidance (4, 5) refer to the process of data extraction in a scoping review as data charting.

§ The process of systematically examining research evidence to assess its validity, results, and relevance before using it to inform a decision. This term is used for items 12 and 19 instead of "risk of bias" (which is more applicable to systematic reviews of interventions) to include and acknowledge the various sources of evidence that may be used in a scoping review (e.g., quantitative and/or qualitative research, expert opinion, and policy document).

From: Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. *Ann Intern Med.* 2018;169:467–473. doi: [10.7326/M18-0850](https://doi.org/10.7326/M18-0850).



# BMJ Open

## Investigating the impact of stigma, accessibility, and confidentiality on STI/STD/HIV self-testing among college students in the United States: protocol for a scoping review

Journal:	<i>BMJ Open</i>
Manuscript ID	bmjopen-2022-069574.R1
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<b>Primary Subject Heading</b>:	Sexual health
Secondary Subject Heading:	Health services research
Keywords:	HIV & AIDS < INFECTIOUS DISEASES, Public health < INFECTIOUS DISEASES, Infection control < INFECTIOUS DISEASES, Health & safety < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, INFECTIOUS DISEASES

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Manuscripts

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3 1 **Investigating the impact of stigma, accessibility, and confidentiality on STI/STD/HIV self-**  
4 2 **testing among college students in the United States: protocol for a scoping review**  
5 3

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#### 7 4 **Abstract**

8  
9 5 **Introduction:** In 2019, there were 2.5 million reported cases of chlamydia, gonorrhoea, and  
10 6 syphilis. The CDC reported in the United States (U.S.), young people aged 15–24 made up 61%  
11 7 and 42% of chlamydia and gonorrhoea cases, respectively. Moreover, the highest rates of STIs  
12 8 were reported among college-aged students. In this paper, we outline our protocol to  
13 9 systematically review published literature on, the use of STI/HIV self-test kits, increasing  
14 10 STI/HIV testing uptake, and stigma, access, and confidentiality issues, among young adult  
15 11 college students in the U.S.  
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22 13 **Methods and analysis:** This scoping review will be conducted and reported according to the  
23 14 guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses  
24 15 extension for Scoping Reviews (PRISMA-ScR). We will search electronic databases, OVID  
25 16 Medline, OVID Embase, Web of Science, Cochrane Library, PubMed, and CINAHL, for articles  
26 17 published in English from inception to the present. We will search other alternative sources such  
27 18 as ProQuest, Google Scholar, and Google to identify grey literature. A two-step process will be  
28 19 used to identify eligible studies based on the defined inclusion criteria. First, the title and  
29 20 abstract of identified articles will be screened for possible inclusion. Second, full-text articles of  
30 21 relevant studies will be retrieved and screened for inclusion. Both screening steps will be done  
31 22 by two people independently. Finally, data will be extracted by two researchers working  
32 23 independently. Any arising disagreements will be resolved by consensus or by a third author.  
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41 25 **Ethics and dissemination:** This study is a scoping review of the literature. Therefore, ethics  
42 26 approval is not required. Our plan for the dissemination of findings includes peer-reviewed  
43 27 manuscripts, conferences, and webinars.  
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#### 47 29 **Strengths and limitations of this study**

- 48 30 • A strength of the study is that it will employ a robust search strategy conducted by an  
49 31 expert medical librarian and supplemented with grey literature, for comprehensive  
50 32 coverage of existing literature.  
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- 1 • Another strength of the study is that it will provide up-to-date insights and directions for
- 2 research and interventions to increase HIV/STI self-testing uptake among youth and
- 3 young adults.
- 4 • Limitations of this review include its focus on the United States only and the inclusion
- 5 only of articles published in English.
- 6 • Another limitation is the focus on only one relevant population (college students).

7  
8 **Keywords:** *sexual health, sexually transmitted diseases, infection control, prevention*

For peer review only

## 1 INTRODUCTION

2 Sexually transmitted infections (STIs) and HIV infections remain a significant global and public  
3 health problem in the United States (U.S.; CDC, 2021).<sup>1, 2, 3</sup> The Centers for Disease Control  
4 and Prevention (CDC) report that from 2015 through 2019, HIV diagnoses increased among  
5 people aged 13 to 24 years old (CDC, 2021), and approximately 51 percent of youth living with  
6 HIV were unaware that they are infected.<sup>4, 5</sup> It is more alarming that surveillance systems in the  
7 U.S. have recently found that more than 1 in 5 new HIV diagnoses were among youth between  
8 the age of 13 to 24 years old.<sup>6</sup> Moreover, many of these STIs do not show symptoms for a long  
9 time, therefore an individual could be transmitting an infection without even knowing it.<sup>6</sup>  
10 Although treatment is available for all STIs, not all are curable. There is no cure for viral STIs,  
11 such as genital herpes and HIV, but antiviral medication may be used for viral suppression and  
12 to treat symptoms.<sup>7, 8</sup> Without proper treatment, STIs can cause serious complications such as  
13 infertility, pregnancy complications, and increased risk of organ damage, potentially serious or  
14 deadly diseases, and cancer.<sup>7, 9</sup>

15 Risky sexual behaviors can lead to negative outcomes including the occurrence of STIs,  
16 HIV, and unplanned pregnancies.<sup>7, 9, 10</sup> Risky sexual behaviors are defined as: (1) early sexual  
17 debut, before the age of 18 years old<sup>10, 11</sup>, (2) having oral, vaginal, or anal sex without a  
18 condom (male, female or dental dam) or inconsistent condom use, and (3) having multiple sex  
19 partners or a high-risk partner, such as one who engages in intravenous drug use.<sup>9, 10, 12</sup>  
20 Sexually active young adults should get tested at least once for HIV<sup>10</sup>. However, depending on  
21 their sexual behaviors, individuals who are at a higher risk of acquiring HIV should be tested  
22 annually. The CDC recommends that all sexually active young adult women under the age of 25  
23 should be tested yearly for gonorrhea and chlamydia.<sup>13</sup> Most young adults do not receive many  
24 of the recommended sexual health care services, including STI and HIV screenings or  
25 counseling services.<sup>6, 14</sup> According to other studies, national guidelines for STI and HIV testing  
26 among youth aged 15–25 are not regularly followed and STI testing is suboptimal.<sup>15, 16, 17</sup> In  
27 addition, young adults face multiple barriers to accessing proper sexual health and STI  
28 preventative services, such as a lack of health insurance, employment, and transportation.<sup>18, 19</sup>  
29 Also, due to concerns of confidentiality, costs, embarrassment or shame, and other social  
30 factors, many young adults don't seek STI and HIV testing with their primary medical provider.<sup>15,</sup>  
31 <sup>20</sup> Although there seems to be a burgeoning interest in understanding the role of self-testing kits  
32 in increasing STI/STD/HIV testing, knowledge remains limited on acceptance and uptake of self-  
33 testing among young adults, especially among young adults on college campuses. In this paper,  
34 we outline our scoping review protocol to systematically review published literature specific to



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3 1 the use of STI/STD/HIV self-test kits, increasing testing uptake and reducing barriers of stigmas,  
4 2 lack of access, and confidentiality among young adult college students in the U.S. Findings of  
5 3 the scoping review will provide insights on the state of science around HIV and STI self-testing  
6 4 acceptance and uptake. It will also explain the factors that facilitate or hinder access,  
7 5 acceptance, and uptake of self-testing for STI and HIV among young adults on college  
8 6 campuses.  
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## 14 8 **METHODS AND ANALYSIS**

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16 9 We will adopt the scoping review framework approach proposed by Arksey and O'Malley and  
17 10 later advanced by Levac et al.<sup>21</sup> The framework consists of five iterative steps: identifying the  
18 11 review topic, identifying relevant studies, selecting the studies, charting the data, and compiling,  
19 12 summarizing, and reporting the results.<sup>22, 23</sup> The review will also follow recommendations  
20 13 from Peterson et al. to ensure that the review is executed such that it can inform practice, policy,  
21 14 education, and research.<sup>24</sup> The protocol is drafted according to the reporting guidance provided  
22 15 in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for  
23 16 Scoping Reviews (PRISMA-ScR).<sup>25</sup> We also compared the protocol with already published  
24 17 protocols using the same guidelines and incorporating other expectations of BMJ. The protocol,  
25 18 when reviewed and published, will ensure transparency, and sharing of the process with the  
26 19 wider scholarly society to prevent duplication of efforts.<sup>25, 26, 27</sup>  
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### 35 21 **Identifying the research question**

36 22 In this scoping review, defining the research question is an essential first step that provides the  
37 23 rationale for decision-making in the scoping review design, conduct, and reporting.<sup>22</sup> For this  
38 24 study we developed the following research questions:

- 39 25 1. Does STI/HIV self-test kits have the potential to increase testing rates among  
40 26 college students?
- 41 27 2. Does offering STI/HIV self-test kits improve testing rates among college students?
- 42 28 3. How do stigmas, lack of access, and confidentiality negatively impact STI/HIV  
43 29 testing rates among college students?

### 44 31 **Criteria for study inclusion**

45 32 For an article to be included in this scoping review, it must (1) discuss STI/STD/HIV kit and self-  
46 33 testing (2) be in English (3) talk about college students (4) include participants at or beyond the  
47 34 age of 18, and (5) be set in the USA. Review papers (scoping, systematic), book chapters,  
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1 reports, opinions, commentaries, conference abstracts and papers not published in English will  
2 be excluded from this review.

### 3 4 **Types of studies**

5 We will consider experimental (randomized or non-randomized), observational studies  
6 (longitudinal, cross-sectional), and qualitative or mixed-methods studies.

### 7 8 **Search strategy**

9 This scoping review's search strategy is formulated by an expert medical librarian (JB) from the  
10 Harvey Cushing/John Hay Whitney Medical Library at Yale University in consultation with the  
11 research team. The search of studies published in English will be conducted in multiple  
12 databases using appropriate syntax and keywords for each database. The search strategies for  
13 all databases can be found in **Supplement 1**.

### 14 15 **Electronic database searching**

16 Sources for relevant documents will include OVID Medline, OVIDSP Embase, Web of Science,  
17 Cochrane Library, PubMed, and CINAHL from inception to present. Citations will be imported  
18 into and de-duplicated using EndNote20 (Clarivate, Philadelphia, PA) and then imported for  
19 screening into Covidence systematic review software (Veritas Health Innovation, Melbourne,  
20 Australia). Using the references from studies that are relevant to the final inclusion set forwards  
21 and backward citation chasing will be manually performed.

### 22 23 **Grey literature searching**

24 For other relevant works such as reports and data not found within databases or references of  
25 published articles, we will search other alternative sources such as ProQuest for dissertations  
26 and thesis and conference papers. We will also search for possible reports from organizations  
27 such as NIH, CDC, and other identified HIV organizations. We will also use GoogleScholar and  
28 Google to identify any other sources that report HIV testing among young adults on college  
29 campuses.

### 30 31 **Data screening**

32 A two-step process will be used to identify eligible studies. First, each citation title and abstract  
33 will be screened to identify those that are relevant. Next, the full text of relevant articles will be  
34 retrieved and screened for inclusion. Reviewers (PD, JR) will pilot screening with a sample of

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3 1 100 abstracts to ensure consistency of use and clarity of the inclusion and exclusion criteria. A  
4 2 Cohen's kappa statistic will measure inter-rater reliability and screening will begin when more  
5 3 than 70% agreement is achieved.<sup>28</sup> In duplicate, the authors EYZ, OWS, GAF and GRA will  
6 4 conduct all screening, data extraction, and quality assessment procedures. Disagreements will  
7 5 be resolved by consensus. Consensus that cannot be reached will be resolved by a third author  
8 6 who will arbitrate (PD, JR).  
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## 14 8 **Data extraction**

### 15 9 *Content*

16 10 The extraction of data will comprise various stages. The first will include extracting data on the  
17 11 publication information. This stage will involve extracting author names, year of publication,  
18 12 journal source, and funding sources. The second will comprise extracting data on the  
19 13 conceptualizations and the third extracting data on the methodology and results. This stage will  
20 14 include the research question(s), the hypothesis, concepts, and theoretical frameworks, and the  
21 15 variable studied. The final extraction stage will include sorting for information on study design,  
22 16 recruitment and sampling techniques, and data collection methods. Furthermore, attempts will  
23 17 be made to extract findings from the study on self-testing among college students, stigma, and  
24 18 accessibility options.  
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### 33 20 *Process*

34 21 To ensure a systematic and coordinated data extraction process, we will utilize a Google Form  
35 22 containing questions for each extractor to answer. At least two authors will extract data from  
36 23 each publication. Disagreements will be resolved by consensus. If the two authors are unable to  
37 24 reach a consensus, a third reviewer will resolve the disagreement. The authors will  
38 25 independently extract data on author names, publication years, journal of publication, and  
39 26 funding sources if applicable. We will also extract information on the research questions,  
40 27 theoretical or conceptual frameworks used, variables of interest (STI testing, HIV testing), the  
41 28 study design, method of data collection, and analytical techniques. For results, we will also  
42 29 extract the study population characteristics, the number of participants, main thematic areas,  
43 30 and statistical findings.  
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### 52 32 *Analyses and reporting*

53 33 Our findings will be reported according to the PRISMA-ScR guidelines.<sup>25</sup> We will be  
54 34 summarizing our findings narratively and using tables. Data will be grouped by outcomes, with  
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1 the number of studies, their design, and their methodological quality. The key findings of each  
2 study will also be summarized using tables. Although we will be screening experimental studies,  
3 we will not be performing any quantitative data-analysis. However, frequency and range will be  
4 used to narrate the results. We will conduct thematic analysis using grounded theory.<sup>29</sup> A list of  
5 codes related to the research question and outcomes will be identified in duplicate by authors  
6 (EYZ, OWS, GAF and GRA) who participated to data extraction of the articles. The team will  
7 review all the codes as a group until consensus is achieved on a single set of codes. The codes  
8 will then be used to create themes for narrative synthesis of the extracted data and identify  
9 knowledge gap.

### 11 **Outcomes**

12 The primary outcome of this study will look into facilitators and barriers to STI/STD/HIV self-  
13 testing uptake among college students. Facilitators could include access, education, social  
14 support, etc. that encourage young adults to pick up testing kits and test for STI/STD/HIV.  
15 Barriers could include stigma, lack of confidentiality, and other factors that prevent access to  
16 testing kits and ultimately uptake of testing. The secondary outcome of this scoping review is to  
17 assess the state of science on STI/STD/HIV self-testing kits' potential to increase the rate of  
18 testing among college students in the U.S.

### 20 **Patient and public involvement**

21 We will not engage college students in the process of conducting this scoping review. However,  
22 we foresee findings to be made public to people involved in STI/STD/HIV studies and practices  
23 to aid in decision-making in health care practice and policies.

### 25 **ETHICS AND DISSEMINATION**

26 This study is a scoping review of the literature and therefore does not require ethics approval.  
27 Our dissemination plans includes publishing scoping review results in a scientific, peer-reviewed  
28 journal. Findings will also be presented at scholarly conferences and webinars. Findings could  
29 also be made available for relevant stakeholders to use in understanding ways to engage young  
30 adults on college campuses with HIV/STI self-testing.

### 32 **DISCUSSION**

33 Multiple challenges and roadblocks to proper sexual health and STI preventive services for  
34 young adults have been an ongoing pressing concern. These barriers range from the lack of

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3 1 health insurance and coverage to the lack of employment opportunities and transportation  
4 2 services.<sup>18, 19</sup> Social factors related to cost, embarrassment and shame, and confidentiality have  
5 3 been attributed to poor testing habits among young adults when seeking STI/STD/HIV  
6 4 knowledge from health providers.<sup>15, 20</sup> Despite researchers showing increasing interest in  
7 5 understanding the role of self-testing kits, knowledge on acceptance and uptake of self-testing  
8 6 remains limited among young college students in the U.S. In this scoping review, scholarly  
9 7 insight on the state of science around HIV/STI self-testing will be enhanced around acceptance  
10 8 and uptake. The findings of this scoping review will elucidate factors that facilitate or prevent  
11 9 access, acceptance, and uptake of self-testing among young college adults in the U.S.  
12 10 One limitation of this review is its focus on the U.S. and articles published in English. Therefore,  
13 11 it could not be generalized globally and studies in other languages will be missed (e.g., articles  
14 12 in Spanish). Furthermore, the fact that the study is limited to college students will limit access to  
15 13 potential studies in the U.S. However, the the study could be replicated for college students  
16 14 beyond the U.S.  
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### 30 18 **Competing interests**

31 19 The authors declare no conflicts of interest.  
32 20  
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14 8 **Contributors**  
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16 9 JR is the first and corresponding author; JR, PD, DD, JB, and LEN conceived the study; JR, PD,  
17 10 DD, JB, and GAF conducted the initial review, finalized the focus of the study, and designed the  
18 11 study; PD and JB established the search strategy; JB conducted the search strategy; all authors  
19 12 contributed to drafting the manuscript; GRA, EZ, and OS performed critical revisions of the  
20 13 manuscript. All authors approved the final version of the manuscript.  
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## REFERENCES

1. Linley, L. *et al.* Estimated HIV incidence and prevalence in the United States 2010–2015. (2018).
2. Johnson, A. & Brooks, J. Sexually transmitted infections among college students. *Sexually transmitted infections among college students* 5 (2021).
3. CDC. Reported stds reach all-time high for 6th consecutive year. Centers for Disease Control and Prevention 2021 [cited Oct 14, 2022] Available from: <https://www.cdc.gov/media/releases/2021/p0413-stds.html>
4. CDC. HIV in the United States by Age. Centers for Disease Control and Prevention 2022. Available from: <https://www.cdc.gov/hiv/group/age/youth/status-knowledge.html>
5. CDC. National Youth HIV & AIDS Awareness Day. Centers for Disease Control and Prevention 2022. Available from: [https://www.cdc.gov/healthyouth/youth\\_hiv/resources.htm](https://www.cdc.gov/healthyouth/youth_hiv/resources.htm)
6. CDC. Adolescents and stds. Centers for Disease Control and Prevention 2022 [cited Oct 14, 2022]. Available from: <https://www.cdc.gov/std/life-stages-populations/stdfact-teens.htm>
7. CDC. Sexual Risk Behaviors Can Lead to HIV, STDs, & Teen Pregnancy. Centers for Disease Control and Prevention 2021 [cited Oct 14, 2022]. Available from: <https://www.cdc.gov/healthyouth/sexualbehaviors/index.htm>
8. CDC. Special focus profiles. Centers for Disease Control and Prevention 2021 [cited Oct 14, 2022]. Available from: <https://www.cdc.gov/hiv/library/reports/hiv-surveillance/vol-26-no-2/content/special-focus-profiles.html>
9. NIAID. Sexually transmitted diseases. National Institute of Allergy and Infectious Diseases. U.S. Department of Health and Human Services 2015 [cited Oct 11, 2022]. Available from: <https://www.niaid.nih.gov/diseases-conditions/sexually-transmitted-diseases>
10. Kann, L. *et al.* Youth risk behavior surveillance—United States, 1999 [Internet]. MMWR. CDC Surveillance summaries: Morbidity and mortality weekly report. CDC surveillance summaries. U.S. National Library of Medicine. 70, 271-285 (2000).

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2  
3 1 11. Lowry, R., Dunville, R., Robin, L. & Kann, L. Early sexual debut and associated risk  
4 2 behaviors among sexual minority youth. *American journal of preventive medicine* **52**,  
5 3 379-384 (2017).  
6  
7 4  
8 5 12. Kieran, E. & DP., H. Sexually transmitted infections - stis [Internet]. HIV.gov. 2022 [cited  
9 6 Oct 14, 2022]. Available from: [https://www.hiv.gov/hiv-basics/staying-in-hiv-care/other-](https://www.hiv.gov/hiv-basics/staying-in-hiv-care/other-related-health-issues/sexually-transmitted-diseases)  
10 7 [related-health-issues/sexually-transmitted-diseases](https://www.hiv.gov/hiv-basics/staying-in-hiv-care/other-related-health-issues/sexually-transmitted-diseases)  
11  
12 8  
13 9 13. CDC. Which STD tests should I get? Centers for Disease Control and Prevention, 2021  
14 10 [cited Oct 1, 2022]. Available from:  
15 11 <https://www.cdc.gov/std/prevention/screeningreccs.htm>  
16  
17 12  
18 13 14. Hull, S., Kelley, S. & Clarke, J.L. Sexually transmitted infections: compelling case for an  
19 14 improved screening strategy. *Population health management* **20**, S-1-S-11 (2017).  
20  
21 15  
22 16 15. Cuffe, K.M., Newton-Levinson, A., Gift, T.L., McFarlane, M. & Leichter, J.S. Sexually  
23 17 transmitted infection testing among adolescents and young adults in the United States.  
24 18 *Journal of Adolescent Health* **58**, 512-519 (2016).  
25  
26 19  
27 20 16. Shannon, C.L. & Klausner, J.D. The growing epidemic of sexually transmitted infections  
28 21 in adolescents: a neglected population. *Current opinion in pediatrics* **30**, 137 (2018).  
29  
30 22  
31 23 17. WHO. Global progress report on HIV, viral hepatitis and sexually transmitted infections.  
32 24 World Health Organization, 2021 [cited Oct 14, 2022]. Available from:  
33 25 <https://www.who.int/publications/i/item/9789240027077>  
34 26  
35 27 18. Moilanen, K.L., Crockett, L.J., Raffaelli, M. & Jones, B.L. Trajectories of sexual risk from  
36 28 middle adolescence to early adulthood. *Journal of Research on Adolescence* **20**, 114-  
37 29 139 (2010).  
38  
39 30  
40 31 19. Cassidy, C. *et al.* Barriers and enablers to sexual health service use among university  
41 32 students: a qualitative descriptive study using the theoretical domains framework and  
42 33 COM-B model. *BMC health services research* **18**, 1-12 (2018).  
43  
44 34  
45 35 20. Griner, S.B. *et al.* Consumer-Based Sexually Transmitted Infection Screening Among  
46 36 Young Adult Women: The Negative Influence of the Social System. *Sexually*  
47 37 *Transmitted Diseases* **49**, 596-600 (2022).  
48  
49 38  
50 39 21. Arksey, H. & O'Malley, L. Scoping studies: towards a methodological framework.  
51 40 *International journal of social research methodology* **8**, 19-32 (2005).  
52  
53 41  
54 42 22. Colquhoun, H.L. *et al.* Scoping reviews: time for clarity in definition, methods, and  
55 43 reporting. *Journal of clinical epidemiology* **67**, 1291-1294 (2014).  
56  
57  
58  
59  
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- 1  
2  
3  
4 1  
5 2 23. Levac, D., Colquhoun, H. & O'Brien, K.K. Scoping studies: advancing the methodology. *Implementation science* **5**, 1-9 (2010).  
6 3  
7 4  
8 5 24. Peterson, J., Pearce, P.F., Ferguson, L.A. & Langford, C.A. Understanding scoping  
9 6 reviews: Definition, purpose, and process. *Journal of the American Association of Nurse  
10 7 Practitioners* **29**, 12-16 (2017).  
11 8  
12 9 25. Tricco, A.C. *et al.* PRISMA extension for scoping reviews (PRISMA-ScR): checklist and  
13 10 explanation. *Annals of internal medicine* **169**, 467-473 (2018).  
14 11  
15 12 26. Abubakari, G.M. *et al.* Intersectional stigma and its impact on HIV prevention and care  
16 13 among MSM and WSW in sub-Saharan African countries: a protocol for a scoping  
17 14 review. *BMJ Open* **11**, e047280 (2021).  
18 15  
19 16 27. Djiaideu, P. *et al.* Barriers to HIV care among Francophone African, Caribbean and Black  
20 17 immigrant people living with HIV in Canada: a protocol for a scoping systematic review.  
21 18 *BMJ Open* **9**, e027440 (2019).  
22 19  
23 20 28. McHugh, M.L. Interrater reliability: the kappa statistic. *Biochemia medica* **22**, 276-282  
24 21 (2012).  
25 22  
26 23 29. Corbin, J. & Strauss, A. *Basics of qualitative research: Techniques and procedures for  
27 24 developing grounded theory*. Sage publications, 2014.  
28 25  
29 26  
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3 **Supplement 1: Scoping review protocol's Search Strategies.**  
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5 **“Investigating the impact of stigma, accessibility and confidentiality on STI/STD/HIV self-**  
6 **testing among college students in the United States: A protocol for a scoping review”**  
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For peer review only

## OVID Medline.

#	Query
1	exp HIV Infections/ or exp HIV/
2	(hiv* or hiv infect* or human immunodeficiency virus or human immunodeficiency virus or human immune deficiency virus or human immune deficiency virus or acquired immunodeficiency syndrome or acquired immunodeficiency syndrome or acquired immune deficiency syndrome or acquired immune deficiency syndrome).ti,ab.
3	1 or 2
4	exp sexually transmitted infections/ or exp hepatitis b/ or exp herpes genitalis/ or exp syphilis/ or exp gonorrhea/ or exp chlamydia trachomatis/ or exp calymmatobacterium/ or exp trichomonas vaginitis/ or exp Alphapapillomavirus/ or exp Human papillomavirus 6/ or exp Human papillomavirus 11/ or exp Human papillomavirus 16/ or exp Human papillomavirus 18/ or exp Human papillomavirus 31/ or exp Betapapillomavirus/ or exp Gammapapillomavirus/ or exp granuloma Inguinale/
5	(sexually transmitted disease* or sexually transmissible disease* or sexually transmitted infection* or sexually transmissible infection* or sexually transmitted infectious disease* or sexually transmissible infectious disease* or sexually transmitted disorder* or sexually transmissible disorder* or STI or STIs or STD or STIs or venereal disease* or venereal infection* or venereal disorder* or genital herpes or herpes genitalis or genital infection* or genital disorder* or herpes simplex or herpes virus or HSV*).ti,ab. or chancroid/ or chancroid*.ti,ab. or haemophilus ducreyi.ti,ab. or chlamydia infection*.ti,ab. or chlamydia trachomatis.ti,ab. or gonorrhoea*.ti,ab. or gonorrhea*.ti,ab. or syphilis.ti,ab. or syphillis.ti,ab. or condylomata lata.ti,ab. or chancre*.ti,ab. or lymphogranuloma venereum.ti,ab. or lymphogranuloma venereum.ti,ab. or granuloma inguinale.ti,ab. or donovania.ti,ab. or donovanosis.ti,ab. or calymmatobacterium granulomatis.ti,ab. or klebsiella granulomatis.ti,ab. or klebsiella granulomatis.ti,ab. or treponema pallidum.ti,ab. or treponema pallidum.ti,ab. or genital wart*.ti,ab. or venereal wart*.ti,ab. or condylomata acuminata.ti,ab. or human papillomavirus 6.ti,ab. or hpv*.ti,ab. or hpv6.ti,ab. or human papillomavirus.ti,ab. or hepatitis b.ti,ab. or trichomonas vaginitis.ti,ab. or genital ulcer*.ti,ab. or anogenital ulcer*.ti,ab. or anorectal ulcer*.ti,ab. or anorectal ulcer*.ti,ab. or penile ulcer*.ti,ab. or human papillomavirus*.ti,ab. or hpv.ti,ab. or recurrent respiratory papillomatosis.ti,ab. or condyloma*.ti,ab.
6	4 or 5
7	3 or 6
8	exp Self-Testing/
9	((home adj testing) or self test* or self sample or self sampling or rapid diagnostic test*).tw,kf.
10	(self collect* or home-based HIV test* or home-based STI test* or home-based STD test* or ((community-based or community-led or community-driven) adj3 test*)).tw,kf.
11	8 or 9 or 10
12	7 and 11

13	exp Students/ or exp Universities/
14	exp Young Adult/ or exp Adolescent/
15	(college student* or higher education or teen* or adolescen*).tw,kf.
16	13 or 14 or 15
17	12 and 16

For peer review only



## OVID EMBASE.

#	Query
1	exp Human immunodeficiency virus/ or exp Human immunodeficiency virus infection/
2	(hiv* or hiv infect* or human immunodeficiency virus or human immunodeficiency virus or human immune deficiency virus or human immune deficiency virus or acquired immunodeficiency syndrome or acquired immunodeficiency syndrome or acquired immune deficiency syndrome or acquired immune deficiency syndrome).ti,ab.
3	1 or 2
4	exp sexually transmitted disease/ or exp hepatitis B/ or exp genital herpes/ or exp syphilis/ or exp gonorrhea/ or exp Chlamydia trachomatis/ or exp Klebsiella/ or exp vaginal trichomoniasis/ or exp Alphapapillomavirus/ or exp Wart virus/ or exp granuloma inguinale/ or exp Gammapapillomavirus/ or exp betapapillomavirus/
5	(sexually transmitted disease* or sexually transmissible disease* or sexually transmitted infection* or sexually transmissible infection* or sexually transmitted infectious disease* or sexually transmissible infectious disease* or sexually transmitted disorder* or sexually transmissible disorder* or STI or STIs or STD or STDs or venereal disease* or venereal infection* or venereal disorder* or genital herpes or herpes genitalis or genital infection* or genital disorder* or herpes simplex or herpes virus or HSV* or chancroid or chancroid* or haemophilus ducreyi or chlamydia infection* or chlamydia trachomatis or gonorrhoea* or gonorrhea* or syphilis or syphilis or condylomata lata or chancre*).ti,ab. or lymphogranuloma venereum/ or lymphogranuloma venereum.ti,ab. or granuloma inguinale.ti,ab. or donovania.ti,ab. or donovanosis.ti,ab. or calymmatobacterium granulomatis.ti,ab. or klebsiella granulomatis.ti,ab. or klebsiella granulomatis.ti,ab. or treponema pallidum.ti,ab. or treponema pallidum.ti,ab. or genital wart*.ti,ab. or venereal wart*.ti,ab. or condylomata acuminata.ti,ab. or human papillomavirus 6.ti,ab. or hpv*.ti,ab. or hpv6.ti,ab. or human papillomavirus.ti,ab. or hepatitis b.ti,ab. or trichomonas vaginitis.ti,ab. or genital ulcer*.ti,ab. or anogenital ulcer*.ti,ab. or anorectal ulcer*.ti,ab. or anorectal ulcer*.ti,ab. or penile ulcer*.ti,ab. or human papillomavirus*.ti,ab. or hpv.ti,ab. or recurrent respiratory papillomatosis.ti,ab. or condyloma*.ti,ab.
6	4 or 5
7	3 or 6
8	exp self-testing/
9	((home adj testing) or self test* or self sample or self sampling or rapid diagnostic test*).tw,kf.
10	(self collect* or home-based HIV test* or home-based STI test* or home-based STD test* or ((community-based or community-led or community-driven) adj3 test*)).tw,kf.
11	8 or 9 or 10
12	exp student/ or exp university/ or exp university student/ or exp young adult/ or exp adolescent/
13	(college student* or university student* or higher education or teen* or adolescen*).tw,kf.
14	12 or 13
15	7 and 11 and 14

## CINAHL Complete

#	Query
S11	S4 AND S7 AND S10
S10	S8 OR S9
S9	"college student*" OR "university student*" OR higher education" OR "teen*" OR "adolescen*"
S8	(MH "student+") or (MH "university+") OR (MH "university student+") OR (MH "young adult+") or (MH "adolescent+")
S7	S5 OR S6
S6	"home test*" OR "self test*" OR "self sample" OR "self sampling" OR "rapid diagnostic test*" OR "self collect*" OR "home-based HIV test*" OR "home-based STI test*" OR "home-based STD test*" OR "community-based test*" OR "community-led test" OR "community-driven test"
S5	(MH "self-testing+")
S4	S1 OR S2 OR S3
S3	"hiv"OR "hiv infection"OR "human immunodeficiency virus"OR "human immunodeficiency virus"OR "human immune deficiency virus"OR "acquired immunodeficiency syndrome"OR "acquired immunodeficiency syndrome"OR "acquired immune deficiency syndrome"
S2	"sexually transmitted disease" OR "sexually transmissible disease" OR "sexually transmitted infection" OR "sexually transmissible infection" OR "sexually transmitted infectious disease" OR "sexually transmissible infectious disease" OR "sexually transmitted disorder" OR "sexually transmissible disorder" OR "STI" OR "STIs" OR "STD" OR "STDs" OR "venereal disease*" OR "venereal infection" OR "venereal disorder" OR "genital herpes" OR "herpes genitalis" OR "genital infection" OR "genital disorder*" OR "herpes simplex" OR "herpes virus" OR "HSV" OR "chancroid" OR "chancroid" OR "haemophilus ducreyi" OR "chlamydia infection" OR "chlamydia trachomatis" OR "gonorrhoea" OR "gonorrhoea" OR "syphilis" OR "syphillis" OR "condylomata lata" OR "chancres" OR "lymphogranuloma venereum" OR "lymphogranuloma venereum" OR "granuloma inguinale" OR "donovania" OR "donovanosis" OR "calymmatobacterium granulomatis" OR "klebsiella granulomatis" OR "klebsiella granulomatis" OR "treponema pallidum" OR "treponema pallidum" OR "genital wart" OR "venereal wart" OR "condylomata acuminata" OR "human papillomavirus 6" OR "hpv" OR "hpv6" OR "human papillomavirus" OR "hepatitis b" OR "trichomonas vaginitis" OR "genital ulcer" OR "anogenital ulcer" OR "anorectal ulcer" OR "anorectal ulcer" OR "penile ulcer" OR "human papillomavirus" OR "hpv" OR "recurrent respiratory papillomatosis" OR "condyloma"
S1	(MH "HIV Infections+") OR (MH "Human Immunodeficiency Virus+")

## Web of Science Core Collection.

4	1 AND 2 AND 3
3	TS: hiv* OR hiv infect* OR human immunodeficiency virus OR human immunodeficiency virus OR human immune deficiency virus OR human immune deficiency virus OR acquired immunodeficiency syndrome OR acquired immunodeficiency syndrome OR acquired immune deficiency syndrome OR acquired immune deficiency syndrome OR sexually transmitted disease* OR sexually transmissible disease* OR sexually transmitted infection* OR sexually transmissible infection* OR sexually transmitted infectious disease* OR sexually transmissible infectious disease* OR sexually transmitted disorder* OR sexually transmissible disorder* OR STI OR STIs OR STD OR STIs OR venereal disease* OR venereal infection* OR venereal disorder* OR genital herpes OR herpes genitalis OR genital infection* OR genital disorder* OR herpes simplex OR herpes virus OR HSV* OR chancroid OR chancroid* OR haemophilus ducreyi OR chlamydia infection* OR chlamydia trachomatis OR gonorrhoea* OR gonorrhoea* OR syphilis OR syphilis OR condylomata lata OR chancre* OR lymphogranuloma venereum OR lymphogranuloma venereum OR granuloma inguinale OR donovania OR donovanosis OR calymmatobacterium granulomatis OR klebsiella granulomatis OR klebsiella granulomatis OR treponema pallidum OR treponema pallidum OR genital wart* OR venereal wart* OR condylomata acuminata OR human papillomavirus 6 OR hpv* OR hpv6 OR human papillomavirus OR hepatitis b OR trichomonas vaginitis OR genital ulcer* OR anogenital ulcer* OR anorectal ulcer* OR anorectal ulcer* OR penile ulcer* OR human papillomavirus* or hpv or recurrent respiratory papillomatosis or condyloma*
2	TS: self collect* or home-based HIV test* or home-based STI test* or home-based STD test* or community-based test* or community-led test* or community-driven test* OR home-based test
1	TS: college student* OR higher education OR teen* OR adolescen* OR university* OR university student*

## Cochrane Database

#	Query
4	1 AND 2 AND 3
3	Title Abstract Keyword: hiv* OR hiv infect* OR human immunodeficiency virus OR human immunodeficiency virus OR human immune deficiency virus OR human immune deficiency virus OR acquired immunodeficiency syndrome OR acquired immunodeficiency syndrome OR acquired immune deficiency syndrome OR sexually transmitted disease* OR sexually transmissible disease* OR sexually transmitted infection* OR sexually transmissible infection* OR sexually transmitted infectious disease* OR sexually transmissible infectious disease* OR sexually transmitted disorder* OR sexually transmissible disorder* OR STI OR STIs OR STD OR STIs OR venereal disease* OR venereal infection* OR venereal disorder* OR genital herpes OR herpes genitalis OR genital infection* OR genital disorder* OR herpes simplex OR herpes virus OR HSV* OR chancroid OR chancroid* OR haemophilus ducreyi OR chlamydia infection* OR chlamydia trachomatis OR gonorrhoea* OR gonorrhoea* OR syphilis OR syphilis OR condylomata lata OR chancre* OR lymphogranuloma venereum OR lymphogranuloma venereum OR granuloma inguinale OR donovania OR donovanosis OR calymmatobacterium granulomatis OR klebsiella granulomatis OR klebsiella granulomatis OR treponema pallidum OR treponema pallidum OR genital wart* OR venereal wart* OR condylomata acuminata OR human papillomavirus 6 OR hpv* OR hpv6 OR human papillomavirus OR hepatitis b OR trichomonas vaginitis OR genital ulcer* OR anogenital ulcer* OR anorectal ulcer* OR anorectal ulcer* OR penile ulcer* OR human papillomavirus* or hpv OR recurrent respiratory papillomatosis or condyloma*
2	Title Abstract Keyword: self collect* or home-based HIV test* or home-based STI test* or home-based STD test* or community-based test* or community-led test* or community-driven test* OR home-based test*
1	Title Abstract Keyword: college student* OR higher education OR teen* OR adolescen* OR university* OR university student*

## PubMed

#	Query
4	1 AND 2 AND 3
3	<p>((("sexually transmitted disease"[Title/Abstract] OR "sexually transmissible disease"[Title/Abstract] OR "sexually transmitted infection"[Title/Abstract] OR "sexually transmissible infection"[Title/Abstract] OR "sexually transmitted infectious disease"[Title/Abstract] OR "sexually transmissible infectious disease"[Title/Abstract] OR "sexually transmitted disorder"[Title/Abstract] OR "sexually transmissible disorder"[Title/Abstract] OR "STI"[Title/Abstract] OR "STIs"[Title/Abstract] OR "STD"[Title/Abstract] OR "STDs"[Title/Abstract] OR "venereal disease*"[Title/Abstract] OR "venereal infection"[Title/Abstract] OR "venereal disorder"[Title/Abstract] OR "genital herpes"[Title/Abstract] OR "herpes genitalis"[Title/Abstract] OR "genital infection"[Title/Abstract] OR "genital disorder*"[Title/Abstract] OR "herpes simplex"[Title/Abstract] OR "herpes virus"[Title/Abstract] OR "HSV"[Title/Abstract] OR "chancroid"[Title/Abstract] OR "chancroid"[Title/Abstract] OR "haemophilus ducreyi"[Title/Abstract] OR "chlamydia infection"[Title/Abstract] OR "chlamydia trachomatis"[Title/Abstract] OR "gonorrhoea"[Title/Abstract] OR "gonorrhea"[Title/Abstract] OR "syphilis"[Title/Abstract] OR "syphillis"[Title/Abstract] OR "condylomata lata"[Title/Abstract] OR "chancre"[Title/Abstract] OR "lymphogranuloma venereum"[Title/Abstract] OR "granuloma inguinale"[Title/Abstract] OR "donovania"[Title/Abstract] OR "donovanosis"[Title/Abstract] OR "calymmatobacterium granulomatis"[Title/Abstract] OR "klebsiella granulomatis"[Title/Abstract] OR "treponema pallidum"[Title/Abstract] OR "genital wart"[Title/Abstract] OR "venereal wart"[Title/Abstract] OR "condylomata acuminata"[Title/Abstract] OR "human papillomavirus 6"[Title/Abstract] OR "hpv"[Title/Abstract] OR "hpv6"[Title/Abstract] OR "human papillomavirus"[Title/Abstract] OR "hepatitis b"[Title/Abstract] OR "trichomonas vaginitis"[Title/Abstract] OR "genital ulcer"[Title/Abstract] OR "anogenital ulcer"[Title/Abstract] OR "anorectal ulcer"[Title/Abstract] OR "penile ulcer"[Title/Abstract] OR "recurrent respiratory papillomatosis"[Title/Abstract] OR "condyloma"[Title/Abstract] OR OR[Title/Abstract] OR OR[Title/Abstract] OR OR[Title/Abstract] OR ("sexually transmitted infections"[MeSH Terms] OR "hepatitis b"[MeSH Terms] OR "herpes genitalis"[MeSH Terms] OR "syphilis"[MeSH Terms] OR "gonorrhoea"[MeSH Terms] OR "chlamydia trachomatis"[MeSH Terms] OR "calymmatobacterium"[MeSH Terms] OR "trichomonas vaginitis"[MeSH Terms] OR "Alphapapillomavirus"[MeSH Terms] or "Human papillomavirus 6"[MeSH Terms] or "Human papillomavirus 11"[MeSH Terms] or "Human papillomavirus 16"[MeSH Terms] or "Human papillomavirus 18"[MeSH Terms] or "Human papillomavirus 31"[MeSH Terms] or "Betapapillomavirus"[MeSH Terms] or "Gammapapillomavirus"[MeSH Terms] OR "granuloma Inguinale"[MeSH Terms])) OR ("HIV Infections"[MeSH Terms] OR "HIV"[MeSH Terms] OR "hiv"[Title/Abstract] OR "hiv infection"[Title/Abstract] OR "human immunodeficiency virus"[Title/Abstract] OR "human immunodeficiency virus"[Title/Abstract] OR "human immune deficiency virus"[Title/Abstract] OR "acquired immunodeficiency syndrome"[Title/Abstract] OR "acquired immunodeficiency syndrome"[Title/Abstract] OR "acquired immune deficiency syndrome"[Title/Abstract])) - Saved search</p>
2	<p>((("home testing" OR "self test" OR "self sample" OR "self sampling" OR "rapid diagnostic test" OR "self collect" OR "home-based HIV test" OR "home-based STI test" OR "home-based STD test" OR "community-based test" OR "community-led test" OR "community-driven test") OR (self testing[MeSH Terms])))</p>
1	<p>((("Students"[MeSH Terms] OR "Universities" [MeSH Terms] OR "Young Adult"[MeSH Terms] OR "Adolescent"[MeSH Terms]) OR ("college student"[Title/Abstract] OR "higher education"[Title/Abstract] OR "teen"[Title/Abstract] OR "adolescent"[Title/Abstract] OR "adolescence"[Title/Abstract]))</p>

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## Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
<b>TITLE</b>			
Title	1	Identify the report as a scoping review.	1
<b>ABSTRACT</b>			
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	2
<b>INTRODUCTION</b>			
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	4-5
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	5
<b>METHODS</b>			
Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.	N/A
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	6
Information sources*	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	6
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	6
Selection of sources of evidence†	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	7
Data charting process‡	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	8
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	8
Critical appraisal of individual sources of evidence§	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).	N/A
Synthesis of results	13	Describe the methods of handling and summarizing the data that were charted.	8





SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
<b>RESULTS</b>			
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	N/A
Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data were charted and provide the citations.	N/A
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).	N/A
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	N/A
Synthesis of results	18	Summarize and/or present the charting results as they relate to the review questions and objectives.	N/A
<b>DISCUSSION</b>			
Summary of evidence	19	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	N/A
Limitations	20	Discuss the limitations of the scoping review process.	9
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	9
<b>FUNDING</b>			
Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	10

JBI = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.

\* Where *sources of evidence* (see second footnote) are compiled from, such as bibliographic databases, social media platforms, and Web sites.

† A more inclusive/heterogeneous term used to account for the different types of evidence or data sources (e.g., quantitative and/or qualitative research, expert opinion, and policy documents) that may be eligible in a scoping review as opposed to only studies. This is not to be confused with *information sources* (see first footnote).

‡ The frameworks by Arksey and O'Malley (6) and Levac and colleagues (7) and the JBI guidance (4, 5) refer to the process of data extraction in a scoping review as data charting.

§ The process of systematically examining research evidence to assess its validity, results, and relevance before using it to inform a decision. This term is used for items 12 and 19 instead of "risk of bias" (which is more applicable to systematic reviews of interventions) to include and acknowledge the various sources of evidence that may be used in a scoping review (e.g., quantitative and/or qualitative research, expert opinion, and policy document).

From: Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. *Ann Intern Med.* 2018;169:467–473. doi: 10.7326/M18-0850.



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