

University Students’ Sexual Health Knowledge: A Scoping Literature Review

Christine Cassidy, Janet Curran,
Audrey Steenbeek, Donald Langille

Sexual health plays an important role in the well-being of university students. The literature shows that the majority of university undergraduates are sexually active and at high risk of contracting sexually transmitted infections (STIs); however, the breadth and degree of the literature on their sexual health knowledge is unclear. The purpose of this scoping review was to gain a deeper understanding of the state of research on the sexual health knowledge of university/college students globally. A 5-stage framework was used to guide the review and to characterize the literature on sexual health knowledge. Articles published in English between 2000 and 2014 were reviewed if they included university students as a population of interest and described the methods used to measure sexual health knowledge. Of the 2,386 articles retrieved, 91 met the criteria. The majority of the articles ($n = 79$) used a cross-sectional design to investigate students’ knowledge about HIV/AIDS ($n = 45$), STIs ($n = 23$), HPV ($n = 9$), and contraception ($n = 24$). The review highlights gaps in the literature and in findings relating to the research dominance of various geographic locations, common research designs, the wide range of measurement tools used, and the variety of sexual health knowledge outcomes of interest. The review provides a useful description of the literature on sexual health knowledge among university/college students and some recommendations for moving the field forward.

Keywords: sexual health, knowledge, students, scoping literature review, health education

Résumé

Revue de la littérature sur les connaissances des étudiants universitaires en matière de santé sexuelle

Christine Cassidy, Janet Curran,
Audrey Steenbeek, Donald Langille

La santé sexuelle joue un rôle important dans le bien-être des étudiants universitaires. La littérature indique que la majorité des étudiants de premier cycle sont actifs sexuellement et présentent un risque élevé de contracter une infection transmissible sexuellement (ITS). Toutefois, l'étendue et la profondeur des études et travaux de recherche sur la connaissance que possède cette population des questions de santé sexuelle demeurent mal connues. L'objectif de la présente revue de la littérature est de mieux comprendre l'état actuel de la recherche sur la connaissance qu'ont les étudiants universitaires et de niveau collégial à l'échelle mondiale des questions de santé sexuelle. Un cadre d'analyse en cinq étapes a été utilisé pour orienter l'exercice d'examen et caractériser la littérature quant à la question des connaissances relatives à la santé sexuelle. Un corpus d'articles publiés en anglais entre 2000 et 2014 a été évalué de manière à repérer les études ayant comme population cible les étudiants universitaires et proposant une méthode pour mesurer les connaissances de cette population en matière de santé sexuelle. Parmi les 2 386 articles évalués, 91 répondaient à ces critères. La majorité d'entre eux ($n = 79$) s'appuyaient sur un modèle d'étude transversale pour examiner les connaissances des étudiants concernant le VIH/sida ($n = 45$), les ITS ($n = 23$), le virus du papillome humain ($n = 9$) et la contraception ($n = 24$). Cette revue de la littérature a permis de relever des lacunes dans les études et travaux de recherche ainsi que dans leurs conclusions concernant la prédominance de certaines régions géographiques dans la recherche, la présence de modèles de recherche communs, la grande diversité des outils de mesure utilisés et la variété des résultats liés aux connaissances en matière de santé sexuelle ciblés par les études. L'article fournit une description utile de la littérature touchant la question des connaissances en matière de santé sexuelle chez les étudiants universitaires ou de niveau collégial et formule certaines recommandations afin de contribuer à la progression de ce domaine de recherche.

Mots-clés : santé sexuelle, connaissances, étudiants, revue de la littérature, connaissances en matière de santé sexuelle

Background

The transition from adolescence to young adulthood can be difficult, as this is when many youths leave home for the first time to attend university. According to the Association of Universities and Colleges of Canada (2011), 62% of full-time undergraduate students are under the age of 22. For most the transition to university is uneventful but for others it may involve high-risk behaviours or new sexual experiences, which can lead to negative health outcomes, including sexually transmitted infections (STIs) and unplanned/unwanted pregnancy (Dalton & Galambos, 2008; Public Health Agency of Canada [PHAC], 2011).

Research with the university and college student population has focused on sexual health behaviours and negative health outcomes, including contraception use, sexual activity, sexual coercion, and the relationship between alcohol use and sexual intercourse (Scholly, Katz, Cole, & Heck, 2010; Snipes & Benotsch, 2013). Eighty percent of young adults in Canada aged 20 to 24 are sexually active (PHAC, 2011). This high prevalence of sexual activity, coupled with newfound independence and campus culture, may lead to opportunities for high-risk behaviours, including unhealthy sexual practices (PHAC, 2011; Scholly et al., 2010). For example, in one study only 58% of young adults reported using a condom the last time they had sexual intercourse (PHAC, 2011).

Despite extensive research on sexual health behaviours and outcomes in this population (Certain, Harahan, Saewyc, & Fleming, 2009; Martson & King, 2006; PHAC, 2011; Rhodes et al., 2006; Scholly et al., 2010; Snipes & Benotsch, 2013), the breadth and degree of sexual health knowledge among university students are unclear. On the international front, a few studies have focused on sexual health knowledge among university students, with the findings indicating that university students overall have a minimal level of sexual health knowledge (Bertram & Niederhauser, 2008; Moore & Smith, 2012; Peate et al., 2002; Simbar, Tehrani, & Hashemi, 2004; Tung, Ding, & Farmer, 2008). The results of various studies indicate that students are able to name various STIs but are unaware of how these are transmitted, the signs and symptoms, and how to get diagnosed (D'Urso, Thompson-Robinson, & Chandler, 2007; Lewis, Rosenthal, Succop, Stanberry, & Bernstein, 1999; Moore & Smith, 2013; Weinstein, Walsh, & Ward, 2008).

Sexual health and well-being are important components of holistic nursing care, as they intersect with a variety of other health factors (East & Jackson, 2013; Evans, 2013). Nurses have a unique opportunity to ensure the best possible health outcomes by engaging patient populations, across a range of practice settings, in sensitive discussions related to sexuality and safe sex; however, this aspect of care is often neglected (East

& Jackson, 2013; Hayter, 2005). Studies have found that many nurses do not feel adequately prepared to address the sexual health concerns of patients in various health-care settings (Astbury-Ward, 2011; Evans, 2013; Hayter, Jackson, Carter, & Nyamathi, 2012). Hayter et al. (2012) recommend that nurses develop communication skills and knowledge specific to their population of interest in order to support communication during sensitive discussions, such as those about sexual health. It is critical that nurses working with adolescents and young adults understand the state of research on sexual health knowledge of university students, so that they can tailor their approach to their patients.

The literature examining the sexual health knowledge of university and college students has not been systematically reviewed. More specifically, it is unclear how the literature is dispersed in the field and how sexual health knowledge is defined and measured. The uncertainty makes it challenging for health-care providers working with this population to gain an understanding of the variation in sexual health knowledge and the range of sexual health practices and the tools available to capture them. This scoping literature review had two research objectives: (1) to describe the range of current research related to sexual health knowledge among university and/or college students, and (2) to describe the tools and measures used to capture sexual health knowledge among these students.

Methods

Scoping reviews “map the key concepts underpinning a research area and the main sources and types of evidence available, and can be undertaken as standalone projects in their own right, especially where an area is complex or has not been reviewed comprehensively before” (Arksey & O’Malley, 2005, p. 21). We followed the five-stage framework outlined by Arksey and O’Malley to map the literature on the sexual health knowledge of university students.

Stage 1: Identifying the Research Question

Identification of the research question is the initial stage of a scoping literature review, as it provides a guide for building the search strategies (Arksey & O’Malley, 2005). We used the PICOT (Population, Intervention, Comparison, Outcome, Time) format (Glasziou & Del Mar, 2003) to frame our research question. Our population of interest was university or college undergraduate students and our target outcome was sexual health knowledge. Our two research questions were as follows: *What literature has been published relating to sexual health knowledge among university and/or college undergraduate students globally? In the literature*

on the sexual health knowledge of university and/or college undergraduate students, what tools or measures are used to capture their sexual health knowledge?

Stage 2: Identifying Relevant Studies

A systematic approach was used to identify relevant studies. This involved articulation of strict inclusion and exclusion criteria and development of a comprehensive search strategy.

Inclusion and exclusion criteria. Criteria were developed in order to build a well-defined strategy for identifying studies pertaining to the sexual health knowledge of young adults. In 2002 the World Health Organization reworked the definition of sexual health with the aid of a number of expert consultants. The new, holistic definition includes the state of physical, mental, and social well-being in relation to sexuality, as well as changing sexual behaviours among young adults in today's society (Dalton & Galambos, 2008; World Health Organization, 2013). We decided to review articles published between 2000 and 2014 to capture any changes in the sexual health literature that could reflect this new definition. Three sexual health themes were identified: STIs (including chlamydia, gonorrhoea, syphilis, herpes, human papillomavirus [HPV], and HIV/AIDS); condoms; and contraception. Articles focusing on sexual health knowledge were included if they explored how the knowledge was measured, influences on sexual health knowledge, level of knowledge, or predictors of sexual health knowledge. Articles could be from any geographic location, as a range of locations could serve to deepen our understanding of any knowledge differences among various countries and cultures. Only articles published in English were included. Additionally, only articles using a quantitative, qualitative, or mixed methods research design were included. Editorials and commentaries were excluded. Also, the data had to pertain to college or university student populations; if other populations were part of the study, the results for the student population had to be provided separately.

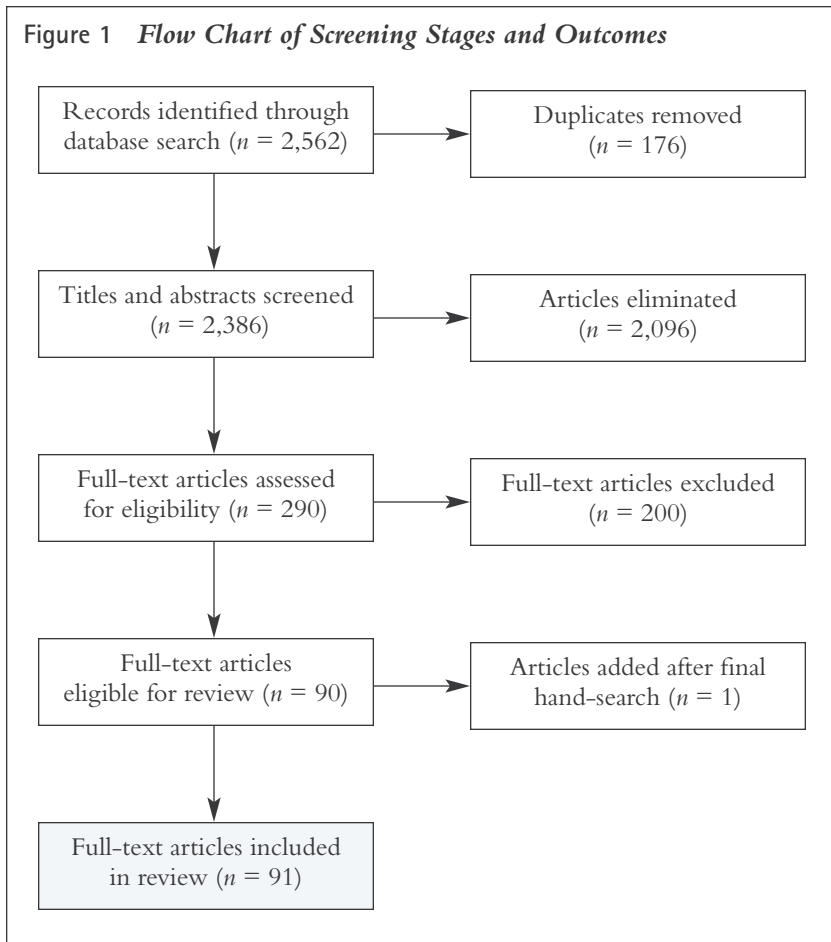
Search strategy. The search strategy, developed in consultation with a library scientist, included electronic databases, reference lists, and key journals that were hand-searched for relevant studies.

Four electronic databases were searched: CINAHL, PsycINFO, PubMed, and EMBASE. MeSH headings and keyword searches — college, university, undergraduate, student,* sexual,* knowledge — were applied in combinations using the Boolean operators AND and OR. The truncation symbol allowed for a variety of spellings of the root word. As described above, date limits (2000–14) and language limits were placed on each search. (The search strategy is available upon request from the first author.) Additional search initiatives included hand-searching of relevant journals (*College Student Journal* and *Journal of American College*

Health) and the reference lists of the final articles selected for review. All retrieved references were imported into RefWorks.TM Following removal of duplicates, 2,386 citations were screened for inclusion.

Stage 3: Selecting the Studies

Studies that did not meet the inclusion and/or exclusion criteria were eliminated (Arskey & O'Malley, 2005). Selection of articles involved two stages of screening. First, two reviewers working independently screened the titles and abstracts of the selected articles. Next, two independent reviewers screened the full-text articles. The researchers then met to compare their selections and discuss articles that they were unsure about (Figure 1).



Stage 4: Charting the Data

In the next stage of the scoping literature review, two reviewers extracted data from the 91 selected articles. Three members of the team developed a data-charting template (using Microsoft ExcelTM) to extract the data needed to answer the research questions. Additionally, as the objective of the review was to draw a map of the literature, the seven selected variables were author(s), year of publication, country of publication, research design, population of interest, outcome variables, and measurement tools. Two independent researchers extracted data from the first 15 articles and met to ensure that their approach was consistent; subsequently data were extracted from the remaining articles. Once data abstraction was complete, the two reviewers met again to compare their results. Variations in extraction were discussed and consensus was used to settle discrepancies. After the data were extracted, they were coded in Microsoft ExcelTM and a descriptive approach was used to organize the findings into groupings. A deductive approach was then used to group the textual data based on the inclusion/exclusion criteria and the data-extraction categories.

Stage 5: Collating, Summarizing, and Reporting the Results

The fifth stage consisted of an overview of the data extracted from the 91 articles included for review (Arksey & O'Malley, 2005; Levac, Colquhoun, & O'Brien, 2010; Rumrill, Fitzgerald, & Merchant, 2010). The data were analyzed descriptively on the variables selected and a deductive approach based on established categories was used to determine patterns and groupings. The results of the scoping literature review are described below.

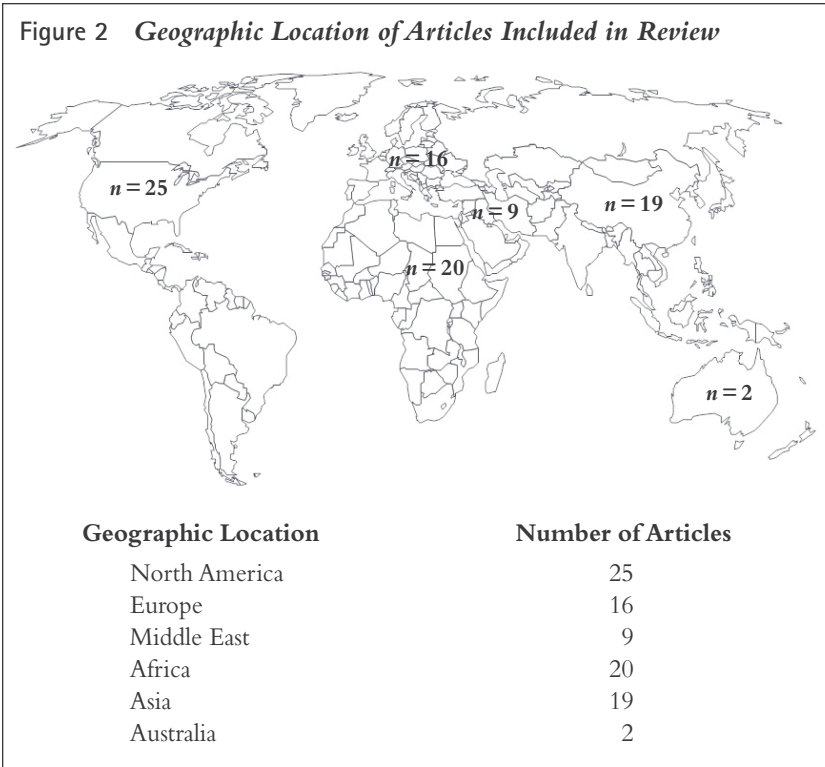
Results

Year of Publication

As described above, the inclusion criteria stipulated articles published between 2000 and 2014 using the World Health Organization's (2013) modified definition of sexual health. For the years 2003 to 2010, the number of publications on the sexual health knowledge of university students ranges between four and eight. More publications appear in later years: 11 in 2011, 11 in 2012, and 14 in 2013 (Table 1).

Table 1 *Year of Publication for Articles Included in Review*

Year of Publication	Number of Articles
2000	2
2001	4
2002	2
2003	6
2004	5
2005	4
2006	8
2007	4
2008	8
2009	7
2010	4
2011	11
2012	11
2013	14
2014	1



Geographic Location of Publications

Of the 91 articles included in the review, the largest number, 25, were published in the United States (27%). Twenty of the articles reported on studies conducted in African countries (22%), of which Nigeria had the largest number — all focused on university students' knowledge about HIV/AIDs. Countries in Asia and Europe followed, with 19 and 16 papers, respectively (Figure 2).

Research Design

Of the 91 articles included for review, the majority ($n = 79$) reported on cross-sectional descriptive and/or cross-sectional comparative studies.

Five studies used a pre/post-test quasi-experimental design to capture the sexual health knowledge of their participants (Chi, Hawk, Winter, & Meeus, 2013; Lambert, 2001; Mill, Opare, & Fleming, 2004; Moore & Smith, 2012; Warren, 2010). Another five used a qualitative and/or mixed methods design (Brown et al., 2008; Burchard, Laurence, & Stocks, 2011; Goundry, Finlay, & Llewellyn, 2013; Li et al., 2004; Tagoe & Aggor, 2009).

Of this latter group, one study (Brown et al., 2008) interviewed each of its 105 participants individually, while the remainder used focus groups as their method of data collection.

The sample size for the above studies depended on the total student population, research design, and research question ($\mu = 716.7$; $\sigma = 827.6$). The sample size for the cross-sectional studies ranged between 55 (a single-site study in Vadodara, India, that compared medical and dental students [Agrawa, Sadadi, Dat, & Trivedi, 2013]) and 4,769 (a multisite study that examined sexual health knowledge among female undergraduate students from 16 colleges in China [Li et al., 2013]). The sample size for the qualitative studies ranged from 21 (Burchard et al., 2011) to 105 (Brown et al., 2008).

Variables of Interest

The studies examined knowledge, attitudes, and behaviours across several variables under the phrase “sexual health”: HIV/AIDS, contraception, STIs, and sources of sexual health information (Table 1).

HIV/AIDS. Almost half of the studies (49%; $n = 45$) examined students' HIV/AIDS knowledge. The majority of these ($n = 16$) were conducted in Africa between 2004 and 2013 (Brown et al., 2008; Chng, Eke-Huber, Eaddy, & Collins, 2005; Hoque & Ghuman, 2011; Mill et al., 2004; Mkumbo, 2013; Nkuo-Akenji et al., 2007; Nwezeh, 2010; Odu et al., 2008; Ogbuji, 2005; Onah, Mbah, Chukwuka, & Ikeme, 2004; Oppong Asante & Oti-Boadi, 2013; Oyefara & Bisiriyu, 2007; Petro-Nustas, 2000; Reddy & Frantz, 2011; Tagoe & Aggor, 2009; Unadike, Ekrikpo, & Bassey, 2012). Ten of the articles that focused on HIV/AIDS were published in the United States (Grin, Chan, & Operario, 2013; Inungu, Mumford, Younis, & Langford, 2009; Lance, 2001; Mancoske, Rountree, Donovan, & Neighbors, 2006; Sileo & Sileo, 2008; St. Rose, 2008; Sutton et al., 2011; Tung, Hu, Efir, Su, & Yu, 2013; Weinstein et al., 2008).

The HIV/AIDS-focused studies examined various student subpopulations in addition to undergraduates in general: medical students, female students, MSM (men who have sex with men) college students, heterosexual students, African-American college students, and first-year undergraduates. The articles relating to HIV/AIDS investigated the following outcomes of interest: knowledge ($n = 6$); knowledge and awareness ($n = 2$); knowledge, attitudes, and practices ($n = 1$); knowledge, attitudes, and behaviours ($n = 22$); perceived risk ($n = 7$); and sources of HIV/AIDS information ($n = 14$) (Table 1).

STIs. A total of 23 studies (25%) explored knowledge related to STIs, including symptoms, transmission, complications, screening/testing, and treatment. The populations of interest were undergraduates in general;

female undergraduates; health and education students; and medical, engineering, and human sciences students. The outcomes of interest were knowledge ($n = 5$); knowledge, awareness, and beliefs ($n = 3$); knowledge, attitudes, and practices ($n = 4$); knowledge, attitudes, and behaviours ($n = 8$); and sources of STI information ($n = 6$) (Table 1).

Nine studies (10%) examined students' knowledge about one STI in particular — HPV — including prevalence, symptoms, complications, prevention, treatment, and screening/testing. Subpopulations of interest for the HPV studies were medical science students; female students; male students; female sorority members; Black undergraduates; physician assistant students; and psychology students. The outcomes of interest were knowledge ($n = 3$); knowledge and attitudes ($n = 2$); knowledge, attitudes, and behaviours ($n = 3$); and sources of HPV information ($n = 2$). Four of the articles also explored students' knowledge about the relationship between HPV and cervical cancer as well as beliefs and attitudes towards the HPV vaccine (Aleshire, Lock, & Jensen, 2013; Ghojzadeh, Azar, Saleh, Naghavi-Behzad, & Azar, 2012; Katz, Krieger, & Roberto, 2011; Wong & Sam, 2010).

Contraception. Twenty-four studies (26%) investigated students' knowledge about various contraception methods, including oral contraception, condoms, and overall family planning (Agrawa et al., 2013; Ajmal, Agha, & Karim, 2011; Aygin & Fidan, 2012; Barbour & Salameh, 2009; Franklin & Dotger, 2011; Li et al., 2013; Reis, Ramiro, Matos, & Diniz, 2013; Simbar et al., 2005; Zhang, Maddock, & Li, 2010; Zhou et al., 2012). Ten of the 91 studies investigated students' knowledge about emergency contraception: four from the United States (Corbett, Mitchell, Taylor, & Kemppainen, 2006; Hickey, 2009; Miller, 2011; Sawyer & Thompson, 2003), four from African countries (Ahmed, Moussa, Petterson, & Asamoah, 2011; Aziken, Okonta, & Ande, 2003; Ebuehi, Ekanem, & Ebuehi, 2006; Kebede, 2006), one from Australia (Calabretto, 2009), and one from India (Puri et al., 2007).

The studies examined knowledge of contraception among several subpopulations: undergraduates in general; female students; kinesiology and education students; first-year students; and medical, engineering, and human science students. The outcomes of interest were knowledge ($n = 2$); knowledge, attitudes, and practice ($n = 7$); knowledge, attitudes, and behaviours ($n = 3$); and sources of information ($n = 4$).

Predictors of Knowledge

The studies collected a wide range of variables in their demographic questions. The researchers analyzed these variables to determine whether they were statistically significant predictors of sexual health knowledge. Demographic variables throughout the 91 articles were age, sex, religion,

marital status, level of education, number of sexual partners, academic standing, place of residence, ethnicity, academic major, sexual orientation, sexual experience, socio-economic status, family monthly income, and number of siblings.

Measurement Tools

A wide variety of instruments were used to measure students' knowledge about sexual health. The most common type of measurement tool was a true or false (yes/no) questionnaire. The second most common was a multiple-choice questionnaire, followed by the Likert scale. Students were given a list of sources of sexual health knowledge and asked to check all that applied.

Several studies used instruments developed specifically for the study and tested for validity and reliability. Among the 91 studies, only two valid and reliable measurement tools were used more than once. The HIV Knowledge Questionnaire, which assesses HIV knowledge using true/false questions, was used by Grin et al. (2013), Mancoske et al. (2006), and Reddy and Frantz (2011); this tool has strong internal consistency across various samples (Cronbach $\alpha = 0.75-0.89$). The International AIDS Questionnaire (Cronbach's $\alpha = 0.76$) was used in all four studies by Tung (Tung et al., 2008; Tung, Cook, Lu, & Yang, 2013; Tung, Hu, et al., 2013; Tung, Hu, Efirid, Yu, & Su, 2012); this questionnaire used a five-point Likert scale to assess students' knowledge about AIDS.

Discussion

The purpose of this scoping review was to map the literature concerning the sexual health knowledge of university and/or college students. A comprehensive search strategy and independent screening yielded 91 articles that together offer health-care providers a snapshot of the sexual health literature. The scoping review highlights the key findings, the implications of the absence of research carried out in a Canadian context, the most common research design and data collection methods, and the variety of variables of interest that have been examined as a component of sexual health.

The vast majority of the studies focused on HIV/AIDS were carried out in African countries. This may be attributable to the high prevalence of HIV/AIDS on the African continent (Brown et al., 2008; Chng et al., 2005; Hoque & Ghuman, 2011; Mill et al., 2004; Mkumbo, 2013; Nkuo-Akenji et al., 2007; Nwezeh, 2010; Odu et al., 2008; Ogbuji, 2005; Onah et al., 2004; Oppong Asante & Oti-Boadi, 2013; Oyefara & Bisiriyu, 2007; Petro-Nustas, 2000; Reddy & Frantz, 2011; Tagoe & Aggor, 2009; Unadike et al., 2012). Overall, the United States was found to have con-

ducted the greatest amount of research on sexual health knowledge within the university student population. No research literature on the sexual health knowledge of university students in Canada or in Central and South America was found. How do Canadian students compare with students in other countries in terms of sexual health knowledge? Might aspects of Canadian or Central and South American culture have an impact on students' sexual health knowledge? This gap in the literature highlights the need for research in these geographical regions in order to furnish health-care providers with valuable evidence to inform their practice.

The results of this scoping review draw attention to several aspects of sexual health, including STIs, HIV/AIDS, contraception, and HPV. One area that has not received adequate attention is students' specific knowledge about condoms. The use of condoms can prevent STIs as well as pregnancy. Further research is needed to measure students' knowledge about this form of protection (Weinstein et al., 2008).

In the articles reviewed, the most common research design was a cross-sectional descriptive or comparative means of describing the sexual health knowledge of students. A wide range of measurement tools were used, and most studies developed their own instruments. Data collection was primarily by means of surveys using a true/false method of evaluation. Tools varied in terms of focus on knowledge, attitudes, and behaviours regarding sexual health, with no single tool measuring all aspects of sexual health. Due to the lack of reliable and valid tools, the Public Health Agency of Canada (2012) has developed the Canadian Sexual Health Indicators (CSHI) survey. This is a comprehensive tool that encompasses positive and negative aspects of sexual health, including traditional inquiries and new questions on self-efficacy and access to information and services. The CSHI survey was developed following a thorough review of existing sexual health measures and focus groups with key informants, and was pilot-tested with 1,185 people aged 16 to 24 (Cronbach's $\alpha = 0.883$) (PHAC, 2012). While this tool was not used in the articles included in the present review, it can be useful for practitioners and researchers in measuring all aspects of sexual health, including university students' sexual health knowledge.

Sexual health and well-being are important components of holistic nursing care (Evans, 2013). According to Hayter et al. (2012), nurses require specific communication skills to discuss sensitive sexual health issues, as well as knowledge specific to their patient population, so as to avoid a one-size-fits-all approach. The results of this review could help nurses practising in the area of sexual health among university students to better understand the current state of knowledge within this population. Further research is needed to examine the sexual health knowledge

of diverse subpopulations of university students, such as international students, students with disabilities, and students from the LGBTQ community. Overall, the present results offer researchers, health-care providers — including nurses — and health-service administrators an understanding of the gaps in sexual health research with university students, especially in Canada. These findings can be used by researchers to inform their investigations into the sexual health knowledge of young adults and by health-care providers seeking to become better informed about sexual health knowledge, thus strengthening their provision of holistic care.

Limitations

This scoping literature review has several limitations. First, all major electronic databases were used, and although every effort was made to ensure a comprehensive search, some articles may have been missed. Second, the review included only articles written in English. It is likely that valuable research on sexual health knowledge has been published in other languages. Third, the review did not undergo consultation with experts in the field, as recommended by Arksey and O'Malley (2005) as an optional sixth stage. However, two members of the review team (AS and DL) had expertise in the area of sexual health service use among university students. Lastly, the review did not cover sexual health knowledge among diverse groups of university students, such as international students and students from the LGBTQ community, which could differ from that of the populations described in the primary studies that were included in the review.

Conclusion

This scoping review describes current research activity in the area of sexual health knowledge among university students, while also identifying gaps in the literature. The objective of the review was to describe the range of current research evidence and the instruments used to measure sexual health knowledge among university students, and not to analyze the findings of the 91 selected articles. The scoping review was an appropriate first step given that this literature has not previously been synthesized. The findings reveal the need for further investigation of sexual health knowledge among university/college students in the Western hemisphere, as well as the need for a standardized measurement tool that is reliable and valid. The findings provide important contextual information for nurses and other health-care providers working with young adults, especially university/college students, in the area of sexual health so that they can provide holistic care. As researchers continue to explore this important nursing and health promotion topic, health-care providers

can use the knowledge generated to help prevent negative health outcomes and increase students' overall sexual well-being.

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Christine Cassidy, Janet Curran, Audrey Steenbeek, Donald Langille

Christine Cassidy, RN, BScN, is a doctoral student in the School of Nursing, Dalhousie University, Halifax, Nova Scotia, Canada. Janet Curran, RN, PhD, is Assistant Professor, School of Nursing, Dalhousie University. Audrey Steenbeek, RN, PhD, is Assistant Director, Graduate Studies, and Associate Professor, School of Nursing and Department of Community Health and Epidemiology, Dalhousie University. Donald Langille, MD, is Professor, Department of Community Health and Epidemiology, Dalhousie University.