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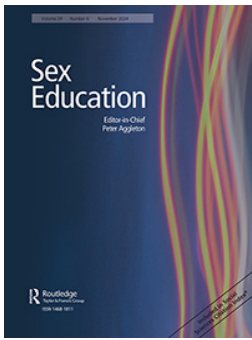
*Associations between school-based relationships and sexuality education and young people's sexual experiences*

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# Associations between school-based relationships and sexuality education and young people's sexual experiences

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## ABSTRACT

This study explored the relationship between sexual health indicators and the receipt of, and perceived relevance of, school-based sexuality education. Multiple regression analyses were conducted using data from 4,189 14- to 18-year-olds who participated in a cross-sectional Australian study. Receiving sexuality education was significantly associated with decreased STI risk, decreased experiences of unwanted sex, and better STI knowledge. High perceived relevance of the most recent sexuality education received was significantly associated with confidence and assertiveness in communication, intention to use condoms in the future, and STI knowledge. Sexuality education spanning multiple grades, incorporating topics about contraception, STI prevention and testing, different sexual practices, sexual and gender diversity, and information about sex in general, as well as involvement by an external educator, were significantly associated with higher perceived relevance of sexuality education. Perceived relevance of most recent classes decreased with age, highlighting the need for sexuality education early in the school years to ensure relevance and effectiveness. Findings suggest that strengthened teacher education, which will reduce the need for external educators and increase the frequency of classes, as well as consulting with students about their needs to improve the relevance of sexuality education, may improve young people's sexual health and experiences.

## ARTICLE HISTORY

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## KEYWORDS

Adolescence; sexual health; sexual development; education

## Introduction

Sexuality education, also known as sex education or school-based relationships and sexuality education (RSE), is a key area in the Australian Curriculum (ACARA 2015). Schools are an important source of sexual health information and education for young people (Fisher et al. 2019; McLaughlin et al. 2007; Macdowall et al. 2015) and school-based sexuality education is recognised as a key strategy to promote safe sexual practices (Fernandes and Junnarkar 2019; Goldfarb and Lieberman 2021; Garzón-Orjuela et al. 2021). Sexuality education has been shown to reduce HIV-related risk (Fonner et al.

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2014), promote condom use (Kirby 2008; von Sadvoszky, Draudt, and Boch 2014), delay sexual activity (Kirby 2008; Lindberg and Maddow-Zimet 2012), reduce sexually transmissible infections (STIs; von Sadvoszky, Draudt, and Boch 2014) and prevent unintended pregnancy (Kohler, Manhart, and Lafferty 2008). Relative to other sources of sexual health information and education (such as learning from parents, sexual partners, peers, siblings, internet sources, pornography, media sources and health professionals), Macdowall et al. (2015) found that school-based sexuality education was associated with older age at first sex, lower likelihood of unsafe sexual practices and STI diagnoses, higher levels of sexual competence, and less distress about sex. Furthermore, sexuality education in schools has been shown to be effective at reducing poor sexual health outcomes for minority ethnic groups, those with lower socioeconomic status, and those living in rural areas (Kirby, Laris, and Roller 2007).

Generally, studies investigating the effects of sexuality education have focused on its ability to prevent risk-based practices and/or negative clinical outcomes, such as early sexual debut, STIs and unwanted pregnancy. However, sexuality educators and youth advocates are increasingly calling for a more comprehensive approach to sexuality education (Aggleton and Campbell 2000; Goldfarb and Lieberman 2021), supporting young people to pursue safe and fulfilling sexual relationships. Research is needed to strengthen these arguments with a focus on emotional, relational and social outcomes for young people rather than relying only on clinical measures or measures of harm or negative health outcomes. Holistic definitions of sexual health, such as that offered by the WHO (2006), see 'good' sexual health as an affirming concept, and something more than just the absence of risk and disease. For Aggleton and Campbell (2000, 285), sexual health should be considered a 'state of well-being imbued with positive qualities, not merely the absence of those that are undesirable'. Because of this, in addition to disease prevention, it should include a focus on safe, pleasurable and respectful sexual relationships (Aggleton and Campbell 2000; McKee et al. 2010).

McKee et al. (2010) have developed a framework for a nuanced and socially oriented understanding of healthy sexual development in young people, with relationship skills, open communication, freedom from unwanted activity, understanding of safety, and agency included as some of the key domains. In a systematic review, Goldfarb and Lieberman (2021) examined research conducted between 1990 and 2020, and identified 218 studies related to the impact of sexuality education on young people's sexual health. Over 80% of these studies focused on unwanted pregnancy and STIs. However, those examining more comprehensive forms of sexuality education found associations with positive sexual outcomes including a greater appreciation and acceptance of diverse sexualities, the development of healthy relationships, and improved social and emotional development.

Goldfarb and Lieberman (2021) also found that sexuality education was most effective when taught from a young age, before the debut of sexual activity, and with programmes of a longer duration. The effectiveness of sexuality education may be mitigated by young people's perceptions of their classes, including the perceived usefulness and relevance of the teaching and learning that takes place (Aggleton and Campbell 2000; Allen 2008). In Australia, many young people report that school-based sexuality education is of limited relevance for them, which raises important questions about its relevance and efficacy (Benzaken, Palep, and Gill 2011; Fisher

et al. 2019; Mitchell et al. 2014). Young people frequently perceive the topics discussed in sexuality education to be too 'scientific' and therefore irrelevant to them or disconnected from their lives (McKee, Watson, and Dore 2014). Such research suggests that while young people can see the benefit of school-based sexuality education in general terms, it rarely meets their personal needs and expectations. Research examining the relationship between perceived relevance and usefulness of sexuality education and specific sexual health outcomes is therefore warranted.

Using data from the 2021 National Survey of Australian Secondary Students and Sexual Health (Power et al. 2022), and drawing from McKee et al.'s (2010) framework for healthy sexual development, this paper argues that good quality sexuality education can support positive sexual outcomes for young people. We hypothesise that both attendance and perceived relevance of sexuality education are associated with various positive sexual health indicators, in particular, improved confidence and assertiveness in communication, STI knowledge, and intention to use condoms, as well as lower STI risk and fewer unwanted sexual experiences.

## Methods

Data come from the 2021 Australian Survey of Secondary Students and Sexual Health (Power et al. 2022), a large national survey that involved 6,841 young people aged 14–18 years in Australia. The analysis presented here focuses on the following research questions:

- What sociodemographic factors and sexual experiences are associated with attendance at and the perceived relevance of sexuality education?
- Are attendance (frequency and duration) and the perceived relevance of sexuality education associated with sexual health outcome indicators – in particular, improved confidence and assertiveness in communication; greater STI knowledge; greater intention to use condoms; lower STI risk; and fewer unwanted sexual experiences?
- How does sexuality education as its own subject differ from sexuality education as part of the school curriculum in the way the subject is conducted (i.e. number of lessons and the type of teachers), the topics discussed, and young people's perceived relevance of the subject?

## Study sample

Participants were recruited through advertising on Facebook, Instagram and TikTok using minimum quota sampling (Panacek and Bagley Thompson 2007). Strata were calculated on total population proportions of young people by state/territory, school type (Government, Catholic or Independent), gender and year level (ABS 2019).

As the survey was completed anonymously online and did not involve contact with researchers or require engagement with distressing topics, the study was assessed as low risk using the NHMRC Statement on Ethical Conduct in Human Research (NHMRC 2018). Therefore, implied consent was deemed suitable rather than parental consent. This

involved young people reading an information statement and selecting 'I agree' to participate. Participants were advised to discuss their participation with a parent or carer. This study was approved by the La Trobe University Human Ethics Committee (HEC20401).

Participants were excluded from the analysis if they were not attending school at the time of the survey ( $n = 889$ ). Participants were given the option to select 'prefer not to answer' to each question. As complete case analyses were necessary for the regression analyses we conducted, participants who answered 'prefer not to answer' or who did not respond to questions about age, gender, sexuality, receiving sexuality education, or who did not provide a response for perceived relevance or the number of lessons they received during their most recent sexuality education were also excluded from this analysis, leaving a total of 4,189 participants. Power et al. (2022) provides a full account of the study procedures and further information about school leavers.

### ***Measures***

The survey instrument consisted of several measures listed below. For all questions, participants were given the option of selecting 'prefer not to answer' to reduce the burden of participating in the study. If selected, this was coded as missing data for the purpose of these analyses.

#### ***Sociodemographic variables***

Participants were asked about their age, year level at school (Year 9–12), the type of school they attended (Government, Catholic or Independent), whether their school was co-educational or a single sex school, their place of residence (regional/remote or urban) and state/territory. They were also asked about their cultural background including whether they identified as Aboriginal and/or Torres Strait Islander and if they identified as culturally and linguistically diverse (CaLD; measured as either speaking a language other than English at home or being born, or having at least one parent born, in a non-English speaking country). Participants were asked about their sexual orientation (straight/heterosexual or lesbian/gay, bisexual, not sure/questioning or used another term [LGBQ+]) and gender. Gender was determined by asking participants if they identified as 'man/male', 'woman/female', or 'trans and non-binary'. The term 'trans and non-binary' was used for young people who identified as non-binary, transgender or used other terms to denote a non-binary gender. There may be young people with transgender experience who identified as a man or woman and were included in these categories.

#### ***Experiences of sexuality education at school***

Participants were asked if they had received any sexuality education over their school years (yes/no) and in which year levels: 'between prep/kinder and Grade 4' (5–10 years of age), 'Year 5' (10–11 years), 'Year 6' (11–12 years), Year 7 (12–13 years), Year 8 (13–14 years) or Year 9 to 12 (14–18 years). These were summed together to form a scale from 0 ('No' to all year levels) to 6 ('Yes' to all year levels). Participants who had received sexuality education were asked five follow-up questions about their most recent class including its perceived relevance, a dichotomised variable comparing low relevance ('did not receive sexuality education', 'not at all relevant', 'a

little relevant', and 'somewhat relevant') and high relevance ('very' and 'extremely relevant'); number of lessons ('one or less', 'two to four lessons' and 'five or more'); who taught these classes (a teacher at school, someone else at school, external educator, or unknown/no teacher); whether the lesson took place in health and physical education, its own subject, or another class; and what topics were covered (out of a list of 31). The 31 topics were grouped into seven categories (see online supplemental Material 1): contraception, STI prevention and testing; information about sex in general (including pleasure, love, sex with disabilities and safe sex); puberty and reproductive health; different sexual practices; gender and sexual diversity; respectful relationships and consent; and sex and technology. Participants were also asked about whether they received sexuality education during the COVID-19 pandemic.

### ***STI knowledge***

Twenty-nine items assessed STI knowledge (see Power et al. 2022 for details). An exploratory factor analysis using the *psych* package (<https://CRAN.R-project.org/package=psych>) in R was conducted with all items loading onto one factor except for 'Can HIV be spread by mosquitos?' which was removed. Factor loadings for the remaining items ranged from 0.37 to 0.62 (Cronbach's  $\alpha = 0.90$ , McDonald's  $\omega = 0.90$ ). Given that a unidimensional structure is verified to be adequate for the remaining 28 items (as per Widaman and Revelle 2023), a summed STI knowledge scale was created with these items, ranging from 0 to 28.

### ***Sexual health indicators***

STI risk was defined as ever having had vaginal or anal sex without a condom; having ever received an STI diagnosis; or ever having sex that resulted in a pregnancy (yes/no). A variable assessing confidence and assertiveness in communication included: being moderately or extremely confident talking about sex with a parent, a GP or school staff; discussing sex with last sexual partner 'a moderate amount' or 'a great deal' (for sexually active students); or saying 'no' to sex and being proud of it (for non-sexually active young people). To assess experiences of unwanted sexual activity, young people were asked 'have you ever had sex when you didn't want to (yes/no)?'. Finally, young people were asked if they intended to use a condom if they were to have sex in the next few months (yes/no).

### ***Data analysis***

The statistical programme R ([www.R-project.org/](http://www.R-project.org/)) and interface RStudio ([www.posit.co](http://www.posit.co)) were used for data analysis. The R-packages *gtsummary* (Sjoberg et al. 2021), *tidyverse* (Wickham et al. 2019) and *flextable* (Gohel and Skintzos 2023) were used to present descriptive statistics describing young people's experiences of school-based sexuality education and regression analysis tables. Multiple logistic regression analyses with non-missing data were used to examine associations between variables using maximum likelihood estimation. Estimates, 95% confidence intervals and *p* values are presented adjusted for age, gender, sexuality and school type. Post-hoc means comparison tests were conducted using the R-package *multcomp* (Hothorn,

Bretz, and Westfall 2008) to perform Tukey's test where appropriate on gender and school type.

## Results

### Participant characteristics

Table 1 provides details of the characteristics of participants. Notably, almost two-thirds of the sample identified as women ( $n = 2,708$ , 64.6%), and 43.1% ( $n = 1,806$ ) of participants identified as LGBTQ+. Almost all trans and non-binary young people ( $n = 312$ , 99.4%), 42.0% of women ( $n = 1,138$ ) and 30.5% ( $n = 356$ ) of men identified as LGBTQ+. The majority of participants attended government schools ( $n = 2,352$ , 56.1%) and lived in urban areas ( $n = 2,047$ , 63.6%).

### Receiving sexuality education over school years

Most students ( $n = 3,887$ , 92.6%) reported receiving sexuality education at least once during their schooling. Young people attended sexuality education for an average of

**Table 1.** Demographic and school characteristics of participants by gender.

Characteristic	Women	Men	Trans and non-binary	Total sample
Overall, $n$ (%)	2,708 (64.6%)	1,167 (27.9%)	314 (7.5%)	4,189
Age, mean ( $sd$ )	16.1 (1.10)	16.1 (1.11)	15.7 (1.15)	16.1 (1.11)
Sexuality, $n$ (%)				
Heterosexual	1,570 (58.0%)	811 (69.5%)	2 (0.6%)	2,383 (56.9%)
LGBTQ+	1,138 (42.0%)	356 (30.5%)	312 (99.4%)	1,806 (43.1%)
LGBTQ+ subcategories				
Gay or lesbian	85 (3.1%)	121 (10.4%)	68 (21.7%)	274 (6.5%)
Bisexual	725 (26.8%)	164 (14.1%)	119 (37.9%)	1,008 (24.1%)
Used different term	135 (5.0%)	33 (2.8%)	110 (35.0%)	278 (6.6%)
Questioning	193 (7.1%)	38 (3.3%)	15 (4.8%)	246 (5.9%)
Sexually active, $n$ (%)				
Not sexually active	1,038 (38.3%)	609 (52.2%)	163 (51.9%)	1,810 (43.2%)
Sexually active	1,670 (61.7%)	558 (47.8%)	151 (48.1%)	2,379 (56.8%)
School type, $n$ (%)				
Government	1,558 (57.5%)	609 (52.2%)	185 (58.9%)	2,352 (56.1%)
Independent	590 (21.8%)	293 (25.1%)	68 (21.7%)	951 (22.7%)
Catholic	560 (20.7%)	265 (22.7%)	61 (19.4%)	886 (21.2%)
Single sex or co-ed school ( $n = 4,182$ ), $n$ (%)				
Mixed gender school	2,332 (86.2%)	999 (85.8%)	265 (84.7%)	3,596 (86.0%)
All-boys school	1 (0.0%)	163 (14.0%)	7 (2.2%)	171 (4.1%)
All-girls school	371 (13.7%)	3 (0.3%)	41 (13.1%)	415 (9.9%)
Remoteness ( $n = 3,219$ ), $n$ (%)				
Major city	1,258 (61.2%)	636 (68.2%)	153 (65.9%)	2,047 (63.6%)
Regional/Remote	797 (38.8%)	296 (31.8%)	79 (34.1%)	1,172 (36.4%)
Cultural and linguistic background ( $n = 3,953$ ), $n$ (%)				
Non-CalD	2,149 (84.0%)	903 (81.9%)	250 (85.3%)	3,302 (83.5%)
CaLD	409 (16.0%)	199 (18.1%)	43 (14.7%)	651 (16.5%)
Aboriginal and Torres Strait Islander ( $n = 4,071$ ), $n$ (%)				
Non-Indigenous	2,493 (94.9%)	1,098 (96.2%)	283 (93.7%)	3,874 (95.2%)
Aboriginal and Torres Strait Islander	135 (5.1%)	43 (3.8%)	19 (6.3%)	197 (4.8%)

Total number of participants was 4,189 with exceptions noted in the table above.



three years (mean = 3.2, *sd* = 1.85), most often in Year 9 (aged 14–15 years; *n* = 2,549, 60.8%) and Year 8 (aged 13–14 years; *n* = 2,375, 56.7%). Most students (*n* = 3,714, 96.1%) thought that sexuality education was an important part of the curriculum.

Table 2 lists differences in sociodemographic characteristics for those who had received sexuality education compared to those who had not. Receiving sexuality education was significantly more likely for older students ( $OR_{adj} = 1.29$ ,  $p < .001$ ) and less likely for LGBTQ+ students ( $OR_{adj} = 0.62$ ,  $p < .001$ ). Students attending Catholic schools ( $OR_{adj} = 0.45$ ,  $p < .001$ ) were less likely to have received sexuality education than those attending government schools. A post hoc Tukey test showed no differences between genders, however students attending Catholic schools were less likely to have received sexuality education than those attending Independent schools ( $OR_{adj} = 0.62$ ,  $p = .003$ ).

### Description of most recent sexuality education classes

At the most recent sexuality education, 101 (26.3%) participants reported they had received one lesson or less, 1,625 (38.8%) had received two to four lessons, and 1,463 (34.9%) had received five or more lessons. Most commonly, young people reported that a teacher employed at their school had taught their most recent sexuality education (*n* = 2,934, 83.3%), 410 (11.6%) were taught by educators external to the school, and 179 (5.1%) were taught by someone who worked at the school but was not a teacher (e.g. a nurse or counsellor).

The most recent sexuality education was commonly taught as part of health and physical education classes (*n* = 2,522, 71.1%), 16.1% (*n* = 571) received sexuality education in the form of an assembly or talk from external person, and for 455 (12.8%) participants, sexuality education was its own subject. The most recent sexuality education lessons were more likely to be taught as its own class in Independent schools ( $OR_{adj} = 1.56$ , 95% CI = 1.19:2.04,  $p < .001$ ) compared to Government schools.

**Table 2.** Multiple logistic regression analysis examining demographic and school characteristics and whether young people received sexuality education at school.

Characteristic	Received sex ed	No sex ed	$OR_{adj}$	95% CI	<i>p</i>
Overall, <i>n</i> (%)	3,878 (92.63%)	311 (7.4%)			
Age, mean ( <i>sd</i> )	16.10 ( <i>sd</i> = 1.10)	15.82 ( <i>sd</i> = 1.17)	1.29	1.15:1.44	<b>&lt;.001</b>
Gender, <i>n</i> (%)					
Men/male	1,098 (94.1%)	69 (5.9%)	—	—	
Women/female	2,504 (92.5%)	204 (7.5%)	0.80	0.60:1.06	.13
Trans and non-binary	276 (87.9%)	38 (12.1%)	0.65	0.41:1.02	.056
Sexuality, <i>n</i> (%)					
Heterosexual	2,244 (94.2%)	139 (5.8%)	—	—	
LGBQ+	1,634 (90.5%)	172 (9.5%)	0.62	0.48:0.80	<b>&lt;.001</b>
Sexually active, <i>n</i> (%)					
Not sexually active	1,676 (92.6%)	134 (7.4%)	—	—	
Sexually active	2,202 (92.6%)	177 (7.4%)	0.62	0.48:0.80	<b>&lt;.001</b>
School type, <i>n</i> (%)					
Government	2,213 (94.1%)	139 (5.9%)	—	—	
Independent	881 (92.6%)	70 (7.4%)	0.73	0.54:0.99	<b>.038</b>
Catholic	784 (88.5%)	102 (11.5%)	0.45	0.34:0.59	<b>&lt;.001</b>

$OR_{adj}$  = Adjusted Odds Ratio, CI = Confidence Interval. Bold values denote statistical significance at the  $p < 0.05$  level.

### ***Differences between sexuality education as its own subject or as part of another subject***

There was no association between the perceived relevance of most recent sexuality education and whether the class was taught as its own subject or as part of another subject such as health and physical education or science ( $OR_{adj} = 1.10$ , 95% CI = 0.83:1.45,  $p = .51$ ). Sexuality education taught as its own subject (compared to being taught as part of another subject) was associated with less discussion about puberty and reproductive health or contraception ( $OR_{adj} = 0.36$ , 95% CI = 0.24:0.73,  $p < .001$ ), and STI prevention and testing ( $OR_{adj} = 0.54$ , 95% CI = 0.40:0.73,  $p < .001$ ). Sexuality education as its own subject was associated with more discussion about different sexual practices ( $OR_{adj} = 1.39$ , 95% CI = 1.07:1.82,  $p = .015$ ) and sexual and gender diversity ( $OR_{adj} = 1.36$ , 95% CI = 1.05:1.76,  $p = .020$ ). External educators were more likely to teach sexuality education when it was taught as its own subject rather than someone at the school ( $OR_{adj} = 12.7$ , 95% CI = 9.58:17.0,  $p < .001$ ), and it was more likely to comprise one lesson or less as compared to two or more lessons ( $OR_{adj} = 2.95$ , 95% CI = 1.06:7.42,  $p = .027$ ).

### ***Most recent sexuality education***

One quarter of students ( $n = 984$ , 23.5%) found their most recent sexuality education subject to be very or extremely relevant. Over 80% of participants reported learning about puberty and reproductive health ( $n = 3,537$ , 84.4%), and respectful relationships and consent ( $n = 3,515$ , 83.9%). Most young people had also received information about sex in general ( $n = 3,347$ , 79.9%), contraception, STI prevention and testing ( $n = 3,029$ , 72.3%), and sex and technology ( $n = 2,806$ , 67.0%). Less than half of the sample had learned about sexual and gender diversity ( $n = 1,592$ , 38.0%) or different sexual practices ( $n = 1,329$ , 31.7%). Abstinence-only education was taught to only 43 (1.0%) participants, although 2,348 (56.1%) participants were taught about abstinence as well as other topics.

A multiple logistic regression examining the effects of sociodemographic characteristics and attributes of sexuality education classes on perceived relevance of these classes (Table 3) found that, for the most recent sexuality education, high perceived relevance was associated with the number of years received ( $OR_{adj} = 1.12$ ,  $p < .001$ ), receiving five or more classes compared to one or less during their most recent sexuality education subject ( $OR_{adj} = 2.37$ ,  $p < .001$ ), and having an external educator ( $OR_{adj} = 1.82$ ,  $p < .001$ ) compared to a teacher at school. Sexuality education was also more likely to be perceived as relevant if topics were about contraception, STI prevention and testing ( $OR_{adj} = 2.07$ ,  $p < .001$ ), information about sex in general ( $OR_{adj} = 1.91$ ,  $p = .002$ ), different sexual practices ( $OR_{adj} = 1.74$ ,  $p < .001$ ), or sexual and gender diversity ( $OR_{adj} = 1.99$ ,  $p < .001$ ). Older students were less likely to report their most recent sexuality education classes to be relevant than younger students ( $OR_{adj} = 0.87$ ,  $p < .001$ ).

**Table 3.** Multiple logistic regression analysis examining demographic and school characteristics and the perceived relevance of most recent sexuality education.

Characteristic	High relevance	Not received or low relevance	OR <sub>adj</sub>	95% CI	<i>p</i>
Overall, <i>n</i> (%)	984 (23.5%)	3,205 (76.5%)			
Age, mean ( <i>sd</i> )	16.0 ( <i>sd</i> = 1.10)	16.1 ( <i>sd</i> = 1.11)	0.87	0.81:0.94	<b>&lt;.001</b>
Gender, <i>n</i> (%)					
Men/male	321 (27.5%)	846 (72.5%)	—	—	
Women/female	613 (22.6%)	2,095 (77.4%)	1.01	0.85:1.21	.90
Trans and non-binary	50 (15.9%)	264 (84.1%)	0.84	0.57:1.22	.37
Sexuality, <i>n</i> (%)					
Heterosexual	633 (26.6%)	1,750 (73.4%)	—	—	
LGBQ+	351 (19.4%)	1,455 (80.6%)	0.85	0.72:1.01	.069
School type, <i>n</i> (%)					
Government	589 (25.0%)	1,763 (75.0%)	—	—	
Independent	219 (23.0%)	732 (77.0%)	1.07	0.88:1.30	.51
Catholic	176 (19.9%)	710 (80.1%)	1.10	0.89:1.36	.36
Sexually active, <i>n</i> (%)					
Not sexually active	458 (25.3%)	1,352 (74.7%)	—	—	
Sexually active	526 (22.1%)	1,853 (77.9%)	0.86	0.73:1.02	.087
Number of years received, <i>n</i> (%)	3.95 ( <i>sd</i> = 1.87)	3.01 ( <i>sd</i> = 1.97)	1.12	1.06:1.17	<b>&lt;.001</b>
Number of classes in most recent classes, <i>n</i> (%)					
One lesson or less	131 (11.9%)	970 (88.1%)	—	—	
2–4 lessons	316 (19.4%)	1,309 (80.6%)	1.15	0.90:1.48	.25
5 or more lessons	537 (36.7%)	926 (63.3%)	2.37	1.85:3.04	<b>&lt;.001</b>
Educator, <i>n</i> (%)					
A teacher at school	733 (25.0%)	2,201 (75.0%)	—	—	
Other person at the school	50 (27.9%)	129 (72.1%)	1.17	0.81:1.69	.39
External educator	121 (29.5%)	289 (70.5%)	1.82	1.40:2.36	<b>&lt;.001</b>
Unknown/no teacher	80 (12.0%)	586 (88.0%)	0.96	0.70:1.32	.80
Topics discussed in sexuality education classes, <i>n</i> (%)					
Contraception or STI prevention	893 (29.5%)	2,136 (70.5%)	2.07	1.59:2.71	<b>&lt;.001</b>
Information about sex in general	943 (28.2%)	2,404 (71.8%)	1.91	1.29:2.88	<b>.002</b>
Puberty and reproductive health	917 (25.9%)	2,620 (74.1%)	0.71	0.50:1.01	.053
Different sexual practices	522 (39.3%)	807 (60.7%)	1.74	1.46:2.07	<b>&lt;.001</b>
Sexual and gender diversity	616 (38.7%)	976 (61.3%)	1.99	1.67:2.36	<b>&lt;.001</b>
Respectful relationships and consent	944 (26.9%)	2,571 (73.1%)	1.42	0.93:2.22	.11
Sex and technology	800 (28.5%)	2,006 (71.5%)	1.03	0.83:1.29	.77

OR<sub>adj</sub> = Adjusted Odds Ratio, CI = Confidence Interval. Bold values denote statistical significance at the  $p < 0.05$  level.

### **Associations between the characteristics of sexuality education and sexual health outcomes**

Table 4 presents five regression models examining the relationship between sexuality education characteristics (the number of years of sexuality education was received, the number of classes received during the most recent sexuality education subject, and a high perceived relevance of most recent sexuality education class) and sexual health outcomes (confidence and assertiveness of communication about sex, intention to use condom in the future, STI risk, experience of unwanted sex and STI knowledge). Models 1 to 4 also included STI knowledge as a predictor variable.

Confidence and assertiveness in communication about sex (Model 1) was positively associated with high perceived relevance (OR<sub>adj</sub> = 1.56,  $p < .001$ ) and STI knowledge (OR<sub>adj</sub> = 1.03,  $p < .001$ ). Intention to use condoms in the future (Model 2) was positively associated with high perceived relevance of sexuality education (OR<sub>adj</sub> = 1.35,  $p < .001$ ). STI risk (Model 3) was associated with lower receipt of sexuality education over the years (OR<sub>adj</sub> = 0.95,  $p = .037$ ) and higher STI knowledge (OR<sub>adj</sub> = 1.01,  $p = .019$ ). Experience of unwanted sex (Model 4) was related to less sexuality education receipt over the years

**Table 4.** Multiple regression analyses examining sexuality education attendance, perceived relevance, and STI knowledge and sexual health outcomes.

Characteristic	Model 1 Confidence and assertiveness in communication about sex			Model 2 Intention to use condoms			Model 3 STI risk			Model 4 Experience of unwanted sex			Model 5 STI knowledge		
	OR <sub>adj</sub>	95% CI	p	OR <sub>adj</sub>	95% CI	p	OR <sub>adj</sub>	95% CI	p	OR <sub>adj</sub>	95% CI	p	OR <sub>adj</sub>	95% CI	p
Years received	1.05	1.00:1.10	.054	1.03	0.99:1.07	.16	0.95	0.91:1.00	<b>.037</b>	0.89	0.85:0.93	<b>&lt;.001</b>	0.28	0.17:0.39	<b>&lt;.001</b>
Very/extremely relevant	1.56	1.25:1.94	<b>&lt;.001</b>	1.35	1.15:1.59	<b>&lt;.001</b>	0.94	0.78:1.14	.54	0.98	0.80:1.19	.82	0.56	0.09:1.0	<b>.020</b>
Number of classes in most recent subject	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
One lesson or less	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2–4 lessons	1.12	0.91:1.38	.27	0.92	0.78:1.09	.35	1.06	0.88:1.29	.53	0.90	0.74:1.10	.30	0.40	–0.10:0.90	.12
5 or more lessons	1.15	0.92:1.44	.22	0.96	0.80:1.15	.66	1.01	0.82:1.24	.95	0.87	0.70:1.08	.21	0.93	0.39:1.5	<b>&lt;.001</b>
Total knowledge scale	1.03	1.02:1.04	<b>&lt;.001</b>	1.01	1.00:1.02	.051	1.01	1.00:1.03	<b>.019</b>	1.03	1.01:1.04	<b>&lt;.001</b>	—	—	—

OR<sub>adj</sub> = Adjusted Odds Ratio, CI = Confidence Interval.

Model 4 (n = 4,163) due to missing data about unwanted sexual experiences. Bold values denote statistical significance at the p < 0.05 level.

( $OR_{adj} = 0.89, p < .001$ ) and better STI knowledge ( $OR_{adj} = 1.03, p < .001$ ). STI knowledge (Model 5) was associated with higher receipt of sexuality education over the school years ( $\beta_{adj} = 0.28, p < .001$ ), high perceived relevance ( $\beta_{adj} = 0.56, p = .020$ ), and having five or more sexuality education lessons during the most recent sexuality education received (compared to one or less;  $\beta_{adj} = .93, p < .001$ ). These analyses were adjusted by gender, age, sexuality and school type (see online supplemental material 2 for the analyses with these covariates).

### ***Associations between the topics discussed in sexuality education and sexual health outcomes***

For students who had received sexuality education, some of the topics discussed in sexuality education were also associated with sexual health indicators (see online supplemental material 3). Discussions about puberty and reproductive health, and sexuality and gender diversity were more likely to be associated with confidence and assertiveness in communication about sex (Model 1). Intention to use condoms (Model 2) was more likely when puberty and reproductive health, and respectful relationships and consent had been discussed. Topics about different sexual practices were associated with STI risk (Model 3). Discussions about different sexual practices, and respectful relationships and consent were more likely to be associated with experiences of unwanted sex (Model 4). Topics related to contraception, STI prevention and testing, and respectful relationships and consent, were more likely to be associated with STI knowledge (Model 5).

### ***Sexuality education during the COVID-19 pandemic***

In Australia, state/territory-based and federal COVID-19 restrictions on school attendance occurred during data collection. Victoria, and Melbourne in particular, experienced the longest and harshest lockdowns (Edwards et al. 2022). Just under half the young people in this survey ( $n = 1,377, 47.1\%$ ) reported that they did not receive sexuality education during the COVID-19 lockdowns with 163 (5.6%) participants reporting that this was because sexuality education classes were cancelled during this period,

There were 1,212 (41.4%) participants who reported that they attended sexuality education in person at school during this time and 192 (6.6%) who attended online. Young people living in Victoria were less likely to have received sexuality education during COVID-19 lockdowns than those in the rest of the country ( $OR_{adj} = 0.75, 95\% CI = 0.64:0.89, p = .001$ ). Participants in Tasmania ( $OR_{adj} = 2.23, 95\% CI = 1.49:3.41, p < .001$ ), Western Australia ( $OR_{adj} = 1.42, 95\% CI = 1.11:1.83, p = .006$ ) and the Northern Territory ( $OR_{adj} = 2.35, 95\% CI = 1.06:5.71, p = .044$ ) were more likely to have received sexuality education during lockdowns than those in the rest of Australia.

## **Discussion**

These findings support the growing field of research indicating that broad-based sexuality education provides a valuable tool for promoting young people to pursue safe and affirming sexual relationships when they are ready to do so (Fonner et al. 2014; Kirby 2008; Kohler, Manhart, and Lafferty 2008; Lindberg and Maddow-Zimet 2012; von

Sadovszky, Draudt, and Boch 2014). Consistent with this kind of approach to sexuality education, our findings show that it is possible, and valuable, to study the effectiveness of sexuality education with respect to positive outcomes, including young people's experiences and perceived capacity to navigate safe, pleasurable and respectful relationships. These findings show that young people who reported their sexuality education to be more useful and relevant also reported being more confident and assertive in communicating about sex and were more likely to report they intended to use condoms in the future.

In this study, young people were more likely to report that the sexuality education they received was relevant to their life if a wide range of topics were covered, including contraception, STI presentations and testing, different sexual practices and sexuality and gender diversity and information about sex in general (including pleasure) were discussed in class. This is consistent with previous research (Ezer et al. 2020; Fisher et al. 2019; Power et al. 2022) which has shown that young people are interested in sexuality education that provides detailed information about how to navigate sexual and intimate romantic relationships (such as talking to partners and dealing with new relationships), explicit and open conversations about sexual practices, and issues relating to concerns about their bodies. In addition, Waling et al. (2020) found that young people want sexuality education to focus on the complexities of sex and be more inclusive approach to gender and sexuality. Comprehensive forms of sexuality education of this type have been shown to have benefits over abstinence-only sex education, and consistent with this, we found that young people were more likely to perceive sexuality education as relevant when topics of contraception, STI prevention and testing, different sexual practices and sexuality and gender diversity and information about sex in general were discussed in class.

In Australia, there is no consistent approach to the delivery of sexuality education. Some schools will deliver it as a single session, bringing in outside educators, while others will integrate it into other classes, or organise provision as a dedicated subject (Ezer et al. 2022). Most young people in this study had received at least some sexuality education in school, although some schools, particularly Independent schools, had organised sexuality education as a single session, workshop or assembly, calling in external educators, rather than integrating sexuality education into the curriculum as recommended by the Australian Curriculum, Assessment and Reporting Authority (ACARA 2012). In this study, consistently receiving sexuality education across multiple years of schooling was associated with good sexual health indicators, including lower STI risk, less experiences of unwanted sex, and good STI knowledge.

Our findings also show that students found sexuality education taught by external educators to be more relevant than when taught by a teacher at school. This may be related to external educators having received better training, having more experience teaching sexuality education, and being more comfortable with the topic than teachers who primarily focus on academic subjects. While external sexuality educators can potentially provide more satisfactory engagement in sexuality education for young people, reliance on them may limit the frequency and amount of sexuality education taught and undermine the sexuality education being taught as part of the school curriculum (Bragg et al. 2022; Ollis and Harrison 2016). Ezer et al. (2022) found that the duration and type of teacher education and training received (e.g. pre-service education, professional

development), the perceived usefulness of the training, comfort in delivering the content, and the time spent delivering the content, shaped the quality of the sexuality education provided.

In Australia, any teacher can be called upon to teach sexuality education and opportunities for training in the delivery of sexuality education are limited (Ezer et al. 2022). In this study, we found that regular sexuality education was associated with higher relevance and STI knowledge suggesting that improved teacher education training may be beneficial, combining the expertise found with external educators with the accessibility of teachers within schools. Additional education and training for current and pre-service teachers could improve young people's perceptions of sexuality education while enabling sexuality education to be taught at regular intervals throughout the school year.

For young people in this study, attending Catholic schools was associated with receiving less sexuality education than attending a Government or Independent school. This is perhaps not surprising given the potential sensitivities navigating sexuality and relationships, which may be more controversial or challenging to deliver in the context of Catholic, or other religious, schools (Peppard 2008). There is a need for more research in Australia and worldwide on ways to support delivery of sexuality education in religious schools that respects cultural and religious values and beliefs while also being comprehensive and meaningful to young people (Allen et al. 2014). In an Australian study, Hendriks et al. (2023) found that there were no differences in parental attitudes towards sexuality education whether parents identified as Catholic or not. This suggests that the parents of young people attending Catholic schools may be more supportive of sexuality education than often believed.

In contrast to previous research (e.g. Epps, Markowski, and Cleaver 2023; Grant and Nash 2019), in this study there was no difference between the perceived relevance of sexuality education for LGBTQ+ young people compared to heterosexual young people. However, LGBTQ+ young people in this study were less likely to report receiving sexuality education than heterosexual young people. It is possible that some LGBTQ+ young people in the study chose not to attend sexuality education even when it was available because they felt it would not be relevant and/or prove to be a negative experience for them.

### **Limitations**

There are limitations to this study. As the study used non-probability sampling, young people self-selected to participate which resulted in a large sample of young people from diverse backgrounds; however, women and young people identifying as LGBTQ+ were over-represented. Research suggests that an increasing number of young people are identifying their sexuality in other than heterosexual terms (Jones 2022; Warren and Swami 2018), indicating the importance of ensuring that sexuality education is approachable and relevant to all young people regardless of gender and sexuality.

There were substantial school closures in Australia during data collection as a result of the COVID-19 pandemic (Biddle et al. 2020). We found that many young people did not receive sexuality education during this time and that young people living in states most severely affected by these restrictions were less likely to receive sexuality education than when less restrictions were in place. In addition, there may have been changes in young

people's sexual experiences and sexual health outcomes due to lockdown regulation related to the COVID-19 pandemic that we were unable to measure.

The analyses were based on data from a large national study which explored several aspects of young people's sexual health experiences, attitudes and knowledge. As such, the analyses conducted can only provide a snapshot into young people's experiences of school-based sexuality education and associations between receipt and relevance of this education and outcomes for sexual health. More focused longitudinal research is required to determine whether these relationships are causal. The measurement of quantity, quality and topics of sexuality education received in this study were necessarily simplistic to reduce the cognitive burden to participants. Longitudinal research would allow for more nuanced measurement of sexuality education as young people progress through their school years.

## Conclusion

While a large body of work discusses the importance of perceived usefulness and relevance of comprehensive sexuality education on sexual health outcomes and positive sexual health indicators (Aggleton and Campbell 2000; Allen 2008; Benzaken, Palep, and Gill 2011; Fisher et al. 2019; McKee, Watson, and Dore 2014; Mitchell et al. 2014), this is not often translated into empirical research that investigates the impact of perceived relevance of sexuality education on sexual health outcomes. Research into the effectiveness of sexuality education to date has tended to rely on negative or risk-based indicators, such as condom use or rates of unwanted pregnancy, rather than a more positive or comprehensive approach to sex and sexuality that considers the social and relational aspects of sex, such as communication, assertiveness, consent or pleasure and enjoyment (Wellings and Johnson 2013). In this study, we explored the relationship between sexuality education and sexual health using a comprehensive set of indicators, including confidence and assertiveness in communication about sex, intention to use condoms, STI risks, experiences of unwanted sex and STI knowledge. Our findings show that this approach is of value, demonstrating a relationship between perceived usefulness and measures related to confidence and assertiveness in communicating about sex. Focusing on factors that improve young people's perceived relevance of sexuality education, such as improved teacher education and training, selective use of external teachers, and incorporating multiple topics in classes, as well as improving attendance rates, is likely to improve these outcomes to better support young people's sexual health and wellbeing.

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