

# Young Australians' use of pornography and associations with sexual risk behaviours

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**P**ornography use may be a public health concern. The rapid growth of the internet, smartphones and social media among young Australians means that pornography use is common and the average age at first pornography exposure has declined in recent years.<sup>1</sup> Reports from the early and mid-2000s showed that rates of lifetime exposure to pornography were 73–93% for adolescent boys and 11–62% for adolescent girls in Australia.<sup>1,2</sup> Qualitative research indicates that many young Australians believe pornography use is ubiquitous among their peers,<sup>3</sup> despite laws prohibiting people under 18 years of age viewing pornography.<sup>4</sup>

A key public health concern regarding trends in pornography exposure is that pornography may affect the sexual socialisation of young people by influencing their understanding of which sexual behaviours and attitudes are normative, acceptable and rewarding.<sup>5</sup> Although pornography use may be viewed positively and offers an avenue for exploration of one's sexuality,<sup>6,7</sup> pornography often depicts behaviours that many adults do not perceive as mainstream, nor consider enjoyable, and/or are high risk in terms of sexual health. For example, in online pornography only 2–3% of heterosexual encounters involve condom use.<sup>8,9</sup>

There is a growing body of literature describing the potential impact of pornography on sexual health, sexual behaviour and mental health.<sup>10</sup> Young people have reported using pornography

## Abstract

**Objectives:** Amid public health concern that rising pornography use may have a negative impact on young people's health and wellbeing, we report prevalence of pornography viewing and explore factors associated with viewing frequency and age at first viewing.

**Methods:** Cross-sectional online survey in a convenience sample of Victorians aged 15 to 29 years recruited via social media.

**Results:** Ever viewing pornography was reported by 815 of 941 (87%) participants. The median age at first pornography viewing was 13 years for men and 16 years for women. More frequent pornography viewing was associated with male gender, younger age, higher education, non-heterosexual identity, ever having anal intercourse and recent mental health problems. Younger age at first pornography viewing was associated with male gender, younger current age, higher education, non-heterosexual identity, younger age at first sexual contact and recent mental health problems.

**Conclusions:** Pornography use is common and associated with some health and behavioural outcomes. Longitudinal research is needed to determine the causal impact of pornography on these factors.

**Implications for public health:** Viewing pornography is common and frequent among young people from a young age and this needs to be considered in sexuality education.

**Key words:** pornography, sexual health, young people, sexual media

as a form of sexual education, such as incorporating pornography-inspired practices into their real life sexual experiences.<sup>11,12</sup> For example, qualitative research indicates that some young women feel pressured to engage in anal intercourse, which is depicted in 15–32% of pornographic scenes with heterosexual encounters,<sup>8,9</sup> and many attribute this pressure to their male partners' pornography use.<sup>13</sup> Internationally, longitudinal research has found that early exposure to pornography, and more frequent exposure, are both associated with initiation of sexual behaviours at younger age among

adolescents.<sup>14,15</sup> A recent systematic review showed an association between pornography consumption and sexual risk behaviours among adult consumers;<sup>16</sup> evidence linking pornography and sexual behaviours among adolescents is mixed.<sup>17</sup>

To inform health policy and sexuality education, it is important to understand how young people use pornography and to determine whether pornography use has adverse effects on health and wellbeing. Pornography research involving adolescents transitioning into adulthood in the smartphone era is limited, and there

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have been no recent studies in the Australian context. There is a paucity of recent data available regarding age at exposure, frequency of exposure and modes used by young people to view pornography. This study reports the prevalence of pornography viewing in a convenience sample of young Australians. It explores the factors associated with pornography viewing frequency and age at first viewing and the extent to which salient factors in pornography consumption are moderated by gender. We hypothesise that more frequent and younger age at first viewing pornography are associated with sexual risk behaviour and that patterns and correlates of pornography viewing may differ by gender with young men being more likely to watch pornography and watch pornography more frequently.

## Methods

### Design and sampling

The study was a cross-sectional online survey with a convenience sample of Victorians aged 15–29 years, conducted in January to March 2015. Eligibility was assessed through self-reported month and year of birth and postcode. Recruitment utilised social media including paid advertisements on Facebook, directed at Victorians aged 15–29, and advertisements shared through the researchers' professional and personal networks. Advertisements did not mention pornography, but described the survey as being about sexual health. Participants completed an online questionnaire that covered the themes of demographics, sexual health and behaviour, and other health behaviours. The questionnaire was adapted from the 'Sex, Drugs, and Rock'n'Roll' study that has collected risk and health data from young people since 2005.<sup>18</sup> Participants had the opportunity to win a gift voucher. Approval was granted by the Alfred Hospital Human Research Ethics Committee.

### Measures

Demographics included gender (male, female, transgender or other) and age, which was computed from month and year of birth. Participants reported the age at which they first experienced a range of sexual behaviours, or indicated that they had never engaged in that behaviour; these behaviours included touching a partner's genitals with their hands, being touched on your genitals by a partner's hand, giving oral sex, receiving

oral sex, vaginal sex (penis in vagina), and anal sex (penis in anus). Throughout this paper, we use the term 'sexual contact' to refer to any of these six behaviours, whereas 'sexual intercourse' refers only to vaginal or anal sex.

### Outcomes

Participants were asked four questions relating to viewing pornography; (no specific definition of pornography was provided in the questionnaire):

- How old were you when you first saw pornography? (an option for never viewed was provided)
- In the last 12 months, how often did you view pornographic material? 'never', 'less than monthly', 'monthly', 'weekly' or 'daily/almost daily'.
- How did you usually view this? 'streamed/downloaded on a mobile phone', 'streamed/downloaded on a computer', 'DVD', 'live webcam', 'magazines/books' or 'other'
- With whom did you usually view this? 'with a partner', 'with friends', or 'on my own'

For analysis, 'weekly' and 'daily/almost daily' were combined as 'weekly or more'.

### Exposures

The following factors were included in models, based on our hypotheses:

*Early sexual experience* – Those reporting first engaging in any of the sexual behaviours (listed above) at 15 years or younger were classified as having a young age at first sexual contact.

*Anal sex* – Ever experienced anal intercourse was treated as a binary variable.

*Sexual risk* – Risk of sexually transmitted infections (STI) was trichotomised to those with no, low or high risk; participants reporting sexual intercourse without using condoms with any of: new partners, casual partners or more than one partner in the past 12 months were classified as being at higher risk; those who had had sexual intercourse but always used condoms or only reported one regular partner in the past year were treated as low risk; participants not reporting any experience of sexual intercourse were considered not to be at risk. Those with no experience of sexual intercourse were treated as the reference in analyses.

*Mental health* – Participants were asked to respond yes or no to "In the last six months have you had any mental health problems?"

This includes any issues that you haven't spoken to a health professional about."

*Living situation* – Participants indicated who they lived with; this was dichotomised to those who lived with their partner or did not live with their partner.

*Education* – Participants indicated the highest level of education they had completed. This was dichotomised to any post-high school education or not.

*Sexual identity* – Participants indicated their sexual identity. This was dichotomised to heterosexual or gay, lesbian, bisexual, questioning, queer or other (GLBQQ+) sexual identity.

### Analysis

Contingency table analyses were used to provide estimates of prevalence for demographic, health and sexual health-related risk behaviours and pornography viewing patterns.

### Frequency of current pornography viewing

Correlates of current frequency of viewing pornography were determined using proportional odds logistic regression; both bivariate and multivariate (including all independent variables). To explore whether the effects for specific factors were moderated by gender, less constrained models with interaction terms were estimated in modelling. Where the proportional odds assumption was not met for specific factor effects in proposed models (i.e. the independent effects of a factor varied across levels of pornography viewing), generalised linear and latent mixed modelling (gllamm)<sup>19</sup> was used to specify covariate specific threshold logit regression models in order to relax the proportional odds constraint. Brant tests<sup>20</sup> and likelihood ratio tests between nested gllamm models (less constrained models relaxing the proportional odds assumption for selected factors) were used to provide statistical inference on whether data met the proportional odds regression assumption.

### Age at first pornography viewing

Correlates of age at first pornography viewing were determined using Cox proportional hazards regression,<sup>21</sup> taking into account the inherent censoring in the data due to study participants who were yet to view pornography at the time of the survey. In addition to main effects, interaction terms were also estimated in these survival models

to explore the extent to which effects were moderated by gender. Median age at first pornography viewing, sexual contact and sexual intercourse were also determined using this method.

A complete case approach was used in analyses where participants with missing data on any of the key exposure factors were excluded from analyses. All analyses were conducted using the Stata statistical package version 13.1.

## Results

Among the 1,001 people surveyed, nine identified as transgender or 'other' gender but were not included in analyses due to the small numbers in these groups. A further 26 participants did not respond to questions about pornography and 25 exhibited missing data on key covariates and were

Table 1: Sample socio-demographic, health and sexual risk behaviour characteristics: Count (n) and per cent (%) (n= 941).	
	n (%)
<b>Gender</b>	
Female	683 (73)
Male	258 (27)
<b>Age group</b>	
15-19	374 (40)
20-24	348 (37)
25-29	219 (23)
<b>Currently live with partner</b>	
Yes	146 (16)
No	795 (84)
<b>Education</b>	
Post high school education	635 (67)
No post-high school education	306 (33)
<b>Sexual identity</b>	
Heterosexual	728 (77)
GLBQQ+	213 (23)
<b>Ever had any sexual contact</b>	
Yes	804 (85)
No	137 (15)
<b>Ever had sexual intercourse</b>	
Yes	710 (75)
No	231 (25)
<b>Higher risk sexual behaviour (among sexually active)</b>	
Yes	230 (32)
No	480 (68)
<b>Ever had anal intercourse</b>	
Yes	277 (29)
No	664 (71)
<b>Any mental health problem, past 6 months</b>	
Yes	509 (54)
No	432 (46)

excluded from analysis. Those missing key covariate data did not significantly differ from those included in analysis on frequency of pornography viewing ( $p=0.555$ ) or age at first pornography viewing ( $p=0.729$ ).

Of the 941 participants included, 73% were female and the median age was 20 years (IQR 17-24) for women and 21 years (IQR 19-25) for men. Table 1 shows characteristics of respondents. Among 804 participants who reported ever having had any sexual contact with a partner, the median age at first sexual contact was 16 years (IQR 16-17) for women and 16 years (IQR 16-16) for men. Among 710 participants who reported ever having had sexual intercourse, the median age at first sexual intercourse was 17 years (IQR 17-18) for women and 18 years (IQR 17-18) for men.

Ever viewing pornography was reported by 815 (87%) participants. Male participants reported higher frequency of pornography viewing than female participants (Table 2). Most participants ( $n=629$ , 87%) usually watched pornography alone and most usually streamed or downloaded pornography onto a computer or phone. The median age at first pornography viewing was 13 years for male participants (95%CI=12-13) and 16 years for female participants (95%CI=16-16;  $p<0.001$ ).

We compared participants' age at first viewing pornography with their age at first

sexual contact. Forty-four (5%) participants reported never having viewed pornography or experienced any sexual contact, 536 (57%) had viewed pornography before any sexual contact, 80 (9%) experienced both at the same age, and 281 (30%) were younger at their first sexual contact compared to first pornography viewing.

Brant tests showed that the assumption of proportional odds for the specified model was not reasonable given the data ( $\chi^2(20)=50.3$ ;  $p<0.001$ ). Sexual risk ( $\chi^2(2)=11.8$ ;  $p=0.003$ ) and mental health ( $\chi^2(2)=5.7$ ;  $p=0.05$ ) factors exhibited non-proportional effects. This was supported statistically by likelihood ratio testing from gllamm modelling, which showed that a proportional odds regression model with partial relaxation of effect proportionality (i.e. for sexual risk and mental health factors) showed significantly better fit than the fully constrained model (LR  $\chi^2(6)=31.5$ ;  $p<0.001$ ). Hence, for sexual risk and mental health an unconstrained model was used.

Table 3 shows correlates of pornography viewing frequency using gllamm modelling. Female participants were markedly less likely to watch pornography frequently compared to male participants (AOR=0.02; 95%CI=0.01-0.12). Analyses showed that compared to heterosexual participants, those who were GLBQQ+ were three times more

Table 2: Pornography viewing characteristics by sex: Counts (n) and per cent (%).			
	Female n (%) n=683	Male n (%) n=258	Total n (%) n=941
<b>Ever viewed pornography</b>	558 (82)	257 (100)	815 (87)
<b>Among those who ever viewed pornography</b>	n=558	n=257	n=815
<b>Age first viewed</b>			
13 years or younger	129 (23)	176 (69)	305 (37)
14 years or older	429 (77)	81 (32)	510 (63)
<b>Frequency of viewing in the 12 months prior to survey</b>			
Daily	23 (4)	99 (39)	122 (15)
Weekly	105 (19)	117 (46)	222 (27)
Monthly	139 (25)	25 (10)	164 (20)
Less than monthly	198 (35)	14 (5)	212 (26)
Not at all	93 (17)	2 (1)	95 (12)
<b>Among those who viewed pornography in the past year</b>	N=465	N=255	N=720
<b>Most common mode of viewing pornography</b>			
Stream/download on phone	191 (41)	84 (33)	275 (38)
Stream/download on computer	228 (49)	161 (63)	389 (54)
DVD/webcam/magazine/book	17 (4)	2 (1)	19 (3)
Other/not stated/missing	29 (6)	8 (3)	37 (5)
<b>Who did they usually view with</b>			
Alone	386 (83)	243 (95)	629 (87)
With friends	13 (3)	1 (0)	14 (2)
With partner	63 (14)	11 (4)	74 (10)
Other/not stated/missing	3 (1)	0 (0)	3 (0)

likely to watch pornography more frequently (AOR=3.04; 95%CI=2.20-4.21); and those with post-secondary education were 48% more likely (AOR=1.48; 95%CI=1.01-2.17) to view pornography more frequently than those with secondary education only. Those reporting an experience of anal sex were likely to watch pornography more frequently (AOR=1.50; 95%CI=1.09-2.06); however, estimation of an interaction between anal sex and gender (AOR=2.47; 95%CI=1.03-5.90; Wald  $\chi^2(1)=4.14$ ;  $p=0.042$ ) showed this association was confined to women only (men: AOR=0.70, 95%CI=0.33-1.45; women: AOR=1.72, 95%CI=1.12-2.63). There was no significant interaction found between gender and sexual identity (Wald  $\chi^2(1)=2.29$ ;  $p=0.13$ ) or gender and living situation (Wald  $\chi^2(1)=0.17$ ;  $p=0.68$ ).

Compared to those who had never experienced sexual intercourse, sexually active participants considered to be engaging in low risk (AOR=1.91; 95%CI=1.23-2.98) or high risk (AOR=2.45; 95%CI=1.44-4.16) sexual behaviour were more likely to report watching pornography less than monthly, but there were no differences in odds of viewing pornography more frequently across these groups. Similarly, there was heterogeneity in effect of mental health problems across levels of pornography-viewing frequency. Compared to those with no reported history of mental health problems in the past six months, those reporting mental health problems during this period were 65% more likely to report watching pornography less than monthly (AOR=1.65; 95%CI=1.18-2.31) and 52% more likely to watch weekly or more often (AOR=1.52; 95%CI=1.06-2.18).

Table 4 shows correlates of age at first viewing pornography. In multivariable Cox regression, younger age at first pornography viewing was reported by participants who were male, currently younger, currently lived with a partner, had not completed high school, had a younger age at first sexual contact, and who reported a recent mental health problem. Those reporting GLBQQ+ sexual identity were also more likely to watch pornography from a younger age (AOR=1.25; 95%CI=1.05-1.48); however, estimation of an interaction between sexual identity and gender (AOR=2.08; 95%CI=1.43-3.02; Wald  $\chi^2(1)=14.6$ ;  $p<0.01$ ) showed this association was confined to women only (men: AOR=0.72, 95%CI=0.50-1.04; women: AOR=1.63, 95%CI=1.34-1.99).

## Discussion

Viewing pornography was a common practice among young people in our sample, especially among young men. One hundred per cent of young men and 82% of young women had ever viewed pornography. The median age at first pornography viewing was 13 years for men and 16 years for women. Eighty-four per cent of young men and 19% of young women watched pornography on a weekly or daily basis. The nationally representative Second Australian Study of Health and Relationships, conducted in 2012–2013, did not include frequency or age of pornography viewing; however, it found that a lower proportion of young people had ever viewed pornography: 84% of men aged 16–19; 89% of men aged 20–29; 28% of women aged 16–19; and 57% of women aged

20–29.<sup>22</sup> Other Australian studies suggest that the number of people recently exposed to pornography is increasing. In 2012–13, 63% of men and 20% of women aged 16 years and over had viewed pornographic material in the past year.<sup>23</sup> In comparison, in 2001–02, 17% of men and 12% of women had visited a sex website on the internet.<sup>24</sup> The percentage of Australians viewing pornography before age 16 increased from 37% in the 1950s to 79% in the early 2000s.<sup>1</sup>

Women were less likely than men to watch pornography, watched less frequently, and first watched at an older age. This finding is consistent with US research that reported men are more likely to be exposed to online pornography at an earlier age than women.<sup>25</sup> While men were much greater consumers of pornography, it should be noted that among the 82% of young women who reported viewing pornography the majority (84%) usually watched alone and 22% watched at least weekly. This indicates that there are a significant number of young women who watch pornography regularly. Past research has shown that adolescent boys report more positive attitudes towards pornography than adolescent girls; however, girls have increasingly positive attitudes as they grow older.<sup>25</sup>

We found increased pornography viewing among GLBTIQ+ young people; this is consistent with previous research.<sup>26,27</sup> This finding may reflect a lack of information in mainstream culture around non-heteronormative sexual behaviour, resulting in a need to access this information via pornography.<sup>28</sup> For example, in a qualitative study of same-sex attracted adolescent boys,

**Table 3: Factors associated with pornography viewing frequency: proportional odds regression analyses from generalised linear and latent mixed modelling showing unadjusted (OR) and adjusted (AOR) odds ratios, 95% confidence intervals (95% CI) and probability values ( $p$ -values) ( $n=941$ )†.**

Factor	Proportional odds				Unconstrained effects						
	OR (95% CI)		$p$ -value		< monthly		monthly		Weekly or >		
	AOR (95% CI)	$p$ -value	AOR (95% CI)	$p$ -value	AOR (95% CI)	$p$ -value	AOR (95% CI)	$p$ -value	AOR (95% CI)	$p$ -value	
Female	0.05 (0.04-0.07)	<0.001	0.03 (0.02-.05)	<0.001							
Age in years	1.21 (1.01-1.07)	0.006	0.97 (0.92-1.02)	0.227							
Living with partner	0.74 (0.55-1.00)	0.048	0.76 (0.51-1.12)	0.167							
Post high school education	1.53 (1.20-1.95)	0.001	1.48 (1.01-2.17)	0.042							
GLBQQ+ identity	2.10 (1.62-2.73)	<0.001	3.04 (2.20-4.21)	<0.001							
First sexual contact <16 years	1.17 (0.93-1.48)	0.176	1.11 (0.84-1.49)	0.454							
Ever had anal intercourse	1.78 (1.40-2.27)	<0.001	1.50 (1.09-2.06)	0.013							
<b>Sexual risk behaviour</b>											
No risk	-	-	-	-	ref	-	ref	-	ref	-	
Low risk	-	-	-	-	1.92 (1.23-2.98)	0.004	1.12 (.73-1.71)	0.598	0.81 (0.51-1.29)	0.375	
High risk	-	-	-	-	2.45 (1.44-4.16)	0.001	0.86 (0.53-1.42)	0.564	0.74 (0.43-1.28)	0.283	
Mental health problem, past 6 months	-	-	-	-	1.65 (1.18-2.31)	0.003	1.18 (0.86-1.62)	0.293	1.52 (1.06-2.18)	0.022	

† Model cut-points -  $k1 = -3.49$ ,  $k2 = -2.84$ ,  $k3 = -1.80$

participants reported using pornography to learn about sexual organs and function, the mechanics of same-gender sex, to learn about sexual performance and roles and to understand how sex should feel in terms of pleasure and pain.<sup>6</sup>

Among women, more frequent pornography use was associated with ever having had anal sex. Past research has found that some women find anal sex pleasurable; however, women report finding anal sex less pleasurable than men do overall.<sup>29</sup> In one qualitative study, women reported being pressured or coerced into anal sex by male partners who had seen anal sex in pornography.<sup>13</sup> It was interesting that in our study, an association between anal intercourse and pornography was found for female participants but not male participants. Possible explanations for this may be that women who are more interested in learning about different sexual practices or may be curious about trying anal sex are more likely to watch pornography; alternatively, women who watch pornography might be more likely to think that anal sex is expected of them by their male partners.

A systematic review of studies involving adult consumers found links between pornography consumption and unsafe sexual practices and higher numbers of sexual partners.<sup>16</sup> Evidence linking pornography and sexual behaviours among adolescents is mixed.<sup>17</sup> Some studies of adolescents and young people have shown associations between pornography and more lifetime sexual partners.<sup>30,31</sup> One study found an association between pornography and non-condom use for adolescent males, but not for females, as well as no association between pornography use and number of sexual partners or younger age of sexual debut.<sup>27</sup> Other studies have found no correlation between pornography use and unprotected sex with casual partners.<sup>32</sup> In the current study, we found no correlation between younger age at pornography viewing and recent sexual risk behaviour. We also found that compared to those who were sexually inexperienced, those who engaged in either low risk or high risk sexual behaviour had greater odds of watching pornography less than monthly compared to not viewing at all. Watching pornography more frequently (monthly, weekly or daily) was not associated with differences in sexual risk behaviour. Other studies have not investigated the correlation between sexual risk behaviour and different frequencies of viewing

**Table 4: Correlates of age of first pornography viewing: Cox proportional hazards regression analyses showing unadjusted (HR) and adjusted (AHR) hazard ratios, 95% confidence intervals (95% CI) and probability values (p-values).**

	HR (95% CI)	p-value	AHR (95% CI)	p-value
Female	0.26 (0.22-0.31)	<0.001	0.20 (0.17-0.24)	<0.001
Age in years	0.94 (0.93-0.96)	<0.001	0.92 (0.90-0.95)	<0.001
Living with partner	0.84 (0.70-1.01)	0.060	1.29 (1.04-1.59)	0.019
Post high school education	0.66 (0.57-0.77)	<0.001	0.78 (0.64-0.95)	0.015
GLBQQ+ identity	1.34 (1.15-1.57)	<0.001	1.25 (1.05-1.48)	0.010
First sexual contact <16 years	1.64 (1.42-1.88)	<0.001	1.55 (1.33-1.82)	<0.001
Ever had anal intercourse	1.21 (1.05-1.40)	0.009	1.17 (0.98-1.38)	0.077
Low risk sexual behaviour	0.95 (0.80-1.14)	0.595	1.08 (0.87-1.33)	0.494
High risk sexual behaviour	1.11 (0.91-1.35)	0.312	1.16 (0.91-1.48)	0.226
Mental health problem, past 6 months	1.12 (0.97-1.28)	0.113	1.20 (1.04-1.40)	0.014

pornography, so further research is needed to understand whether viewing pornography less than monthly is an important threshold level for correlation with sexual behaviour. Discrepancies between studies may be due to differing populations, research designs, definitions, or inclusion of different measures of sexual risk behaviours.<sup>17</sup>

Young age at first sexual experience has been shown to have negative associations with ongoing sexual health.<sup>18,33</sup> Younger age at first sexual experience was associated with younger pornography viewing but not current frequency of viewing. Several cross-sectional studies support a relationship between pornography use and initiation of sexual behaviours at a younger age.<sup>22,34-36</sup> International longitudinal research has found that early exposure and frequent exposure to pornography are both associated with initiation of sexual behaviours at a younger age.<sup>14,15</sup> However, this relationship may not be causal; it may be confounded by pubertal status and sensation seeking.

A correlation between poor mental health and frequent use of pornography has been previously noted. In a Swedish study, nearly 20% of daily pornography users had depressive symptoms, significantly more than infrequent users (12.6%).<sup>11</sup> Frequency of pornography use has been associated with negative affect,<sup>37</sup> depression and stress among young men,<sup>38</sup> and depressive symptoms in young women.<sup>39</sup> Pornography exposure in younger children has been associated with short-term distress;<sup>40</sup> however, to our knowledge this is the first study to demonstrate an association between younger age of exposure and poor mental health in later life.

Other correlates of more frequent and younger initiation of pornography use included higher education levels and not

living with a partner. People living with their partner may view pornography less frequently due to more frequent partnered sex, or possibly from less opportunity to privately view pornography.

### Implications for public health

The findings of this study have important implications for designing sexuality education. Results suggest that the majority of young people have viewed pornography and that almost all young men are frequently accessing pornography. Therefore, it is vital that pornography is addressed as part of high school sexuality education programs. Pornography is first watched from a young age, so age-appropriate educational programs need to be implemented from formative years of high school, if not sooner. Such programs should not be heteronormative, as our results show that those identifying as GLBQQ+ watched pornography more frequently and from a younger age. It should also not presume that young women will not watch or enjoy pornography. Education programs should address issues such as the prevalence and practice of heterosexual anal sex in the real world as opposed to in pornography. While pornography education programs are starting to emerge,<sup>41,42</sup> there has yet to be any research determining the effectiveness of this approach.<sup>10</sup>

Australian law prohibits people under 18 from viewing pornography;<sup>4</sup> however, our findings demonstrate that current laws and regulations are not preventing access from a young age. Interventions such as age verification software, internet filtering software and parental monitoring may play a role in reducing casual or accidental exposure to pornography, particularly among younger

children. However, these methods are not likely to be effective in stopping a motivated young person from accessing pornography.<sup>2,43</sup>

The correlation between poor mental health and pornography is also cause for concern. It is unclear whether pornography is a causal factor in poor mental health or if it is an indicator of underlying problems. In either case, those involved in treating young people with mental health conditions may want to consider whether pornography is a problem for some clients.

### Limitations

Limitations in assessment of our outcome variables include that questions did not distinguish between deliberate and accidental exposure to pornography and that no explicit definition or contextualisation of pornography was given. Further, no detail was collected on motivations for viewing or type of content viewed. Past research has identified other potential correlates of pornography that were not included in our survey, including less satisfaction in relationships and sexual encounters, sexual aggression and having sexist attitudes toward women.<sup>14</sup> Other exposure measures did not use validated scales, for example, mental health problems were assessed using a single item. The survey also did not include variables relating to positive impacts of pornography use. The survey relied on self-reported information, which is subject to recall bias and self-presentation bias. The cross-sectional research design means that we cannot attribute any causal relationship between pornography and other factors. Finally, the survey used a convenience sample that was recruited online, which is not representative of the general population.

### Conclusions

This is the first Australian study to examine associations between frequency and age of first pornography use and sexual behaviour, mental health, and other characteristics among young people. Our study has demonstrated that pornography viewing is common and frequent among young Australians from a young age. Pornography use was associated with potentially harmful outcomes, such as mental health problems, sex at a younger age and anal intercourse. To investigate the potential causal impact of pornography on young people's health and behaviour, more specific longitudinal research

is needed. The findings of this study highlight the importance of including discussion of pornography in sexuality education from a young age.

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