Psychological distress and risky sexual behaviours among women aged 16–25 years in Victoria, Australia

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Background and objectives

Identifying factors related to risky sexual behaviour may contribute to preventive and interventional approaches to reduce negative mental health outcomes among young women. The aim of this study was to investigate the association between psychological distress and risky sexual behaviours in females aged 16–25 years in Victoria, Australia.

Method

Data were extracted from the Young Female Health Initiative (YFHI), a study in which participants were recruited via advertisements on Facebook. Logistic regression was used to assess associations between psychological distress, as measured by the Kessler 10 (K10) Psychological Distress Scale, and risky sexual behaviours.

Results

Data were available from 200 sexually active participants and 40 non-sexually active participants. We found that the K10 score was independently associated with sex while under the influence of alcohol or drugs (odds ratio: 1.7; 95% confidence intervals: 1.2, 2.7; $P = 0.006$).

Discussion

Although data were collected from a small sample of young women, we found that those with underlying psychological distress may adopt risky sexual behaviours, especially if concomitantly drinking alcohol or taking drugs.

Understanding the determinants of sexual behaviour among young people may help inform the development of policies and programs for effective prevention and treatment of sexually transmissible infections (STIs). Researchers have previously identified risk factors for risky sexual behaviours, including psychological issues,[1–3] substance use,[4,5] peer delinquency[5,6] and involvement in violence.[7] Some examples of risky sexual behaviours include not using condoms or other birth control measures, substance use while having sex, multiple sexual partners, and performing acts of paid sex. However, little is known about which risk factors are most strongly correlated with risky sexual behaviours.

A relationship between clinical depression and sexual intercourse under the influence of drugs and alcohol has been found among adolescent females.[4] Furthermore, adolescents with depression who reported substance use were more likely to have STIs.[8] Although evidence from previous studies has linked psychological distress to risky sexual behaviours, few researchers have found this association during the transition period from late adolescence to early adulthood. Therefore, the objective of this study was to investigate the association between psychological distress and risky sexual behaviours in sexually active females aged 16–25 years, living in Victoria, Australia.

Methods

Ethics

This study protocol was approved by the Royal Women's Hospital (#11/14) and Melbourne Health Human Research and Ethics Committees (#2012.189).

Study design and participants

Data were extracted from the Young Female Health Initiative (YFHI) launch study database. The YFHI study is ongoing and covers a wide range of health issues, such as reproductive and

sexual health, mental health and health-related behaviours. Participants were recruited via Facebook advertisements.[9] When clicking on the Facebook advertisements, potential participants were redirected to the study website (www.yfhi.org), where they could register an expression of interest. Research staff assessed eligibility of all participants over the telephone after initial contact, explained the study, and then obtained informed consent.

Inclusion criteria

Eligible participants for this sub-study were females aged 16–25 years, living in Victoria, Australia, and who were sexually active, which was defined as having had vaginal intercourse. Participants were excluded if they did not consent verbally to participate in the study or did not complete the questionnaire.

Data collection

A self-administered online questionnaire was used to collect information on sociodemographic factors, psychological distress and risky sexual behaviours. Psychological distress was measured using the Kessler 10 (K10) Psychological Distress Scale, covering feelings of nervousness, hopelessness, restlessness, depression and worthlessness.[10] The K10 consists of a 10-item self-report questionnaire using a five-point scale.[10] Items were summed for a total scale score.

Definitions

Young females were characterised as those aged 16–25 years in this study.

Risky behaviours

Reported risky sexual behaviours were measured through five binary variables:
- sex while drunk or 'high' on drugs
- sex with non-current partner
- having four or more male partners in a lifetime
- providing paid sex
- non-current use of condom.

It should be noted that although we asked participants the following question:

'Were you drunk or high last time you had sex?', we refer to this risky behaviour hereafter as 'sex under the influence of alcohol or drugs'.

K10 score units of change

We needed to re-scale numerical exposure variables (such as the K10 in this study), so the unit change in the exposure variable represents a clinically important change in the exposure variable. In order to calculate odds ratios (ORs) for a re-scaled change in the K10 (eg seven units instead of one unit), we used the exponential function. ORs and 95% confidence intervals (CIs) will be exponential according to the re-scaled unit, but the *P* value will remain unchanged. This is noted in the footnotes of relevant tables.

Statistical analyses

Data were analysed using Stata version 13.1. The analysis included descriptive statistics and logistic regression. Sociodemographic variables, including age, relationship status, household structure, level of the highest qualification, current formal education, occupation, individual income, religion, Aboriginal and Torres Strait Islander status, and geographic region, were assessed as covariates.

Univariable logistic regression models were used to assess the association between exposure (psychological distress), covariates (sociodemographic factors) and five components of outcomes (risky sexual behaviours). Any factors associated with both exposure and outcomes were treated as confounding factors and put in the multivariable logistic regression model. We also looked at interactions between relationship status, current formal education and K10 score by using the likelihood ratio test.

Results

From the available data (n = 252), 200 (79.4%) women reported having had vaginal intercourse and 40 (15.9%) reported that they were not sexually active. Twelve women (4.8%) preferred

not to disclose information about their sexual activity and so were not included in this sub-study.

Description of study sample

The mean age of the sample was 22.4 years (standard deviation [SD]: 2.0; Table 1). Approximately 65% of this population was in a relationship and 56% lived with their family. One-third of the sample did not have tertiary qualifications. Approximately 75% were currently attending an educational institution and were employed.

The internal consistency of the K10 for this sample was strong (Cronbach's alpha of 0.91). The mean K10 score for this sample was 21.4 (SD: 7.5). About 65% of young females who had vaginal intercourse reported that the last person they had sex with was their current partner. Around 10% reported having sex while under the influence of alcohol or drugs and 53% reported having had four or more male partners in their lifetime. Only 3.5% had ever been paid to perform a sexual act. About 46% reported currently using condoms during sex.

We also looked at those who reported that they were not sexually active. The distribution of exposure variables among non-sexually active women was similar to the sexually active group, except that a greater proportion of non-sexually active women reported having no employment, no income and to follow a religion (*P* <0.05).

Association between psychological distress and five components of risky sexual behaviours

The unit change in K10 score was re-scaled from one unit to seven units in order to represent a clinically important change in the K10 score. The only significant association between K10 score and risky sexual behaviours was with sex while drunk or 'high' on drugs (OR: 1.7; 95% CI: 1.2, 2.7; *P* = 0.006), suggesting that for a change in K10 score of seven units, the estimated relative change in the odds of having sex while under the

Table 1. Interview schedule: Key topics and questions

	Sexually active women (n = 200)				Non-sexually active women (n = 40)			
	Mean	SD	n	%	Mean	SD	n	%
Age (years)	22.4	2.0			21.2	2.3		
Relationship status								
Single			68	34.2			40	100
Couple			131	65.8				
Household structure								
Living in a family			111	55.8			28	70
Not living in a family			88	44.2			12	30
Level of the highest qualification								
No tertiary qualifications			63	31.7			16	40
Certificate, diploma or advanced diploma			57	28.6			12	30
Undergraduate			66	33.2			10	25
Graduate or postgraduate degree			13	6.5			2	5
Current formal education								
No current formal education			74	37.2			9	22.5
Full-time student			103	51.8			29	72.5
Part-time student			22	11.0			2	5
Occupation								
No paid job			49	24.6			16	40
Professional job			63	31.7			8	20
Intermediate job			48	24.1			5	12.5
Elementary worker or labourer			39	19.6			11	27.5
Individual income								
No income or negative income			17	8.5			11	27.5
<$500 per week			116	58.3			22	55
$500–699 per week			23	11.6			1	2.5
$700–999 per week			23	11.6			4	10
$1,000–1,499 per week			20	10.0			2	5
Religion								
No religion			123	62.4			16	41
Religion			74	37.6			23	59
Aboriginal or Torres Strait Islander status								
Non-Indigenous			199	100.0			40	100

Table 1. Interview schedule: Key topics and questions								
	Sexually active women (n = 200)				Non-sexually active women (n = 40)			
	Mean	SD	n	%	Mean	SD	n	%
Geographic region								
Major city			102	51.3			21	52.5
Inner regional			93	46.7			19	47.5
Outer regional or remote			4	2.0			0	0
K10 score	21.4	7.5			21.6	7.3		
Sex while under the influence of alcohol or drugs								
No			179	89.5				
Yes			21	10.5				
Sex with non-current partner								
No			129	64.5				
Yes			71	35.5				
Have four or more male partners in lifetime								
No			93	47.2				
Yes			104	52.8				
Paid sex								
No			193	96.5				
Yes			7	3.5				
Non-current use of condom								
No			92	46.0				
Yes			108	54.0				

Those who preferred not to identify their sexual activity (n = 12) were not included in this study
K10, Kessler 10; SD, standard deviation

influence of alcohol or drugs was 1.7 fold (Table 2). No other components of risky sexual behaviours were associated with K10 score.

We conducted multivariable regression analyses to investigate the association between K10 score and sex while under the influence of alcohol or drugs, adjusted for age, relationship status and current formal education (Table 3). After controlling for covariates, the estimated relative change in the odds of having sex while under the influence of alcohol or drugs persisted: 1.8 (95% CI: 1.1, 3.0;

P = 0.02) for a change in K10 score of seven units. There was no confounding due to age, relationship status and current formal education.

Interactions between K10 score and covariates

We did not detect any interactions between K10 score and covariates such as age group, relationship status and current formal education (Table 4). However, the statistical power to detect an interaction was low because there were too few females in the sample who reported

having sex while under the influence of alcohol or drugs for all strata of K10 score by age group, relationship status or current formal education.

Discussion

To our knowledge, this is the first study in which psychological distress has been examined as a correlate of risky sexual behaviours. We defined risky sexual behaviours as sex while under the influence of alcohol or drugs, sex with a non-current partner, having had four or more male partners in a lifetime, providing

Table 2. Univariable associations between exposure variables and the outcomes (five risky sexual behaviours)*					
	Outcome: Sex while under the influence of alcohol or drugs	**Outcome: Sex with non-current partner**	**Outcome: Paid sex**	**Outcome: Non-current use of condom**	**Outcome: More than four male partners in lifetime**
K10 score (1 unit)	1.1 (1.02, 1.2) *P* = 0.006	1.03 (1.0, 1.1) *P* = 0.2	1.1 (1.0, 1.2) *P* = 0.2	1.01 (1.0, 1.04) *P* = 0.9	1.01 (1.0, 1.05) *P* = 0.7
K10 score (7 units)	1.7 (1.2, 2.7) *P* = 0.006	1.2, (0.9, 1.6) *P* = 0.2	1.5 (0.8, 2.8) *P* = 0.2	1.1 (0.8, 1.3) *P* = 0.9	1.07 (0.8, 1.4) *P* = 0.7

Values in the table indicate odds ratio (95% confidence intervals), P value

paid sex, and non-current use of condoms among sexually active young females aged 16–25 years residing in Victoria, Australia.

Psychological distress and sexual risk behaviours

Evidence from previous cross-sectional and longitudinal studies performed in the US shows that psychological distress is independently associated with sexual risk behaviours (condom non-use, birth control non-use, multiple sexual partners and substance use at last sex) among adolescent populations.[3,11] One possible explanation for this association would be that psychological distress makes it difficult for one to maintain safer sexual practices.[3,12] Alternatively, an individual may become depressed or anxious because of engaging in risky sexual behaviour.[3,13]

However, some researchers have not been able to detect a correlation between psychological distress and sexual risk behaviours.[14,15] These inconsistent findings between studies may be explained by the following reasons. First, negative outcomes of risky sexual behaviours can be characterised by several pathways: as an increased risk of transmitting STIs or unwanted pregnancy, low self-esteem, mental health problems or even conflict with peers. Therefore, researchers may measure different items of risky sexual behaviour, depending on which pathway of negative outcomes they focus on. In this study, current use of

condoms, one component of risky sexual behaviours, was defined as a barrier method for preventing transmission of STIs. Second, there is currently no standard set of items representing risky sexual behaviours, so we cannot readily compare risky sexual behaviours with other studies.

Psychological distress and sex while under the influence of alcohol or drugs

The association between psychological distress and sex while under the influence of alcohol or drugs demonstrated in

this study suggests that mental health problems and substance use co-occur in young females who engage in unsafe sex practices. The use of alcohol and drugs among young people is regarded as a way to reduce psychological distress.[16–18] Conversely, use of these substances may act in the central nervous system to initiate psychiatric disorders.[19] In this study, we evaluated the indirect effect of substance use on the relationship between psychological distress and sexual behaviours through integrated data on sex while under the influence of alcohol or drugs. However, it would

Table 3. Univariable and multivariable associations between Kessler score (exposure) and sex while under the influence of alcohol or drugs (outcome)		
	OR (95% CI)	**Adjusted OR (95% CI)**
K10 score (7 units)	1.7 (1.2, 2.7), *P* = 0.006	1.8*(1.1, 3.0), *P* = 0.02
Age	0.8 (0.7, 1.02), *P* = 0.07	0.9 (0.7, 1.2), *P* = 0.4
Relationship status		
Single	Ref	Ref
Couple	0.1 (0.03, 0.3), *P* <0.001	0.1 (0.03, 0.3), *P* <0.001
Current formal education		
No	Ref	Ref
Full-time student	0.4 (0.1, 1.1)	0.3 (0.1, 1.02)
Part-time student	1.9 (0.6, 6.3)	2.8 (0.6, 11.9)
	P = 0.05†	*P* = 0.01†

Adjusted for age, relationship status and current formal education
†*From likelihood ratio test*
CI, confidence interval; K10, Kesler 10 Psychological Distress Scale; OR, odds ratio

Table 4. Association between K10 score (exposure of interest) and sex while under the influence of alcohol or drugs (outcome) for each age group, relationship status and current formal education group (potential effect modifiers)

Potential effect modifiers	Exposure of interest	OR (95% CI)	*P* value from likelihood ratio test
Age group 16–19 years	K10 score (7 units)	0.6 (0.02, 16.3)	0.5
Age group 20–25 years		2.0 (1.2, 3.2)	
Single	K10 score (7 units)	2.5 (1.3, 4.8)	0.1
Couple		1.0 (0.4, 2.8)	
No current formal education		1.7 (0.9, 3.2)	
Full-time student	K10 score (7 units)	2.2 (0.9, 5.3)	0.9
Part-time student		1.9 (0.4, 7.8)	

K10, Kessler 10; OR, odds ratio

be preferable to use separate variables to elucidate the association between psychological distress, substance use and risky sexual behaviours. In fact, the YFHI questionnaires included questions about alcohol use such as 'Have you ever tried alcohol?', 'Have you ever had a full serve of alcohol?', 'Have you had an alcoholic drink of any kind in the last 12 months?'. However, because there was a substantial number of missing values (57/200), we elected not to include these variables in our analysis. Further studies should be implemented to identify whether substance use can mediate or moderate the relationship between the psychological distress and sexual risk behaviours among Victorian young females.

Strengths and limitations of the study

Major strengths of this study are the novel methodology we used to recruit participants into this study and collect sensitive information. Although voluntary participation could lead to undetected bias, we have shown that Facebook recruitment can obtain demographically representative samples of young women. Compared to population data from the Australian Bureau of Statistics, we have shown that the sample recruited into the YFHI study are representative of the study population except that a greater proportion of our sample had completed

tertiary education.[9] The community-wide recruitment using a social networking site was beneficial in terms of cost-effectiveness and of achieving a demographically representative sample.[9] Additionally, sending online surveys to participants to complete instead of interviewing them in person may have made it easier to collect the sensitive data reported in this study. Therefore, we show that recruiting participants into health studies through Facebook and using online survey tools are successful approaches to collecting sensitive information from young Australian females.

A major limitation of this study was that sexual behaviours and psychiatric disorders can change over time so we may need to follow up and assess these women at several time points rather than analysing this association at a single time point. As data were obtained from the YFHI database and retrospectively analysed, residual confounding factors, such as maternal level of education and social support, may be present. Additionally, given the small number of observations we had for each of the risky sexual behaviour categories, we are circumspect about making robust conclusions from these data. Therefore, we are merely proposing that there may be an association between having sex while under the influence of alcohol or

drugs and high levels of psychological distress. We aim to investigate this association further as we continue recruiting more participants into the YFHI study.

We were also unable to comprehensively investigate the association between alcohol consumption and risky behaviours as almost 30% of observations were missing. Finally, we did not capture data on feelings of regret after sex, or difficulty negotiating condom or contraceptive use. These may have also served as surrogate markers for mental health and feelings of self-efficacy.

Conclusion

We have shown that there may be an association between high levels of psychological distress and reports of having experienced sex while under the influence of alcohol or drugs in young Victorian females. However, further prospective studies are needed to better understand the basis for this association and to investigate possible intervention strategies. By coordinating sexual healthcare with mental health services, early detection of potential psychological distress and STIs may be facilitated. We have also shown that using social media and online survey tools are successful methodological tools for recruiting young Australian females and collecting sensitive information.

Implications for general practice

Health professionals who care for young females in a primary care or gynecological setting should take into account that patients with risky sexual behaviours may also suffer from psychological distress and vice versa.

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