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Clustering of sex and substance use behaviours in adolescence

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Abstract

Abstract

Background: Adolescents often experiment with substance use and sexual activity, which can impact upon their health and well-being, and establish harmful patterns of behaviour which continue into adulthood. While substance use and participation in sexual behaviours often co-occur, few studies have examined whether these behaviours cluster in adolescence.

Objective: To investigate clustering of sexual activity and substance use among youth in Northern Ireland.

Method: Data from 875 young people (aged 16) who participated in the 2008 Northern Ireland Life and Times Survey was used to investigate clustering using the Odds/Expected ratio method, and gender differences explored.

Results: Alcohol consumption was the most prevalent risk behaviour (75%), followed by cigarette smoking, sexual intercourse, illicit substance use and solvent use the least prevalent. Over 40% of young people participated in multiple risk behaviours (2 or more). Several behaviour combinations were statistically clustered, for most the reported prevalence was lower than expected, however participation in all 5 risk behaviours occurred at a much higher rate than expected, particularly for male youth.

Conclusions: While experimentation with risky behaviours is often considered developmentally appropriate in adolescence it is important to understand how young people experience these behaviours, and the potential for multiple risk exposures as a result of participation in substance use and sexual behaviours. These findings highlight the clustering of substance use and sexual behaviours, and indicate variations in vulnerability to participation in multiple risk behaviours by gender.

Keywords: sex; substance use; adolescents; clustering; risk behaviours

Introduction

Adolescence is characterized by increased risk taking and experimentation as young people negotiate the transition to adulthood. Many of those behaviours which are considered normative in adulthood, such as smoking, drinking and sexual activity are potentially risky for teenagers (van Nieuwenhuijzen et al., 2009) while experimentation with illicit drugs and volatile substance use are risks particularly associated with the adolescent period. A trend for co-occurrence of risk behaviours has been noted (Igra & Irwin, 1995), whereby individuals who are involved in, or have participated in, one risk behaviour, are more likely to be involved in other risk behaviours. Many explanations have been suggested to explain this co-occurrence of behaviours including the presence of an underlying personality trait or syndrome which results in increased risk-taking, impulsivity and sensation-seeking; the relaxation of inhibitions brought about by substance use itself which results in a greater likelihood of participation in other behaviours, such as sexual activity, which would not be participated in when sober; and the normalisation of risk behaviour within adolescent peer groups (Jessor, 1991; Jessor, Chase & Donovan, 1980; Mawson et al., 1996; Weis, Jampol, Lievano, Smith & Wurster, 2008).

However less work has focused on investigating the patterns of co-occurrence and whether particular behaviours are in fact clustered. Several studies have linked substance use, both licit and illicit, with sexual activity among teens (Bachanas et al., 2002; Lowry et al., 1994; Morrison-Beedy, Carey, Feng & Tu, 2008). For example, in the US an increased risk of violence, and sexual risk behaviour was found among late adolescents/young adults who reported use of alcohol and illicit drugs (Baskin-Sommers & Sommers, 2006). Similarly in Northern Ireland being sexual active was significantly associated with cigarette smoking and with use of alcohol, cannabis and ecstasy among 17 – 19 year olds; and risky sexual behaviours such as early sexual initiation, number of partners, and casual sexual activity were

also associated with a range of licit and illicit substances (McAloney, McCrystal & Percy, 2010).

While many studies have explored associations between sexual activity and substance use, there is limited work exploring whether these behaviours are in fact clustered, as indicated by inter-dependency among the behaviours (McAloney, Graham, Law & Platt, 2013). This study investigated whether smoking, drinking, illicit drug use, solvent use and sexual activity were clustered among 16 year old youth who participated in the 2008 Northern Ireland Young Life and Times Survey (NIYLTS; ARK, 2008), and whether this clustering differed by gender.

Method

Participants

The sample consisted of 16 year old adolescents who participated in the 2008 Northern Ireland Life and Times Survey (NIYLTS; ARK, 2008) The 2008 NIYLTS was approved by the Department for Social Development Northern Ireland, and Her Majesty's Revenue and Customs, and no further ethical review was sought for this study as it is a secondary analysis of the anonymised, non-sensitive survey data made publicly available, and managed, by the NIYLTS team. For this study the sample was restricted to those participants with complete data on the five risk variables of interest, resulting in an effective sample size of 875 young people.

Measures

The design and scope of the NIYLTS are reported elsewhere (ARK, 2009), and for this study only the variables of interest are detailed below.

Substance use behaviours. Participants were asked to indicate how often they had used four substances –cigarettes, alcohol, solvents and illicit drugs. Responses were recorded on a 4-point scale - 'not at all', 'once', 'a few times' and 'many times'. These responses

where dichotomised to reflect ever having participated in the risk behaviour (as indicated by ever use of the substance).

Sexual activity. Participants were asked to indicate how often they had been sexually active, 'not at all', 'once', 'a few times' and 'many times'. This item was also dichotomised to indicate whether the young person had ever participated in sexual intercourse.

Procedure

Frequencies of participation in each of the five risk behaviours were produced, and clustering was investigated using the Odds/Eexpected (O/E) ratio method (Hardy et al., 2012). Behaviours are considered to be clustered when the observed frequency of the behaviour combination deviates from that expected if the behaviours were independent. O/E ratio values in excess of 1.00 indicate the prevalence of the behaviours together is higher than expected if they were independent, while values less than 1.00 indicate a lower prevalence than expected. 95% confidence intervals are produced as an indication of the significance of the clustering. Descriptive analyses were conducted in PASW v18.0, and calculations of the O/E ratio performed in Excel.

Results

Consumption of alcohol was the most prevalent risk behaviour (75% of all youth), followed by having smoked cigarettes (37.9%). Over a fifth of all young people reported having had sexual intercourse on at least one occasion, while illicit drug use was less common and solvent use the least prevalent (4.3% of all youth). Generally males and females had similar participation rates in the behaviours (table 1), although having smoked cigarettes, and having consumed alcohol were significantly more prevalent among female youth.

A sizeable minority of young people (42.2% of all youth, 36.9% of males, 45.1% of

females) reported participation in two or more risk behaviours, although the modal number of risk behaviours participated in for all groups was 1 risk. More males than females reported participation in multiple behaviours, although these differences were not significant (table 2). As can be seen in table 3 there were 31 possible behaviour combinations, 15 of which were present in the overall sample. Of these combinations 9 were significantly clustered. Having only ever smoked; having only ever had sex; having used drugs and alcohol; having smoked and had sex; having used alcohol and had sex; having used drugs, alcohol and had sex; and having used alcohol, solvents and had sex were less prevalent in the sample than expected if the behaviours were independent. Participation in none of the behaviours, and participation in all five of the behaviours were significantly more prevalent than expected. Over twice as many young people as expected reported participation in none of the behaviours, while over 85 times as many young people as expected reported having participated in all 5 risks.

For males (table 4) seven significantly clustered patterns emerged. Unlike the sample overall there was no significant clustering of smoking and sex; drug use, alcohol use and sex; or alcohol use, solvent use and sex. Smoking only; sexual activity only; use of drugs and alcohol; and use of alcohol and sex were again significantly less prevalent than expected; while participation in none of the behaviours, and participation in all five were more prevalent, as was drug use, smoking and alcohol use. Two and a half times as many males as expected reported participation in no risk behaviours, almost twice as many reported drug use, smoking and alcohol use, and 104 times as many males as expected reported participation in all five behaviours. For females (table 5) there were 9 significantly clustered behaviour patterns. Unlike the overall sample, alcohol use, solvent use and sex were not significantly clustered among females, but smoking alcohol use and sexual activity were. Smoking only; sex only; drug and alcohol use; smoking and sex; alcohol use and sex; and drug use, alcohol use and sex were less prevalent than expected, while participation in no

risks; participation in smoking; alcohol use and sex; and participation in all 5 were significantly more prevalent than expected. Nearly two and a half times as many females as expected reported no risk behaviours, one and a half times more than expected reported smoking, alcohol use and sex, and participation in all five behaviours was reported by 75 times as many females than expected.

Discussion

While the majority of young people in this sample of youth in this sample from Northern Ireland reported only 1 or no risk behaviours, in contrast to other research from the US (Baskin-Sommers & Sommers, 2006), a sizeable proportion reported multiple co-occurring risk behaviours. This pattern of risk participation implies multiple exposures to potentially harmful consequences as a result of their behaviour, and presents a threat to the health and well-being of adolescents. Several of the behaviour combinations were statistically clustered although it is reassuring that many of these combinations occurred at a lower rate than expected for this sample. However participation in all 5 risk behaviours was also statistically clustered and occurred substantially more (85 times) among the participants than expected. This strongly supports assertions that these five behaviours share underlying mechanisms or processes (Jessor, 1991; Weis, et al., 2008) although the identification of those mechanisms is outside the scope of this paper.

Additionally while male and female youth appear to participate in multiple risky behaviours at comparable levels, there were notable differences in the patterns of behaviours that where participated in. Male youth did not report any participation in smoking alongside sexual activity; nor did they report any co-occurrence of alcohol use, solvent use and sexual activity, while female youth reported participation in both sets of behaviours. Participation in all 5 risk behaviours was also differently dispersed across gender patterns. While both more males and females than expected participated in all 5 risk behaviours, the difference in

observed and expected prevalence was greater for males than females; 104 times as many males as expected reported participation in all 5 risk behaviours, while 76 times as many females as expected participated in all 5 behaviours.

These findings highlight variations in vulnerability to participation in multiple risk behaviours by gender, and further work is needed to better understand how gender and other social characteristics influence young people's participation in risky behaviours. While experimentation with substance use behaviours is often viewed as normative in adolescence (Bartlett, Holditch-Davis & Belyea, 2007), it is important to understand how young people experience these behaviours, and the potential for multiple risk exposures as a result of participation in substance use and sexual behaviours. This is particularly true as behaviours adopted in adolescence are often continued into adulthood, and so the initiation of multiple risky behaviours at this young age can have consequences for health and well-being in later life (Due et al, 2011).

This study does have a number of limitations which must be addressed, among which is the focus on 'ever' participating in the behaviours. The categorisation of the risk variables does not allow for any exploration of how frequency of participation in different behaviours is related. Additionally this categorisation does not allow for any distinction to be made between experimentation with a substance or activity and initiation of that behaviour over a more sustained period of time. However this dichotomization is necessary to identify if statistical significant clusters of behaviours are present (McAloney et al., 2013)

Additionally while the patterns were investigated for both males and females in the sample, there were limitations as to the number of social characteristics which could be explored in this analysis. Further research which uses more advanced techniques such as latent class or cluster analysis, and which incorporates more potentially explanatory variables is necessary to further understand variations in risk behaviour participation among young

people. The NIYLTS is a repeated cross-sectional survey conducted in Northern Ireland annually, and so may not be representative of adolescents in other countries or locales. Additionally it is worth noting that in 2008 when this survey was conducted the minimum age of consent with regards to sexual activity in Northern Ireland was lowered from 17 years to 16 years, and it is not known what effect, if any, this may have had on young people's participation in this activity.

Conclusion

This study examined whether substance use behaviours – smoking, drinking, drug use and solvent use, and sexual intercourse were clustered among young people in Northern Ireland. Several combinations of these behaviours were statistically clustered, and while for most combinations the behaviours occurred at a lower prevalence than expected, participation in all 5 risk behaviours occurred much more than expected if the behaviours were independent, particularly for male youth. More research is needed to further understand how these behaviours cluster, and the mechanisms by which young people choose to participate in multiple behaviours, in order that intervention methods which target these behaviours can be tailored most effectively to meet the needs of young people.

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Table 1

Prevalence (%) of ever having participated in the risk behaviours

	Full sample	Males	Females
Ever taken drugs	14.5	16.7	12.6
Ever smoked cigarettes	37.9	31.5	41.6
Ever consumed alcohol	75.0	70.5	78.0
Ever used solvents	4.3	4.8	4.1
Ever had sex	21.9	19.0	23.7

Table 2

Number of risk behaviours participated in

	Full sample	Males	Females
0	23.3	28.0	20.2
1	34.5	35.1	34.7
2	20.6	17.0	23.0
3	11.7	10.1	12.4
4	6.6	6.0	6.8
5	3.3	3.9	3.0

Table 3

Clustering for full sample

	% Observed	% Expected	O/E	95% CI
None	23.3	9.9	**2.35**	**2.03 – 2.67**
Drugs only	0.0	1.7 *		
Cigarettes only	0.7	6.1	**0.11**	**0.02 – 0.20**
Alcohol only	32.9	29.8	1.11	0.98 – 1.24
Solvents only	0.0	0.4*		
Sex only	0.9	2.8	**0.33**	**0.10 – 0.56**
Drugs and cigarettes	0.0	1.0*		
Drugs and alcohol	0.2	5.0	**0.05**	**0.0 – 0.11**
Drugs and solvents	0.0	0.1*		
Drugs and sex	0.0	0.5*		
Cigarettes and alcohol	16.3	18.2	0.90	0.75 – 1.05
Cigarettes and solvents	0.0	0.3*		
Cigarettes and sex	0.1	1.7	**0.7**	**0.0 – 0.20**
Alcohol and solvents	0.0	1.3*		
Alcohol and sex	0.1	1.7	**0.07**	**0.00 – 0.20**
Solvents and sex	0.0	0.1*		
Drugs, cigarettes and alcohol	4.1	3.1	1.34	0.90 – 1.77
Drug, cigarettes and solvents	0.0	0.0*		
Drugs, cigarettes and sex	0.0	0.3*		
Drugs, alcohol and solvents	0.0	0.2*		
Drugs, alcohol and sex	0.7	1.4	**0.48**	**0.10 – 0.87**

Drugs, solvents and sex	0.0	0.0*		
Cigarettes, alcohol and solvents	0.0	0.8*		
Cigarettes, alcohol and sex	6.7	5.1	1.32	0.99 – 1.66
Cigarettes, solvents and sex	0.0	0.1*		
Alcohol, solvents and sex	0.1	0.4	**0.30**	**0.00 – 0.90**
Drugs, cigarettes, alcohol and solvents	0.5	0.1	3.30	0.07 -6.54
Drugs, cigarettes, alcohol and sex	0.0	0.9*		
Drugs, alcohol, solvents and sex	0.0	0.1*		
Cigarettes, alcohol, solvents and sex	0.5	0.2	2.00	0.04 – 3.64
All five behaviours	3.3	0.0	**85.39**	**54.31 – 116.47**

*, behaviour combination not present in sample; bold typeface indicates significant O/E ratio

Table 4

Clustering for Males

	% Observed	% Expected	O/E	95% CI
None	28.0	10.7	**2.62**	**2.09 – 3.15**
Drugs only	0.0	2.1*		
Cigarettes only	0.6	4.9	**0.12**	**0.00 – 0..29**
Alcohol only	33.6	32.1	1.05	0.86 – 1.25
Solvents only	0.0	0.5*		
Sex only	0.9	3.0	**0.30**	**0.00 – 0.64**
Drugs and cigarettes	0.0	1.0*		
Drugs and alcohol	0.3	6.4	**0.05**	**0.00 – 0.14**
Drugs and solvents	0.0	0.1*		
Drugs and sex	0.0	0.6*		
Cigarettes and alcohol	12.2	14.7	0.83	0.58 – 1.08
Cigarettes and solvents	0.0	0.2*		
Cigarettes and sex	0.0	1.4*		
Alcohol and solvents	0.0	1.4*		
Alcohol and sex	1.5	9.0	**0.50**	**0.25 – 0.75**
Solvents and sex	0.0	0.1*		
Drugs, cigarettes and alcohol	5.7	2.9	**1.92**	**1.06 – 2.78**
Drug, cigarettes and solvents	0.0	0.1*		
Drugs, cigarettes and sex	0.0	0.3*		
Drugs, alcohol and solvents	0.0	0.3*		

Drugs, alcohol and sex	3.3	4.1	0.79	0.32 – 1.26
Drugs, solvents and sex	0.0	0.0*		
Cigarettes, alcohol and solvents	0.0	0.7*		
Cigarettes, alcohol and sex	3.3	4.1	0.79	0.32 – 1.26
Cigarettes, solvents and sex	0.0	0.1*		
Alcohol, solvents and sex	0.0	0.4*		
Drugs, cigarettes, alcohol and solvents	0.6	0.1	4.49	0.00 – 10.72
Drugs, cigarettes, alcohol and sex	0.0	0.8*		
Drugs, alcohol, solvents and sex	0.0	0.3*		
Cigarettes, alcohol, solvents and sex	0.3	0.2	1.61	0.00 – 4.75
All five behaviours	3.9	0.0	**104.13**	**47.53 – 160.75**

*, behaviour combination not present in sample; bold typeface indicates significant O/E ratio

Table 5

Clustering for Females

	% Observed	% Expected	O/E	95% CI
None	20.2	8.2	**2.45**	**1.99 – 2.92**
Drugs only	0.0	1.2*		
Cigarettes only	0.8	5.9	**0.13**	**0.00 – 0.25**
Alcohol only	33.0	29.1	1.13	0.96 – 1.30
Solvents only	0.0	0.4*		
Sex only	0.9	2.6	**0.37**	**0.05 – 0.69**
Drugs and cigarettes	0.0	0.8*		
Drugs and alcohol	0.2	4.2	**0.04**	**0.00 – 0.13**
Drugs and solvents	0.0	0.1*		
Drugs and sex	0.0	0.4*		
Cigarettes and alcohol	19.0	20.8	0.92	0.74 – 1.10
Cigarettes and solvents	0.0	0.3*		
Cigarettes and sex	0.2	1.8	**0.0**	**0.00 – 0.31**
Alcohol and solvents	0.0	1.2*		
Alcohol and sex	3.6	9.0	**0.40**	**0.22 – 0.57**
Solvents and sex	0.0	0.1*		
Drugs, cigarettes and alcohol	2.8	3.0	0.94	0.47 – 1.42
Drug, cigarettes and solvents	0.0	0.1*		
Drugs, cigarettes and sex	0.0	0.3*		

Drugs, alcohol and solvents	0.0	0.2*		
Drugs, alcohol and sex	0.4	1.3	**0.29**	**0.00 – 0.69**
Drugs, solvents and sex	0.0	0.0*		
Cigarettes, alcohol and solvents	0.0	0.9*		
Cigarettes, alcohol and sex	9.0	6.4	**1.40**	**1.01 – 1.80**
Cigarettes, solvents and sex	0.0	0.1*		
Alcohol, solvents and sex	0.2	0.4	0.49	0.00 – 1.44
Drugs, cigarettes, alcohol and solvents	0.4	0.13	2.94	0.00 – 7.03
Drugs, cigarettes, alcohol and sex	0.0	0.9*		
Drugs, alcohol, solvents and sex	0.0	0.2*		
Cigarettes, alcohol, solvents and sex	0.6	0.3	2.05	0.00 – 4.37
All five behaviours	3.0	0.04	**75.85**	**38.68 – 113.01**

*, behaviour combination not present in sample; bold typeface indicates significant O/E ratio