Associations between probable anxiety and mood disorder and measures of alcohol and cannabis use in young, middle-aged and older adults.

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Abstract

Objective: This study examined the associations of cannabis use, alcohol use and alcohol problems with probable anxiety and mood disorders (AMD) in young, middle-aged and older adults. Method: Data are based on the CAMH Monitor, an ongoing cross-sectional telephone survey of Ontario adults aged 18 years and older. For the purposes of the current study, a merged dataset from the years 2001 through 2009 inclusive was separated into three individual datasets: 18-34 year olds (n=4,211), 35-54 year olds (n=7,874), and 55 years of age and older (n=6,778). The survey included the 12-item version of the General Health Questionnaire, which provides a measure of probable AMD for the general population. Logistic regression analyses examined the odds of probable AMD in three age groups associated with alcohol measures (number of drinks per day and alcohol problems (AUDIT 8+)) and cannabis use, while controlling for self-reported physical health, religious service attendance, and demographic factors. Due to listwise deletion, the logistic regression models were based on reduced samples. Results: Lifetime cannabis use and past year cannabis use predicted probable AMD in young and middle-aged adults, but only lifetime cannabis use predicted probable AMD among older adults. Alcohol problems predicted probable AMD among middle aged and older adults, but not among younger adults. No consistent link between recent alcohol consumption and probable AMD was observed. Conclusion: These analyses suggest that the impact of alcohol and cannabis use and problems on probable AMD may differ across age groups.

Keywords: cannabis, anxiety, mood disorders, Ontario, AUDIT.

Introduction

Anxiety and mood disorders (AMD) are the most common psychiatric disorders, and in Western jurisdictions affect approximately 10% of the adult population in a given year (Bijl et al., 1998; Rush et al., 2008). These disorders are considered to be the product of many complex biological, psychological, and social factors. They may be triggered by stressful life events and shaped by individuals' genetic makeup, coping skills, and social environment (Patten & Juby, 2008). They are often comorbid with substance abuse (Grant et al., 2004; Kessler et al., 2010; Ross et al., 1988a).

Links between AMD and alcohol use began to receive increasing attention in the 1980's. Ross and colleagues (1988a; 1988b) reported on the prevalence of psychiatric disorders among patients receiving treatment for alcohol use problems. They observed that a very high proportion of the patients (78%) had a lifetime psychiatric disorder (Ross et al., 1988a). Among those with a diagnosis of alcohol abuse or alcohol dependence, 87.1% showed evidence of a lifetime psychiatric diagnosis, and 72.7% had a current psychiatric diagnosis. AMD were common among those with alcohol disorders. For example, major depression was observed among 22.6% and generalized anxiety was observed among 50.7%. Grant et al. (2004) examined the prevalence and co-occurrence of substance use disorders and independent mood and anxiety disorders in data from the National Epidemiological Survey on Alcohol and Related Conditions. Those who were classified as having any alcohol use disorder (AUD) (abuse or dependence) had elevated odds of having any mood disorder (OR = 2.8) and any anxiety disorder (OR = 1.7) in the past 12 months. Lai et al. (2015) reported a systematic review and meta-analysis of the comorbidity of substance use disorders, anxiety disorders and major depression in 22 unique epidemiological surveys. They observed that individuals who had an AUD were 2.03 times more likely to have any anxiety disorder, and 2.22 times more likely to have major depression, than controls. The evidence on the association of AUD and AMD would suggest that there may be an association of alcohol use patterns with AMD as well. Many studies have observed that heavier drinkers are more likely to show evidence of AMD (Mann et al., 2012). Interestingly, some research suggests that moderate drinkers may be less likely to show evidence of AMD than abstainers or heavy drinkers (Mann et al., 2012; Skogen et al., 2009). However, as with the relationship of alcohol consumption and cardiovascular disease, these findings may result from confounding of the abstaining group by the inclusion of large numbers of former abusive drinkers or individuals who are otherwise medically compromised (Zhao et al., 2017).

Similarly, researchers have observed an association between other substance use problems and AMD. For example, Grant et al. (2004) reported that those with any drug use disorder were more likely to report current mood disorders (OR = 4.9) and current anxiety disorders (OR = 2.8). The association between cannabis use and AMD specifically has received increasing attention in recent years. Cheung et al. (2010) observed, in a general population sample, that individuals who reported heavy cannabis use were more likely to be classified as having probable AMD compared to abstainers (OR = 2.04). Moore et al. (2007) reported a meta-analysis of longitudinal population-based studies assessing the impact of cannabis use on subsequent psychotic or affective mental health outcomes. They observed that there was strong evidence for an association between cannabis use and subsequent psychotic outcomes; the evidence was less strong for an association between cannabis use and subsequent affective disorders. The pooled estimate for an association of heaviest cannabis use with subsequent depression was significant (OR = 1.49), but there was no strong evidence for an association of cannabis use with suicide or anxiety. The authors noted several methodological concerns with the studies examined. There is also evidence that the impact of cannabis use on AMD may be greatest among youth. A recent meta-analysis reported a significant increased risk of AMD among adolescent cannabis users, although no comparison was made with older users (Gobbi et al., 2019).

Sociodemographic factors show important associations with AMD. Females are more likely to experience AMD than males (Kessler et al., 2003). Education and income are also related; those with higher incomes and education levels typically report lower levels of AMD. Compared to individuals who are married, those who have never married or are divorced or widowed show higher rates of AMD (Kessler et al., 2003). The presence of physical health problems can also predispose individuals to AMD (Kessler et al., 2010). A factor that has been reported to have a beneficial effect on mental health generally is religion or spirituality, which may provide individuals with positive coping skills and community support (Weber & Pargament, 2014).

Age is an important factor that influences the prevalence of AMD. Rates of recent AMD appear highest among young adults and lowest among older adults. For example, Klerman et al. (1985) reported that the highest prevalence for major depression was among young adults, with a decline in the prevalence of major depression with age (Simon & von Korff, 1992).

Kessler et al. (2010) noted that there was little to no research on age differences in the association of AMD with other disorders. In their study of age differences in major depression, they examined the comorbidity of major depressive episodes with other psychiatric disorders. They observed that the odds of individuals having a concurrent substance use disorder were highest among older respondents compared to younger adults (ORs = 8.0 versus 2.2). This important finding suggests that the association of substance use and problems with AMD may increase with age. Despite the potential importance of these observations, few studies have since examined age-related differences in the association of AMD with substance use problems.

Kessler et al.'s (2010) finding of stronger associations between recent AMD and substance use and problems among older individuals compared to younger individuals may be surprising for several reasons. First, research suggests that heavy or problematic substance use may play a causal role in AMD, and for cannabis use this relationship may be strongest among youth (e.g., Gobbi et al., 2019). Rates of use and problems with alcohol and cannabis are highest among young adults (e.g., Ialomiteanu et al., 2018), which would suggest that higher rates of AMD resulting from alcohol and cannabis use might be observed in this age group. Similarly, substance use and problems may result from AMD, with individuals turning to substance use for self-medication (Turner et al., 2018). On the other hand, heavy substance use is more normative among younger age groups, and the continued presence of heavy substance use among older adults could be more reflective of deviance and social pathology that could also predispose individuals to or result from AMD. Alternatively, the temporal relationships between heavy or problematic substance use and resulting AMD may be important. For example, there may be a latency period between the onset of heavy or problematic substance use and the onset of associated AMD. A better understanding of age-related differences in the association of AMD with heavy or problematic use of alcohol and cannabis may thus provide important information for treatment and prevention purposes.

In this paper, we examine age-related associations between alcohol use and problems, cannabis use, and probable AMD, based on the 12-item version of the General Health Questionnaire (Goldberg et al., 1997) in data from a large representative sample of the Ontario adult population. We assess these relationships among young adults aged 18-29 years, middle-aged adults aged 30-54 years, and older adults aged 55 years and over. Additionally, we examine the associations of sociodemographic measures, self-reported physical health, and religious engagement to determine the stability of these associations across age groups.

Method

Sample

The data are drawn from the Centre for Addiction and Mental Health (CAMH) Monitor, an ongoing cross-sectional telephone survey of Ontario adults (18 years of age or older) conducted by CAMH and administered by the Institute for Social Research at York University. Each year, the CAMH Monitor consists of 12 independent monthly surveys, with approximately 200 completions each month. The survey uses list-assisted random-digit-dialing methods via Computer Assisted Telephone Interviews. The list-assisted sampling frame is comprised of commercially available lists of telephone numbers, as well as unlisted numbers, cellular telephone numbers, and newly activated numbers. A computer is used to generate a random sample of telephone numbers from this frame, from which each monthly sample is drawn. The design employs a two-stage probability selection procedure. Within each regional stratum, a random sample of telephone numbers is selected with equal probability in the first stage of selection (i.e., households). Within households of selected telephone numbers, one respondent aged 18 years or older who could complete the interview in English is usually selected according to the last birthday method. For each calendar year, the monthly samples were combined to provide a single annual dataset. The data were weighted to adjust for varying selection probabilities, regional representation, and a final post-stratification adjustment to restore the age by gender distribution based on the most recently available census figures. The weighted sample is considered representative of the non-institutionalized Ontario adult population. The institutional research ethics committees at CAMH and York University have

approved the survey annually. More details on sampling design can be found in Ialomiteanu et al. (2018).

For purposes of the current study, data from 2001 to 2009 (response rates were 53% to 61%) were merged and then separated into three individual datasets: 18-34 year olds (n=4,211), 35-54 year olds (n=7,874), and 55 years of age and older (n=6,778).

Dependent Variable

The 12-item version of the General Health Questionnaire (GHQ12), using binary scoring, served as the measure of probable AMD. The term 'probable' is used to differentiate this measure from cases of AMD identified by a more formal diagnostic process. Likert responses were coded to "0, 0, 1, 1". Zero represents 'more so than usual' or 'same as usual', 1 represents 'less so than usual' or 'much less than usual'. The GHQ12 items correspond well with many of the Composite International Diagnostic Interview (CIDI) and Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) items for AMD. The GHQ12 has proven useful for the detection of psychiatric problems in many different settings, including general population surveys, and its validity has been demonstrated in comparison with diagnoses based upon the DSM-IV and CIDI. Previous studies have provided evidence that the GHQ12 can be effective in detecting AMD in individual clinical cases (e.g., Goldberg et al., 1997). Mann et al. (2011) observed that a cutoff score of 4 on the GHQ12 appeared optimal in identifying individuals with AMD in a general population sample, and resulted in prevalence estimates for AMD that are very similar to those based on standardized instruments such as the CIDI. This cutoff score was used here to identify individuals with probable AMD.

Independent Variables

Demographic variables examined were gender, income (<$30,000, $30,000-49,999, $50,000-79,999, $80,000+, don't know/refused), education (<high school, completed high school, some post-secondary, university degree), and marital status (married/common law partner, previously married, never married). General physical health assessed respondents' perception of their general health (fair or poor physical health versus good or excellent physical health). Religious services attendance measured attendance less than once a week and once a week or more.

The alcohol consumption variable used in the analyses referred to the number of drinks consumed per day, which was estimated using the product of usual number of drinks consumed by frequency of drinking in the last 12 months (number of drinks categories: none, 0.01-0.999 (<1), 1-1.999, 2-2.999, 3-4.999, and 5 or more). Problem drinking was assessed by the Alcohol Use Disorders Identification Test (AUDIT) (Babor et al., 2001). A score of 8 or more indicates hazardous or harmful drinking. The AUDIT was designed to detect drinkers with less severe alcohol problems, as it assesses a pattern of drinking that increases the likelihood of future health problems as well as a pattern of drinking that is already causing damage to health (Babor et al., 2001; Saunders et al., 1993).

The cannabis use measure is derived from two items: 1) "Have you ever used cannabis in your lifetime?", and 2) "How many times, if any, have you used cannabis during the past twelve months?" (response options: never, used in lifetime but not in past 12 months, and used in the past 12 months).

Analyses

The results are based on "valid" responses (n's) such that missing data (i.e., "don't know" responses and refusals) were excluded from analyses. The percentages reported are based on the weighted sample size and are considered representative for the population surveyed. Data on AMD by independent variables were examined through chi-square analyses for each age group sample (18-34, 35-54, 55+).

Logistic regression analysis was used to estimate the odds ratio of AMD for alcohol and cannabis measures while adjusting for potential confounding effects of demographic, physical health, and church attendance measures. Logistic regression models of AMD were obtained for each age group. Due to listwise deletion, the logistic regression models were based on reduced samples: 18-34 year olds (n=3,829), 35-54 year olds (n=7,105), 55 years of age and older (n=5,871). STATA software (Statacorp, 2013) for the logistic regression analysis (svy: logit) was employed to take into account the survey sampling design. The *F*-adjusted mean residual goodness-of-fit test was applied after fitting the logistic regression models.

Results

Table 1 presents the prevalence of self-reported AMD for each age group, by demographic characteristics and risk factor variables. The

prevalence of AMD was greatest in young adults (10.5%), followed by the middle-age group (9.9%), and lowest among those aged 55 years or older (7.0%). The demographic characteristics associated with AMD appear to be fairly consistent across age groups. A significant gender difference was found across all age groups, with females showing a significantly higher prevalence of AMD than males (*p*s<.01). AMD differed by marital status for all age groups (*p*s<.001); the highest prevalence belonged to those previously married and the lowest to those married or with a common law partner at the time of the survey. AMD in each age group was found to significantly differ by household income, decreasing as income increases (*p*s<.05). The prevalence of AMD for those earning <$30,000 was 14.2% for the youngest group, 22.3% for the middle-age group, and 9.0% for those aged 55+ years. The prevalence of AMD was lowest (3.8%) for older respondents who earn $80,000+. The prevalence of AMD also decreased with increased level of education for all age groups (*p*s<.05). Compared to those with good/excellent general health, respondents with fair/poor health had significantly higher prevalence of AMD for all age groups (*p*s<.001). The prevalence of AMD for those with poor health was about one third in the youngest (29.3%) and middle-age group (30.7%) and about one fifth in the oldest group (19.3%). Those reporting less than weekly religious services attendance had significantly higher prevalence of AMD for the middle-age group (*p*<.01) and oldest age group (*p*<.05), but not for the youngest group.

Self-reported cannabis use was significantly related to AMD for the youngest and middle-age groups (*p*s<.001), but not for the oldest age group. The prevalence of AMD for respondents who used cannabis in the past 12 months was 12.8% for the youngest group and 13.8% for the middle-age group.

AMD was significantly related to alcohol consumption for the youngest (p<.05) and oldest age groups (*p*s<.01), but not for those 35-54 years old. However, being classified as a hazardous or harmful drinker (AUDIT 8+) was significantly related to AMD for the middle-age and oldest age groups (*p*s<.05), but not for the youngest group.

Table 2 presents the logistic regression models of factors associated with AMD for each age group. Gender was significantly associated with AMD in all age groups. The odds of AMD for males (*OR*=.46, *p*<.001) was less than half that of females for the youngest group. Overall, income was a significant factor in the odds of AMD for the middle-aged and oldest groups. The odds of AMD for the middle-aged group was lower (about half) for all income levels when compared to those with <$30,000. For the oldest group, income of $80,000 or more was associated with lower odds of AMD (*OR*=.56, *p*<.05) compared to those earning <$30,000. Income was not a significant risk factor for AMD for the youngest group. Marital status was found to be a significant factor overall in AMD for the middle-aged group. People who were previously married were more likely to experience AMD for the middle-aged (*OR*=1.81, *p*<.001) and for the youngest group (*OR*=1.93, *p*<.05) compared to those married/partnered.

People from all age groups who reported having poor health had significantly increased odds of AMD compared to those in good health (*OR*=3.75, *p*<.001 for youngest, *OR*=4.56, *p*<.001 for middle-aged, *OR*=5.05, *p*<.001 for oldest group). Religious service attendance was not found to be a significant factor for AMD for any age group in the multivariate analyses.

Overall, use of cannabis was a significant factor in the odds of AMD for all age groups. Lifetime cannabis use (but not in the last 12 months) was associated with significantly increased risk of AMD for all age groups compared to those who never used cannabis (*OR*=1.42, *p*<.05 for the youngest group, *OR*=1.47, *p*<.001 for the middle-aged group, *OR*=1.68, *p*<.001 for the oldest group). Cannabis use in the last 12 months was associated with significantly increased odds of AMD for the youngest (*OR*=1.70, *p*<.01) and middle-aged (*OR*=1.63, *p*<.01) groups, but not in the oldest group, compared to those who never used cannabis.

Number of drinks of alcohol consumed per day was found to be a significant overall risk factor for AMD for the youngest age group, but none of the comparisons of the abstainer group with other drinking categories was statistically significant. For middle-aged and older respondents, the omnibus comparisons of abstainers with other drinking categories did not reach significance.

Harmful or hazardous drinking as demonstrated by the AUDIT 8+ was associated with significantly increased odds of AMD for the middle-aged (*OR*=1.46, *p*<.05) and oldest groups (*OR*=2.25, *p*<.01) but not for the youngest group. Other drinker status measures showed no significant impact on AMD in the logistic regression analyses.

Discussion

The results presented here provide an interesting perspective on the relationships among alcohol and cannabis measures and anxiety and mood disorders. However, they must be interpreted in light of the limitations of the research. First, our measure of probable AMD is based on a screening instrument rather than a clinical diagnosis. Second, these data are based on self-reports and thus could be subject to sources of bias, such as hesitancy to disclose personal information like higher levels of drinking, cannabis use, or emotional problems. Third, the data are cross-sectional in nature, and thus cannot be assumed to reflect causal relationships. Fourth, it cannot be determined whether non-respondents would have responded the same way as the respondents in this study. Finally, the survey does not include individuals in hospitals, nursing homes, and homeless shelters, thus omitting people with serious physical and mental disorders that might particularly affect the elderly. Also, the survey targets households with landline telephones, and omits individuals who only use cellular telephones. This issue is of greater concern for later sample years in the merged data employed in this study, since 7.4% of Ontario households in 2008 only use cellular telephones, but it is much higher (34.4%) among households comprised of 18-34 year olds (Statistics Canada, 2013).

Keeping these limitations in mind, the results are nevertheless of substantial interest. First of all, these findings replicate other studies in showing important relationships between sociodemographic factors and probable AMD. As observed in previous research (e.g., Kessler et al., 2003), women had higher rates of AMD than men. Also, we observed a strong and consistent association between probable AMD and reporting fair or poor general physical health across all age groups, as observed in previous studies (e.g., Kessler et al., 2010). However, the association of some sociodemographic characteristics with probable AMD appeared to vary with age group. Marital status was most strongly related to probable AMD for those in middle-age. It is possible that the break-up of a marriage, or the death of a spouse, may create more distress among those in middle-age than among younger or older adults. Similarly, income appeared most strongly related to probable AMD among those in middle-age, with those reporting lowest incomes having higher levels of probable AMD than those with higher incomes. Much research demonstrates the impact of financial factors on mental health and health more generally (e.g., Hamilton et al., 2019). The apparent stronger impact of income among those in middle-age may point to the increased financial stressors experienced in that period of life, or perhaps the increased salience of financial factors for determining stress levels among the middle-aged.

Interestingly, we observed no significant impact of the measure of spirituality included here (weekly religious service attendance) on probable AMD in any age group. This may be surprising in view of previous research suggesting an association of spirituality and religiosity with mental health and substance use (Tuck et al., 2017a; Tuck et al., 2017b; Weber & Pargament, 2014). Spirituality and belonging to a religious community may provide psychological coping mechanisms and social resources that could mitigate the effects of stressors. The failure to find an association of spirituality here could be a result of using a measure that does not capture those aspects of spirituality that impact mental health.

The associations of lifetime cannabis use, and cannabis use in the past 12 months, with probable AMD across age groups suggested some important relationships. Lifetime cannabis use was significantly associated with probable AMD for all three age groups. Interestingly, past 12-month use was significantly associated with probable AMD among young and middle-aged adults, but not among older adults. While these findings might suggest important differences in the relationship between recent cannabis use and AMD in older versus younger adults, it is important to keep in mind that the number of older adults who used cannabis in the past 12 months was relatively small, and thus the failure to observe a relationship here may result at least in part from a lack of power. The broader finding of a relationship between both lifetime and recent cannabis use and probable AMD replicates previous findings of increased likelihood of AMD among individuals who are heavy users of cannabis (e.g., Cheung et al., 2010; Gobbi et al., 2019). Previous research has tended to focus on the relationship of cannabis use and AMD among young people, but the present results suggest that this relationship may also be found among middle-aged and older adults as well. The finding that lifetime use, even in the absence of recent use, is associated with an increased likelihood of probable AMD may be consistent with the hypothesis that cannabis use, particularly during youth, may alter brain functions in ways

that predispose individuals to psychiatric problems (Gobbi et al., 2019; Volkow et al., 2014). The finding that lifetime cannabis use, but not past year use, is associated with probable AMD among older adults may provide support for this suggestion. More research is needed to understand the association between cannabis use and AMD, in order to determine if any causal relationships are present, and if so, what aspects of cannabis use might increase the likelihood of AMD.

We also assessed the relationship between alcohol problems, as measured by the AUDIT, and probable AMD. The results indicated that those who are hazardous or harmful drinkers are more likely to demonstrate probable AMD, but only among middle-aged and older adults. These findings thus appear consistent with Kessler et al.'s (2010) finding of higher levels of comorbidity among older adults, even though rates of alcohol use disorders and recent major depression are lower among this group. The observation that comorbidity rates increase with age may have important implications for diagnosis and treatment of mental health problems in these age groups, and suggests that clinicians should be more vigilant to detect comorbidity among older adults. Conversely, the finding that rates of probable AMD are not increased among young adults who are hazardous or harmful drinkers seems surprising. As noted previously, one possible interpretation is that a hazardous or harmful drinking style, as reflected by a score of 8 or more on the AUDIT, tends to be a common and normative drinking style among young adults. It is certainly true that young adult drinkers are more likely to report more drinks per drinking occasion, or to be heavy episodic drinkers (Ialomiteanu et al., 2018), which would increase AUDIT scores even though drinking may not be causing affective changes. Also, it is possible that there is a latency period between heavy or problem drinking and the onset of AMD caused, at least in part, by that drinking.

We also examined the relationship between recent drinking and probable AMD. Previous research suggests that heavier drinking is associated with negative affect and increased likelihood of AMD, but also that moderate drinking may be associated with reduced likelihood of AMD, similar to the J-shaped relationship reported between alcohol consumption and heart disease (Mann et al., 2012; Skogen et al., 2009). However, the present results provide only modest support for an impact of recent consumption on probable AMD. The univariate analyses suggested the presence of these relationships, but once covariates and potential confounders were controlled for in the multivariate analyses, little supporting evidence was observed. These findings might suggest that the level of recent consumption itself may be less important in any link between alcohol and AMD, and that the sustained pattern of heavy consumption along with symptoms indicative of disorder (e.g., dependence, abuse), as reflected in the AUDIT scale, are most important in the relationship of alcohol with AMD.

As noted previously, there are many limitations to keep in mind when considering these results. Nevertheless, they do point to the value in considering possible age-related effects when examining the associations between cannabis, alcohol, and AMD. More research to replicate these observations and to understand causal linkages between cannabis use and problems, alcohol use and problems, and AMD are needed. These relationships may not be simple, and may be influenced by biological, socioeconomic and cultural factors specific to age groups or stages of life.

Conflict of Interest

Robert E. Mann, Wah Lap Cheung, Gina Stoduto, Christine M. Wickens, Anca R. Ialomiteanu, Chloe Docherty, Roxana Florica, Justin Matheson, Lily Y. Li, and André J. McDonald declare that they have no conflicts of interest.

Informed Consent

All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000 (5). Informed consent was obtained from all patients for being included in the study.

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Submitted: March 22, 2019
Revised: May 17, 2019
Accepted: May 20, 2019

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Table 1. Anxiety and mood disorder (AMD)[a] for three age groups (18-34, 35-54, 55+ years) by demographic characteristics and substance use: CAMH Monitor, 2001-2009

	Age 18-34		Age 35-54		Age 55+	
	N	AMD Yes (%)	N	AMD Yes (%)	N	AMD Yes (%)
TOTAL	4211	10.5	7874	9.9	6778	7.0
Gender		***		***		**
Male	1943	7.4	3541	8.1	2726	6.1
Female	2268	13.6	4333	11.7	4052	7.9
Marital Status		***		***		***
Married/partner	1843	9.4	5565	8.4	3938	5.9
Previously married	164	19.1	1315	18.0	2398	10.1
Never married	2194	10.9	961	12.5	383	6.7
Education		**		***		*
<High school	281	14.7	713	14.2	1803	8.4
Completed HS	1021	11.8	1799	10.3	1747	6.8
Some post-secondary	1697	10.0	2933	10.1	1663	7.0
University degree	1199	9.3	2393	8.2	1461	5.6
Income[b]		*		***		***
<$30,000	637	14.2	795	22.3	1564	9.0
$30,000-$49,999	751	10.0	1100	12.1	1252	7.7
$50,000-$79,999	959	10.7	1846	9.3	1127	7.9
$80,000+	1191	9.8	2915	8.1	1109	3.8
Don't know/Refused	973	9.7	1218	7.9	1726	7.0
Cannabis use		***		***		
Never	1922	8.6	3900	7.7	5547	6.6
Lifetime only	1136	11.5	3049	11.8	1029	8.8
Past 12 months	1117	12.8	826	13.8	156	7.0
Number of drinks/day[c]		*				**
None	636	10.1	1352	10.8	1846	8.8
< 1	2955	10.7	5368	9.8	3745	6.5
1 – 1.999	325	7.3	708	8.5	342	4.4
2 – 2.999	117	12.6	181	9.9	235	8.9
3 – 4.999	94	7.6	108	9.2	131	6.6
5 or more	31	21.4	62	14.5	50	5.6
AUDIT 8+				*		*
No (0-7)	3145	10.1	6751	9.3	6132	6.8
Yes (8+)	926	11.5	885	12.0	377	9.8
General Physical Health		***		***		***
Excellent/Good	3986	9.11	7035	7.7	5471	4.6
Fair/Poor	3111	29.3	823	30.7	1260	19.3
Religious Services Attendance				**		*
<Weekly	3636	10.9	6680	10.2	5157	7.4
Once a week or more	363	9.5	778	7.1	1112	5.5

Notes: CAMH=Centre for Addiction and Mental Health; [a] Anxiety and mood disorder is defined as reporting at least 4 of the 12 symptoms on the GHQ12 scale; [b] Canadian dollars; [c] Derived from the product of usual number of drinks consumed by frequency of drinking in the past 12 months; Statistical significance (chi-square): * p<.05; ** p<.01; *** p<.001.

Table 2. Logistic regression models of anxiety and mood disorder (AMD)[a] for three age groups (18-34, 35-54, 55+ years): CAMH Monitor, 2001-2009

	Age 18-34		Age 35-54		Age 55+	
	OR	95%CI	OR	95%CI	OR	95%CI
Gender (r.c. female)	.46***	.35, .61	.64***	.52, .78	.76*	.58, .997
Marital Status (r.c. married/partner)			***			
Previously married	1.93*	1.04, 3.58	1.81***	1.42, 2.31	1.23	.93, 1.62
Never married	1.20	.90, 1.59	1.28	.97, 1.69	.78	.46, 1.30
Education (r.c. <high school)						
Completed high school	.81	.49, 1.33	.91	.65, 1.29	1.04	.74, 1.45
Some post-secondary	.62	.38, 1.00	1.02	.73, 1.42	1.12	.79, 1.57
University degree	.67	.40, 1.13	.91	.64, 1.29	1.05	.70, 1.57
Income[b] (r.c. <$30,000)			**		*	
$30,000-$49,999	.68	.44, 1.05	.63**	.45, .87	1.04	.72, 1.51
$50,000-$79,999	.81	.53, 1.23	.57***	.41, .78	1.21	.83, 1.78
$80,000+	.80	.52, 1.17	.61**	.44, .84	.56*	.34, .92
Don't know/refused	.58*	.36, .94	.49***	.34, .71	.89	.63, 1.27
Cannabis use (r.c. never)	*		***		**	
Lifetime use but not past 12 months	1.42*	1.02, 1.98	1.47***	1.20, 1.81	1.68***	1.23, 2.30
Used in past 12 months	1.70**	1.15, 2.50	1.63**	1.19, 2.24	.94	.41, 2.11
Number of drinks/day[c] (r.c. none)	*					
< 1	.95	.64, 1.40	.90	.71, 1.16	.95	.72, 1.27
1 – 1.999	.61	.31, 1.21	.67*	.44, 1.02	.54*	.31, .94
2 – 2.999	1.32	.57, 3.05	.73	.36, 1.48	1.00	.53, 1.90
3 – 4.999	.54	.21, 1.43	.76	.33, 1.74	.55	.21, 1.47
5 or more	1.73	.56, 5.35	.79	.30, 2.03	.33	.07, 1.48
AUDIT 8+ (r.c. <8)	1.05	.70, 1.56	1.46*	1.03, 2.06	2.25**	1.34, 3.77
Fair/Poor General Physical Health (r.c. excellent/good)	3.75***	2.61, 5.40	4.56***	3.63, 5.72	5.05***	3.89, 6.55
Weekly Religious Services Attendance (r.c. <weekly)	1.06	.68, 1.65	.81	.58, 1.13	.83	.58, 1.19

Notes: CAMH=Centre for Addiction and Mental Health; [a] Anxiety and mood disorder is defined as reporting at least 4 of the 12 symptoms on the GHQ12 scale; [b] Canadian dollars; [c] Derived from the product of usual number of drinks consumed by frequency of drinking in the past 12 months; OR=odds ratio; CI=confidence interval; r.c.=reference category; Statistical significance (Wald): * p<.05; ** p<.01; *** p<.001.