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Sex differences and eating disorder risk among psychiatric conditions, compulsive behaviors and substance use in a screened Canadian national sample ☆

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ABSTRACT

Objective: This study examined sex differences and eating disorder risk among psychiatric conditions, compulsive behaviors (i.e., gambling, suicide thoughts and attempts) and substance use in a nationally representative sample.
Method: Data from participants of the Canadian Community Health Survey Cycle 1.2 who completed the Eating Attitudes Test ($n=5116$) were analyzed. Sex differences were compared among psychiatric comorbidities according to eating disorder risk, binging, vomiting and dieting behavior. Poisson regression analysis provided prevalence ratios (PRs) of disordered eating adjusting for age, marital status, income, body mass index and recent distress.
Results: Pronounced sex differences were associated with eating disorder risk (PRs 4.89–11.04; all P values $<.0001$). Findings of particular interest included significantly higher PRs for eating disorder risk in males associated with gambling (PR 5.07, $P<.0001$) and for females associated with steroid and inhalant use as well as suicide thoughts and attempts (PRs 5.40–5.48, all P values $<.0001$).
Discussion: The findings from this detailed exploration of sex differences and eating disorder risk among psychiatric conditions, compulsive behaviors and substance use suggest that problem gambling, the use of inhalants and steroids and suicidal ideation in relationship to eating disorder risk warrant further investigation.

Disordered eating often occurs with mood and anxiety disorders, as well as substance use [1,2]; however, little is known about sex differences that may occur among various psychiatric conditions. Research suggests there are sex differences among psychiatric comorbidities [3–5] and symptoms such as excess laxative use [6], weight dissatisfaction, dieting, fasting, vomiting, binging, purging and exercising excessively for weight control [7–8]; however, results vary. This investigation capitalized upon the availability of a large, national sample from the Canadian Community Health Survey Cycle 1.2 (CCHS 1.2) to examine in detail sex differences in disordered eating among a range of psychiatric conditions, compulsive behaviors and substances used.

1. Methods

The CCHS 1.2 on Mental Health and Well-being [9] was a national survey that included 36,984 respondents (1 person was randomly selected from 48,047 sampled private dwellings), representing approximately 98% of the Canadian population aged 15 years or older in the 10 provinces. Interviews were conducted by well-trained lay interviewers using computer-assisted procedures while participants were usually at their residence (86% of cases) and, where required, done in English, French, Chinese and Punjabi. There was an 87% household-level response rate; among eligible individuals, the response rate was 89%. The overall response rate was 77%. After participants responded to questions related to psychiatric conditions, compulsive behaviors and use of substances, they were asked two eating attitudes and behaviors screener questions: (1) Was there ever a time in your life when you had a strong fear or a great deal of concern about being too fat or overweight? and (2) During the past 12 months, did you have a strong fear or a great deal of concern about being too fat or overweight? Those who answered "yes" ($n=5116$) to both screener questions formed the study sample, and the Eating Attitudes Test (EAT-26) was administered to them. Individuals excluded from the CCHS 1.2 included those living in health care institutions; on Aboriginal reserves; on government-owned land; in the Yukon, Northwest Territories, Nunavut, or in remote regions; or who were full-time members of the Canadian Armed Forces.

☆ The authors have no conflicts of interest to declare.

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1.1. Measures: eating disorder risk and symptoms, psychiatric comorbidities and covariates

Eating disorder risk was assessed using the EAT-26 [10], a 26-item measure of symptoms and concerns related to eating disorders, which contains Likert-type scale responses. A total score of 20 or greater suggests risk for having an eating disorder. Analysis using the EAT-26 consisted of comparison of respondents above and below the cutoff score and those with affirmative responses (i.e., answers of "often," "usually," or "always") to questions about binging, vomiting and dieting behavior.

The CCHS 1.2 interview was based on The World Mental Health Composite International Diagnostic Interview [11]; *Diagnostic and Statistical Manual of Mental Disorders* [12] algorithms were supported. Psychiatric measures selected were major depression, major depressive episode (MDE) or mania (past 12 months), panic disorder and posttraumatic stress disorder (PTSD). Measures of alcohol interference were based on average scores of 4 or greater on five items that measured alcohol use and the person's functioning. Substance use measures [13] were also based on responses to whether either in the past 12 months or during their lifetime marijuana/cannabis/hashish (excluding one time use), cocaine/crack, inhalants (glue/gasoline/other solvents), amphetamines (speed), 3,4-methylenedioxy-N-methylamphetamine (MDMA or ecstacy) hallucinogens/phencyclidine (PCP)/lysergic acid diethylamide (LSD), heroin or steroids were used. Gambling severity, dichotomized as non-/non-problem/low-risk gamblers versus moderate risk/problem gamblers, was based on frequency and type of gambling activities (e.g., casino games, lotteries, Internet gambling) in the past 12 months. Suicide factors included suicidal thoughts or attempts in the past 12 months. Some respondents were not asked the appropriate question to determine suicidal thoughts or attempts and, in these cases, Statistics Canada used an imputation strategy to assign values [19]. Sociodemographic and health-related covariates included age, education, marital status, income, body mass index (BMI) [14] and the Chronicity of Distress and Impairment Scale, which assessed chronicity and associated impairment with distress in the past month [15].

1.2. Analysis

Measurements of association included Fisher's Exact Test and binomial tests of two proportions. Poisson regression with robust variance provided prevalence ratios (PRs) of eating disorder risk, binging and dieting behavior by psychiatric comorbidities and sex adjusted for the covariates. Interactions of each psychiatric comorbidity with sex and age were also analyzed.

2. Results and discussion

Of the 5116 respondents screened to complete the EAT-26, 74% were female, 50% were married, 24% had less than high school, 53% were between the ages of 15 and 39 years and 15% were considered low income based on Canadian government standards. The findings of sex differences of eating disorder risk and symptoms among different psychiatric comorbidities (Table 1) are consistent with previous investigations [3,8,16–19]. Of interest were associations of sex differences and eating disorder risk with gambling (higher prevalence in males), steroid and inhalant use, as well as suicide thoughts and attempts (higher prevalence in females). The underlying mechanisms for these relationships may be related to impulsiveness and higher novelty seeking [20]. Sex differences in relationship to eating disorder risk (i.e., EAT-26 score >20), binging and dieting behavior were consistently significant in the Poisson regression analysis (Table 2) with pronounced effects (PRs ranged from 4.9 to 11.04; all P values <.0001) for eating disorder risk.

Table 1
Prevalence of disordered eating behaviors according to psychiatric-related comorbidities in a national subsample screened for eating disorder risk (n=5116)

Classification[a]	EAT-26 >20[b]				Binges[c]				Vomits[d]				Dieting behavior[e]			
	Totals		Sex		Totals		Sex		Totals		By sex		Totals		Sex	
	Yes	No	W	M	Yes	No	W	M	Yes	No	W	M	Yes	No	W	M
Depression	2.7***	0.8	4.0***	0.8	8.3***	3.5	9.3*	5.9	0.8*	0.3	10.3	0.2	24.7***	20.0	27.0***	18.2
Gambling[f]	3.5***	71.7	3.0**	5.1	11.7*	7.0	11.5	11.9	4.4	5.4	5.3	3.0	19.4	23.7	18.6	20.9
MDE	4.9***	1.3	6.6***	1.5	13.8***	5.0	14.4	11.8	1.1*	0.5	1.4	0.0	25.7*	22.6	28.2*	16.5
Mania	1.3***	1.7	15.3***	1.7	20.4***	6.6	22.3	16.3	3.1**	0.5	4.5	0.0	24.2	23.2	30.4*	10.2
Panic disorder	9.5***	1.6	12.2**	3.3	15.7***	6.4	16.1	14.0	1.3	0.7	1.6	0.0	22.0	23.3	21.2	25.6
PTSD	7.4***	1.7	10.2*	2.8	18.3	19.7	17.9	20.0	1.5	0.6	1.9	0.0	27.7	23.2	28.6	24.0
Suicide thoughts	7.6***	1.5	11.9***	2.2	15.6***	6.1	16.3	13.7	3.0***	0.4	3.9	0.8	25.5	23.1	28.6*	17.7
Suicide attempt	16.4***	0.9	24.1**	3.5	27.4***	6.6	28.6	22.2	6.3***	0.6	7.8	0.0	36.2*	23.1	42.1*	11.1
Substance use																
Alcohol[g]	5.6***	2.1	14.2***	2.1	15.0*	7.1	17.4	11.5	2.7*	0.6	4.7	0.0	29.3	24.6	30.2	27.9
Cannabis [h]	2.5**	1.7	5.7***	0.5	10.9***	6.4	13.0*	6.5	1.2*	0.6	1.6	0.4	25.1	23.0	30.0**	16.1
Cocaine/crack [h]	2.5*	1.7	5.5***	0.7	10.9**	6.6	12.3	8.5	1.4*	0.6	1.9	0.5	25.4	23.1	28.2	20.6
Ecstacy [h]	3.7***	1.7	7.4***	1.1	11.7*	6.8	13.0	8.3	1.9*	0.6	1.7	1.7	31.3*	23.0	34.4	23.3
Hallucinogens, PCP or LSD [h]	2.8***	1.7	6.5	5.6	9.4*	6.7	11.3*	5.3	2.0***	0.5	2.7	0.5	26.0	23.0	29.0*	19.5
Heroin[h]	3.0	1.8	7.2*	1.0	10.6	7.0	7.7	14.8	4.5**	0.6	5.1	3.7	18.2	23.4	20.5	14.8
Inhalants[h]	3.3*	1.7	6.9*	1.5	19.2***	6.8	15.0	25.6	3.0*	0.6	3.3	2.6	23.2	23.3	26.7	17.9
Speed [h]	3.2***	1.7	7.1***	0.8	15.6	7.3	20.0	8.3	9.4*	1.0	10.0	8.3	43.8*	22.8	60.0*	16.7
Steroid[h]	1.4	1.8	4.9*	0.6	7.9	7.0	12.5	4.5	2.6	0.7	6.3	0.0	21.1	23.3	12.5	27.3

* P<.05.
** P<.001.
*** P<.0001.
[a] All variables refer to last 12 months unless indicated otherwise.
[b] EAT-26 item questions; scores >20 indicate participant at eating disorder risk.
[c] EAT-26, Q05: You go on eating binges where you feel you may not be able to stop (always, usually, and often responses coded as 1).
[d] EAT-26, Q10: You vomit after you eat (always, usually, and often responses coded as 1).
[e] EAT-26, Q24: You engage in dieting behavior (always, usually, and often responses coded as 1).
[f] Non-, non-problem, or low-risk gambler vs moderate risk or problem gambler.
[g] Based on Alcohol Interference score.
[h] Lifetime use; inhalants includes glue, gasoline, or other solvent use.

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