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Associations Between Compulsive Buying and Substance Dependence/Abuse, Major Depressive Episode, and Generalized Anxiety Disorder Among Men and Women

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Abstract

Aims—The objective of this study was to examine the associations between compulsive buying (CB) and **substance dependence/abuse**, major depressive episode (MDE), and generalized anxiety disorder (GAD) at mean age 43.

Methods—Participants came from a community-based random sample of residents in two New York counties (N=548). The participants were followed from adolescence to early midlife. The mean age of participants at the most recent interview was 43.0 (SD=2.8). Fifty five percent of the participants were females. Over 90% of the participants were white. The prevalence of substance dependence/abuse, MDE, and GAD (during the past 5 years before the interviews) was 6.6%, 13.7, and 11.5%, respectively.

Results—Logistic regression analyses showed that CB was significantly associated with **substance dependence/abuse** [Adjusted Odds Ratio (A.O.R.) = 1.60], MDE (A.O.R. = 1.70), and GAD (A.O.R. = 1.63), despite controlling for **substance dependence/abuse**, MDE, and GAD, respectively, at mean age 37, and demographic factors.

Discussion—Since the study sample is limited to predominantly white participants (over 90%) with a close association to a small geographic area, the findings may not be generalizable to racial/ethnic minority groups or individuals living in other parts of the country. Nevertheless, it is important that clinicians treating substance dependence/abuse, MDE, and GAD consider the role of CB.

Keywords

compulsive buying; substance dependence/abuse; major depressive episode; generalized anxiety disorder; public health; longitudinal studies

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INTRODUCTION

As a chronic, excessive, and repetitive purchasing behavior,^{1,2} compulsive buying (CB) has been reported worldwide.^{3,4} Even though the appropriate classification of CB continues to be debated,^{5,6} some consider CB as a behavioral addiction,^{7,8} because, in many respects, CB shares some features with other behavioral addictions, including pathological gambling (PG)^{1,9–11} and compulsive hoarding.¹²

The adverse consequences of CB have been documented. According to Christenson et al.,¹³ compulsive buying induces large debts, difficulty in paying debts, financial legal consequences, and criminal legal problems. Research has shown that individuals who have CB experience personal and family financial problems,^{14–19} as well as psychological symptoms/psychiatric disorders (e.g., emotional distress, depression).² CB is also related to interpersonal conflict and marital conflict.²⁰

There are studies that have shown that substance use/disorder is associated with CB.^{21–23} For example, Roberts **and** Tanner²³ found that self-report measures of illegal drug use were significantly associated with CB among teenagers (12–19 years). Mitchell et al.²² found that compulsive buyers were significantly more likely to have a lifetime history of substance abuse or dependence. However, relatively little is known about the nature of the associations between CB and substance use/disorder. It is still unclear whether substance use/disorder is a trigger for CB or vice versa, or **whether** there is a reciprocal association between CB and substance use/disorder. CB and substance use may serve as **expressions** of another underlying factor or disorder.

Depression and anxiety are also important psychological symptoms commonly present among compulsive buyers.^{5,13,24–29} Indeed, Lejoyeux and Weinstein²⁰ in their review of the literature found that one of the most commonly associated comorbidities of CB is depression. One possible explanation of both depression-CB comorbidity and anxiety-CB comorbidity is the self-medication hypothesis,³⁰ which suggests that CB may act as a form of self-medication among individuals who are depressed. Individuals with depressive mood and anxiety may depend on CB to relieve themselves temporarily from their stressful emotional states.^{26,31,32} This hypothesis has generally been supported in the literature. For example, Sneath and his colleagues³³ found that event-induced depression, such as that related to natural disaster, can lead to CB.

A second **explanation** proposes that CB, as other behavioral addictions, may influence mood regulation by altering neurotransmitters, such as dopamine, in the regulatory systems, thus resulting in long-term changes in reward circuitry in the brain³⁴ and elevated risk for depression and anxiety. The remorse and family and financial conflicts experienced after **repeated** excessive purchasing may also contribute to the development of depression or anxiety over time.^{35,36}

The main objective of this study is to shed light on the associations between CB and subsequent substance dependence/abuse, major depressive episode (MDE), and generalized anxiety disorder (GAD) among a community sample of adult men and women at mean age 43. This study adds to existing literature by focusing on the associations between adult CB

and substance dependence/abuse, MDE, and GAD, while controlling for earlier measures of substance dependence/abuse, MDE, and GAD, respectively, and other important demographic factors. We hypothesize that: adult CB will be associated with substance dependence/abuse, MDE, and GAD, despite controlling for earlier substance dependence/abuse, MDE, and GAD, respectively.

METHODS

Participants and Procedure

Data on the participants in this study come from a community-based random sample residing in one of two upstate New York counties (Albany and Saratoga) first assessed in 1983. The participants' mothers were interviewed about the participants in 1975 to assess psychosocial development among youngsters, when the mean age of the participants was 5 years. The sampled families were generally representative of the population of families in the two upstate New York counties. There was a close match of the participants on **parental** income, maternal education, and family structure with the 1980 census. Follow-up interviews of the participants were conducted seven times from 1983 (N=756) through 2012–2013. In the present analyses, we used the data from two of the most recent interviews of this longitudinal study, when the mean ages (SDs) of participants were 36.6 (2.8) and 43.0 (2.8) in 2005–2006 (N=607) and 2012–2013 (N=548), respectively.

Extensively trained and supervised lay interviewers administered interviews in private **in 2005–2006**. The data collection **in 2012–2013** involved an Internet-based self-administered questionnaire. Written informed consent was obtained from participants in 2005–2006 and 2012–2013. The Institutional Review Board of the New York University School of Medicine authorized the use of human subjects in this research study. Earlier waves of the study were approved by the Institutional Review Boards of the Mount Sinai School of Medicine and New York Medical College. Additional information regarding the study methodology is available in prior publications.³⁷

Measures

Dependent Variables—Substance Dependence/Abuse, Major Depressive Episode (MDE), and Generalized Anxiety Disorder (GAD) were each assessed **in 2005–2006 and 2012–2013** using the respective measures of the University of Michigan Composite International Diagnostic Interview (UM-CIDI),³⁸ which has predictive validity and test-retest reliability.³⁹ These adaptations were made to make our measures consistent with the diagnoses presented in the Diagnostic and Statistical Manual of Mental Disorders, 4th ed. (DSM-IV).⁴⁰

Substance Dependence/Abuse—We ascertained substance dependence by the presence of three or more of the following criteria for each substance (marijuana or other illicit drugs: for example, cocaine/crack, heroin, ecstasy, and amphetamines) used during the past 5 years: (1) use of more of the substance than usual to get the same effect or the same amount has less of an effect than before; (2) the presence of withdrawal symptoms or the use of the substance to avoid withdrawal symptoms; (3) the use of much larger amounts of the

substance than intended or use for a longer period of time than intended; (4) the presence of such a strong desire or urge to use the substance that the person could not resist using it; (5) a period of a month or more in which the person spent a great deal of time using the substance or getting over its effects; (7) the person gave up activities because of use of the substance; or (8) emotional or psychological problems resulting from using the substance such as feeling uninterested in things, feeling depressed, suspicious of people, paranoid, or having strange ideas. If a participant did not meet the criteria for substance dependence, substance abuse was ascertained by the presence of at least one of the following four criteria **during the past 5 years**: (1) being under the effects of the substance or suffering its after-effects while at work or school or while taking care of children; (2) being under the effects of the substance or feeling its after-effects in a situation which increased the user's chances of getting hurt—that is, when driving a car or boat, using a knife or gun or machinery, crossing against traffic, climbing, or swimming; (3) having legal problems because of use of the substance; or (4) having problems getting along with other people because of use of the substance. We assigned a score of 1 to participants diagnosed with substance dependence or abuse. A score of 0 was then assigned to the remainder of the sample.

Major Depressive Episode (MDE)—MDE was **ascertained** if participants had a change in functioning reflected by 5 or more of the following criteria during a period lasting at least two weeks in a row in the past five years: (1) consistently depressed or down most of the day, nearly every day, or (2) markedly diminished interest or pleasure in all, or almost all, activities [either (1) or (2) must be present]; (3) significant weight loss or gain when not dieting; (4) hypersomnia or insomnia nearly every day; (5) psychomotor agitation or retardation; (6) feeling tired nearly every day; (7) feeling worthlessness or inappropriate guilt; (8) problems concentrating, and (9) recurrent thoughts about death.

Generalized Anxiety Disorder (GAD)—GAD was **ascertained** if participants had a period lasting six months or more in the past five years when (1) they worried excessively or were anxious about several things most days; (2) these worries were present most days; and (3) it was difficult to control the worries or the worries interfered with their ability to focus on what they were doing. In addition, there was a change in functioning reflected by 3 or more of the following criteria: (1) feeling restless; (2) feeling tense; (3) feeling tired or weak; (4) feeling irritable; and (5) having sleep problems.

Independent Variables

Compulsive Buying (CB)—In 2012–2013, the participants responded to 10 questions scored on a five-point scale: strongly disagree (1) to strongly agree (5); Cronbach's alpha = .91; modified from Valence, d'Astous, & Fortier, 1988⁴¹). **The** construct validity and internal reliability of the Valence CB scale was established in the literature.^{32,42} Among these 10 items, 5 items relate to the tendency to spend: (1) “I feel others would be horrified if they knew of my spending habits” (2) “When I have money, I cannot help but spend part or the whole of it” (3) “I am often impulsive in my buying behavior” (4) “As soon as I enter a shopping center, I have an irresistible urge to go into a shop to buy something” (5) “I have often bought a product that I did not need, while knowing I had very little money left.” There are 3 items that relate to the reactive aspect/compulsion/drive or urge to spend: (1)

“For me, shopping is a way of facing the stress of my daily life and of relaxing” (2) “I sometimes feel that something inside of me pushes me to go shopping” (3) “There are times when I have a strong urge to buy (clothing, electronics, etc.).” There are also two items that reflect post-purchase guilt: (1) “At times, I have felt somewhat guilty after buying a product, because it seemed unreasonable” (2) “There are some things I buy that I do not show to anybody for fear of being perceived as irrational in my buying behavior.” The mean of the 10 items was used in the analysis.

Demographic Variables

Demographic variables were: Gender (male = 1), age, marital status (currently married = 1), annual household income before taxes (in units of \$10,000), and low educational level (high school diploma or less = 1) measured **in 2012–2013**.

Analysis

The participants who did not participate in the study **in 2012–2013** ($N = 208$) were excluded from the analyses. There was a higher percentage of females (55% in the sample of 548 participants vs. 40.5% in the sample of 208 non-participants; $\chi^2(1) = 16.3$, p -value < 0.001) and greater family income **in 1983** ($t = 2.05$, p -value < 0.05) among the participants. There were no associations between those included in the analysis ($N = 548$) as compared with those who were excluded ($N = 208$) from it with respect to age ($t = 0.19$, p -value $= 0.85$).

The Statistical Analysis Software (SAS) program was used to perform logistic regression analyses. **The dependent variables were** substance dependence/abuse, MDE, and GAD **in 2012–2013**, respectively. The independent variable was CB **in 2012–2013**. In each logistic regression, in addition to the demographic variables (i.e., gender, age, marital status, educational level, and household income **in 2012–2013**), we included the earlier measure of the dependent variable **in 2005–2006** as a control variable. For example, in the regression of substance dependence/abuse **in 2012–2013**, we included substance dependence/abuse **in 2005–2006** as a control variable. We then tested the interactive effects between CB and the demographic factors (e.g., gender) on the dependent variables.

RESULTS

Table 1 presents the mean (*SD*) or percentage (%) of the dependent and independent variables used in the present study. As shown in Table 1, the proportions of participants who met the *DSM-IV* criteria for MDE, GAD, and substance dependence/abuse **in 2012–2013** were 13.7%, 11.5%, and 6.6%, respectively. Table 2 presents the results of the multivariate logistic regression analyses. As shown in Table 2, greater CB **in 2012–2013** was significantly associated with a higher likelihood of having substance dependence/abuse [Adjusted Odds Ratio (A.O.R.) = 1.60; 95% Confidence Interval (C.I.) = 1.05 – 2.42; $p < 0.05$], MDE (A.O.R. = 1.70; 95% C.I. = 1.28 – 2.26; $p < 0.001$), and GAD (A.O.R. = 1.63; 95% C.I. = 1.21 – 2.19; $p < 0.01$) **in 2012–2013**, after controlling for a measure of the dependent variable in 2005–2006 (i.e., substance dependence/abuse, MDE, and GAD, respectively) and demographic variables (i.e., gender, age, low educational level, household annual income before taxes, and marital status). In addition, earlier substance dependence/

abuse, MDE, and GAD in 2005–2006 were significantly associated **with substance dependence/abuse**, MDE, and GAD in 2012–2013, respectively ($p < 0.001$). Among the demographic variables, being married was significantly associated with a lower likelihood of MDE ($p < 0.01$). Greater household annual income before taxes was significantly associated with a lower likelihood of having GAD ($p < 0.05$). As compared to females, males were more likely to have substance dependence/abuse ($p < 0.01$). In addition, none of the interactive effects between CB and the demographic factors on the dependent variables were statistically significant ($p > .05$, data not shown).

DISCUSSION

To our knowledge, this is the first study to examine the association between adult CB and substance dependence/abuse, MDE, and GAD in participants in their early 40s while controlling for substance dependence/abuse, MDE, and GAD, respectively, in their late 30s. In support of our hypotheses, the findings indicate that greater CB is associated with a significantly increased likelihood of substance dependence/abuse, MDE, or GAD by mean age 43.

Compulsive Buying and Substance Use

Currently, there is a dearth of community studies focused on CB and substance use/disorders. Roeberts and Tanner²³ reported that uncontrolled buying in college students is correlated with a pattern of behavioral disinhibition that includes drug use. Data from clinical research confirm compulsive buyers report high rates of substance use (21% – 46%, by Black¹). In an earlier paper, Marks⁴³ indicated that CB may represent a behavioral non-chemical addiction. According to Marks,⁴³ CB and **substance dependence/abuse** have a number of common features such as craving, symptoms of withdrawal, and a compulsive drive or an urge to spend. The evidence from studies of neurobiology suggests that CB is similar in its neurocircuitry to substance dependence/abuse.⁴⁴ It is possible that both CB and substance dependence/abuse activate similar brain reward mechanisms. In accord with this view, this study contributes to the literature by providing evidence that the association between CB and substance dependence/abuse is maintained despite controlling **for earlier substance dependence/abuse**. Therefore, the development of an addictive syndrome may place people with the syndrome at increased risk for continuing addictive behaviors and for developing new addictive behaviors.⁴⁵ From a psychological perspective, CB may lead to family problems which then increase the likelihood of drug use. Despite these possibilities, at present, the etiology of the association between CB and substance dependence/abuse is not fully understood, although as with other complex behavioral disturbances, it may have contributions from developmental, neurobiological, and cultural factors.

Compulsive Buying (CB) and Major Depressive Episode (MDE) and Generalized Anxiety Disorder (GAD)

In the present analysis, we also found that CB was associated with a significantly increased likelihood of MDE or GAD by mean age 43. Our findings are consistent with the studies of several researchers who noted that depression and anxiety are present among compulsive buyers.^{1,5,13,20,28} Evidence has accumulated that CB among some individuals may result in

a decrease in their feelings of negative emotions. Relief from this stress becomes a primary motivation for CB.⁴¹ Our findings further suggest that, there may also be reciprocal associations between CB and MDE and between CB and GAD. One possible explanation is that, similar to substance use and other behavioral addictions, CB may increase an individual's vulnerability to stress by causing adverse changes in the brain.⁴⁴ CB may also contribute to disturbed neurotransmission,⁴⁶ which, in turn, is related to an elevated risk for depression and anxiety. This view is partially supported by encouraging results from **the use of** selective serotonin reuptake inhibitors (e.g., Citalopram) and other antidepressants to treat CB.⁴⁶ Another possibility is that CB may result in personal and family financial difficulties,^{15–19} which in turn, are associated with an increased likelihood of MDE and GAD.^{35,36}

Limitations

Some limitations should be noted. First, the present study relies on self-reported measures, which may be problematic in terms of their reliability and validity. However, many of the measures are reliable and have predictive validity.⁴⁷ Second, early CB was not assessed. Ideally, to strengthen the results, both earlier and concurrent CB should be included as independent variables. Third, this study is limited because the sample was comprised of predominantly white participants. Related to this, about 50% of the participants lived in the Albany/Saratoga areas **in 2012–2013**. Therefore, the findings may not be generalizable to racial/ethnic minority groups or individuals living in other parts of the country. Future research should examine the associations between CB and substance dependence/abuse, MDE, and GAD in more diverse populations. Fourth, it is not possible to infer causality based on the results of the present study. Specifically, the fact that CB was associated with substance dependence/abuse, MDE, and GAD does not necessarily mean that CB causes substance dependence/abuse, MDE, and GAD.

CONCLUSIONS

In sum, this study provides empirical evidence that CB is associated with substance dependence/abuse, MDE, and GAD, after controlling for earlier substance dependence/abuse, MDE, and GAD, respectively. To arrive at a more complete understanding of the role of CB and later substance dependence/abuse, MDE, and GAD for designing interventions, further studies are warranted across multifaceted measures and multiple time points, and with diverse populations. Future studies should focus on charting the course of CB and its association with other psychiatric disorders. It is important that clinicians treating substance dependence/abuse, MDE, or GAD in adults should take into consideration the role of CB. Intervention programs focused on CB may help to reduce comorbid substance dependence/abuse, depression and anxiety.

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Table 1

Descriptive Statistics Regarding Diagnoses and Demographic Factors (N=548)

Variables	Coding	Mean (SD) Median, or %
MDE (2012 – 2013)	No (0) – Yes (1)	13.7% (Yes)
MDE (2007)	No (0) – Yes (1)	11.9% (Yes)
GAD (2012 – 2013)	No (0) – Yes (1)	11.5% (Yes)
GAD (2007)	No (0) – Yes (1)	11% (Yes)
Substance Dependence/Abuse (2012 – 2013)	No (0) – Yes (1)	6.6% (Yes)
Substance Dependence/Abuse (2007)	No (0) – Yes (1)	6.9% (Yes)
CB (2012 – 2013)	Strongly disagree (1) - Strongly agree (5)	1.82 (0.84)
Gender	Female (0) – Male (1)	45% (Male)
Age (2012 – 2013)	Years	43.01 (2.78)
Low Educational Level (2012 – 2013)	Associate's Degree or greater (0) – High school diploma or less (1)	39.4% (High School or less)
Household Income before Taxes (2012 – 2013)	US Dollar (\$)	\$85,000 ^a
Marital Status (2012 – 2013)	Not currently married (0) – Currently married (1)	69.5% (Married)

Note: MDE=major depressive episode; GAD=generalized anxiety disorder; CB=compulsive buying;^a median household income.

Table 2

Logistic Regressions: Compulsive Buying (CB) as Related to Substance Dependence/Abuse, Major Depressive Episode (MDE), and Generalized Anxiety Disorder (GAD), Among Men and Women at Mean age 43 (N=548).

Independent Variables	Substance Dependence/ Abuse (2012 – 2013) A.O.R. (95% C.I.)	MDE (2012 – 2013) A.O.R. (95% C.I.)	GAD (2012 – 2013) A.O.R. (95% C.I.)
CB (2012 – 2013)	1.60 (1.05 – 2.42) *	1.70 (1.28 – 2.26) ***	1.63 (1.21 – 2.19) **
Substance Dependence/Abuse (2007)	12.81 (5.25 – 31.27) ***	-	-
MDE (2007)	-	4.42 (2.35 – 8.31) ***	-
GAD (2007)	-	-	3.50 (1.76 – 6.95) ***
Gender	3.62 (1.49 – 8.78) **	0.91 (0.52 – 1.58)	1.10 (0.62 – 1.96)
Age (2012 – 2013)	0.89 (0.77 – 1.04)	1.10 (0.99 – 1.21)	1.03 (0.93 – 1.14)
Low Educational Level (High school or less=1) (2012 – 2013)	2.24 (0.92 – 5.43)	0.67 (0.37 – 1.20)	0.56 (0.30 – 1.04)
Household Income (in \$10,000) (2012 – 2013)	0.96 (0.88 – 1.04)	0.97 (0.93 – 1.02)	0.93 (0.88 – 0.99) *
Marital Status (Married =1) (2012 – 2013)	0.46 (0.2 – 1.05)	0.42 (0.24 – 0.74) **	0.63 (0.34 – 1.14)

Note: A.O.R.= Adjusted Odds Ratio; C.I.=Confidence Interval;

*
p<0.05;

**
p<0.01;

p<0.001.