Disordered Eating and Unhealthy Substance Use among College Students

A Summary of the Recent Literature

July 2011

University of Victoria | Centre for Addictions Research of BC

This summary review was prepared for the BC Partners for Mental Health and Addictions Information to inform future planning and product development related to ongoing work supporting efforts to promote positive mental health on BC post-secondary campuses.

Authors:

Tim Dyck is a Research Associate at the Centre for Addictions Research of BC, University of Victoria.

Dan Reist is the Assistant Director (Knowledge Exchange) at the Centre for Addictions Research of BC, University of Victoria.

Summary

This report sketches the contours of disordered eating and problematic patterns of substance use (particularly alcohol) in the college context. In terms of definitions and scope, both disordered eating and problematic substance use involve a complex array of sub-clinical problems and defined disorders. While specific eating disorders have been largely confined to women, an appreciable number of young men experience sub-clinical disordered eating. And whereas, historically, substance use disorders have been more commonly associated with men, alcohol consumption and heavy drinking is increasing among young women. Problematic substance use seems particularly associated with some forms of eating disorders, and the co-occurrence of the two is associated with increased risk and harm. Discussion on etiology – whether the behaviours in question, when conjoined, share common background features or whether the substance use problems stem from prior difficulties around eating – remains unresolved. It seems best to acknowledge a range of possibilities.

Most importantly, some direction is emerging in terms of promising practice for a campus response. The need for strategies and tools to address both issues simultaneously is well recognized, but such combined approaches and instruments largely await development and evaluation. Nonetheless, an encompassing health promotion perspective could provide a helpful framework for situating and selecting various efforts to prevent, treat and reduce the harm from disordered eating and problematic patterns of substance use among college students.

Definitions and scope

Disordered eating and heavy episodic alcohol use both constitute significant health issues on college campuses. Because of their high prevalence and subsequent link to alcohol use disorders, obesity and eating disorders, these behaviours have started to attract the attention of university administrators, researchers and clinicians (e.g., NIAAA, 2002, 2007; Kelly-Weeder, 2008, 2011). Disordered eating and its connection to alcohol use patterns has been studied almost exclusively among young women. There is a small but growing literature on these patterns among male students that will inform the discussion, but the references throughout will often reflect the focus of published research on women. It is important to note, however, that the emerging literature suggests that, contrary to popular belief, weight- and eating-related problems are not uncommon in men (Grilo et al., 2002).

Most people who have some form of eating-related difficulty (e.g., dysfunctional attitudes about body weight and shape, restrained eating, bingeing and purging) or who use alcohol in risky ways fall short of clinical disorder diagnoses. Nonetheless, they often face struggles that undermine well-being. Recognizing this is important and allows for a more inclusive approach in health promotion and harm prevention that is also protective against the development of more extreme conditions (Birch et al., 2007; Stewart & Brown, 2007a; Kelly-Weeder, 2011; Chamay-Weber et al., 2005).

Major eating disorders officially recognized by the psychiatric profession in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV) are *anorexia nervosa* and *bulimia nervosa*. A third category, *eating disorder not otherwise specified*, is more loosely defined and applied.

Anorexia nervosa is characterized by

- refusal to maintain a normal enough body weight (minimum threshold 15% below a normal level for age and height),
- intense, obsessive fear of becoming fat even though underweight,
- distorted body image in regard to how much it shapes self-evaluation or in denial of a serious weight deficit, and
- amenorrhea (in postmenarchal females): absence of at least three consecutive menstrual cycles.

Two subtypes are used to distinguish those who engage in very strict dieting or exercise as opposed to those who use purging (self-induced vomiting or use of laxatives, enemas or diuretics) to achieve and maintain their weight deficit. While experienced by only 1% of adolescent and young adult females, *anorexia nervosa* can result in dire medical complications and even death (Grilo et al., 2002).

Bulimia nervosa is only diagnosed when the criteria for *anorexia nervosa* are not met but the following criteria are:

- recurrent episodes of binge eating, i.e., eating unusually large amounts within a short period of time,
- a sense of inability to control such behaviour,
- recurrent engagement in extreme weight control measures to compensate for the excess intake,
- frequency of both the inordinate eating and the counter tactics being on average at least twice a week for three months, and
- morbid preoccupation with weight and shape, exaggerating its importance for self-assessment.

Bulimia nervosa, like *anorexia nervosa*, is divided into subtypes based on whether purging or rigorous dieting, fasting or exercise is used as offsetting behaviour. B*ulimia nervosa* has a higher prevalence of about 2-3% among young females (Chamay-Weber et al., 2005; Grilo et al., 2002).

Eating disorder not otherwise specified encompasses disorders that don't meet full criteria for *anorexia nervosa* or *bulimia nervosa* or are marked by inappropriate behaviours such as regular compensatory actions after eating small amounts, or repeatedly chewing and spitting out rather than swallowing larger amounts. Among such partial or subclinical eating disorders, binge eating (occurring an average of two days per week over a six-month period and causing some distress) has attracted the most attention (Ferriter & Ray, 2011). Whereas *anorexia nervosa* and *bulimia nervosa* are predominantly diagnosed in females, there is evidence to suggest that male college students are as likely as female college students to engage in binge eating (Kelly-Weeder, 2011). Most adolescent cases of partial eating disorders move on to spontaneous remission, while a subset deteriorate into a full disorder, with multiple determinants of susceptibility presumably coming into play (Grilo et al., 2002; Chamay-Weber et al., 2005; cf. Kelly-Weeder, 2011).

Unlike eating disorders, substance use disorders are more common among males than females. Yet, patterns of substance use that pose a threat to health (in particular, heavy episodic drinking

resulting in intoxication) have become a growing concern in regard to young women (Kelly-Weeder, 2008; Grucza et al., 2009). Formal diagnostic designations of alcohol or other substance use disorders fall into two brackets: *dependence* and *abuse* (DSM-IV).

Alcohol dependence (or *substance dependence*) requires three or more of the following symptoms measured within the past year:

- tolerance
- withdrawal
- duration of use extending beyond intent
- unfulfilled desire or attempts to cut down on or control use
- considerable time being spent in acquiring the substance, using it or recovering from its effects
- important activities (e.g., social, vocational or recreational) being given up because of use, or use continuing in spite of recognition that it is causing or exacerbating ongoing problems

Alcohol abuse (or *substance abuse*) is affirmed in situations where a person's recurrent use within a 12-month period, without the individual having ever met the criteria for dependence,

- brings about failure to meet major responsibilities (e.g., professional, academic, domestic), or
- takes place in physically hazardous situations, or
- causes repeated legal problems, or
- continues even in the face of ongoing problems (e.g., interpersonal, social) it occasions and/or worsens.

US research indicates that, in regard to drinking, college students aged 18-29 are almost twice as likely as adults 30 years old and up to meet criteria for current *alcohol abuse* and more than four times as likely to meet criteria for current *alcohol dependence* (Beseler et al., 2010; Dawson et al., 2004; Grant et al., 2004). US studies indicate that around 18-20% of college students have an alcohol use disorder. The distribution between *abuse* and *dependence* varies considerably across studies, but males are consistently about twice as high as females on both counts (Dawson et al., 2004; Slutske, 2005; Wu et al., 2007). By comparison, 8% of full-time college students in the US have a substance use disorder involving other drugs (Wu et al., 2007; cf. Caldeira et al., 2008).

In Canada, the *Canadian Campus Survey 2004* (Adlaf et al., 2005) did not assess for DSM-IV criteria but used the AUDIT (Alcohol Use Disorders Identification Test) to determine hazardous or harmful drinking. It indicated hazardous or harmful drinking by 32% of undergraduate students (38% males, 28% females). BC proportions were slightly lower than national averages at 27%. Nearly one-quarter (24%) of BC undergraduates admit drinking risky amounts (five or more drinks at least twice in the last month) during the school term. Almost 10% consume at even riskier levels, having eight or more drinks at least twice in the same period. The gender disparity remains sizable in these patterns, with Canadian collegiate men 2.1 times more likely to report the 5+ twice a month or more and 4.5 times more likely to drink 8+ that often. However, it should be noted that a physiologically sensitive gender-specific demarcation of lower heavy drinking thresholds for women (4+ drinks for elevated risk, 5+ for the still riskier bracket) would presumably have narrowed this gap. US rates of heavy episodic drinking among college students may continue to

exceed those of Canadian counterparts (Grucza et al., 2009; Johnston et al., 2010; cf. Kuo et al., 2002). Proportions north of the border for both genders are still, however, cause for concern. One significant point of congruence is that, in both geographical contexts, students living at home with parents report lower rates of problematic use than do those away from home, whether residing on campus or off (Dawson et al., 2004; Adlaf et al., 2005).

Reported use of other drugs was much lower than alcohol in the *Canadian Campus Survey 2004*, with less than 4% declaring use of cannabis, by far the most popular illicit drug, on a daily basis. These surveys did not attempt to measure risky or damaging use of cannabis (or any other illegal substance).

In defining both eating and substance use difficulties, the need for broader, less strictly defined categories suggests both issues involve a continuum as opposed to a set of very specific disorders. Disordered eating ranges from excessive concern about weight and shape to binge eating and extreme weight-control methods. These behaviours are linked to the development of clinically defined eating disorders, such as *anorexia nervosa* and *bulimia nervosa*. While eating disorders affect only a small percentage of individuals, disordered eating behaviours are far more common. Likewise, heavy episodic drinking is far more common than substance use disorders, and the majority of young people who engage in such heavy drinking will mature into more moderate patterns, but some will progress further into disorders of chronic *abuse* and *dependence* as defined by DSM-IV.

Impact of co-occurring disordered eating and problematic substance use

Troubles with either disordered eating or problematic substance use spell complex challenges (on physical, emotional and social fronts) with elevated liability for harm (Franko et al., 2005a; Ferriter & Ray, 2011; Perkins, 2002; Hingson et al., 2009). When simultaneously faced, that susceptibility is all the more heightened, with any other attending adverse condition exacerbated as well.

Of particular concern is the increase in alcohol consumption and frequency of heavy drinking episodes in women who also report binge eating behaviours. Research has indicated that women are more likely to experience alcohol-related negative consequences that are personal in nature, as opposed to men, who are more likely to experience consequences that involve harm to others (Perkins, 2002). Besides the physiological disadvantage of becoming more quickly impaired than their male counterparts from equivalent amounts of alcohol and their greater susceptibility to sexual assault on occasions of excessive intake, women tend to incur more personal, internal fallout from exorbitant alcohol than do men. These negative consequences are more likely to occur in women who engage in both heavy drinking and binge eating (Kelly-Weeder, 2011).

A recent review (Harrop & Marlatt, 2010) examined the prevalence of co-occurring eating disorders and substance use disorders in both clinical and community samples. In a clinical study of females being treated for drug use disorders, 14% reported having *anorexia nervosa* and 14% reported having *bulimia nervosa*. These figures are much higher than those reported in the general population (Gilchrist et al., 2007). Similarly, *bulimia nervosa* patients report higher rates of alcohol and other drug use (Wiederman & Pryor, 1996). Among patients with eating disorders, lifetime prevalence rates of *alcohol abuse* and *alcohol dependence* range from 17% in the restricting form of

anorexia nervosa, a rate similar to the general population, to 46% in *bulimia nervosa* (Woodside & Staab, 2006; Bulik et al., 2004; Hasin et al., 2007).

These clinical findings of comorbidity are supported by studies of community samples as well. One Canadian study analyzed a national survey female sample for co-occurrence of eating disorders and alcohol-related interference difficulties (with domestic responsibility, educational involvement, employment ability, close relationships and social connections). Co-occurrence comes out 4.4 times more likely than could be expected by chance alone if they were independent conditions. Within age brackets, the conjunction is three times more likely than its random probability for women aged 15-24, four times the probability of chance co-occurrence among women aged 25-44, and eight times that fortuitous probability for women 45 and up. Besides that connection with negative disruption of life because of alcohol, an association of the risk for an eating disorder with *alcohol dependence* likewise held up across all three age groups. So too with lifetime use of illicit drugs, including cannabis, while use within the last year was significantly associated with risk of an eating disorder among the middle and younger age brackets. Both interference from and dependence on illicit drugs occurred at significantly higher rates statistically within the 15-24 year old bracket among those at risk for an eating disorder (Piran & Gadalla, 2006; Gadalla & Piran, 2007b; Harrop & Marlatt, 2010).

A study checking on presence of disordered eating behaviours and use of various substances within a female sample from a Canadian university filling out a health survey found associations between severe levels of alcohol intake and binge eating, between dieting with purging and use of central nervous system stimulants, and between the binge eating and dieting combination and use of tobacco. Among those binge eating and dieting who didn't purge, there was an association with misuse of prescription drugs (antidepressants and sleeping pills). Various plausible explanations can be offered for these associations, such as how certain substances can bring about loss of appetite and facilitate weight control or serve as aids to cope with negative emotional states, but correlations do not on their own show causality (Piran & Robinson, 2006b).

One US study looked at co-occurrence of "binge drinking" (heavier drinking episodes, i.e., four or more drinks on a single occasion at least once in the past two weeks) and "binge eating" (a past week incident of either (a) eating so much in a short period that it would have proved embarrassing if seen by others, or (b) being afraid to start eating out of concern that one might not be able to stop or control it). The research was conducted within a national sample of college women (who reported ever having a drink more than two or three times (Kelly-Weeder & Edwards, 2011). Compared to those who reported neither behaviour, those acknowledging co-occurrence were more likely to have experienced drinking-related problems: five times more liable to a problem at work or school, three times the odds of having a problem with friends, twice as likely to have a problem with someone they were dating, and three times more likely to have had a regrettable sexual experience.

Such results accord with other studies in finding elevated rates of adverse drinking-associated consequences being incurred by collegiate women who manifest eating difficulties alongside alcohol use (e.g., Krahn et al., 2005; Anderson et al., 2005; Adams & Araas, 2006; cf. Heidelberg & Correia, 2009; Khaylis et al., 2009). This can be the case even when those reported difficulties are simply restricting caloric intake on days they are planning to drink (Giles et al., 2009) or just

unhealthy attitudes like desiring weight loss though maintaining a normal level (Dams-O'Connor et al., 2006). Compared to their schoolmates who are not showing symptoms, those who are involved in disordered eating patterns suffer more harm related to use of other substances as well as in regard to alcohol (Dunn et al., 2002, 2009).

Theories of etiology

Beyond the conspicuous co-occurrence of eating and substance use difficulties, various shared features in pronounced symptoms suggest emergence and development of each results from a common underlying factor or an even closer connection involving a causal link between the two phenomena. Commonly cited similarities at more intense (disorder) levels include disruptive impact on appetite and satisfaction as well as behaviours that are unacknowledged, excessive, compulsive, obsessive and self-injurious, with often severe medical damage being suffered (Ferriter & Ray, 2011). Feelings of being powerless, anger, self-loathing and guilt can come into play in both contexts. Symptoms alleged to apply jointly to food deprivation and withdrawal from substance dependence include being nervous, restless, irritable, shaking, finding it difficult to focus attention, suffering headache, having an affected appetite, being drowsy, sad, experiencing edema, bloating, cramping, constipation, diarrhea, nausea and dehydration (Harrop & Marlatt, 2010; Pearlstein, 2002; Wolfe & Maisto, 2000; cf. Stewart & Brown, 2007a). Discussions that claim "symptom substitution," in which people move from one to the other sort of difficulty, fail to identify a common basis and to account adequately for concurrence or for situations in which cessation on the one front does not ensue an uptake on the other (Stewart & Brown, 2007a). Proposals that carry more content have been advanced along two lines, one in which problems in eating and with substance use both derive from the same kind of background feature, the other in which difficulties in the eating domain lead to troubles with substance use.

Shared etiology proposals

Various accounts have in common the contention that a conjoined experience of unhealthy patterns around eating and substance use will arise from a particular source or combination of elements that tends to generate these respective behaviours and to facilitate their appearance together. These accounts differ over which factor or set of factors is credited with bringing on such difficulties. Consideration of them raises questions as to whether any can suffice over its counterparts as a prevailing explanation for a complex terrain of difficulties, and whether they can stand as quite separate contributors or have overlapping dimensions which undermine supposedly discrete labels.

Jointly affected neurological systems

Vulnerability to substance use problems, eating disorders and a combination of the two has been attributed to biological factors, with disturbance in the dopamine and endogenous opiate systems cited as significant contributors. Elevations in the endogenous opiate levels frequent among eating disorder sufferers is viewed as corresponding in a telling way to the appeal of exogenous substances for those with drug addictions. Granting that established use of substances and ongoing disruption in eating patterns involve adverse physical impacts (often of a similar nature) and that alteration of physiological functioning could in part be brought on by and fuel accommodation of increased demand from certain systems within the body chemistry, much more clarification and

demonstration of such processes is required to substantiate a role in helping to precipitate or exacerbate such disorders (Wolfe & Maisto, 2000; Grilo et al., 2002; Sinha & O'Malley, 2000; Harrop & Marlatt, 2010; Ferriter & Ray, 2011).

Common predisposing personality characteristics

Some have contended that certain personality traits lend themselves to individuals falling prey to compulsions to eat and to indulge in substances (Ferriter & Ray, 2011). This claim, however, is questioned by others because the underlying premises (that eating disorders can be characterized as addictive behavioural patterns and that personality traits can be identified in individuals with eating disorders and substance use problems that make them vulnerable to these two addictions) have not been demonstrated.

Attention has been drawn to common markers such as increasing loss of behavioural control, preoccupation with the stuff being consumed, reliance on intake to cope with negative affect, and temporary emotional gratification followed by chronic harm. But these features do not characterize all eating disorders or all substance use problems. Even the notion of an addictive substance is dubious in regard to food and at least some drugs. Binge eating doesn't tidily fit the dependence profile, and the bulimic bent to avoid food and control intake runs in conspicuous contrast to an attraction and lack of restraint associated with chronic drinking (Wolfe & Maisto, 2000).

Certain types or styles of personality (such as sensation-seeking, rebelliousness, low self esteem and depressed mood) have been identified with problematic patterns of substance use, but the notion of an addictive personality as a direct cause of substance use problems has been generally rejected (Chiauzzi & Liljegren, 1993). Just as there is an absence of uniformity in relationships between personality types and substance use problems, there is enough variety of (and even a striking contrast in) personality traits among those with disordered eating to undermine a conclusion of causal relationship. The strongest evidence supporting the role of personality in the relationship between eating disorders and substance use comes from studies that found that individuals with comorbid eating and substance use disorders are more likely to be diagnosed with borderline personality disorder and to report a history of self destructive behaviour such as attempted suicide, promiscuity and reckless driving (Grilo et al., 2002; Sansone et al., 1994) compared to eating disordered individuals without a co-occurring substance use disorder. However, this may simply reflect the fact that the diagnostic criteria for borderline personality disorder include items that overlap with bulimic and substance use symptomatology.

Research indicating behavioural dysregulation is more predictive of substance use disorders, while avoidance and insecurity, along with obsessional sensitive traits, figure more in those developing eating disorders, makes shared personality features less than satisfactory as an underlying explanation of acquisition. This is all the more reinforced when other factors like substance use history show themselves more successful in predicting later occurrence of difficulties (Wolfe & Maisto, 2000; Thompson-Brenner et al., 2008; Harrop & Marlatt, 2010; cf. Stewart & Brown, 2007a).

Comparable impact of a conducive family history

Another candidate to explain both eating and substance use problems is family history, whether genetic or experiential. Family history is widely acknowledged as a factor in regard to substance use disorders (and alcohol use disorders in particular), but the evidence in regard to eating

disorders is unclear (Wolfe & Maisto, 2000). The proposition that eating disorders and substance use disorders have a common genetic component has been challenged by results from a large scale female twin study (Kendler et al., 1995). Moreover, cross-transmission, whereby eating disorder symptoms in one generation are associated with substance use disorders in the next, and substance use difficulties for parents with eating difficulties in children, simply lacks evidence to confirm it as a vehicle (Wolfe & Maisto, 2000; Harrop & Marlatt, 2010; cf. Grilo et al., 2002; Sinha & O'Malley, 2000).

Certainly, family contexts characterized by chronic and traumatic parental alcohol-associated problems are liable to deleterious impact on personal development for children, but the current evidence does not demonstrate underlying familial mechanisms to link problematic substance use with the development of disordered eating. There remains a sizable prevalence of co-occurrence for individuals not subjected to such family history factors (Wolfe & Maisto, 2000; Harrop & Marlatt, 2010; cf. Stewart & Brown, 2007).

Common developmental issues

Given that the adolescent years are marked by high incidence of disordered eating and increased substance use, it has been suggested that vulnerability to cultural pressures around body image and experimentation with drugs may explain the emergence of concurrent difficulties in these areas (Krahn et al., 1992; Stice, 1994). While there is some evidence that female teens with low self esteem may be particularly vulnerable (Fisher et al., 1991), a developmental perspective fails to explain why most female adolescents who engage in dieting behaviour and recreational drug use do not develop disorders or serious problems (Wolfe & Maisto, 2000).

One study of trajectories among adolescent girls in regard to depression, disordered eating, substance use and antisocial behaviour symptoms examined the interrelationships among these domains. Initial signs in eating disorder predicted increases in substance use problems, but this was not the case the other way around. Furthermore, the trajectory study demonstrated that a single underlying developmental or psychological process was unlikely to explain the relationships between the domains. Rather, two second order factors would be needed: one explaining depression and unhealthy eating symptoms and another for substance use and antisocial problems (Measelle et al., 2006; Harrop & Marlatt, 2010).

Causal etiology proposals

An alternative line of explanation, rather than seeking a common underlying factor as predisposing individuals to both disordered eating and problematic substance use, is to suggest that difficulties around disordered eating function causally to bring on unhealthy substance use. Two basic mechanisms have been proposed.

Substances serving to reduce mood or tension symptoms from disrupted eating

A prime suspect here is the use of alcohol or other drugs to self-medicate the symptoms of depression or negative mood that can arise in conjunction with disordered eating. Evidence has not yet accumulated to confirm such a depression-alleviating role as a predominant driver for the use of substances within this population. A very similar account pegs substance use as serving to allay feelings of anxiety that trigger or accompany an eating disorder. This suggestion likewise lacks the

attestation that would widely establish such utilization as a primary motivation and proven means (Wolfe & Maisto, 2000).

Substances serving to compensate for self-starving

Food deprivation has been cited as a precipitator of substance use. Removal of food as a primary reinforcer would raise the value of alternative reinforcers such as alcohol or other drugs. Repeated experience of such hunger-stimulus satisfaction would consolidate their appeal. Here again, however, there is a lack of supporting evidence to corroborate this explanation, and ethical constraints limit experimental exploration of such a factor (Wolfe & Maisto, 2000; Harrop & Marlatt, 2010; cf. Grilo et al., 2002; Sinha & O'Malley, 2000).

Conclusion on etiology

The co-occurrence of difficulties with eating and substance use cannot yet be satisfactorily accounted for in terms of any particular type of contributing factor proving typically predominant (Harrop & Marlatt, 2010; Wolfe & Maisto, 2000; Grilo et al., 2002; Stewart & Brown, 2007a; Ferriter & Ray, 2001). A broader biopsychosocial framework, with attentiveness to a plurality of dynamics that can variously bear on persons and prompt the behaviours, is preferable for situating the phenomena. The frequent impact of trauma, especially in the form of sexual abuse, is not to be ignored. Even though it evidently doesn't apply in all cases, rates of physical and sexual abuse are significantly elevated in eating disordered populations, and where substance use disorders factor in as well, the abuse rates are doubled again (Harrop & Marlatt, 2010; Stewart & Brown, 2007a,b).

The diversity of substance use problems, as well as patterns of disordered eating, suggests the examination of more specific connections between certain drug use patterns and particular practices (bingeing, purging) will shed more light on pertinent factors than merely observing associations between undifferentiated use and established major types of eating disorders like *anorexia nervosa* or *bulimia nervosa* (Harrop & Marlatt, 2010; Dunn et al., 2009; Piran & Robinson, 2006a,b; Wolfe & Maisto, 2000; Corte & Stein, 2000; Wiederman & Pryor, 1996). One example of a more focused examination has detected both correlation and divergence between binge eating and heavy drinking. Both act as negative reinforcement, bringing relief to states of unpleasant emotional and physical discomfort. Such use in relief marks the most common occurrence of both behaviours and presents the highest risk situations, though this is somewhat less the case for college students than other demographic brackets. In contrast, heavy episodic drinking appears more likely than binge eating to take place in positive reinforcement contexts marked by pleasant emotions or interpersonal contact (whether this interaction involves good times, social pressure or even some measure of conflict) where the function is to provide reward. Excessive intake of alcohol in public enjoys more social tolerance than does uncontrolled eating, a reality that may account for the difference observed and which can afford further confirmation in broader testing. Results at least indicate areas of potential overlap in intervention (e.g., helping to improve coping skills to deal with negative affect) while also suggesting points at which treatment for drinking issues may require more particular emphases (Birch et al., 2007; cf. Stewart et al., 2006).

An examination concentrated on a college sample and checking for differences in levels of neuroticism (enduring tendency to experience negative emotional states, including anxiety) and conscientiousness (deliberation and regulation of internal urges) found the former higher among

those both binge eating and engaging in heavy episodic drinking or just binge eating than those simply drinking excessively or those not taking in too much food or alcohol. Under-controlled style in dealing with impulse was also more characteristic of the group with indulgence difficulties in both behaviours. These results are suggestive of issues that could rate attention in screening and equipping efforts (Rush et al., 2009; cf. Benjamin & Wulfert, 2005; Ferriter & Ray, 2011). However, response must seek to do justice to the full range of interdependent influences that bear on these behaviours.

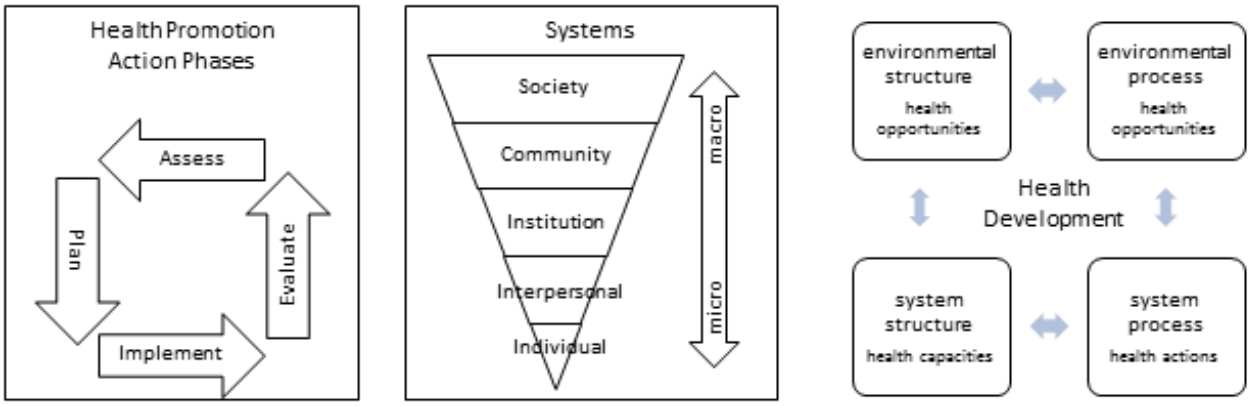
A health promotion perspective

Discussions of concurrent difficulties with eating and substance use tend toward suggesting what could be done to treat individuals afflicted by problematic behaviour on both counts. Some reference is also made to prior preventive efforts to reduce onset of troubles. Both of these worthy aspects of response to the challenge need to be situated within a broader health promotion framework if their relative value is to be appreciated. This perspective regards health as a state of comprehensive physical, mental and social well-being – rather than merely the absence of infirmity or disease – and needs to be appreciated as applying both at an individual level and at collective or population levels (WHO, 2010; Herman et al., 2005). Mental health accordingly goes well beyond the absence of an illness or disorder to encompass, as WHO (2010) puts it, "a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community." Another more complete statement describes it as "the capacity of each and all of us to feel, think, and act in ways that enhance our ability to enjoy life and deal with the challenges we face. It is a positive sense of emotional and spiritual well-being that respects the importance of culture, equity, social justice, interconnections and personal dignity" (Joubert & Raeburn, 1998). Mental health for individuals is not separate or isolated from the other dimensions of their overall personal well-being nor insulated and shielded from political, economic, material and social conditions around them. Multiple factors across those dimensions (as well as features present in the more intrapersonal biological and psychological domains) will have a bearing on mental health. A mentally healthy constituency would be one in which such influences are predominantly positive for all subgroups that compose the populace.

Health promotion has been defined as "the process of enabling/empowering individuals and communities to gain control over the determinants of health and thereby improve their health" (Rootman et al., 2001; cf. Reist, 2010). Central to health promotion are concepts of participation, empowerment and equity. The endeavour could be summed up in terms of building connectedness and health literacy. A strong degree of connectedness will result in shared responsibility and engagement of citizens in mutual efforts to enhance public well-being. Pursuit of health literacy will involve more than helping others to read and write or better access medical information and so facilitate a therapeutic process, whether assisted by a professional practitioner or conducted more as self-help (Reist, 2011). It will strive to increase "ability to access, understand, evaluate and communicate information as a way to promote, maintain and improve health in a variety of settings across the life course" (Rootman & Gordon-El-Bihbety, 2008). This suggests that health literacy is a resource or asset – "a means to enabling individuals to exert greater control over their health and the range of personal, social and environmental determinants of health" (Nutbeam, 2008). Within

such literacy will be recognition of how interconnections among the diverse array of contributing factors have an impact on well-being for individuals and communities (Freedman et al., 2009).

The social-ecological model of public health and health promotion reflects the multidirectional complexity of dynamic interplay among factors operating within and across different levels from macro (societal) through micro (individual), so that environments affect people personally and corporately, while singular and collective action can conversely impact the environment. The model likewise respects the reality that intervention can be made at a variety of points to strengthen resilience and remove or reduce negative features, and that complementary activity on several fronts can produce greater combined benefit than initiatives concentrated only on one level. It thus calls for interdisciplinary collaborative efforts to adequately address the diversity of issues that bear on the health of a community. The model provides a framework for determining and directing strategies that can together comprise a consistent, coherent response, with cumulative force to effect positive change in the settings of concern (Bauer et al., 2003; Stokols, 1996).



Socio-Ecological Model of Health Promotion (adapted from Bauer et al., 2003)

In our case, effective mental health promotion would involve applying the cycle of health promotion action phases (assessment, planning, implementation and evaluation) to the co-occurrence of eating and substance use difficulties among post-secondary students within two or more of the nested ecological systems (e.g., individual, campus and community) in order to impact health development. In the assessment phase, health problems and health determinants with a particularly high impact on health are identified. These high impact determinants provide promising leverage points for public health interventions. During the planning phase, public health strategies appropriate for influencing these factors are selected and implemented during the next phase. Finally, evaluation examines changes within the health development cycle between baseline and follow-up measurement (Bauer et al., 2003).

In the collegiate setting, it is in regard to concerns around substance use, and alcohol-related harm in particular, that research has most conspicuously emphasized the need for a comprehensive approach that will both confront environmental factors and relate to more personal needs (NIAAA, 2002a,b,c, 2007; cf. Walters, 2010). Easy access to alcohol is a recognized determinant of unhealthy

drinking behaviour as is a popular cultural ethos around alcohol in which it is viewed as an indispensible means for having fun with others and establishing gratifying social networks. Efforts to improve the ecosystem of the campus context itself will take different forms (DeJong & Langford, 2002; Toomey & Wagenaar, 2002; Toomey, Lenk & Wagenaar, 2007), including more regulatory policy positions (e.g., constraints on alcohol availability and promotion; cf. Wechsler & Nelson, 2008; Nelson et al., 2009, 2010) as well as attempts to cultivate and nurture a community of constructive, caring interaction (Ziemelis et al., 2002; Murphy et al., 2007; Borsari et al., 2007). Such an agenda will consider effective ways of providing alternative socialization and a variety of relationship-building settings, as well as engaging students in on-campus and community service opportunities (CARBC, 2010a).

Efforts that strengthen the relational fabric of a post-secondary school and enhance participation will be beneficial not only in helping to deter students from recourse to hazardous substance use, but also be something of a buffer against development of patterns of disordered eating. An approach similar to WHO's Health Promoting Schools Framework would supply a more holistic rubric for encouraging positive attitudes and behaviours (O'Dea & Maloney, 2000; Yager, 2007; CARBC, 2010b; WHO, n.d.). Its thrust not only diffuses health education across the curriculum with orientation and training aids for teachers and staff, but also calls for examination of structures, policies and practices that work against rather than support health. It also urges strong collaborative working partnerships with other sectors of the community, including social and health services among others (e.g., community recreation and sports associations). Application of such a philosophy within the collegiate setting to create and sustain a wholesome ethos will employ like means of integrated education, community mobilization and administrative or organizational action to ensure positive interventions.

Institutions of advanced education adhering to such an approach will not be content to warn and equip against high risk situations but will attempt to reduce their existence and increase the appeal of alternative safer settings. Beyond advising in attractive ways on healthy eating habits, a campus can take steps to supply better access to good nutrition versus maintaining easy availability of food that is not of such value. With such a move, direct readily quantifiable economic advantage may get trumped by gradual less precisely measured and tallied gains in well-being. Besides providing help for students on how better to avoid or deal with experience of stress, a post-secondary school can change its ways of doing things that tend to generate intense feelings of pressure, anxiety and negative emotion and make matters more manageable. Procedures that serve to isolate or alienate can be modified to become operations that facilitate inclusion and a sense of belonging.

This kind of outlook will, for example, look for constructive ways of responding to obesity concerns that, instead of singling out students registering above a certain body mass index threshold for mandatory completion of a fitness course (abetting rather than combating stigma in the process), will incorporate good eating and exercise discussion into wellness and healthy lifestyle education for all students (Stein, 2010; again, hopefully making organizational arrangements that concretely encourage better practice). On the substance use front, for instance, disciplinary action in regard to conduct offenses will aim at prompting more respectful and responsible relationships with substances among students than segregating or excluding them (e.g., through a zero tolerance heavily punitive policy on possession that could jeopardize immediate and longer-term welfare).

It will be the task of specific campuses to deliberate on the contours of an overall mental health promotion approach and decide on and design the particular components that promise to be most pertinent for their context. Recognition of the influence of broad social determinants should prompt higher education institutions to work with their surrounding and extended communities to take on challenges such as strengthening interpersonal interactions, and familial relationships in particular, so as to support healthy development and help reduce prevalence of abuse, sexual assault and other traumas which are a conspicuous contributor to disordered eating and difficulties with substances. Another large scale feature of the cultural environment that ought to be addressed, given not only its deleterious influence but the considerable economic interests attached to it and the pervasive media facilitation it enjoys, is the uncritical exaltation of artificial body ideals (cf. the artificial glamorization of alcohol). Countering such unrealistic and injurious images in a sustained public manner that effectively undermines their attraction and commends more appropriate wholesome objectives will require considerable collaboration. A consistent inclusive health promotion emphasis would include such a thrust and entail not just strategic messaging but also systemic programming and opportune policy initiatives.

Responding to eating disorders and substance use in the campus context

The health promotion task involves formulating and implementing a comprehensive thrust that is attentive to complex layers of contributing factors and the need for complementary measures (that include various proactive policy and program avenues) of effecting environmental change. This it does in order to cultivate a climate with conditions more congenial to flourishing communities and more resistant to the emergence of hazardous and harmful behaviours. Within its wide umbrella, health promotion will cover appropriate efforts at pre-emptive or primary prevention addressing collective and individual audiences, as well as interventions to help persons or groups who are already experiencing difficulties to varying degrees. Discussion of needed response often focuses primarily if not exclusively on the latter legitimate and necessary challenge, but an understandable preoccupation with this symptom stage is especially short-sighted. A strategic agenda to avoid such problems on a broader scale rather than simply having to overcome them when they materialize is critical, but such approaches need to go beyond the level of hoping (in vain) that increased education and awareness alone will do the trick. The following summary will pay attention to initiatives aimed specifically at forestalling the development and progression of problems around eating and substance use, as carried out in prevention endeavours and provision of care services.

Prevention Programs

In regard to eating difficulties, such programs often seek to improve outlook on body shape and weight over unrealistic and dangerous ideals that popular media representations reinforce (cf. Spettigue & Henderson, 2004). Social marketing initiatives around such issues as image and stigma are legitimate undertakings and, when conducted in a consistent sustained manner, can be expected to bring some success in countering common adverse stereotypes (Thompson & Heinberg, 1999; Hesse-Biber et al., 2006; Hopkins & Lee, 2007; Brennan, 2005; cf. Andreasen, 2004; Stead et al., 2007 more generally on social marketing; also Jack et al., 2005 in regard to heavy episodic drinking). However, as noted above, these efforts would gain their greatest traction when accompanied by fitting regulatory measures (e.g., organizational practices and advertising

standards) that support or uphold a healthier outlook on personally and socially acceptable appearance.

Attempts to increase media literacy and enhance body satisfaction can be usefully embedded within multi-component programs, universal or selected, to elevate self esteem, improve management skills and encourage positive relationship building (e.g., McVey et al., 2010). Prevention program reviews around disordered eating include some initiatives that aim to offer help on behavioural difficulties already occurring (as reflected in further discussion below under brief and more extended interventions), as well as efforts to reduce onset of future symptoms (e.g., Stice & Shaw, 2004; Stice et al., 2007; Yager & O'Dea, 2008). Not surprisingly, measured results on effects favour endeavours that address selected audiences in an interactive manner to build skills over the course of a number of sessions. As in other areas such as substance use, formats that are primarily didactic, with the preeminent psycho-educational goal of raising awareness, are least productive (and can, as they do for younger age brackets, run the risk of unintentionally abetting unhealthy weight control practice by, e.g., acquainting people with techniques, normalizing difficulties or glamorizing sufferers). Conversely, provisions that not only give participants a chance to engage and acquire ability but also relate to recognized risk factors (e.g., sociocultural pressures for thinness, body dissatisfaction, low self esteem, weight management challenges, and not just aid in handling or coping with stress) are more fruitful in delivering improvement (Stice & Shaw, 2004; Stice et al., 2007; Yager & O'Dea, 2008).

Initiatives that are geared toward promoting healthy weight control through better dietary and exercise techniques, utilizing persuasion principles (such as a foot-in-the-door approach that moves progressively from more easily managed to more difficult requests, motivational enhancement exercises, strategic self-presentation), have shown encouraging results on weight gain in particular but also on functional impairment. Efforts that focus on inducing dissonance in active critique of the thin ideal enjoy even more confirmation of success in reducing internalization of that unhealthy paradigm, body dissatisfaction, elevated dieting, negative affect and disordered eating symptoms (Stice et al., 2007, 2008a,b; cf. Yager & O'Dea, 2008, 2010).

There are challenges for universal initiatives intended for the broad post-secondary student population in regard to disordered eating (as with substance use). It is harder for such broad-based efforts to rise above the level of simply sharing information and to engage the audience in ways that prompt reflection, discussion, and activity that helps shift attitudes and alter habits. Applications that try to take advantage of technological advances and be interactive within newer media, thus reaching out beyond the approach of traditional presentations, are more readily delivered to selected at-risk individuals or groups than to more widespread undifferentiated recipients (e.g., Franko et al., 2005b; Taylor et al., 2006). Media-based advocacy can try to undermine popular media presentation and reinforcement of the thin ideal, but unless general messaging is bolstered by opportunities for students to express themselves and interact with peers in dissonance from that damaging model, only modest erosion of its deleterious influence can be expected (Yager & O'Dea, 2008; Stice et al., 2008). Wellness emphases around eating have to steer a careful course that avoids being misappropriated as lenient toward obesity or unhealthy restriction.

Primary prevention programs around drinking and other substance use difficulties likewise carry added clout when embedded within holistic health emphases that have an affirmative literacy

building orientation to them. As with respect to disordered eating, there is warrant for addressing features such as distorted media representation of a social ideal (carefree and fun-filled consumption of alcohol indifferent to the reality that inappropriate intake invites unwelcome adverse consequences, whereas desired good times and good friends can indeed be had quite apart from alcohol and minus its associated risks). A positive accent that indicates gains from seeing and living out things differently than the pseudo-images suggest will make more headway than tacks that simply dwell on the negative and run the risk of being dismissed as scare tactics or killjoy agendas.

Treating those facing trouble around eating and substance use

Researchers examining co-occurrence of difficulties in eating and substance use (especially alcohol) are strongly reminded to advocate for simultaneous rather than sequential initiatives in treating the unhealthy patterns (Harrop & Marlatt, 2010; Gadalla & Piran, 2007a,b; Grilo et al., 2002; Sinha & O'Malley, 2000; Root et al., 2010). Such proponents acknowledge that integration remains largely an ideal to be worked out instead of an already established and well equipped practice. This holds true at all stages, from first confirming a problem (screening), to trying to correct it with compact help (brief intervention), to remedial efforts involving more sustained engagement (a longer series of skill training sessions), to yet more intensive and extended clinical provisions for very severely affected people.

Screening

There is recognition of advantage in checking for potential development of concurrent problems on the part of people apparently at risk for or already indicating trouble in one of the two areas (Piran & Robinson, 2006a,b; Kelly-Weeder, 2011; Khaylis et al., 2009; Dams-O'Connor et al., 2006). The recurring admission, however, is that tools remain to be fashioned that would do such joint work well at both the initial stage of detection and first response and at a more extended intervention phase for those requiring more treatment (Dunn et al., 2009; Heidelberg & Correia, 2009; Kelly-Weeder & Edwards, 2011; Grilo et al., 2002).

Screening for likelihood of experiencing alcohol-related difficulties can be strategically conducted within the post-secondary context in a variety of specific settings (e.g., in connection with enrolment or registration, at orientation events, routinely for visitors to a health services centre on campus, at residence education events, during health awareness fairs, in a conversation prompted by concerns over the student's behaviour, etc.). It can involve different instruments depending on the circumstances and the mode of application (e.g., a question or two posed by a peer or campus staff member who need not be health specialists, a short formalized test filled out online that supplies program-generated feedback, a detailed questionnaire issued in-person by a clinician). All such scenarios are of potential use for conjoined checking on elevated liability in regard to disordered eating patterns; the suitability of a particular tool will similarly depend on the situation in which the screen is being administered.

Appropriate formal screens in regard to problem drinking for college students (Devos-Comby & Lange, 2008) include the AUDIT (Alcohol Use Disorders Identification Test: Saunders et al., 1993; Fleming et al., 1991; Kokotailo et al., 2004; Zamboanga et al., 2007; DeMartini et al., 2009), validated across a wide swath of general and specific populations. Other instruments more

specifically designed for a young adult age bracket are the RAPI (Rutgers Alcohol Problem Index: White & Labouvie, 1989; Martens et al., 2007; Earlywine et al., 2008) and variants of the YAAPST (Young Adult Alcohol Problems Screening Test: Hurlbut & Sher, 1992; Kahler et al., 2004), the YAACQ (Young Adult Alcohol Consequences Questionnaire: Read et al., 2007; Kahler et al., 2005, 2008) and the CAPS (College Alcohol Problems Scale: O'Hare, 1997; O'Hare & Sherrer, 1997, 2005; Maddock et al., 2001; Talbott et al., 2009). As indicated in their names, these latter tools check for experience of adverse developments in connection with drinking.

Some screening tools have been constructed specifically for cannabis, such as the CUPIT (Cannabis Use Problems Identification Test: Bashford et al., 2010) and the Cannabis Problems Questionnaire (Copeland et al., 2005). For a wider range of drugs, including alcohol and cannabis, WHO has produced the ASSIST (Alcohol, Smoking and Substance Involvement Screening Test: WHO ASSIST Working Group, 2002; Humeniuk et al., 2008).

A range of recognized gauges for eating difficulty or for added likelihood of experiencing such troubles has been utilized (Anderson et al., 2004). Examples include the QEWP-R (Questionnaire on Eating and Weight Problems-Revised; cf. Grilo et al., 2002), the EDE-Q (Eating Disorder Examination Questionnaire: Fairburn & Beglin, 1994; Luce et al., 2008; Lavender et al., 2010), the EDDS (Eating Disorder Diagnostic Scale: Stice et al., 2000, 2004), the EAT-26 (Eating Attitude Test: Garner et al., 1982) and the MEBS (Minnesota Eating Behavior Survey: von Ranson et al., 2005, 2007; Harrell et al., 2009).

Sufficiently sensitive short screens are desirable, particularly for non-clinical and less specialized contexts of administration. In relation to problematic drinking, single queries that ask about recent or frequency of heavy episodic consumption appear helpful for indications of a situation worth exploring further (e.g., McMillen et al., 2009; O'Brien et al., 2006; cf. Seale et al., 2006; Smith et al., 2009). Some brief screens for disordered eating have also been favourably assessed (Hawkins & Clement, 1980; Anstine & Grinenko, 2000; Cotton et al., 2003; Parker et al., 2005; Hill et al., 2010). Checks that focus on negative consequences in both domains are advantageous in attending to significant causes for concern, even among those whose levels of substance or food intake may not yet be troubling quantity-wise. An attested implement that does this in a combined or unified and efficient fashion would be welcome, but is still awaited.

Brief intervention

Screening is strategically carried out primarily to pave the way for brief intervention where necessary (e.g., Becker et al., 2003, 2004). Though generally not sufficient to obviate any need for follow-up and occasionally precipitating the urgency of immediately or imminently available help, sometimes the exercise of being screened can itself be fruitful in prompting adequate favourable change on the part of individuals without the aid of further input being offered to them. Brief interventions are a single or very short series of compact sessions (generally ranging from a few minutes to a maximum of an hour and a half each) in which a person or group receives counselling assistance designed to support them towards healthier behaviour. With respect to alcohol and other substance-related problems, brief interventions have proven beneficial not only in preventing the exacerbation of early stage difficulties into more severe situations of need, but also in avoiding the added expense that accompanies more intensive and extended therapeutic measures. The more

confined interventions have traditionally taken the form of face-to-face conversations between client(s) and clinician, with the latter not needing to be a treatment specialist or addictions practitioner. More recently, alternative applications of screening and brief intervention (SBI) have also been administered in which the help may be communicated by telephone, mail, email or online.

Brief interventions in relation to substance- (especially alcohol-) related problems incurred by college students are most effective when they involve motivational enhancement. This is most often achieved by employment of a non-judgmental, non-confrontational and non-coercive counselling style that draws on the motivational interviewing philosophy and approach advocated by Miller and Rollnick (1995, 2002, 2004, 2008, 2009) to facilitate recognition of a problem and encourage adoption of a course of change. Typically included in such brief interventions around alcohol as conducted by professionals (and also reflected in self-help provisions not involving in-person encounters) is some feedback on a person's acknowledged drinking pattern in relation to recognized risk levels and perhaps to relevant norms (actual versus perceived). Other items for consideration (and discussion where direct contact is taking place) might be influential expectancies, operative motives or reasons for drinking, experience of diverse harms, and use of personal protective behavioural strategies. While challenging popular myths and undue expectancies as well as addressing situations that prompt hazardous use may be part of the conversation (or presentation in less direct modes), the goal is not merely informational nor to dissuade by playing on fear, but rather to discern and enhance readiness to change, and help lead the person to choose and take up an appropriate alteration in practice (Larimer et al., 2004/2005; Larimer et al., 2005; Larimer & Cronce, 2007; Walters & Neighbors, 2005; White, 2006; see Dimeff et al., 1999; Whiteside et al., 2010 on the acclaimed BASICS program; cf. Walters & Baer, 2006). Brief intervention that includes such components and incorporates this approach can be constructively tailored for a female audience and concerns more particular to them (Kelly-Weeder, 2008; LaBrie et al., 2009).

Brief interventions more informally conducted on the part of non-specialists may simply (and tactfully) seek a basic indication of typical use and acknowledgment of alcohol's contribution to apparent difficulties the person is or might be experiencing and could do well to avoid. This can be done with a modest view to drawing the person's attention to low-risk drinking guidelines, encouraging their reflection on adjustments they can make and, if appropriate, recommending campus healthcare services to them for further support. While non-specialists need only to adopt an orientation and gain some acquaintance with basic issues and resources in order to carry out minimal intervention, they can as they wish familiarize themselves further with the approach and key instruments to allow for more robust discussions. In the case of eating disorders and the sensitive issues around them (e.g., body image, stigma), the ranks of acceptable candidates to potentially function as initial inquirers may be more confined, such as female friends, trusted peers or familiar staff members.

Some studies have already indicated the value of adapted motivational interviewing (AMI), even in a brief application, for helping women with disordered eating that involves bingeing (Cassin et al., 2008; Dunn et al., 2006). The benefit appears to lie in the increased confidence and sense of self-efficacy that this approach seeks to evoke, elevating readiness to change even among those who may have a history of failed attempts to overcome a binge eating pattern. While some research

suggests that some progress may be made simply by this build-up of self-esteem and appreciation of personal ability without necessarily needing to focus simultaneously on reducing particular symptoms, the strongest package would appear to be one that supplements or combines such a motivation enhancing thrust with tools that help clients work through strategies to implement change. On the one hand, attention might be paid to raising awareness of causes for concern, exploring ambivalence, assessing readiness, considering pros and cons, reflecting on values and dissonance in relation to those, recognizing and affirming capacity and competence, generating ideas for change and selecting from alternatives, and designing a plan. On the other side, a resource might clarify the pattern in question, introduce techniques that may be employed in a process of change, take up points of challenge and problem solving steps, as well as address relapse prevention matters, all with a view to imparting skills and raising literacy to access external helps (Cassin et al., 2008; Dunn et al., 2006).

Cognitive behavioural skills training

A stepped care approach in intervention responding to individual problems around substance use and/or disordered eating would first offer unsupervised self-help available in some form (e.g., referral to an online resource), proceed as required to more guided forms of such assistance in a group context, and move to private formats involving sessions with the person experiencing the difficulty. When the intervention is extended beyond the "brief" parameters of a single occasion or a few segments into a more prolonged series of engagements, with more intensive effort being placed on equipping clients, cognitive behavioural therapy (CBT) is the most widely attested treatment. On the eating disorders front, it essentially amounts to a continuation and amplification of the sorts of components alluded to above under skill development in brief intervention, ideally incorporating some of the motivational enhancement emphases in the process (Grilo et al., 2002; Sinha & O'Malley, 2000; Adams & Araas, 2006; Cassin et al., 2008).

For difficulties with substance use, particularly alcohol, the Alcohol Skills Training Program developed as BASICS by the University of Washington's Addictive Behaviors Research Center (Alan Marlatt and colleagues: Miller et al., 2001; Fromme et al., 1994; Kivlahan et al., 1990) is regarded as the CBT exemplar that has been most productively appropriated (Larimer & Cronce, 2007; Neighbors et al., 2006; Walters & Neighbors, 2005) and has inspired kindred programs (e.g., Fromme & Orrick, 2004). While there has been much less formulation and testing of initiatives aimed at reaching those experiencing difficulties with other drugs, indications are that the same key elements of motivational encouragement and building resilience, by helping to equip with more positive proactive and reactive behaviours, will be equally crucial for effectiveness (e.g., Larimer et al., 2005). At certain points, there should be opportunities for convergence, not only of style and thrust (e.g., self-monitoring, identification and management of high-risk situations, avoidance of negative consequences) but also of content in CBT for difficulties with substance use and disordered eating (Sinha & O'Malley, 2000; Dunn et al., 2002). Enhancement of coping skills in regulating negative affect or stress is a frequently cited key component of CBT for situations where inability to deal with depressed emotions or pressure has led to such maladaptive responses as episodic heavy eating or drinking or excessive intake in both (Sinha & O'Malley, 2000; Grilo et al., 2002; Franko et al., 2005a; Benjamin & Wulfert, 2005; Birch et al., 2007; cf. Anderson et al., 2006; Rush et al., 2009; Harrell et al., 2009; Khaylis et al., 2009; Luce et al., 2007; Ferriter & Ray, 2011).

However, though there can be direct overlap in dealing with factors that contribute to both substance and food use problems, complexity and diversity must be kept in view. Within eating disorder categories, there are different behaviours (e.g., restricting, bingeing, purging) that will reflect distinct considerations or interests on the part of various individuals and may link up with substance use in different ways. Use of stimulants can serve the cause of appetite suppression and weight reduction (cf. Piran & Robinson, 2006a,b; Herzog et al., 2006). Anticipated alcohol intake can take priority over and prompt lesser intake of food (in order to minimize aggregate calories), which circumstances can contribute to earlier intoxication and associated dangers as well as greater liability to internal physical damage. The context and effects of alcohol use can also limit or hinder sound choices on quality of food as well as compromise ability to regulate food intake and process it. Thus alcohol can abet both unhealthy dieting and excessive weight gain (Giles et al., 2009; Lloyd-Richardson et al., 2008; Nelson et al., 2009). Binge eating tends to be a more private, solitary practice given the stigma attached to it, in contrast to the perceived acceptability of heavy drinking episodes in some public settings (Birch et al., 2007). Illegality of other substances will have some impact on their contexts of use. Exploration and discussion of predominant motives and incentives should be an integral component of brief intervention and more extended skills training for those struggling with such problems.

While CBT is widely accepted as a preferred therapy in regard to eating disorders, other forms of skill-enhancing care enjoy some advocacy too. Dialectical behaviour therapy (DBT) has been adapted from use with borderline personality disorder and shows some promise for dealing with regulation of negative affect and avoidant coping (Grilo et al., 2002; Telch, Agras & Linehan, 2001). DBT is one form among others of mindfulness training that is being explored for possible utility in intervention in both eating and drinking problems. The accent of mindfulness will be on non-judgmental attentiveness to one's emotional, cognitive and bodily experience in the present moment; training can foster utilization of this detached, decentred observational awareness and acceptance to shape attitude and enhance control of thinking, response to beliefs, choice and behaviour. While some results are encouraging, more work awaits in clarifying particular ways in which mindfulness emphases, with their distinctive orientation, can best be related to specific features of difficulties being faced and in confirming the extent of effectiveness for those applications (Baer, 2003; Lavender et al., 2009; Leigh & Neighbors, 2009; Courbasson et al., 2011; Kristeller et al., 2011; Zgierska et al., 2009).

Treatment for more severe cases

Campuses with hospitals are in a better position to receive students who need critical care treatment. With or without such facilities, an institution can benefit from good working relationships with local services. While definite preference has been affirmed for dual in-patient care, the literature on simultaneous treatment of overlapping conditions has been called "disappointingly quiet" (Harrop & Marlatt, 2009). In the absence of established integrated protocols enjoying empirical attestation of effectiveness, at least some considerations have been underscored. Where involved, starvation effects and implications need to be carefully taken into account and addressed as a priority issue crucial for avoiding further harm and allowing other aspects of intervention opportunity to improve matters. Just as eating disorder specializing practitioners need to be alert to ramifications of a substance use disorder for safety in prescription of pharmacological

help, so those whose expertise is more in the treatment of substance use disorders need to be attentive to possible exacerbation with diet and exercise regimens they might advise (Harrop & Marlatt, 2009; Woodside & Staab, 2006). Clearly collaboration that involves close consultation and mutually informed consensus is called for in concomitant continuing care.

Male students and eating disorders

Most research, the majority of reviews and the preponderance of initiatives have focused on female students, given the demonstrably higher prevalence of problems around eating for that sex as opposed to their male peers, hence the limited purview of this report as well. However, more evidence is being compiled to show that at the subclinical/sub-threshold level of partial difficulties, a significant minority of men are mal-affected and that substance use issues can be involved too (Lavender et al., 2010; Kelly-Weeder, 2011; O'Dea & Abraham, 2002; Petrie et al., 2008; cf. Giles et al., 2009; Nelson et al., 2009; Rush et al., 2009; Gadalla & Piran, 2007b; Yager & O'Dea, 2008, 2010). Indications are that males who binge eat are more disposed toward rigorous exercise than purging compensatory practices. The ideal image more often contributing to difficulties in body satisfaction and inordinate exercise for males (and so needing to be addressed) is a muscular one rather than the thin ideal posing problems for females. There is a need for encouragement for both those unduly restricting as well as those overeating in regard to appropriate goals and practices. Gender role considerations need to be taken into account as well (Pritchard, 2008).

Conclusion

Prevalence of difficulties with eating is higher among those struggling with substance use issues and vice versa, with this overlap of problems a matter of concern even at sub-clinical levels of unhealthy behaviour. Causation is a complex matter. A range of behaviours and contributing factors need to be addressed. Such features involve different domains (including biological, psychological and social) and come into play with each other at various levels at which people are influenced by their environment and affect it. Tools remain to be designed for use in treating people in co-occurring situations (in order to allow preferable integrated care at all levels of severity). Affinities in certain components of style (e.g., motivational interviewing), approach (e.g., cognitive behavioural skills training) and content (e.g., assistance in better ways of coping with negative affect) can facilitate development of dual-thrust instruments in intervention. Adoption of a comprehensive health promotion orientation within which to position distinct but mutually supporting or reinforcing initiatives is critical to ensure that all common determinants of health for these difficulties are addressed in an appropriate manner. Such a cohesive strategy, with necessary collaborative mobilization of institutional and community capacity, is required to enhance prospects for minimizing harm from both unhealthy eating and substance use and for reducing the occurrence of these problems among college students.

Reference Material

Adams, T.B. & Araas, T.E. (2006). Purging and alcohol-related effects in college women. *International Journal of Eating Disorders*, 39(3), 240-244.

Adlaf, E.M., Demers, A. & Gliksman, L. (Eds.) (2005). *Canadian Campus Survey 2004*. Toronto: Centre for Addiction and Mental Health. http://www.camh.net/research/population_life_course.html.

Anderson, D.A., Lundgren, J.D., Shapiro, J.R. & Paulosky, C.A. (2004). Assessment of eating disorders: Review and recommendations for clinical use. *Behavior Modification*, 28(6), 763-782.

Anderson, D.A., Martens, M.P. & Cimini, M.D. (2005). Do female college students who purge report greater alcohol use and negative alcohol-related consequences? *International Journal of Eating Disorders*, 37(1), 65-68.

Anderson, D.A., Simmons, A.M., Martens, M.P., Ferrier, A.G. & Sheehy, M.J. (2006). The relationship between disordered eating behavior and drinking motives in college-age women. *Eating Behaviors*, 7(4), 419-422.

Andreasen, A.R. (2004). A social marketing approach to changing mental health practices directed at youth and adolescents. *Health Marketing Quarterly*, 21(4), 51-75.

Anstine, D. & Grinenko, D. (2000). Rapid screening for disordered eating in college-aged females. *Journal of Adolescent Health*, 26(5), 338-342.

Baer, R.A. (2003). Mindfulness training as a clinical intervention: A conceptual and empirical review. *Clinical Psychology: Science and Practice*, 10(2), 125-143.

Bashford, J., Flett, R. & Copeland, J. (2010). The Cannabis Use Problems Identification Test (CUPIT): development, reliability, concurrent and predictive validity among adolescents and adults. *Addiction*, 105(4), 615-625.

Bauer, G., Davies, J.K., Pelikan, J., Noack, H., Broesskamp, U. & Hill, C. (2003). Advancing a theoretical model for public health and health promotion indicator development. *European Journal of Public Health*, 13(3), 107-113.

Becker, A.E., Franko, D.J., Nussbaum, K. & Herzog, D.B. (2004). Secondary prevention for eating disorders: The impact of education, screening and referral in a college-based screening program. *International Journal of Eating Disorders*, 36(2), 157-162.

Becker, A.E., Franko, D.L., Speck, A. & Herzog, D.B. (2003). Ethnicity and differential access to care for eating disorder symptoms. *International Journal of Eating Disorders*, 33(2), 205-212.

Benjamin, L. & Wulfert, E. (2005). Dispositional correlates of addictive behaviors in college women: Binge eating and heavy drinking. *Eating Behaviors*, 6(3), 197-209.

Beseler, C.L., Taylor, L.A. & Leeman, R.F. (2010). An item-response theory analysis of DSM-IV alcohol-use disorder criteria and "binge" drinking in undergraduates. *Journal of Studies on Alcohol and Drugs*, 71(3), 418-423.

Birch, C.D., Stewart, S.H. & Brown, C.G. (2007). Exploring differential patterns of situational risk for binge eating and heavy drinking. *Addictive Behaviors*, 32(3), 433-448.

Borsari, B., Murphy, J.G. & Barnett, N.P. (2007). Predictors of alcohol use during the first year of college: Implications for prevention. *Addictive Behaviors*, 32(10), 2062-2086.

Brennan, J. (2005). A selective prevention study: Decreasing body dissatisfaction and eating disorder symptomatology in sorority women using psychoeducation, social norms and social marketing strategies. http://etd.ohiolink.edu/send-pdf.cgi/Brennan%20Julie.pdf?osu1121286117.

Bulik, C.M., Klump, K.L., Thornton, L., Kaplan, A.S., Devlin, B., Fichter, M.M. et al. (2004). Alcohol use disorder comorbidity in eating disorders: A multicenter study. *Journal of Clinical Psychiatry*, 65(7), 1000-1006.

Caldeira, K.M., Arria, A.M., O'Grady, K.E., Vincent, K.B. & Wish, E.D. (2008). The occurrence of cannabis use disorders and other cannabis-related problems among first-year college students. *Addictive Behaviors*, 33(3), 397-411.

CARBC (2010a). Promising practices for campuses in reducing harm from substance use. http://carbc.ca/HelpingCampuses/PromisingPractices.aspx.

CARBC (2010b). Promising practices for promoting health in high schools. http://carbc.ca/HelpingSchools/PromisingPractices.aspx.

Chamay-Weber, C., Narring, F. & Michaud, P-A. (2005). Partial eating disorders among adolescents: A review. *Journal of Adolescent Health*, 37(5), 417-427.

Chiauzzi, E.J. & Liljegren, S. (1993). Taboo topics in addiction treatment: An empirical review of clinical folklore. *Journal of Substance Abuse Treatment*, 10(3), 303–316.

Copeland, J., Gilmour, S., Gates, P. & Swift, W. (2005). The Cannabis Problems Questionnaire: Factors, structure, reliability and validity. *Drug and Alcohol Dependence*, 80(3), 313-319.

Corte, C. & Stein, K.F. (2000). Eating disorders and substance use: An examination of behavioral associations. *Eating Behaviors*, 1(2), 173-189.

Cotton, M.A, Ball, C. & Robinson, P. (2003). Four simple questions can help screen for eating disorders. *Journal of General Internal Medicine*, 18(1), 53-56.

Courbasson, C.M., Nishikawa, Y. & Shapira, L.B. (2011). Mindfulness-action based cognitive behavioral therapy for concurrent binge eating disorder and substance use disorders. *Eating Disorders: The Journal of Treatment and Prevention*, 19(1), 17-33.

Dams-O'Connor, K., Martens, M.P. & Anderson, D.A. (2006). Alcohol-related consequences among women who want to lose weight. *Eating Behaviors*, 7(3), 188-195.

Dawson, D.A., Grant, B.F., Stinson, F.S. & Chou, P.S. (2004). Another look at heavy episodic drinking and alcohol use disorders among college and noncollege youth. *Journal of Studies on Alcohol*, 65(4), 477-488.

DeJong, W. & Langford, L.M. (2002). A typology for campus-based alcohol prevention: Moving toward environmental management strategies. *Journal of Studies on Alcohol,* Supplement 14, 140-147.

DeMartini, K.S. & Carey, K.B. (2009). Correlates of AUDIT risk status for male and female college students. *Journal of American College Health*, 58(3), 233-239.

Devos-Comby, L. & Lange, J.E. (2008). Standardized measures of alcohol-related problems: a review of their use among college students. *Psychology of Addictive Behaviors*, 22(3), 349-361.

Dimeff, L.A., Baer, J.S., Kivlahan, D.R. & Marlatt, G.A. (1999). *Brief Alcohol Screening and Intervention for College Students (BASICS): A harm reduction approach*. New York: Guilford Press.

Dunn, E.C., Neighbors, C., Fossos, N. & Larimer, M.E. (2009). A cross-lagged evaluation of eating disorder symptomatology and substance-use problems. *Journal of Studies on Alcohol and Drugs*, 70(1), 106-116.

Dunn, E.C., Larimer, M.E. & Neighbors, C. (2002). Alcohol and drug-related negative consequences in college students with bulimia nervosa and binge eating disorder. *International Journal of Eating Disorders*, 32(2), 171-178.

Earlywine, M., LaBrie, J.W. & Pedersen, E.R. (2008). A brief Rutgers Alcohol Problem Index with less potential for bias. *Addictive Behaviors*, 33(9), 1249-1253.

Fairburn, C.G. & Beglin, S.J. (1994). Assessment of eating disorders: Interview or self-report questionnaire? *International Journal of Eating Disorders*, 16(4), 363-370.

Ferriter, C. & Ray, L.A. (2011) Binge eating and binge drinking: An integrative review. *Eating Behaviors*, 12(2), 99-107.

Fisher, M., Schneider, M., Pegler, C., & Napolitano, B. (1991). Eating attitudes, health-risk behaviors, selfesteem, and anxiety among adolescent females in a suburban high school. *Journal of Adolescent Health,* 12(5), 377–384.

Fleming, M.F., Barry, K.L. & MacDonald, R. (1991). The Alcohol Use Disorders Identification Test (AUDIT) in a college sample. *International Journal of the Addictions/Substance Use and Misuse*, 26(11), 1173-1185.

Franko, D.L., Dorer, D.J., Keel, P.K., Jackson, S., Manzo, M.P. & Herzog, D.B. (2005a). How do eating disorders and alcohol use disorder influence each other? *International Journal of Eating Disorders*, 38(5), 200-207.

Franko, D.L., Mintz, L.B., Villapiano, M., Green, T.C., Mainelli, D., Folensbee, L. et al. (2005b). Food, mood and attitude: Reducing risk for eating disorders in college women. *Health Psychology*, 24(6), 567-578.

Freedman, D., Bess, K., Tucker, H., Boyd, D., Tuchman, A., & Wallston, K. (2009). Public health literacy defined. *American Journal of Preventive Medicine,* 36(5), 446-51.

Fromme, K. & Orrick, D. (2004). The lifestyle management class: A harm reduction approach to college drinking. *Addiction Research and Theory*, 12(4), 335-351.

Fromme, K., Marlatt, G.A., Baer, J.S. & Kivlahan, D.R. (1994). The alcohol skills training program: A group intervention for young adult drinkers. *Journal of Substance Abuse Treatment*, 11(2), 143-154.

Gadalla, T. & Piran, N. (2007a). Co-occurrence of eating disorders and alcohol use disorders in women: a meta analysis. *Archives of Women's Mental Health*, 10(4), 133-140.

Gadalla, T. & Piran, N. (2007b). Eating disorders and substance abuse in Canadian men and women: a national study. *Eating Disorders*, 15(3), 189-203.

Garner, D.M., Olmsted, M.P., Bohr, Y. & Garfinkel, P.E. (1982). The eating attitudes test: Psychometric features and clinical correlates. *Psychological Medicine*, 12(4), 871-878.

Gilchrist, G., Gruer, L. & Atkinson, J. (2007). Predictors of neurotic symptom severity among female drug users in Glasgow, Scotland. *Drugs: Education, Prevention and Policy*, 14(4), 347-365.

Giles, S.M., Champion, H., Sutfin, E.L., McCoy, T.P. & Wagoner, K. (2009). Calorie restriction on drinking days: an examination of drinking consequences among college students. *Journal of American College Health*, 57(6), 603-609.

Grant, B.F., Dawson, D.A., Stinson, F.S., Chou, S.P., Dufour, M.C. & Pickering, R.P. (2004). The 12-month prevalence and trends in DSM-IV alcohol abuse and dependence: United States, 1991-1992 and 2001-2002. *Drug and Alcohol Dependence*, 74(3), 223-234.

Grilo, C.M., Sinha, R. & O'Malley, S.S. (2002). Eating disorders and alcohol use disorders. *Alcohol Research and Health*, 26(2), 151-160.

Grucza, R.A., Norberg, K.E. & Bierut, L.J. (2009). Binge drinking among youths and young adults in the United States: 1979-2006. *Journal of the American Academy of Child and Adolescent Psychiatry*, 48(7), 692-702).

Harrell, Z.A.T., Slane, J.D. & Klump, K.L. (2009). Predictors of alcohol problems in college women: The role of depressive symptoms, disordered eating, and family history of alcoholism. *Addictive Behaviors*, 34(3), 252-257.

Harrop, E.N. & Marlatt, G.A. (2010). The comorbidity of substance use disorders and eating disorders in women: prevalence, etiology and treatment. *Addictive Behaviors*, 35(5), 392-398.

Hasin, D.S., Stinson, F.S., Ogburn, E. & Grant, B.F. (2007). Prevalence, correlates, disability, and comorbidity of DSM-IV alcohol abuse and dependence in the United States. *Archives of General Psychiatry,* 64(7), 830-842.

Hawkins, R.C. & Clement, P.F. (1980). Development and construct validation of a self-report measure of binge-eating tendencies. *Addictive Behaviors*, 5(3), 219-226.

Heidelberg, N.F. & Correia, C.J. (2009). Dieting behaviour and alcohol use behaviors among National Eating Disorders Screening Program participants. *Journal of Alcohol and Drug Education*, 53(3), 53-64.

Hesse-Biber, S., Leqavy, P., Quinn, C.E. & Zoino, J. (2006). The mass marketing of disordered eating and Eating Disorders: The social psychology of women, thinness and culture. *Women's Studies International Forum*, 29(2), 208-224.

Hill, L.S., Reid, F., Morgan, J.F. & Lacey, J.H. (2010). SCOFF, the development of an eating disorder screening questionnaire. *International Journal of Eating Disorders*, 43(4), 344-351.

Hingson, R.W., Zha, W. & Weitzman, E. (2009). Magnitude of and trends in alcohol-related mortality and morbidity among U.S. college students ages 18-24, 1998-2005. *Journal of Studies on Alcohol and Drugs*, Supplement 16, 12-20.

Hopkins, E. & Lee, A.H. (2007). Formative research for UCLA EATask Force's body image social marketing campaign. http://www.lifeed.ucla.edu/documents/EMHFinal282Paper--FinalFormatting_000.pdf.

Humeniuk, R.E., Ali, R.A., Babor, T.F., Farrell, M., Formigoni, M.L., Jittiwutikarn, J. et al. (2008). Validation of the Alcohol Smoking and Substance Involvement Screening Test (ASSIST). *Addiction*, 103(6), 1039-1047.

Hurlbut, S.C. and Sher, K.J. (1992). Assessing alcohol problems in college students. *Journal of American College Health,* 41(2), 49-58.

Jack, S.M., Sangster Bouck, L.M., Beynon, C.E., Ciliska, D.K. & Lewis (Mitchell), M.J. (2005). Marketing a hard-to-swallow message: Recommendations for the design of media campaigns to increase awareness about the risks of binge drinking. *Canadian Journal of Public Health*, 96(3), 189-193.

Johnston, L.D., O'Malley, P.M., Bachman, J.G. & Schulenberg, J.E. (2010). *Monitoring the future: National survey results on drug use, 1979-2009, Volume II, College students and adults ages 19-50, 2009*. http://monitoringthefuture.org/pubs/monographs/vol2_2009.pdf.

Joubert, N. & Raeburn, J. (1998). Mental health promotion: People, power and passion. *International Journal of Mental Health Promotion,* 1(Inaugural Issue), 15-22.

Kahler, C.W., Hustad, J., Barnett, N.P., Strong, D.R. & Borsari, B. (2008). Validation of the 30-day version of the Brief Young Adult Alcohol Consequences Questionnaire for use in longitudinal studies. *Journal of Studies on Alcohol and Drugs*, 69(4), 611-615.

Kahler, C.W., Strong, D.R. & Read, J.R. (2005). Toward Efficient and Comprehensive Measurement of the Alcohol Problems Continuum in College Students: The Brief Young Adult Alcohol Consequences Questionnaire. *Alcoholism: Clinical and Experimental Research,* 29(7), 1180-1189.

Kahler, C.W., Strong, D.R., Read, J.P., Palfai, T.P. & Wood, M.D. (2004). Mapping the continuum of alcohol problems in college students: A Rasch Model analaysis. *Psychology of Addictive Behaviors*, 18(4), 322-333.

Kelly-Weeder, S. (2011). Binge drinking and disordered eating in college students. *Journal of the American Academy of Nurse Practitioners*, 23(1), 33-41.

Kelly-Weeder, S. (2008). Binge drinking in college-aged women: Framing a gender-specific prevention strategy. *Journal of the American Academy of Nurse Practitioners*, 20(12), 577-584.

Kelly-Weeder, S. & Edwards, E. (2011). Co-occurring binge eating and binge drinking in college women. *Journal for Nurse Practitioners*, 7(3), 207-213.

Kendler, K.S., Walters, E.E., Neale, M.C., Kessler, R.C., Heath, A.C., & Eaves, L J. (1995). The structure of the genetic and environmental risk factors for six major psychiatric disorders in women: Phobia, generalized anxiety disorder, panic disorder, bulimia, major depression, and alcoholism. *Archives of General Psychiatry*, 52(5), 374–383.

Khaylis, A., Trockel, M. & Taylor, C.B. (2009). Binge drinking in women at risk for developing eating disorders. *International Journal of Eating Disorders*, 42(5), 409-414.

Kivlahan, D.R., Marlatt, G.A., Fromme, K., Coppel, D.B., & Williams, E. (1990). Secondary prevention with college drinkers: Evaluation of an alcohol skills training program. *Journal of Consulting and Clinical Psychology*, 58(6), 805-810.

Kokotailo, P.K., Egan, J., Gangnon, R., Brown, D., Mundt, M. & Fleming, M.F. (2004). Validity of the alcohol use disorders identification test in college students. *Alcoholism: Clinical and Experimental Research*, 28(6), 914-920.

Krahn, D., Kurth, C., Demitrack, M., & Drewnowski, A. (1992). The relationship of dieting severity and bulimic behaviors to alcohol and other drug use in young women. *Journal of Substance Abuse*, 4(4), 341–353.

Krahn, D.D., Kurth, C.L., Gomberg, E. & Drewnowski, A. (2005). Pathological dieting and alcohol use in college women—a continuum of behaviors. *Eating Behaviors*, 6(1), 43-52.

Kristeller, J.L. & Wolever, R.Q. (2011). Mindfulness-based eating awareness training for treating binge eating disorder: The conceptual foundation. *Eating Disorders*, 19(1), 49-61.

Kuo, M., Adlaf, E.M., Lee, H., Gliksman, L., Demers, A. & Wechsler, H. (2002). More Canadian students drink but American students drink more: comparing college alcohol use in two countries. *Addiction*, 97(12), 1583-1592.

LaBrie, J.W., Huchting, K.K., Lac, A., Tawalbeh, S., Thompson, A.D. & Larimer, M.E. (2009). Preventing risky drinking in first-year college women: Further validation of a female-specific motivational-enhancement group intervention. *Journal of Studies on Alcohol and Drugs*, Supplement 16, 77-85.

Larimer, M.E. & Cronce, J.M. (2007). Identification, prevention and treatment revisited: Individual-focused college drinking prevention strategies 1999-2006. *Addictive Behaviors*, 32(11), 2439-2468.

Larimer, M.E. & Cronce, J.M. (2002). Identification, prevention and treatment: a review of individual-focused strategies to reduce problematic alcohol consumption by college students. *Journal of Studies on Alcohol,* Supplement 14, 148-163.

Larimer, M.E., Kilmer, J.R. & Lee, C.M. (2005). College student drug prevention: A review of individually oriented prevention strategies. *Journal of Drug Issues*, 35(2), 431-456.

Larimer, M.E., Cronce, J.M., Lee, C.M. & Kilmer, J.R. (2004/2005). Brief intervention in college settings. *Alcohol Research & Health*, 28(2), 94-104.

Lavender, J.M., De Young, K.P. & Anderson, D.A. (2010). Eating Disorder Examination Questionnaire (EDE-Q): Norms for undergraduate men. *Eating Behaviors*, 11(2), 119-121.

Lavender, J.M., Jardin, B.F. & Anderson, D.A. (2009). Bulemic symptoms in undergraduate men and women: Contributions of mindfulness and thought suspension. *Eating Behaviors*, 10(4), 228-231.

Leigh, J. & Neighbors, C. (2009). Enhancement motives mediate the positive association between mind/body awareness and college student drinking. *Journal of Social and Clinical Psychology*, 28(5), 650-669.

Luce, K.H., Crowther, J.H. & Pole, M. (2008). Eating Disorder Examination Questionnaire (EDE-Q): Norms for undergraduate women. *International Journal of Eating Disorders*, 41(3), 273-276.

Luce, K.H., Engler, P.A. & Crowther, J.H. (2007). Eating disorders and alcohol use: Group differences in consumption rates and drinking motives. *Eating Behaviors*, 8(2), 177-184.

Maddock, J.E., Laforge, R.G., Rossi, J.S. & O'Hare, T. (2001). The College Alcohol Problems Scale. *Addictive Behaviors,* 26(3), 385-398.

Martens, M.P., Neighbors, C., Dams-O'Connor, K., Lee, C.M. & Larimer, M.E. (2007). The factor structure of a dichotomously scored Rutgers Alcohol Problem Index. *Journal of Studies on Alcohol and Drugs*, 68(4), 597-606.

Matthews, C.R. (2004). Examining problem drinking and eating disorders from a gendered perspective. *Journal of Addictive Diseases*, 23(3), 67-80.

McMillen, B.A., Hillis, S.M. & Brown, J.M. (2009). College students' responses to a 5/4 drinking question and maximum blood alcohol concentration calculated from a timeline followback questionnaire. *Journal of Studies on Alcohol and Drugs*, 70(4), 601-605.

McVey, G., Kirsh, G., Maker, D., Walker, K.S., Mullane, J., Laliberte, M. et al. (2010). Promoting positive body image among university students: A collaborative pilot study. *Body Image*, 7(3), 200-204.

Measelle, J.R., Stice, E. & Hogansen, J.M. (2006). Developmental trajectories of co-occurring depressive, eating, antisocial, and substance abuse problems in female adolescents. *Journal of Abnormal Psychology*, 115(3), 524-538.

Miller, E., Kilmer, J.R., Kim, E.L., Weingardt, K.R. & Marlatt, G.A. (2001). Alcohol skills training for college students. In Monti, P.M., Colby, S.M. & O'Leary, T.A. (Eds.), *Adolescents, Alcohol and Substance Abuse: Reaching Teens Through Brief Intervention* (pp. 183-215). New York: Guilford Press.

Miller, W.R. & Rollnick, S. (2009). Ten things that motivational interviewing is not. *Behavioural and Cognitive Psychotherapy*, 37(2), 129-140.

Miller, W.R. & Rollnick, S. (2004). Talking oneself into change: motivational interviewing, stages of change, and therapeutic process. *Journal of Cognitive Psychotherapy: An International Quarterly*, 18(4), 299-308.

Miller, W.R. & Rollnick, S. (2002). *Motivational interviewing: Preparing people to change*. New York: Guilford Press, 2nd ed.

Murphy, J.G., Correia, C.J. & Barnett, N.P. (2007). Behavioral economic approaches to reduce college student drinking. *Addictive Behaviors*, 32(11), 2573-2585.

National Institute on Alcohol Abuse and Alcoholism (NIAAA, 2004). *NIAAA Council Approves Definition of Binge Drinking*. NIAAA Newsletter – Winter 2004, number 3, p.3. NIH Publication No. 04-5346. Available at http://pubs.niaaa.nih.gov/publications/Newsletter/winter2004/Newsletter_Number3.pdf.

Neighbors, C., Larimer, M.E., Lostutter, T.W. & Woods, B.A. (2006). Harm reduction and individually focused alcohol prevention. *International Journal of Drug Policy*, 17(4), 304-309.

Nelson, M.C., Lust, K., Story, M. & Ehlinger, E. (2009). Alcohol use, eating patterns, and weight behaviors in a university population. *American Journal of Health Behavior*, 33(3), 227-237.

Nelson, T.F., Toomey, T.L., Lenk, K.M., Erickson, D.J. & Winters, K.C. (2010). Implementation of NIAAA College Drinking Task Force recommendations: How are colleges doing 6 years later? *Alcoholism: Clinical & Experimental Research*, 34(10), 1687-1693.

Nelson, T.F., Xuan, Z., Lee, H., Weitzman, E.R. & Wechsler, H. (2009). Persistence of heavy drinking and ensuing consequences at heavy drinking colleges. *Journal of Studies on Alcohol and Drugs*, 70(5), 726-734.

NIAAA (2007). *What Colleges Need to Know Now: An Update on College Drinking Research*. http://www.collegedrinkingprevention.gov/1College_Bulletin-508_361C4E.pdf

NIAAA (2002a). *A Call to Action: Changing the Culture of Drinking at U.S. Colleges*. http://www.collegedrinkingprevention.gov/NIAAACollegeMaterials/TaskForce/TaskForce_TOC.aspx. http://www.collegedrinkingprevention.gov/media/TaskForceReport.pdf

NIAAA (2002b). *High-risk drinking in college: What we know and what we need to learn. Final report of the panel on contexts and consequences.* http://www.collegedrinkingprevention.gov/media/FINALPanel1.pdf

NIAAA (2002c). *How to reduce college drinking: Use proven strategies, fill research gaps. Final report of the panel on prevention and treatment.* http://www.collegedrinkingprevention.gov/media/FINALPanel2.pdf

Nutbeam, D. (2008). The evolving concept of health literacy. *Social Science & Medicine,* 67(12), 2072-78.

O'Brien, M.C., McCoy, T.P., Champion, H., Mitra, A., Robbins, A., Teuschlser, H. et al. (2006). Single question about drunkenness to detect college students at risk for injury. *Academic Emergency Medicine*, 13(6), 629-636.

O'Dea, J.A. & Abraham, S. (2002). Eating and exercise disorders in young college men. *Journal of American College Health*, 50(6), 273-278.

O'Dea, J. & Maloney, D. (2000). Preventing eating and body image problems in children and adolescents using the Health Promoting Schools Framework. *Journal of School Health*, 70(1), 18-21.

O'Hare, T. (1997). Measuring problem drinking in first time offenders. Development and validation of the College Alcohol Problem Scale (CAPS). *Journal of Substance Abuse Treatment*, 14(4), 383-387.

O'Hare, T. & Sherrer, M. (2005). Assessment of youthful problematic drinkers: Validating the Drinking Context Scale (DCS-9) with freshmen first offenders. *Research on Social Work Practice*, 15(2), 110-117.

O'Hare, T. & Sherrer, M. (1997). Drinking problems, alcohol expectancies, and drinking contexts in college first offenders. *Journal of Alcohol and Drug Education*, 43(1), 31-45.

Parker, S.C., Lyons, J. & Bonner, J. (2005). Eating disorders in graduate students: Exploring the SCOFF questionnaire as a simple screening tool. *Journal of American College Health*, 54(2), 103-107.

Pearlstein, T. (2002). Eating disorders and comorbidity. *Archives of Women's Mental Health*, 4(3), 67-78.

Perkins, H.W. (2002). Surveying the damage: A review of research on consequences of alcohol misuse in college populations. *Journal of Studies in Alcohol*, Supplement 14, 91-100.

Petrie, T.A., Greenleaf, C., Reel, J. & Carter, J. (2008). Prevalence of eating disorders and disordered eating behaviors among male collegiate athletes. *Pscyhology of Men and Masculinity*, 9(4), 267-277.

Piran, N. & Gadalla, T. (2006). Eating disorders and substance abuse in Canadian women: a national study. *Addiction*, 102(1), 105-113.

Piran, N. & Robinson, S.R. (2006a). The association between disordered eating and substance use and abuse in women: a community-based investigation. *Women & Health*, 44(1), 1-20.

Piran, N. & Robinson, S.R. (2006b). Associations between disordered eating behaviors and licit and illicit substance use and abuse in a university sample. *Addictive Behaviors*, 31(10), 1761-1775.

Pritchard, M. (2008). Disordered eating in undergraduates: Does gender role orientation influence men and women the same way? *Sex Roles*, 59(3-4), 282-289.

Read, J.P., Merrill, J.E., Kahler, C.W. & Strong, D.R. (2007). Predicting functional outcomes among college drinkers: reliability and predictive validity of the Young Adult Alcohol Consequences Questionnaire. *Addictive Behaviors*, 32(11), 2597-2610.

Read, J.P., Kahler, C.W., Strong, D.R. & Colder, C.R. (2006). Development and preliminary validation of the Young Adult Alcohol Consequences Questionnaire. *Journal of Studies on Alcohol,* 67(1), 169-177.

Reist, D. (2011). Mental health literacy: what does it mean for substance use and why does it matter? *Visions: BC's Mental Health and Addictions Journal*, forthcoming.

Reist, D. (2010). Introduction to health promotion. http://carbc.ca/HelpingCampuses/ImplementingPromisingPractices/tabid/641/agentType/View/PropertyID/463/Default.aspx.

Rollnick, S., William, W.R. & Butler, C.C. (2008). *Motivational interviewing in health care: Helping patients change behavior*. New York: Guilford.

Rollnick, S. & Miller, W.R. (1995). What is motivational interviewing? *Behavioural and Cognitive Psychotherapy,* 23(4), 325-334.

Rootman, I., & Gordon-El-Bihbety, D. (2008). *A vision for a health literate Canada: report of the expert panel on health literacy.* Ottawa: Canadian Public Health Association.

Rootman, I., Goodstadt, M., Potvin, L. & Springett, T. (2001). A framework for health promotion evaluation. In I. Rootman, M. Goodstadt, B. Hyndman et al. (eds.), *Evaluation in health promotion: Principles and perspectives* (pp. 7-38). Copenhagen: World Health Organization.

Rush, C.C., Becker, S.J. & Curry, J.F. (2009). Personality factors and styles among college students who binge eat and drink. *Psychology of Addictive Behaviors*, 23(1), 140-145.

Sansone, R.A., Fine, M.A. & Nunn, J.L. (1994). A comparison of borderline personality symptomatology and self-destructive behavior in women with eating, substance abuse, and both eating and substance abuse disorders. *Journal of Personality Disorders*, 8(3), 219-228.

Saunders, J.B., Aasland, O.G., Babor, T.F., de la Fuente, J.R. & Grant, M. (1993). Development of the alcohol use disorders identification test (AUDIT): WHO collaborative project on early detection of persons with harmful alcohol consumption II. *Addiction*, 88(6), 791-804.

Seale, J.P., Boltri, J.M., Shellenberger, S., Velasquez, M.M., Cornelius, M., Guyinn, M. et al. (2006). Primary care validation of a single screening question for drinkers. *Journal of Studies on Alcohol*, 67(5), 778-784.

Sinha, R. & O'Malley, S.S. (2000). Alcohol and eating disorders: Implications for alcohol treatment and health services research. *Alcoholism: Clinical and Experimental Research*, 24(8), 1312-1319.

Slutske, W.S. (2005). Alcohol use disorders among US college students and their non-college-attending peers. *Archives of General Psychiatry*, 62(3), 321-327.

Smith, P.C., Schmidt, S.M., Allensworth-Davies, D. & Saitz, R. (2009). Primary care validation of a single-question alcohol screening test. *Journal of General Internal Medicine*, 24(7), 783-788.

Spettigue, W. & Henderson, K.A. (2004). Eating disorders and the role of the media. *The Canadian Child and Adolescent Psychiatry Review*, 13(1), 16-19.

Stead, M., Gordon, R., Angus, K. & McDermott, L. (2007). A systematic review of social marketing effectiveness. *Health Education*, 107(2), 126-191.

Stein, M.K. (2010). Five eating disorders groups successfully challenge a university's policy. *Eating Disorders Review*, 21(1), 1.

Stewart, S. H. & Brown, C.G. (2007a). The relationship between disordered eating and substance use problems among women: A critical review. In N. Poole & L. Greaves (eds.), *Highs and lows: Canadian perspectives on women and substance use* (pp. 157-163). Toronto, ON: CAMH. http://knowledgex.camh.net/amhspecialists/specialized_treatment/women/relationship/Documents/disordered_eating_substance_use_highs_lows_13.pdf.

Stewart, S. H. & Brown, C.G. (2007b). Challenges in understanding the co-prevalence of disordered eating and substance use problems and in responding with integrated services. In N. Poole & L. Greaves (eds.), *Highs and lows: Canadian perspectives on women and substance use* (pp. 355-362). Toronto, ON: CAMH. http://knowledgex.camh.net/amhspecialists/specialized_treatment/women/challenges/Documents/challenges_understanding_coprevalance_highs_lows_29.pdf.

Stewart, S.H., Angelopoulos, M., Baker, J.M. & Boland, F.J. (2000). Relations between dietary restraint and patterns of alcohol use in young adult women. *Psychology of Addictive Behaviors*, 14(1), 77-82.

Stice, E. (1994). Review of the evidence for a sociocultural model of bulimia nervosa and an exploration of the mechanisms of action. *Clinical Psychology Review,* 14(7), 633–661.

Stice, E., Shaw, H. & Marti, C.N. (2007). A meta-analytic review of eating disorder prevention programs: Encouraging findings. *Annual Review of Clinical Psychology*, 3, 207-231.

Stice, E. & Shaw, H. (2004). Eating disorder prevention programs: A meta-analytic review. *Psychological Bulletin*, 130(2), 206-227.

Stice, E., Fisher, M. & Martinez, E. (2004). Eating Disorder Diagnostic Scale: Additional evidence of reliability and validity. *Psychological Assessment*, 16(1), 60-71.

Stice, E., Telch, C.F. & Rizvi, S.L. (2000). Development and validation of the Eating Disorder Diagnostic Scale: A brief self-report measure of anorexia, bulimia, and binge-eating disorder. *Psychological Assessment*, 12(2), 123-131.

Stokols, D. (1996). Translating social ecological theory into guidelines for community health promotion. *American Journal of Health Promotion*, 10(4), 282-298.

Talbott, L.L., Umstattd, M.R., Usdan, S.L., Martin, R.J. & Geiger, B.F. (2009). Validation of the College Alcohol Problems Scale – revised (CAPS-r) for use with non-adjudicated first-year students. *Addictive Behaviors*, 34(5), 471-473.

Telch, C.F., Agras, W.S. & Linehan, M.M. (2001). Dialectical behavior therapy for binge eating disorder. *Journal of Consulting and Clinical Psychology*, 69(6), 1061-1065.

Thompson, J.K. & Heinberg, L.J. (1999). The media's influence on body image disturbance and eating disorders: We've reviled them, now can we rehabilitate them? *Journal of Social Issues*, 55(2), 339-353.

Thompson-Brenner, H., Eddy, K.T., Franko, D.L., Dorer, D., Vashchenko, M. & Herzog, D.B. (2008). Personality pathology and substance abuse in eating disorders: A longitudinal study. *International Journal of Eating Disorders,* 41(3), 203-208.

Toomey, T.L., Lenk, K.M. & Wagenaar, A.C. (2007). Environmental policies to reduce college drinking: An update of research findings. *Journal of Studies on Alcohol and Drugs*, 68(2), 208-219.

Toomey, T.L. & Wagenaar, A.C. (2002). Environmental policies to reduce college drinking: Options and research findings. *Journal of Studies on Alcohol*, Supplement 14, 193-205.

von Ranson, K.M., Cassin, S.E., Bramfield, T.D. & Fung, T.S. (2007). Psychometric properties of the Minnesota Eating Behavior Survey in Canadian university women. *Canadian Journal of Behavioural Science*, 39(2), 151-159.

von Ranson, K.M., Klump, K.L., Iacono, W.G. & McGue, M. (2005). The Minnesota Eating Behavior Survey: A brief measure of disordered eating attitudes and behaviours. *Eating Disorders*, 6(4), 373-392.

Walters, S.T. (2010). If the drinking age were lowered, what then? A view from the year 2010. *Journal of American College Health*, 58(6), 579-581.

Walters, S.T. & Baer, J.S. (2006). *Talking with college students about alcohol: Motivational strategies for reducing abuse*. New York: Guilford Press.

Walters, S.T. & Neighbors, C. (2005). Feedback interventions for college alcohol misuse: What, why and for whom? *Addictive Behaviors*, 30(6), 1168-1182.

Wechsler, H. & Nelson, T.F. (2008). What we have learned from the Harvard School of Public Health College Alcohol Study: Focusing attention on college student alcohol consumption and the environmental conditions that promote it. *Journal of Studies on Alcohol and Drugs*, 69(4), 481-490.

White, H.R. (2006). Reduction of alcohol-related harm on United States college campuses: The use of personal feedback interventions. *International Journal of Drug Policy*, 17(4), 310-319.

White, H.R. and Labouvie, E.W. (1989). Towards the assessment of adolescent problem drinking. *Journal of Studies on Alcohol*, 50(1), 30-37.

Whiteside, U., Cronce, J.M., Pedersen, E.R. & Larimer, M.E. (2010). Brief motivational feedback for college students and adolescents: A harm reduction approach. *Journal of Clinical Psychology*, 66(2), 150-163.

WHO (2010). *Mental health: strengthening our response.* Fact sheet No. 220. http://www.who.int/mediacentre/factsheets/fs220/en/.

WHO (no date). What is a health-promoting school? http://www.who.int/school_youth_health/gshi/hps/en/.

WHO ASSIST Working Group (2002). The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST): development, reliability and feasibility. *Addiction,* 97(9), 1183-1194.

Wiederman, M.W. & Pryor, T. (1996). Substance use among women with eating disorders. *International Journal of Eating Disorders*, 20(2), 163-168.

Wolfe, W.L. & Maisto, S.A. (2000). The relationship between eating disorders and substance use: moving beyond co-prevalence research. *Clinical Psychology Review*, 20(5), 617-631.

Woodside, B.D. & Staab, R. (2006). Management of psychiatric comorbidity in anorexia nervosa and bulimia nervosa. *CNS Drugs*, 20(8), 655-663.

Wu, L., Pilowsky, D.J., Schlenger, W.E. & Hasin, D. (2007). Alcohol use disorders and the use of treatment services among college-age young adults. *Psychiatric Services*, 58(2), 192-200.

Yager, Z. (2007). What not to do when teaching about eating disorders. *Journal of the HEIA*, 14(1), 28-33.

Yager, Z. & O'Dea, J. (2010). A controlled intervention to promote a healthy body image, reduce eating disorder risk and prevent excessive exercise among trainee health education and physical education teachers. *Health Education Research*, 25(5), 841-852.

Yager, Z. & O'Dea, J.A. (2008). Prevention programs for body image and eating disorders on university campuses: a review of large, controlled interventions. *Health Promotion International*, 23(2), 173-189.

Zamboanga, B.L., Horton, N.J., Tyler, K.M.B., O'Riordan, S.S., Calvert, B.D. & McCollum, E.C. (2007). The utility of the AUDIT in screening for drinking game involvement among female college students. *Journal of Adolescent Health*, 40(4), 359-361.

Zgierska, A., Rabago, D., Chawla, N., Kushner, K., Koehler, R. & Marlatt, G.A. (2009). Mindfulness meditation for substance use disorders: A systematic review. *Substance Abuse*, 30(4), 266-294.

Ziemelis, A., Bucknam, R.B. & Elfessi, A.M. (2002). Prevention efforts underlying decreases in binge drinking at institutions of higher education. *Journal of American College Health*, 50(5), 238-252.