Gender differences in alcohol prevention programming

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ABSTRACT

The purpose of this article is to describe a study of the outcomes of a school-based alcohol abuse prevention initiative. The initiative was focused on identifying, developing, disseminating, and evaluating information for high school students based on the school community needs. Student learning outcomes were measured using pre- and post-tests and focus groups.

Descriptive statistics were calculated for the pre- and post-tests as well as by gender. Through this study it was found that both females and males reported significant change in knowledge. Three main themes emerged from the focus groups with male students prioritizing different themes than female students. Implications for future programming keeping in mind gender differences are recommended. The method, data and findings are discussed along with implications for practice and future research.

Keywords: youth alcohol prevention, gender and alcohol prevention, school-based alcohol prevention

INTRODUCTION

Alcohol use tends to start in adolescence and continues to be the most frequently used controlled substance by Canadian young men and women (Health Canada, 2005). In fact, youth aged 15 to 24 years of age reported drinking alcohol, at heavy rates frequently, three times higher than adults aged 25 years of age and older (Health Canada, 2011). The *Canadian Addiction Survey* (2005) reported that 15% of women aged 18 and 19 years old reported heavy frequent drinking.

As a result of alcohol use, motor vehicular accidents remain the number one cause of death in youth (Saskatchewan Government Insurance, 2008). The early initiation of alcohol use by youth has been shown to be linked to binge drinking (Zakrajsek, 2006). The early use of alcohol is also associated with development of dependence and of various types of harm related with its use, including problems pertaining to physical, psychological, emotional, behavioural, social, spiritual, familial or legal issues (DeWit, Adlaf, Offord, & Ogborne, 2000; Poulin & Elliot, 2007). Regardless of age, the use of alcohol by women can present additional health challenges.

This article begins with an overview of the historical development of alcohol prevention programs. The article then provides an introduction to the case study including a brief description of the alcohol education resources that were developed and piloted in one Saskatchewan high school. Significant findings from this case study are then presented followed by implications for universal high school alcohol education programs. The outcomes of this case study support earlier findings that alcohol prevention programs may have differential effects for young men and women.

HISTORICAL OVERVIEW/LITERATURE REVIEW

Mrazek and Haggerty (1994) distinguished three types of prevention programs; universal, selective, and indicated. These three categories differ with respect to the intervention and target group. The most widely used and evaluated school programs for alcohol prevention are universal curriculum-based programs (Roberts, 2010). Universal programs target an entire population group and each member of this group is considered to benefit from the program. The aim of universal prevention programs is to prevent or delay young people from starting to drink alcohol (Foxcroft & Tsertsvadze, 2011). Selective programs "target subsets of the population whose risk of developing use is above average …" and "…identified by the presence of biological, psychological, social or environmental risk factors" (Roberts, pp. 24-25). Indicated programs target high-risk individuals who seem to be at risk of developing a disorder but who do not meet the criteria for diagnosis at this time.

Providing a thorough review of the literature on effective alcohol prevention programs is challenging due to the inconsistent nature in which programs have been evaluated. Various tools, instruments, scales and outcome definitions have been used in outcome measurement. In addition to these barriers, there is a general lack of clear information about the content of the interventions. Therefore, many literature reviews concluded with effective techniques and strategies versus effective programs. Nonetheless, universal programs have not been reported to be able to deliver programming that is effective for entire populations mainly because they are unable to tailor the content for youth with different needs or those at higher risk (Gottfredson & Wilson, 2003). It has been concluded that the best of universal curriculum-based programs are

modestly successful, with effects eroding after a year or two, and benefiting those least at risk (Gottfredson & Wilson, 2003; McBride, 2003). The most common positive effects of universal prevention programs focused solely on alcohol were observed for reductions in drunkenness and binge drinking. The duration of post-intervention impact for significant results ranged from 0 days to 2 years. In one trial (Morgenstern, 2009), the students reported significantly reduced risk of lifetime binge drinking at four month and 12 month follow-ups but not lifetime alcohol use or drunkenness. A more recent study evaluated 12-year-old European adolescents' (n=7079) patterns of alcohol use after they attended a new curricular-based program that focused on the social influences model (Caria, Faggiano, Bellocco, & Gallanti, 2011). The results from this trial suggested that the students were less likely to experience alcohol-related behavioral problems than those attending the usual school education; however, this program did not affect overall frequency of alcohol consumption. Two studies were conducted to determine program efficacy across both genders (Dielman, 1986) and results from one trial demonstrated that the program was more effective for females than males. More specifically, the program "was effective in decreasing average alcohol consumption, the frequency of drinking to excess, and the number of alcohol-related harms" for females (Vogl, Teeson, Andrews et al., 2009, p. 573). A recent review of the literature concluded, "it is not clear why some prevention interventions seem to work in some studies but not in others" (Foxcroft & Tsertsvadz, 2011, p. 14) concluding that more rigorous process investigation including specific content of the program being delivered and the context of their delivery is required.

Despite the serious consequences that can potentially face young men and women who consume alcohol, and along with the various outcomes used to evaluate the efficacy of alcohol prevention programs, few school-based prevention programs have been developed and evaluated considering gender-specific information.

PURPOSE OF THE STUDY

Findings from research that took place in four Saskatchewan schools in 2009 identified that the present Saskatchewan curriculum did not allow for adequate time to present information on alcohol prevention in an efficacious manner (Ogenchuk, 2010). In addition to this there were no specific resources available for teachers to utilize in conveying evidence-based practice. Students along with their teachers identified specific needs to improve programming that was consistent with the literature. The purpose of this case study research was to identify, develop, disseminate, and evaluate information for the prevention of alcohol abuse by high school students based on the school community needs for school-based professionals. Specifically this study aimed to assess the outcomes of the developed program by the use of: (1) a pre-assessment and post-assessment of students' learning and (2) student focus groups.

THE CASE: THE SCHOOL-BASED ALCOHOL ABUSE PREVENTION INITIATIVE

A school-based alcohol abuse prevention initiative was developed based on findings from a study entitled, "Grade 11 Students' Perceptions of Alcohol Prevention Programs" that explored students' perceptions (n=452) of alcohol prevention programs in four Saskatchewan high schools (Ogenchuk, 2010). The research findings from student surveys and focus groups revealed that the efficacy of alcohol prevention programs could be improved if more time and information was committed to these programs in the high school years. More specifically, the findings suggested

that student engagement might be improved by providing developmentally appropriate information and by using interactive methods including the opportunity to practice resistance skills. It was found that, after the grade 10 level, there was no formal program in place to offer the recommended information nor did students seem to be aware of how to access support services.

Utilizing an active research approach, the alcohol education resources were developed for the School-based Alcohol Abuse Prevention Initiative based on the above study findings. The main objective of this program was to increase the knowledge of high school students related to alcohol, the effects of alcohol on the body, legal implications of using alcohol, and the effects on family, friends, and society. As recommended by the literature, the content and timing of the program was tailored to the local youth drinking culture by using the data regarding student alcohol use collected in the above study (Roberts, 2010, p. 10).

The School-based Alcohol Abuse Prevention Initiative focused on delivering and evaluating interactive educational resources over one term of the school year in one particular school. The resources were web-based and included 5 lessons that met curricular outcomes of the class. The alcohol education resources were piloted in two grade 10 classrooms in one school (n_1=24, n_2=21). The lessons were completed in 5 to 6 hours of class time. Pre- and post- surveys were administered to the students in each of the two classrooms. Focus groups were also conducted with each of the classrooms. The data from the surveys and focus groups revealed significant findings to consider in future program planning in alcohol education.

METHODOLOGY

A mixed methods design was used in this case study. Typically case studies involve fieldwork whereby studying a phenomenon is done in its natural setting (Denzin & Lincoln, 2005). This case study took place in one school over one term. The intervention was delivered during the school day during scheduled Wellness classes. Pre- and post-tests were completed in the school prior to the intervention and following the intervention to collect the quantitative data and to provide insight into student learning. Student focus groups were conducted after the post-tests to collect the qualitative data and understand more about student perceptions. Teacher interviews followed the collection of student data in an attempt to understand the context in which student learning occurred.

Student sample

The study took place in a school situated in an affluent area of a city in Western Canada. The grade 9 to 12 school had an enrollment of 1200 students. This Collegiate consisted mainly of students from middle to higher income families, but the school had experienced a recent influx of immigrant families. The school provided a variety of supports and special needs students formed an integral part of this school population.

The students who attended the school were from the community itself. The survey sample was purposeful whereby students, who were in the class at the time and participating in the program, were invited to participate in the study. The size of the survey sample was limited to 49 participants (27 female; 22 male) from grade 10. The focus group participants were a subsample of the survey participants.

The two teachers that were involved in the study were the regular curricular teachers. The female participants were taught by a female teacher who had between 10 and 15 years of experience. A male teacher with between 20 and 24 years of teaching experience taught the male participants.

Research process

Following approval from the University Ethics Committee, permission was received from the director of education of the school district and the school principal to conduct this research study. The two teachers that were involved in teaching the program made arrangements for the researcher and research assistant to complete the pre- and post-testing. Data collection was completed over a one-month period. By choosing to complete the pre- and post-tests, the students consented to participate. Students were then invited to participate in focus groups and those participants who expressed an interest were required to sign additional consent forms. Parental consent was not required by the school district.

Two focus groups were conducted: one focus group was conducted with a group of female participants and the second focus group was conducted with a group of male participants. Participants were informed about the purpose of the focus group, the procedure for data collection, reporting, and storage. The participants' rights of confidentiality and their right to withdraw at any time were explained. Transcribed interviews were provided to the teachers, who in turn, made the transcripts available to the participants, so that the participants were able to clarify, add to, or delete from their words to portray the most precise account of the information they shared. The participants were asked to respect confidentiality of the members by not disclosing the contents of the conversation outside the group.

Analysis of quantitative data

Participants responded to a questionnaire consisting of nine items relating to alcohol knowledge, five individual items assessing perceived degree of risk associated with various aspects of alcohol use, four items related to perceived confidence in obtaining support for not drinking, and four items related to perceived confidence in resisting drinking. The alcohol knowledge items were scored as incorrect or correct and were summed to create a nine-item Alcohol Knowledge Scale. The four items related to perceived confidence in obtaining support for not drinking and the four items related to perceived confidence in resisting drinking were summed to create separate Support and Resistance subscales. Descriptive statistics were calculated for all individual items and for the scales at both the pre-intervention time point and at post-intervention as well as by gender. Internal consistency values were computed for the Support and Resistance subscales. Factorial ANOVA's were conducted to examine if there were any statistically significant differences in Alcohol Knowledge, Support, Resistance, and Risk items by time period (i.e., pre/post intervention), gender, or an interaction between gender and time period.

Analysis of focus group data

The focus groups were audio taped, transcribed into paper format, and printed as hard copies. The focus group data were analyzed using the data analysis spiral (Creswell, 2007). The

transcripts were read several times before ideas and quotations were categorized, which emerged based on the interview questions. There were three focus group questions: (a) what students liked about the program; (b) what students didn't like about the program; and (c) what students would like to change about the program.

FINDINGS

As indicated in Table 1 of the Appendix, results showed that the scores on the Alcohol Knowledge Scale ranged from 0 to 9 at both pre-intervention and post-intervention time points. Higher knowledge scores indicated more alcohol knowledge and both males and females in the post-intervention group appeared to score higher than those in the pre-intervention group. Internal consistency values (as measured by Cronbach alpha) for the Support and Resistance subscales were calculated. With the exception of the Support subscale at the pre-intervention time point (Cronbach alpha = .596), results suggested good internal consistency (i.e., >.70; Nunnally, 1978) for the subscales (Support post intervention= .767; Resistance pre-intervention = .772; Resistance post-intervention = .757). It appears as if participants interpreted the item "I am confident that I can get my friends to support me if I choose not to drink" differently than other Support items referencing teachers, parents, and professionals at the pre-intervention but not at the post-intervention time point. Scores on the Support subscale ranged from 8 to 36 pre-intervention and from 9 to 36 for both genders at post-intervention. Scores on the Resistance subscale ranged from 4 to 36 pre-intervention and 9 to 36 post-intervention.

Results of the factorial ANOVA for Alcohol Knowledge demonstrated that only the group variable was statistically significant ($F_{(1,90)}$=7.26; p=.008) with students in the post-intervention group scoring significantly higher on the Alcohol Knowledge scale post-intervention (M=8.04; SD=1.50) than pre-intervention (M=7.10; SD=1.74).

Results of the factorial ANOVA's for the risk questions indicated that gender was statistically significant for "trying one or two drinks once" ($F_{(1,88)}$=3.04; p=.085), "taking four or five drinks nearly every day" ($F_{(1,88)}$=3.87; p=.052), "having one or two drinks nearly every weekend" ($F_{(1,89)}$=9.58; p=.003), and "having five plus drinks nearly every weekend" ($F_{(1,89)}$=6.58; p=.012). Females reported "trying one or two drinks once" as significantly more risky (M=1.45; SD=1.01) than males (M=1.10; SD=0.94). In addition, females reported "having one or two drinks nearly every weekend" (M=2.14; SD=0.78) as significantly more risky than males (M=1.67; SD=0.72) and also reported "having five plus drinks nearly every weekend" (M=3.04; SD=0.89) as significantly more risky than males (M=2.64; SD=0.53). However, males reported "taking four or five drinks nearly every day" (M=2.98; SD=0.16) as significantly more risky than females (M=2.82; SD=0.48).

Results of the factorial ANOVA for the second risk question indicated that there was a statistically significant interaction between gender and group at the .1 level ($F_{(1,89)}$=3.46; p = .066). At pre-intervention, female students reported taking "one or two drinks nearly every day" as being more risky than males but following the intervention, males reported this behavior as being more risky than females.

Results of the factorial ANOVA for the Support subscale demonstrated that gender was statistically significant at the .1 level ($F_{(1,89)}$=3.83; p = 053) with females reporting significantly more perceived confidence in obtaining support for not drinking (M=29.82; SD=6.64) than males (M=27.00; SD=7.64). Results of the factorial ANOVA for the Resistance subscale indicated that there was a statistically significant interaction between gender and group at the .1 level

($F_{(1,86)}$=3.18; p = .078). Although both males and females scored approximately the same on the resistance scale at pre-intervention, male scores decreased substantially at post-intervention while female scores increased at post-intervention.

Focus Group Results

Three main categories emerged from the focus group data. The first category referred to new insights and pertained to the knowledge that students identified as new learning due to the program. The second category involved comments on the program itself and how to improve the program while the third category focused on overall comments and changes that should be considered to improve the program.

The themes that emerged under the first category of "New Insights" differed slightly for male and female participants. Themes emerging from the male focus group included: (1) Community – the effect of irresponsible underage drinking on the community. Incidents affect people beyond the friends and family; (2) Consequences – the results of underage drinking; and (3) Safe Ride Home – the importance of finding a safe ride home. The new insights that emerged from the female focus group included: (1) Effects of alcohol on the body; (2) Consequences – the results of underage drinking; and (3) Safe Ride Home – the importance of finding a safe ride home.

Several themes emerged under the category, "Improvements and Changes to the Program", including having speakers come in and talk about their experiences, the addition of more hands-on, practical activities that can be accomplished by role playing or by putting the "kids in the situation … and see what they will do", and to make the program even longer. The students agreed that although the Alcohol Prevention Program fit into their Wellness curriculum (a Grade 10 health-related subject matter class), the researchers could also consider including the program as part of an English course. Students were also in agreement that "one of the videos did not seem real", and that a separate module on "drinking and the law' should be added to the program.

The final theme pertained to comments about the program in general. Results showed that participants felt that Grade 10 was a perfect time to receive the alcohol prevention information. Additional comments suggested that all students should be receiving this information and that having input from the teens should continue to be included in the process of establishing the program. In general, the male participants wanted more information on the effects of alcohol on their body and less information on the percentage of alcohol in different types of drinks. In contrast, the female participants were unaware of the amount of alcohol there was in different types of alcoholic products and wanted this portion of the program to remain unchanged. The male participants would have liked more information on the legal aspects of drinking.

DISCUSSION

The nine item Alcohol Knowledge scale appears to be an appropriate assessment of students' knowledge of alcohol. Students tended to score higher on the Alcohol Knowledge scale following the intervention. As no significant gender differences were identified at either pre or post-test, these results suggest that the current intervention works equally well for both males and females. However, future research should ensure that students are tracked across time through the use of a unique identifier in order determine whether the intervention is efficacious.

Due to the low internal consistency value calculated for the Support subscale at the pre-intervention time point and the possibility that participants interpreted the first Support item differently than the remaining items, future research should consider revising the content of the items and possibly developing additional Support items to address this lack of reliability. Focus group interviews could also ask participants how they interpreted these items and if their interpretations changed over time. Following the item modifications and additions, further evidence of content validity could be collected through the use of content experts.

The five individual items designed to assess students' perceived degree of risk associated with various aspects of alcohol use demonstrated gender differences in students' perceptions. Female students tended to perceive lower risk drinking behaviours such as "trying one or two drinks once" as well as higher risk drinking behaviours such as "having one or two drinks nearly every weekend" or "having five plus drinks nearly every weekend as significantly more risky than males. These results suggest that, for the most part, females consider alcohol behaviours to be more risky than males, except for the stereotypical heavy daily drinker. It is possible that the stereotypical "heavy daily drinker" is the only drinking stereotype males identify with when they think of risky drinking. Future focus group research should probe male adolescents further about their perceptions of "risky" drinking.

The intervention did appear to affect the perception of risk for males on one item. Males appeared to change their perception of the risk factor involved with "drinking one or two drinks a day" following the intervention by rating the item as significantly more risky post-intervention, while females appeared to rate the same item as less risky following the intervention. As females tended to rate all perception of risk items higher than males, it is probable that the observed .2 decrease in perceived risk for females is a product of the responses rather than a general trend for females. Future research should replicate this study using a larger sample of participants and the ability to track participants individually.

More research is also required on the impact of the intervention on students' resistance scale scores. Although both males and females scored approximately the same on their perceived ability to resist alcohol prior to the intervention, following the intervention females tended to increase their ability to resist alcohol while males' ability to resist alcohol appeared to decrease. These results are preliminary. Providing students with a unique identifier in order to link students and thus more appropriately determining change over time is recommended. Increasing the sample size in the future would also contribute to the generalizability of the findings.

Overall the data collected in the focus groups suggested that despite specific recommendations such as including guest speakers and lengthening the program itself, the web-based method of intervention was viewed favorably. However, each of the focus groups prioritized the content of the program differently. These preliminary findings suggest that prioritizing the information and/or the amount of time dedicated to these components could be adjusted according to gender needs. The female students in this specific group of participants wanted more program content on how much alcohol was in various products and how alcohol affected their bodies. Although the male participants wanted more information on how alcohol affected their bodies, they reported finding the information on the ramifications of irresponsible drinking on the community extremely useful and informative. Male students in this study did not feel the need to learn about how much alcohol was in different products as they reported being familiar with this information already. Segregating programs by gender would allow for individualized needs to be met. Based on the results of this study, gender specific program

delivery for alcohol prevention appears to engage students and allow students to enter into discussion based on common interests.

Limitations of this study include a small sample size being used for this pilot project. Another limitation was that a unique student identifier was not utilized. The use of unique identifiers would aid in evaluating educational success as well as tracking longitudinal data.

IMPLICATIONS AND FUTURE RESEARCH

Adolescent alcohol use continues to be a public health issue in Canada, whereby 15% of females aged 15 to 24 report alcohol consumption in excess of the Canadian guidelines (Adlaf, Begin & Sawka, 2005). The heightened vulnerability of young women to adverse medical and social consequences of alcohol brings an added concern to the issue of alcohol use in youth and supports the need to tailor programs to address these needs.

Notable gender differences in the physiological effects of alcohol exist; women tend to be more susceptible than men to health problems associated with heavy drinking (Greenfield, 2002). Women metabolize alcohol differently than men. More alcohol that is consumed enters the bloodstream in women than in men, leading to women suffering the effects of alcohol more quickly than their male counterparts and leaving women at risk for accelerated development of long-term health problems such as, the development of osteoporosis (Sampson, 2002), breast cancer (Reichman, 1994), cirrhosis of the liver (Deal & Gavaler, 1994), and alcohol-induced brain damage (Hommer, 2008). Additional gender-specific risks of underage alcohol use include unwanted and unplanned pregnancy due to unplanned sex and intoxication can leave women more vulnerable to sexual assault, date rape, and unprotected sex (Abbey, 2002). Women who drink progress more rapidly than their male counterparts to serious alcohol related physical and social consequences and these consequences could occur with "lower doses of alcohol consumed less frequently" (Greenfield, 2002). These facts coupled with the young age in which adolescent women are initiating alcohol consumption comprise a dangerous combination on their health. Alcohol use by girls can more quickly change to abuse than boys, and indicates that although screening and early intervention are important for all individuals, they may be particularly important for women.

Along with the gender differences and physiological changes that adolescence brings, prevention programs need to recognize additional challenges that exist for girls. Girls are more likely than boys to be sexually or physically abused or having eating disorders which heighten the chances for substance abuse (The Nation Centre on Addiction and Substance Abuse and Columbia University, 2003). In addition, girls are more likely than boys to use alcohol to boost their mood and enhance sex.

Adolescence is a critical time for prevention and education on alcohol use to occur and can contribute to behavior change before use can intensify and become problematic. Moreover, education at this time provides vital opportunities to encourage delaying the use of alcohol thereby decreasing the risk of addictions later in life and associated health problems. Delaying the onset of use can also delay all potential risks associated for young women when using alcohol.

With any health issue, accuracy of information is not the only component to successful programs but is a key variable whereby the level of education and timing are significant factors. The findings to date in this pilot study suggest that it is necessary to consider level and timing of information in alcohol education programs specifically keeping gender in mind. Considerable

gaps exist in the knowledge of the level, type, and impact of alcohol use and the adequacy of programming for young men and women. It is worthwhile to further evaluate gender specific school-based alcohol prevention programming in order to assist youth in making healthy well-informed choices about their use of alcohol and to decrease the harms of its use.

CONCLUSION

In this case study, a school-based alcohol abuse prevention initiative utilized an active research approach to develop, disseminate, and evaluate resources for the prevention of alcohol abuse by high school students in one Western Canadian high school. The quantitative findings from this case study suggest that the intervention was successful for increasing knowledge in both male and female participants. The evaluative tool also appeared to be successful in measuring the risk perception in females and the program appeared to improve resistance skills in female participants. The qualitative data suggested that the delivery of content on gender-based alcohol education yielded considerable benefits. The male participants identified relevant topics that differed from the female participants and changes to the program that were identified were also specific to gender. Advantages to providing the content in gender specific classrooms allow the teacher the flexibility to tailor the content level and improve its relevance to the students. For alcohol prevention programming to be effective, it is important for all students to understand the risks of alcohol use and how to prevent harm to themselves and others. Future research needs to include student specific markers to enhance measurement of student learning and to provide longitudinal data. Including behavioral measurements such as the amount of student alcohol consumed and rates of student drinking and driving are important measurements in determining the effects of the program on student behavior. Increasing the sample size is necessary for this research to have implications at the population level.

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APPENDIX

Table 1. Subscale scores pre and post-intervention

Alcohol Knowledge Scores						
	Pre-intervention			**Post-intervention**		
Gender	**Range**	**Mean**	**SD**	**Range**	**Mean**	**SD**
Male	4-9	7.24	1.18	0-9	7.77	1.93
Female	0-9	7.00	2.09	6-9	8.29	0.95
Support Subscale Scores						
	Pre-intervention (α =.596)			**Post-intervention (α =.767)**		
Gender	**Range**	**Mean**	**SD**	**Range**	**Mean**	**SD**
Male	8-36	26.00	7.46	9-36	27.36	7.97
Female	9-36	28.31	7.34	9-36	31.46	5.48
Resistance Subscale Scores						
	Pre-intervention (α =.772)			**Post-intervention (α =.757)**		
Gender	**Range**	**Mean**	**SD**	**Range**	**Mean**	**SD**
Male	20-36	29.33	4.76	9-36	26.68	6.92
Female	4-36	28.88	6.92	16-36	31.32	5.99