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Propensity of Alcohol Establishments to Sell to Obviously Intoxicated Patrons

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Abstract

Background: Although it is illegal to sell alcohol to an individual who appears obviously intoxicated, several recent studies show that the propensity of these types of sales is high. Our study further assesses the propensity of alcohol establishments to sell alcohol to obviously intoxicated patrons. In addition to providing more recent data (2001) on pseudo-intoxicated purchase attempts at Midwestern on-premise establishments, our study examines the association between establishment policies/practices and the likelihood of sales to intoxicated patrons.

Method: We hired professional actors to feign intoxication while attempting to purchase alcohol (pseudo-intoxicated patrons) at 231 bars and restaurants, and we conducted a phone survey of owners/managers of each establishment. Our dependent variable was purchase attempt outcome (alcohol sold vs not sold). Our independent variables included policies/practices of establishments and characteristics of buyers/servers, establishments, and neighborhoods.

Results: Pseudo-intoxicated patrons were able to purchase alcohol in 65% of their attempts. Multivariate analyses showed the following: (1) compared with establishments with beer- and/or wine-only licenses, establishments with full liquor licenses were less likely to sell to intoxicated patrons; (2) establishments with average length of employment among managers of at least 1 year were more likely to sell to obviously intoxicated patrons; and (3) establishments that held staff meetings at least once a month were less likely to sell to obviously intoxicated patrons. Neighborhood characteristics were not associated with our outcome in multivariate analyses.

Conclusions: Our findings provide increased evidence of the need to address the illegal sale of alcohol to intoxicated patrons, particularly given that increased intoxication levels among patrons resulting from these types of sales can lead to alcohol-related problems.

Keywords

Alcohol; Illegal Sales; Policies; Alcohol Establishments

ALCOHOL CONSUMPTION IS linked to a myriad of negative consequences such as traffic crashes, drownings, and physical and sexual assaults (Driscoll et al., 2004; Martin et al., 2004; NHTSA, 2005). In recent years, increased attention has been directed to the many problems associated with “high-risk” drinking—consuming a large amount of alcohol in a short period of time (sometimes referred to as “binge” drinking). High-risk drinking is likely to result in intoxication, potentially increasing the risk of experiencing negative consequences. Servers and sellers of alcohol may increase the likelihood of these negative consequences by serving alcohol to individuals who are already intoxicated. Although it is illegal to sell alcohol to an

individual who appears obviously intoxicated, several recent studies have shown that the propensity of these types of sales is high (Freisthler et al., 2003; Toomey et al., 1999, 2004, 2005).

Researchers have assessed the likelihood of sales to obviously intoxicated persons through purchase attempts by pseudo-intoxicated patrons—actors who feign intoxication while attempting to purchase alcohol. Freisthler et al. (2003) conducted purchase attempts at 135 on-premise establishments (e.g., bars, restaurants) across several neighborhoods in Sacramento, California, and found that pseudo-intoxicated buyers were able to purchase alcohol in 58% of their attempts. Male servers and servers who appeared to be below the age of 30 were more likely to serve alcohol to intoxicated patrons. Illegal sales were also more likely at establishments located in neighborhoods with a large percentage of Hispanic residents, in neighborhoods with a higher number of outlets within 500 m and in neighborhoods with a high population density; neighborhoods with a higher percentage of African Americans were less likely to sell alcohol to pseudo-intoxicated patrons. Factors tested that were not associated with likelihood of selling to intoxicated patrons included establishment characteristics (e.g., exterior condition; business type) and other neighborhood characteristics from the U.S. Census (percentage of residents living in poverty, percentage who had moved within the last 5 years, and percentage who were foreign born).

Three additional studies were conducted in the Mid-western United States. In 106 purchase attempts across 24 bars in 1 metropolitan area in 1997, pseudo-intoxicated buyers were able to purchase alcohol in 62% of their attempts (Toomey et al., 1999). In a larger study in 1999 that included 372 off-premise establishments (e.g., liquor stores, grocery stores) and on-premise establishments in 11 communities, 79% of the establishments sold alcohol to the patrons (Toomey et al., 2004). Servers who appeared less than 31 years old were 2.7 times more likely to sell than those who appeared age 31 years or older and sales were 1.7 times more likely to occur at off-premise establishments than at on-premise establishments. Gender of the server and all other establishment characteristics tested (e.g., exterior maintenance, warning signs posted) were not related to likelihood of sales. In the third study, the propensity to sell to obviously intoxicated patrons was evaluated at 50 community festivals (Toomey et al., 2005). Pseudo-intoxicated patrons purchased alcohol in 89% of their 95 attempts. Server characteristics (age, gender) and festival characteristics (e.g., number of people attending, number of alcohol booths) were not associated with propensity to sell to intoxicated patrons; however, festivals with more alcohol policies in place had higher sales to the pseudo-intoxicated buyers.

Our study further assesses the propensity of alcohol establishments to sell alcohol to obviously intoxicated patrons. In addition to providing more recent data on pseudo-intoxicated purchase attempts in a larger sample of Midwestern on-premise establishments, our study examines the possible role of establishment policies and practices in sales to intoxicated patrons. We conducted a phone survey of owners and managers of the alcohol establishments. We also include a larger variety and number of independent variables than in previous studies, allowing us to further our understanding of factors associated with the propensity to sell to intoxicated patrons. Our results will not only more clearly define the extent of the problem of illegal sales to obviously intoxicated persons, but also provide insight into the policies and practices of alcohol establishments pertaining to these sales.

METHODS

In this study, we present results from analysis of baseline data of the Alcohol Risk Management (ARM) Trial—a pre-post randomized intervention study assessing a training program for owners and managers of licensed alcohol establishments. We collected data through pseudo-

intoxicated purchase attempts and a survey of managers at on-premise alcohol establishments in one large Midwestern city in 2001. Both data collection protocols were approved by the University's Internal Review Board.

Alcohol Establishments

We obtained the full list of on-premise alcohol establishments from the city licensing bureau ($n = 350$). We randomly selected 258 of the 350 to recruit for participation in the full-randomized ARM trial—the sample size was determined based on our power calculation for the trial. Of the 258, 27 refused to participate in the training intervention, bringing our final sample for baseline analyses to 231. Establishments were located in 60 of the 84 neighborhoods throughout the city.

Purchase Attempts

We hired professional actors to feign intoxication while attempting to purchase alcohol. We selected actors following an audition process in which they demonstrated their ability to appear obviously intoxicated. The actors were judged by a panel that included persons with experience in the alcohol industry. We hired 14 actors (7 female; 7 male), ranging in age from 21 to 64 years old (mean age = 48 years old).

A team of 2 people (1 buyer, 1 observer) conducted each purchase attempt. One attempt was made at each establishment. Buyers followed a standardized, well-tested protocol employed in previous studies (Toomey et al., 1999,2004). All buyers attended a training to improve consistency of acting skills and to learn study protocols. Buyers demonstrated signs of intoxication (e.g., stumbling, being uncoordinated, slurring speech) throughout each purchase attempt—beginning when they were in sight of the establishment and continuing until seated in the car following the purchase attempt. If an establishment had a bar, the purchase attempt was made at the bar; if the establishment did not have a bar, the purchase attempt was made while seated at a table. Buyers asked for single vodka, after asking what types of beer were available on tap (if liquor was not available, buyers ordered beer). If buyers were asked whether they were driving, they responded “My buddy is driving,” and if asked whether they had been drinking, they responded “I’ve had a few beers.” If the buyer was served, he/she stared at the drink for a short time, proceeded to the bathroom, and then left the establishment. If the buyer was not served, he/she did not argue or attempt to persuade the server and quietly left the establishment. The observers positioned themselves near the buyers so they could observe all interactions between the buyers and others. The observers ordered a nonalcoholic beverage. Following the purchase attempts, the buyer and observer returned to their vehicle and drove to a safe, well-lit area to fill out data forms.

Telephone Survey of Managers

We invited a manager or owner of each of the 231 establishments to participate in a telephone survey. We asked to speak with the owner or manager responsible for policy decisions for that establishment. Our response rate for the survey was 91% (210/231)—125 managers and 80 owners (5 identified themselves as “other”). The survey consisted of 80 items, primarily pertaining to general and alcohol-specific establishment policies and practices. The surveys were conducted by the Data Collection and Survey Services center at the University of Minnesota. Each survey took approximately 15 minutes to complete.

Variables

The dependent variable was purchase attempt outcome (1 = alcohol sold; 0 = alcohol not sold). We measured independent variables based on items from data collection forms and telephone surveys, our buyer/establishment database, the 2000 U.S. Census, and information provided

by city offices. We obtained 3 independent variables from buyer forms—server perceived age (<30 years; ≥30 years), server's gender, and quality of establishment (upscale vs moderate or downscale)—and 4 from observer forms—area (residential vs down-town), number of customers (1 to 5 scale: 1 = not crowded, few people; 5 = very crowded, many people), signs posted warning against sales to intoxicated patrons (yes, no), and number of intoxicated customers (none vs few or many). We chose all of these independent variables based on results of previous studies and/or because conceptually they were likely to be associated with sales to intoxicated patrons.

We obtained numerous independent variables from the telephone survey pertaining to policies and practices regarding alcohol service. We analyzed individually those policy/practice variables that we hypothesized were most likely to be associated with sales to intoxicated patrons, but also included several variables in 2 indices. We created an index of 7 items that pertain to general alcohol policies/practices (e.g., managers required to attend training), and an index of 9 items that pertain to intoxicated patrons (i.e., preventing sales to, reducing the number of, or handling intoxicated patrons). We chose items for each index based on likelihood of affecting responsible alcohol service, and then tested the correlation between items using Cronbach's α (general index: $\alpha = 0.62$; intoxicated patrons index: $\alpha = 0.64$). For policies/practices that promote responsible alcohol service (e.g., servers required to attend training), 1 point was scored if the establishment had the policy, and for policies/practices that detract from responsible alcohol service (e.g., discounts on drinks offered), 1 point was received if the establishment did not have the policy/practice.

We analyzed individually those items that we initially chose for a policy/practice index but that we did not include in indices because they did not strengthen the correlation of the indices, including the following: (1) staff meetings held at least once a month; (2) rules/guidelines for serving alcohol discussed at staff meetings; (3) obviously intoxicated patrons not allowed in bar/establishment; (4) food menu available at all times; and (5) manager on duty >75% of time.

We analyzed as independent variables 8 additional items from the telephone survey pertaining to establishment characteristics thought to be associated with sales to intoxicated customers: (1) how long the respondent worked for/owned the business (>2 vs ≤ 2 years); (2) how long the business had been in operation (>5 vs ≤ 5 years); (3) whether the establishment is a member of a professional organization (yes, no); (4) average length of employment among staff (>1 vs ≤ 1 year); (5) average length of employment among management (>1 vs ≤ 1 year); (6) percentage of revenues from the sale of alcoholic beverages (>50% vs ≤ 50%); and (7) maximum occupancy of the establishment.

Based on results of our previous studies, we chose 3 independent variables from our buyer/establishment database: gender of buyer, age of buyer (<21 years, 21-30 years, >30 years), and license type (beer/wine only vs full liquor). We also included 6 neighborhood demographics from the 2000 U.S. Census as independent variables, which we measured as 3- or 4-level variables: (1) percentage of residents living in poverty (<10, 10-20, >20); (2) percentage of owner-occupied households (<25, 25-50, 50-75, >75); (3) percentage of female-headed households (<5, 5-15, >15); (4) percentage of black and/or Hispanic/Latino residents (<10, 10-20, 20-30, 30-40, >40); (5) percentage of adults in management or professional occupations; and (6) total population (≤ 3,600, 3,601-4,600, 4,601-7,000, >7,000). Another neighborhood variable, population per square mile (<10,000, 10,000-20,000, >20,000), was constructed using U.S. Census data and land area data obtained from city. Finally, the number of alcohol establishments per roadway mile (<1, 1-4, >4), as obtained from the city licensing department, was another independent variable. We selected our demographic variables based on the study by Freisthler et al. (2003), but included additional variables to expand our understanding of the associations between neighborhood characteristics and sales to intoxicated patrons.

Analysis

We calculated overall sales rates to our pseudo-intoxicated patrons across all establishments, as well as rates at full liquor versus beer- and/or wine-only establishments. Following univariate analyses of our independent variables, we conducted bivariate analyses between our dependent variable, purchase attempt outcome, and each independent variable. The independent variables that had a significant association with the dependent variable using the liberal criteria of $p \leq 0.20$ were included in our multivariate analyses (although the specific level of $p \leq 0.20$ was arbitrary, we chose a liberal value so that no important independent variables were screened out, while at the same time eliminating those independent variables with clearly no association with the outcome). We conducted backward stepwise regression for multivariate analyses, retaining all independent variables significant at $p \leq 0.05$. We ran 4 separate models initially, grouping similar characteristics: (1) observed establishment characteristics (from data collection forms); (2) reported establishment characteristics (from telephone surveys); (3) policies/practices (including the 2 indices); and (4) neighborhood characteristics. We then combined variables from each of the 4 parsimonious models into 1 final model. We used SAS PROC MIXED to assess all initial multivariate models, and estimated our final model using SAS PROC GLIMMIX, which is designed specifically for non-Gaussian outcomes (SAS, 2004).

In addition to our primary analyses, we ran bivariate analyses of our purchase attempt outcome variable and the variable (from observer forms) indicating whether the server made some indication that he/she noticed the actor's intoxicated behaviors (e.g., made a comment about the intoxication).

RESULTS

Pseudo-intoxicated buyers were able to purchase alcohol in 65% of their attempts. Among those establishments with full-liquor licenses, 59% of the attempts resulted in a sale, and among beer/wine-only establishments, 77% resulted in sale. The average score for the general policy/practice index was 4.7 (range = 1-7), and the average score for the index pertaining to intoxicated patrons was 5.4 (range 2-9). Other univariate results of our independent variables are summarized in Table 1.

Bivariate Analyses

Many of our independent variables were significantly associated ($p \leq 0.20$) with purchase attempt outcome in bivariate analyses (Table 1). Establishments with full liquor licenses, those that were upscale, crowded at the time of purchase attempt, had signs posted warning against sales to intoxicated patrons, or had at least 50% of revenues from alcohol sales were less likely to sell alcohol to intoxicated patrons. Establishments that had alcohol promotions displayed, those where the owner or manager had owned managed the business for over 2 years, and those where the average length of employment among staff and management was more than 1 year were more likely to sell to intoxicated patrons.

Policies/practices that were associated with a decreased propensity to sell to intoxicated patrons were requiring staff and management to attend alcohol service training, prohibiting obviously intoxicated patrons from entering the establishment or bar, and holding staff meetings at least once a month. Establishments that had discussions at staff meetings about rules/guidelines for serving alcohol had an increased propensity to sell to intoxicated patrons. Three neighborhood characteristics were associated with propensity to sell to see intoxicated patrons; however, none of these relationships were linear. Neighborhoods with the highest as well as those with the lowest percent of residents living in poverty were more likely to sell to intoxicated patrons. Similarly, neighborhoods with the highest and those with the lowest percentage of owner-

occupied households were more likely to sell to intoxicated patrons. Neighborhoods with the higher population counts tended to have a higher propensity to sell to obviously intoxicated patrons, but this was not a clearly linear relationship.

Multivariate Analyses

Across the 4 separate multivariate models, 3 variables met our significance criteria of $p \leq 0.05$ following backward stepwise regression (Table 2). From the establishment characteristics models, both the full liquor license and the average length of employment among management variables remained statistically significant. From the policies and practices model, the staff meeting variable remained significant. None of the variables in the neighborhood characteristics model were statistically significant at the $p \leq 0.05$ level. The 3 significant variables in the individual models all remained statistically significant in the final, combined model (Table 2). Establishments with full liquor licenses have odds of selling to intoxicated patrons that are 1.2 times lower than establishments with beer- and/or wine-only licenses; establishments with average length of employment among managers of at least 1 year have odds of selling to intoxicated patrons that are 1.2 times higher than establishments where the average length of employment was less than 1 year; establishments that held staff meetings at least once a month have odds of selling to intoxicated patrons that were 1.2 times lower than establishments that held staff meetings less frequently.

Additional Analyses

Servers who made some indication that they noticed the actors' intoxicated behaviors (e.g., made a comment about his/her intoxication) were significantly less likely, compared with servers who did not make any indication of noticing the behaviors, to sell to the actors—45% of servers who noticed sold alcohol to our actors and 98% of servers who did not notice sold to our actors ($p < .0001$). Overall, 59% of servers noticed the intoxication behaviors of our actors.

DISCUSSION

As in previous studies in other cities, we found that licensed alcohol establishments have a high propensity to sell alcohol to obviously intoxicated patrons (65%). These sales rates are similar to the rates found in studies in the 1990s of sales to underage patrons, which led to increased efforts to reduce alcohol sales to youth and a subsequent reduction in sales rates to youth. Given the potential for increased alcohol-related problems with alcohol sales to intoxicated patrons, such as assaults and traffic crashes, increased efforts are needed to reduce these types of sales.

Even though full-liquor license establishments were somewhat less likely to sell to intoxicated patrons, their sales rates were still high (59%) and should not be ignored, given that they are probably the type of establishments most likely to encounter obviously intoxicated patrons. Establishments with beer- and/or wine-only licenses were more likely to sell to intoxicated patrons, perhaps because sales of alcohol may not be their primary focus and/or they do not regularly encounter obviously intoxicated patrons. Despite the difference in sales rates to these 2 types of establishments, interventions to reduce the high sales rate in both are needed.

We found that only 1 type of establishment policy/practice was associated with sales to obviously intoxicated patrons—holding staff meetings at least once a month was associated with a reduced propensity to sell to intoxicated customers. This relationship is as we predicted, as our ARM training program recommends frequent staff meetings as a strategy to increase responsible alcohol sales practices in licensed establishments. We did not, however, predict that establishments that had an average length of employment among management of over 1

year (vs $1 \leq \text{year}$) would be more likely to sell to intoxicated patrons. One explanation of this finding is that management may initially be more cautious of following alcohol sales laws and then perhaps become somewhat lax once they are comfortable in their position. In addition, servers may be more cautious in following rules with a new manager because it is unknown how the managers will react to selling alcohol to intoxicated patrons.

We also found that 59% of the servers noticed the patrons' intoxicated behavior, and these servers were much less likely than servers who did not notice to sell alcohol to the actor. This provides evidence that our actors were, indeed, convincing in their portrayal of intoxicated persons. However, we found that even when the servers appeared to notice that the patron was acting intoxicated, they still served the patron approximately 50% of the time, providing further indication of the need to increase awareness of and decrease the frequency of this type of illegal sale.

Unlike Freisthler et al. (2003), we did not find neighborhood characteristics to be significantly associated with propensity to sell alcohol to obviously intoxicated patrons. Similarly, although Freisthler and colleagues found that younger servers were more likely to sell to obviously intoxicated patrons—a finding similar to previous studies of propensity to sell to underage patrons—we did not find that the apparent age of the server was associated with propensity to sell to obviously intoxicated patrons.

Despite our study's valuable findings, it does have several limitations. The study was conducted in only 1 city and in only on-premise licensed establishments, which limits our ability to generalize our findings to other cities and other types of establishments and venues; however, we would not expect the establishments in our study to differ substantially from establishments in other cities. The study is also cross-sectional, which prevents making causal inferences. However, our full randomized ARM intervention trial, for which analyses are currently under way, is a longitudinal study with multiple purchase attempts and pre-post manager/owner surveys.

Our findings provide increased evidence of the need to address the illegal sale of alcohol to intoxicated patrons. The increased intoxication levels among patrons resulting from these types of sales can obviously lead to various alcohol-related problems. Further studies are needed in other geographic areas to assess the generalizability of these findings. More research is also needed to determine the best types of interventions to reduce the propensity to sell to obviously intoxicated patrons, such as server/management training programs and increased enforcement measures.

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Table 1

Univariate and Bivariate Results

Independent variable	Univariate	Bivariate	
	Percent of group	Direction	p-Value
Server characteristics			
Gender (male)	54	NS	0.6035
Perceived age (30 years and over)	45	NS	0.4207
Buyer characteristics			
Gender (male)	57	NS	0.8118
Age (over 50 years)	46	NS	0.8625
Observed establishment characteristics			
Full liquor license (vs beer-wine only)	69	-	0.0061
Upscale (vs moderate or downscale) ^a	29	-	0.1037
Crowded	31	-	0.0852
Residential	63	NS	0.2341
No intoxicated customers (vs few or many)	81	NS	0.6804
Warning signs posted: no sales to intoxicated patrons	5	-	0.1982
Alcohol promotions displayed ^a	18	+	0.1870
Reported establishment characteristics			
Owned/managed business > 2 years	75	+	0.1771
In operation at present location >5 years	70	NS	0.8751
Member of association	76	NS	0.9426
Average length of employment among staff > 1 year	75	+	0.1943
Average length of employment among management > 1 year	87	+	0.0149
Revenues from alcohol sales >50% ^a	32	-	0.0921
Maximum occupancy <300 ^a	84	NS	0.7559
Establishment policies/practices			
Manager on duty >75% of time	92	NS	0.6982
Staff required to attend alcohol service training	83	-	0.1513
Managers required to attend alcohol service training	83	-	0.0634
Staff meetings held at least once a month	50	-	0.0045
Rules/guidelines re: alcohol service discussed at staff meetings	94	+	0.1162
Overserving of alcohol discussed at staff meetings	77	NS	0.8120
Cutting off service to intoxicated patrons discussed at staff meetings	85	NS	0.7219
Food menu available at all times	85	NS	0.7062
Obviously intoxicated patrons not allowed into the establishment/bar	88	-	0.1456
	Mean (range)	Assn.	p-Value
Neighborhood characteristics (across 60 neighborhoods) ^a			
Owner-occupied households	34% (3%-91%)	NL	0.0938
Female-headed households	7% (0%-32%)	NS	0.3432
Residents living in poverty	18% (0%-51%)	NL	0.0664
Adult residents in management or professional occupations	44% (17%-73%)	NS	0.6382
Black and/or Hispanic/Latino residents	21% (2%-67%)	NS	0.3963
Total population	5,554 (128-19,805)	NL	0.1233
Population per square mile	14,047 (563-37,963)	NS	0.4717
Alcohol establishments per roadway mile	1.8 (0.6-4.8)	NS	0.2549

NL, nonlinear association; NS, not significant.

^a Analyzed as continuous variable in bivariate and multivariate analyses.

Table 2
Intermediate and Final Multivariate Models: Significant Variables ($p \leq 0.05$)

Intermediate models	Significant variables	Estimate	<i>p</i> -Value
Observed establishment characteristics	Full liquor license	-0.1869	0.006
Reported establishment characteristics	Average length of employment among management >1 yr	0.2454	0.015
Establishment policies/practices	Staff meeting held ≥ 1 month	-0.1895	0.004
Neighborhood characteristics	None	—	—

Final model	Significant variables	Estimate (SE)	<i>p</i> -Value	Odds ratio(95% CI) ^a
	Full liquor license	-0.1851 (0.0701)	0.009	0.831 (0.722, 0.956)
	Average length of employment among management >1 year	0.1994 (0.0981)	0.043	1.221 (1.003, 1.485)
	Staff meeting held ≥ 1 month	-0.1917 (0.0651)	0.004	0.825 (0.725, 0.940)

CI, confidence interval.

^a Odds ratio computed by transforming estimate and standard error from log scale.