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Factors associated with over-serving at drinking establishments

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ABSTRACT

Aims: To address characteristics of drinking establishments, bartenders and patrons that may affect the likelihood of over-serving.

Design: A systematic examination of 425 purchase attempts with pseudo-intoxicated patrons enacting scripts that, according to the law, should lead to the denial of alcohol sales.

Setting: Drinking establishments in the three largest cities in Norway were visited by male and female actors aged 20-30 years on weekend nights.

Measurements: Over-serving was recorded when the pseudo-intoxicated patron was served alcohol. Characteristics of the drinking establishment, the bartender and the pseudo-intoxicated patron were systematically recorded.

Results: Pseudo-intoxicated patrons were served in 347 of 425 purchase attempts (82%). In bi-variate analyses, over-serving rate increased with venue characteristics, music/noise level and intoxication level among patrons. These factors were inter-correlated and correlated with poor lighting. Over-serving rate was also higher when the pseudo-intoxicated patron was female and when the purchase attempt occurred after midnight. In multi-variate analyses, two factors increased the likelihood of over-serving significantly: a high problematic bar indicator score (poor lighting, high music/noise level and high intoxication level among patrons) (adjusted OR=3.5, 95% CI = 1.9 , 6.4) and female gender of pseudo-intoxicated patron (adjusted OR=2.6, 95% CI=1.4 , 4.7). The rate of over-serving was 95% when both risk factors were present and 67 % when both factors were absent.

Conclusions: In the Norwegian intoxication oriented drinking culture, over-serving occurs frequently, even in the absence of risk factors such as poor lighting, loud music and high intoxication level among patrons.

Keywords: Drinking establishments, night-time economy, over-serving, pseudo-patrons

INTRODUCTION

Many countries have laws that prohibit the serving of alcohol to intoxicated patrons [1-3]. However, the laws regulating the serving of alcohol to intoxicated patrons of bars and restaurants are not rigorously enforced [1, 3-6], and various server training programmes (Responsible Beverage Service, RBS programmes) have been adopted. Despite widespread implementation, these programmes are mostly ineffective at preventing alcohol sales to intoxicated patrons [7-9]. Thus, despite prohibition and server training programmes, customers who are clearly intoxicated are likely to be served [2, 10-18]. In the following, we refer to this as over-serving.

A knowledge basis to develop more effective strategies to prevent over-serving is warranted, but so far, the factors associated with over-serving have not been well studied. A recent systematic review of the effects of interventions on licensed drinking establishments [19] included 24 primary studies that addressed over-serving, 19 of which assessed whether staff members served alcoholic beverages to seemingly intoxicated patrons. The rate of over-serving in these studies ranged from 53% to 96%, with the exception of one study that had a rate of 30%. Twelve of the 19 studies explored factors associated with over-serving, and nine studies identified one or more factors associated with over-serving. These factors were mainly characteristics of the drinking establishments and the bartenders. Some studies have found that over-serving is more likely to occur later in the evening and in drinking establishments with mainly young guests [20], in venues with a bouncer present, and in venues with a generally high level of intoxication among the guests [17]. Bartender characteristics that have been found to increase the likelihood of over-serving include being male [14, 17] and young [14, 16]. Some of these findings were also reported in a previous systematic review [21], although they were not entirely consistent. Few studies have addressed whether patron

characteristics (e.g. gender or age) are associated with over-serving and, to our knowledge, no study has found any such association.

Recently, Hughes and her colleagues [18] found that the rate of over-serving increased in a linear fashion with a composite measure of poorly managed and problematic bars that included indicators such as the age of the bar staff, cleanliness of the bar, crowdedness, noise level, and age and drunkenness of the customers. Although many studies have found that these factors are associated with violence and disorderly behaviour in bars [21-23], few studies have found them to be associated with over-serving. A possible explanation for this mismatch between findings may be shortcomings in the previous studies of risk factors for over-serving. First, in many of the studies, few or none of these indicators were examined with respect to their impact on over-serving. Second, the vast majority of these studies had small sample sizes, which implies insufficient statistical power to detect substantial risk differences. Finally, the research designs of previous over-serving studies in most cases have not made sure that bartenders can recognize intoxication [2]. In general, intoxication is not always visible even to trained observers [24] and an experimental study revealed that bartenders had difficulties recognizing intoxication [25]. Thus, previous reports of over-serving may have been upward biased. Moreover, bartenders' awareness of intoxication is likely to depend on factors such as lighting, noise levels, crowdedness, and the general level of intoxication of the patrons, which implies that the few previously reported associations between these factors and over-serving may be inflated.

In this study, we attempt to overcome these shortcomings when addressing factors associated with over-serving in Norway. The Norwegian Alcohol Act prohibits serving alcohol to intoxicated patrons, and the enforcement of this prohibition is administered at the municipal level. RBS programmes have been established in many Norwegian cities and they have mainly not been found to have any effect on over-serving [26], with one possible

exception in Oslo [27]. Moreover, the Norwegian drinking culture is liberal, in the sense that visible intoxication is often accepted and even expected [28]. Norway has a reputation for heavy and boisterous drinking behaviour [29], and this seems to be reflected in the nightlife atmosphere in which bartenders allow high levels of intoxication [13].

Against this backdrop, we assessed whether and to what extent characteristics of drinking establishments, bartenders, and patrons may affect the likelihood of over-serving in Norway. These characteristics include the following; type of venue, presence of a bouncer, queue, crowding, intoxication level, music level, lighting, bartender's gender and age, and patron's gender.

METHODS

Sample

As with most previous studies of over-serving [19, 30], we examined purchase attempts by seemingly intoxicated pseudo-patrons in licensed drinking establishments. The dataset was compiled from three evaluation studies of Responsible Beverage Service programmes in the three largest cities in Norway: Trondheim in 2004 (n = 50) and 2006 (n = 49) [31], Bergen in 2006 (n = 55) [32], and Oslo in 2011 (n = 89), 2012 (n = 92), and 2013 (n = 90) [33]. In all, the data comprise 425 purchase attempts at 153 venues. Previous reports based on these data have only addressed the possible effects of RBS programmes on over-serving [26, 31-33].

The purchase attempts were performed on Fridays and Saturdays between 9 p.m. and 3 a.m. (closing time). The pseudo-patrons visited all drinking establishments in the centre of Bergen and Trondheim. In Oslo, 49 venues were selected in two areas of the city centre, and each venue was visited at least twice each year.

Recruitment and training of pseudo-intoxicated patrons

In each city, we used four young adults with theatre background, both male and female and between 20 and 30 years of age, as pseudo-patrons, all together nine different actors. One actor participated in all data collections, six actors participated in 2 or 3 data collections and two actors took part in one data collection. The same research group was responsible for the study design and data collection in the three evaluation studies, which ensures comparability of the data.

The actors rehearsed different ways to express intoxication. Based on the existing literature [10, 34-36] signs of intoxication were divided into three categories: gross motor skills, fine motor skills, and speech/facial expression. Each category contained several indicators of intoxication, and the actors were instructed to use multiple indicators from each of the categories.

In each city, an expert panel consisting of police officers, liquor inspectors, special consultants, and bartenders assessed the level of intoxication enacted in various scenes and then chose a scene that clearly qualified for denial of service. The rehearsal of this scene was filmed to help standardize the measurements.

Members of the research team observed the performances in approximately one-third of the test purchases and assessed whether the actors adhered to the script and whether the performances were similar across cities and time. In a few cases, the actors deviated from the script and they were asked to adjust their performances accordingly.

Procedure

The purchase attempts were scripted to be sure that they met the legal criteria to trigger the denial of service. McKnight [4] argued that the law prohibits service to *visibly* intoxicated customers and thus it is the visible signs of intoxication (whether actual or simulated) to which servers must respond.

The actors performed in pairs, one appearing to be clearly intoxicated, and the other sober, in order to create a contrast that would better illustrate the drunken behaviour. The gender composition of pairs was two males for 30% of the purchase attempts, two females for 30% of the attempts, and mixed gender pairs for 40% of the attempts. The actors dressed as many young adults do when they go out to a club or a bar: the girls wore make-up and high heels, and the boys wore jeans and a shirt. The same script was used in all purchase attempts, with only minor variations to adapt to the different contexts. For instance, to avoid being denied entry from establishments with a bouncer, the pseudo-patrons restricted their intoxicated behaviour as they passed the bouncer. The performance began inside the venue, where the pseudo-intoxicated actor had difficulty walking and often leaned on his/her sober friend. The actor staggered towards the bar and did something to make sure they had the bartender's attention, such as asking, 'Do you serve beer here?' or 'How much is a beer?' with slurred speech and displaying other clear signs of drunken behaviour. The actor leaned on the bar, lost his/her grip and fell together, and spent time finding money. When the pseudo-intoxicated actor had attracted enough attention from the bartender, he/she ordered a beer with slurred speech. The sober companion asked for a glass of water. If the pseudo-intoxicated actor was served alcohol, he/she discreetly got rid of the drink and both actors left the venue. When service was denied, both actors left quietly without arguing.

The project is approved by the Norwegian Social Science Data Services (NSD) (Approval number 28178). The NSD assesses research projects in various disciplines, including social sciences, and ensures that the subjects' rights are safeguarded [37].

Measurements

The actors filled out a registration form for each purchase attempt and gave their assessments of the venue and bartender characteristics. The form was developed over time. The first registration form was based on similar studies in Sweden [35] and new variables were added

in 2006. In 2011, the form was based on a schedule developed by Graham *et al.* [38], which Hughes and her colleagues [39] also used.

Over-serving was recorded when the pseudo-intoxicated patrons were served alcohol.

Characteristics of the drinking establishment included: type of venue (bar/nightclub); presence of a bouncer (yes/no); queue outside the premises (yes/no); crowding (little/medium/crowded); intoxication level of guests (low/moderate/high); music level (low/medium/high); and lighting (brightly lit/medium/dark). The last three variables corresponded to some of those previously used by Hughes *et al.* [18] and were included in a sum-score of *problematic bar indicators* (PBI, range 0–6). This variable was truncated into low (0-1), medium (2-3), and high (4-6) score and in multi-variate analyses used as a dichotomous measure; low/medium score (0-3) vs. high score (4-6).

Characteristics of the bartender included gender and approximate age. Age was dichotomized (under vs. over 30 years).

The gender of the pseudo-intoxicated patron and the sober companion was also recorded.

Statistical analyses

A sample size of 142 is required to detect a relative risk of 1.3 and achieve a power of 0.80 and thus our data set had the capacity for both stratified analyses and multi-variate analyses. Bivariate associations between over-serving and characteristics of the venue, the bartender, and the patrons were analysed by cross-tabulations and tested with Pearson's chi-square and estimated in logistic regression models as odds ratios with 95 % confidence intervals. Inter-correlations between explanatory variables were estimated with Spearman's rho. Possible interactions between explanatory variables were explored in stratified cross-tabulations and tested in logistic regression models. Next, the likelihood of over-serving was analysed in conventional multi-variate logistic regression models. Explanatory variables that were

associated with over-serving in bi-variate analyses ($OR > 1.3$) were included based on model fit criteria (log likelihood ratio). Finally, multi-level logistic regression analysis was conducted to examine possible indirect effects of the city/time-level, applying robust standard errors.

RESULTS

The pseudo-intoxicated patrons were served in 347 of 425 purchase attempts (82%). The service rate varied between cities and years, from 74% (Trondheim, 2004) to 93% (Oslo, 2011). Over-serving was more likely at late hours (after midnight), in venues where most patrons were clearly intoxicated, in venues where the music level was high, and when the pseudo-intoxicated patron was female (Table 1). The first three variables were positively and moderately inter-correlated (Spearman's rho, 0.27–0.50), and they were positively and moderately correlated with lighting level (Spearman's rho, 0.14–0.36). In other words, high intoxication level among patrons tended to occur later at night in poorly lit establishments with loud music. Moreover, the likelihood of over-serving increased significantly with the number of problematic bar indicators (PBI score), implying an additive effects of problematic bar indicators on likelihood of over-serving (Table 1). Several factors were not significantly associated with likelihood of over-serving. These included: whether there was a queue outside, whether or not a bouncer was present, crowding inside the venue, whether there was a queue at the bar, and bartender's gender and approximate age.

Next, we explored whether venue characteristics interacted with bartender or patron characteristics and no statistically significant interactions were observed. Finally, we estimated the associations between venue characteristics, patrons' gender and likelihood of over-serving in multi-variate logistic regression models. Two explanatory variables; presence of bouncer and purchase attempt after midnight, were not included in the models as they did not contribute statistically significantly to model fit. In the multilevel model, the city/year

variable was estimated as random effect and the two other explanatory variables; gender of pseudo-patron and problematic bar indicator score were estimated as fixed effects. In the conventional logistic regression model all three variables were included (and thus estimated as fixed effects). While the standard errors of the estimates and the constant varied between these two models, as could be expected, the parameter estimates for problematic bar indicator score and gender of pseudo-patron were quite similar. Thus, the likelihood of over-serving increased significantly when the venue had a high problematic bar indicator score and when the pseudo-intoxicated patron was female. Notably, the rate of over-serving was 95% when both risk factors were present, but even in the absence of both risk factors the rate of over-serving was as high as 67 %.

DISCUSSION

This study adds to the sparse literature on factors associated with over-serving alcohol. The rate of over-serving in three Norwegian cities was 82 %. The likelihood of over-serving was higher in the presence of problematic bar indicators (poor lighting, high music level, and high intoxication level among patrons) and when the pseudo-intoxicated patron was female.

The high rate at which pseudo-intoxicated patrons were served in this study is in line with findings from many previous studies [15-17, 40, 41], but it was also higher than what has been reported in some studies [2, 8, 36, 42]. Our observation of a higher service rate later at night is consistent with previous observations [17, 20, 43], as was the increased likelihood of over-serving with greater intoxication level of other patrons [17, 43, 44] and with high music (or noise) level [18]. Consistent with Hughes *et al.* [18], we found that over-serving was associated with a sum-score of indicators of problematic bars.

To our knowledge, this is the first study that has demonstrated an association between gender of the pseudo-intoxicated patron and over-serving. Most previous studies have used male actors [30] or they did not address gender differences or report the gender of the actors,

whereas two studies found no significant association between patron gender and over-serving [45, 46]. Similarly, an Australian study [47] found no statistically significant gender difference in survey respondents' reports of servers intervening when the respondents showed signs of intoxication at drinking establishments. However, despite our large sample of purchase attempts, we did not find statistically significant associations between over-serving and some factors that were previously reported to be significant, such as the presence of a bouncer [17, 18, 43], queue at the bar [43], crowding [46], and the age and gender of the servers [14, 15, 17, 43, 46].

Several factors may explain the high rate of over-serving we observed in Norwegian bars and pubs. First, the cultural context of serving is characterized by liberal norms for intoxication and a broad acceptance of drunkenness. Bartenders and other employees in the hospitality industry tend to drink frequently and heavily [48, 49], including at work [50], and bartenders who drink heavily are more likely to serve intoxicated customers [51]. Thus, a social environment characterized by heavy drinking at work and during leisure time probably helps to normalize high levels of intoxication, which in turn may influence over-serving. Second, and related to this, is the overall intoxication level of the patrons. We found that a high intoxication level among patrons was associated with over-serving and the widespread occurrence of intoxicated patrons may be regarded in the context of the intoxication-oriented Norwegian drinking culture. Similar observations were reported in studies from Finland [17, 43], which is also perceived as an intoxication-oriented culture [52, 53]. We may assume that when most or all of the customers in a bar are intoxicated, intoxication is the norm and therefore rejection of service to most or all customers becomes very difficult. A third possible explanation is that denial of service could impose additional use of time on busy staff and increase the risk of confrontations that could spoil the convivial atmosphere [41]. Fourth, in the context of our study and similar studies, reluctance to refuse service is also understandable

because the pseudo-patrons were not causing problems, they were spending money. Finally, several studies [4-6, 54, 55] have emphasized that even though the law prohibits service to intoxicated customers, there is almost no enforcement of the law. The issue has low priority by governments, and because it is difficult and expensive to prove over-serving, such cases are rarely brought to court [4-6].

The likelihood of over-serving varied with factors related to the serving conditions that could hamper the bartender's ability to assess the intoxication level of the customers. Consistent with previous studies [20, 46], we found that a high noise level and low lighting increased the likelihood of over-serving. In a recent qualitative study, bartenders attributed over-serving to hectic working conditions, loud music, and many guests [13].

Strengths and limitations

The large number of observations in this study compared with most previous studies of this kind allowed for more detailed analyses and a lower risk of missing important associations due to insufficient statistical power. Consistent with the argument of Gosselt *et al.* [2], our study design increased the likelihood that the bartenders were actually aware of the actors' apparent state of intoxication. Moreover, the presence of the observers in one-third of the purchase attempts made it possible to provide feedback to adjust the apparent intoxication level and to standardize the performances.

Several limitations should be noted. First, the registration form changed over time and thus there are missing observations for some of the variables. Second, we have few observations between 2 a.m. and 3 a.m. in Bergen and Trondheim, which reduced the power for the test of association between time of night and over-serving. Third, the characteristics of the drinking establishments were assessed by the actors, and these assessments were not systematically evaluated. However, observers from the research team also assessed these characteristics in approximately one-third of the purchase attempts, and discrepancies

between the actors' and the observers' assessments were rare. Fourth, this study design was based on an assumption that sober patrons are not denied service and all purchase attempts were enacted applying the (approximately) same high intoxication level. Thus, the rates of service in the absence of any signs of intoxication cannot be tested and the observed over-service rates could be inflated. Finally, to some extent the actors adapted the script to the different contexts. Especially when the venue was crowded, the actors occasionally acted even more intoxicated to make sure that the bartender noticed the signs of intoxication. This may have increased the likelihood of service denial and thereby reduced the association between crowding and over-serving.

Implications

Serving alcohol to intoxicated patrons contributes to excessive consumption and increases the risk of acute harm to these patrons and others [1, 27]. The development of more effective strategies to prevent such harm may benefit from better knowledge about the factors that facilitate over-serving. Poor lighting and loud music are not only common characteristics of bars and pubs; they probably contribute to difficult working conditions that reduce a bartender's ability to assess patrons' intoxication levels and to interact effectively with intoxicated guests. Thus, working conditions that increase bartenders' opportunities to refuse drunken guests, such as brighter and less noisy bar areas, need to be considered.

More studies are needed to evaluate the possible effects of changing venue characteristics, to develop and evaluate more effective server training programmes, and to assess whether enhanced law enforcement will have an impact on the serving of intoxicated patrons.

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Table 1 Associations between likelihood of over-serving and characteristics of venue, server, and pseudo-patron

Characteristics	Valid observations	Over-serving n (%)	Odds ratio (OR)	95% confidence interval	Odds ratio (OR)	95% confidence interval
Time at night						
Before midnight	135	105 (78)	1.0		1.0	
After midnight	240	205 (85)	1.7	1.0, 2.9	1.7	1.0, 3.0
Queue outside						
No	236	197 (84)	1.0		1.0	
Short/long	35	27 (77)	0.7	0.3, 1.6	0.7	0.3, 1.6
Bouncer present						
No	85	68 (80)	1.0		1.0	
Yes	241	202 (84)	1.3	0.7, 2.4	1.4	0.7, 2.6
Queue at the bar						
No	200	166 (83)	1.0		1.0	
Short/long	125	103 (82)	1.0	0.5, 1.7	1.0	0.6, 1.9
Number of guests						
Small	74	61 (82)	1.0		1.0	
medium	148	120 (81)	0.9	0.4, 1.9	0.9	0.4, 1.8
Many	104	89 (86)	1.3	0.6, 2.9	1.2	0.5, 2.7
Level of intoxication						
Low	101	71 (70)	1.0		1.0	
Medium	211	171 (81)	1.8	1.0, 3.1	1.9	1.1, 3.3
High	110	103 (94)	6.2	2.6, 15.0	6.1	2.5, 14.8
Lighting						
Good	29	21 (72)	1.0		1.0	
Medium	202	202 (81)	1.6	0.7, 3.9	1.9	0.8, 4.6
Poor	124	124 (85)	2.2	0.9, 5.5	2.4	0.9, 6.1
Music/noise level						
Low	69	43 (62)	1.0		1.0	
Medium	179	145 (81)	2.6	1.4, 4.8	2.7	1.4, 5.1
High	175	157 (90)	5.3	2.7, 10.5	5.7	2.7, 11.8
Number of indicators of problematic bar						
0–1	51	33 (65)	1.0	1.1, 5.6	1.0	
2–3	150	113 (75)	2.5	1.7, 10.0	1.7	0.9, 3.6
4–6	218	197 (90)	4.1		5.6	2.6, 12.1
Server gender						
Male	199	166 (83)	1.0		1.0	
Female	127	104 (82)	0.9	0.5, 1.6	0.9	0.5, 1.6
Server age						
> 30 yrs	78	64 (82)	1.0		1.0	
< 30 yrs	240	201 (84)	1.1	0.6, 2.2	0.9	0.7, 1.2
Pseudo-patron gender						
Male	183	140 (77)	1.0		1.0	
Female	175	154 (88)	2.3	1.3, 4.0	2.3	1.3, 4.2

Table 2. Estimated associations between venue and patron characteristics and likelihood of over-serving in multilevel and conventional logistic regression models

	Multilevel logistic regression model					Conventional logistic regression model				
	Estimate	Cluster-robust SE	T-ratio	P-value	Odds Ratio (95 % CI)	Estimate	SE	T-ratio	P-value	Odds Ratio (95 % CI)
Problematic Bar Indicator, high score	1.23	0.12	10.24	<.001	3.4 (2.7 , 4.3)	1.25	0.31	4.02	<.001	3.5 (1.9 , 6.4)
Gender pseudo-intoxicated patron	0.91	0.14	6.28	<.001	2.5 (1.9 , 3.3)	0.94	0.31	3.04	.002	2.6 (1.4 , 4.7)
Constant	0.63	0.30	2.13	.033		0.52	0.47	1.09	.274	
City/year	Random effect					Fixed effect				