Policies on smoking in the casino workplace and their impact on smoking behaviour among employees: Case study of casino workers in Macao

Abstract

Exposure to second hand smoke (SHS) is a major health concern, contributing to a range of adverse health effects. Workers in the hospitality industry are often exposed to increased levels of SHS in the workplace, and casino workers in particular have been shown to be exposed to high levels of SHS. During the past decade, authorities worldwide have introduced smoke-free legislation in enclosed public places, primarily to protect workers from the harmful effects of SHS. Importantly, implementation of smoke-free workplace policies are also associated with decreased prevalence of smoking among workers. This study sought to examine the smoking behaviors of casino workers in Macao, and explore how workplace smoking policies might affect that behavior. The study found that a majority of casino workers who smoked believed that exposure to SHS at work makes it harder to quit smoking, while over a quarter minded people smoking near them at work because of that reason. Over half of the workers believed that they would try to quit smoking if no-one was allowed to smoke in their workplace. At present, a number of jurisdictions, including Macao, have sought to exclude casinos from comprehensive smoke-free legislation. Our findings demonstrate how smoke-free casinos could lead to a healthier workforce, not just due to reduced exposure to dangerous chemicals in SHS, but also from the potential reduction in smoking among workers. The hospitality industry, and policy makers in government, should ensure that casinos, and their workforce, are not excluded from smoke-free legislation.

Key words: casinos, second hand smoke, smoke-free legislation, smoking cessation.

Introduction

Exposure to second hand smoke (SHS) is a major health concern, contributing to a range of adverse health effects for both smokers and non-smokers (U.S. Department of Health and Human Services, 2004). During the past decade, authorities worldwide have introduced smoke-free legislation in enclosed public places, primarily to protect workers from the harmful effects of SHS. These measures have resulted in significant improvements in the health of workers (Allwright *et al.*, 2005; Farrelly *et al.*, 2005). Implementation of smoke-free workplace policies are also associated with decreased prevalence of smoking among workers (Fichtenberg and Glantz, 2002). Despite the considerable efforts devoted to reducing exposure to SHS in recent years, there continues to be less attention on hospitality employees, such as casino workers, who are often most heavily exposed to SHS at work. The hospitality industry has traditionally opposed smoke-free legislation, due to concerns that banning smoking would affect their business (Dearlove *et al.*, 2002; Drope *et al.*, 2004). Indeed, a number of jurisdictions have sought to exclude casinos from comprehensive smoke-free legislation. For instance, smoking is allowed in the VIP areas of Australian casinos, and some states in the US have excluded casinos from smoke-free legislation (Berman and Post, 2007; Blumenfeld, 2006; Hyland *et al.*, 2003). In Atlantic City, New Jersey, authorities reversed the city's smoke-free policies for casinos, following a 5% drop in revenue (Goldstein, 2007).

This paper reports on a study that examined the issue of exposure to SHS in the workplace among casino workers in Macao. Macao has been called the 'Monte Carlo of the Orient' and the 'Las Vegas of the East' and is the only territory under Chinese administrative control in which gambling is legally permitted (Macao has been a Special Administrative Region (SAR) of the Chinese Government since 1999). The casino gaming sector is a main pillar of the local economy, contributing more than 50% of Macao's Gross Domestic Product (GDP) and 70% of government revenue (The Statistics and Census Service, 2009). Gaming

revenues reached a record high of US$10.33 billion in 2007, which far exceeds the US$6.6 billion made on the Las Vegas strip in that year (Central Intelligence Agency, 2011). At present, 45,621 people are employed in Macao's gaming industry, accounting for about 14% of the total employed population (The Statistics and Census Service, 2009). China itself is the world's largest cigarette consumer and producer (Mackay *et al.*, 2006). In contrast to many other industrialized nations where smoking prevalence is declining, few Chinese people fully appreciate the harm associated with smoking (Yang *et al.*, 1999) and few intend to quit (Yang, 2001). There are also indications that the relapse rates are high (Yang *et al.*, 2006).

Macao has proposed legislation that restricts smoking in workplaces, including making a number of workplaces smoke-free. However, under current proposals, smoking will continue to be allowed in up to half the gaming floor area of casinos. The proposed tobacco bill, which will come into effect in January 2012, allow one extra year to casino to set up the designated smoking areas. A previous paper which outlined the attitudes of the casino workers in Macao towards smoking policies, found that the majority of workers disliked SHS exposure at work, recognised that such exposure is harmful to their health, supported the establishment of separate smoking and non-smoking areas for customers and wanted greater restrictions than those that exist at present (Wan and Pilkington, 2009). This paper, using data from the same study, examines the smoking behaviour of casino workers in Macao, and explores how workplace smoking policies might affect that behaviour. Hospitality management has a duty of care towards their employees, and this includes providing a safe and healthy working environment. It is important therefore to examine not only the direct health impacts of exposure to SHS in the workplace, but also how employees' believe they may be helped to become healthier through measures such as smoke-free policies.

Literature review

Exposure to SHS amongst hospitality workers

Exposure to SHS is a major health concern. The World Health Organization estimates that there will be 10 million deaths annually by 2020 if the current smoking trend continues (WHO, 2005). Half the people that smoke today will eventually be killed by tobacco (WHO, 2005). Smoking can cause cancer of the lungs, larynx, esophagus, mouth and bladder and contributes to cancer of the cervix, pancreas, and kidneys (U.S. Department of Health and Human Services, 2004). Exposure to SHS is also harmful to human health. Non-smokers have been shown to be exposed to the same carcinogens as active smokers, and second-hand smoke causes the same health problems as direct smoking, including lung cancer, cardiovascular disease and such lung ailments as emphysema, bronchitis and asthma (International Agency for Research on Cancer, 2002). Lifelong non-smokers with partners who smoke in the home have a 20-30% greater risk of lung cancer and an approximately 25% greater risk of heart disease than do non-smokers who live with other non-smokers (Office of Surgeon General, 2006). Non-smokers exposed to cigarette smoke in the workplace also have a 16-19% greater chance of developing lung cancer (Sasco, Secretan and Straif, 2004). Frequent exposure to SHS also increases the risk of less serious, but nonetheless troubling symptoms, such as sore eyes and throat and lower respiratory tract irritation that results in coughing (Siegel, 1993).

Workers in the hospitality industry, especially those in the restaurant, bar and gambling sectors have the highest rates of exposure to SHS of all occupational groups (Cameron *et al*., 2003; Wakefield *et al*., 2005). A study carried out amongst Australian union members found that 56% of hospitality workers reported being exposed to SHS during a typical work day, compared with only 11% of workers in the community, property and manufacturing industries (Cameron *et al*., 2003). Studies measuring the cotinine levels (an

indicator of SHS exposure) in such workers have found higher than average levels of exposure amongst bar workers in the UK and US, casino employees and waiters in the US, restaurant personnel in Finland and hospitality workers in New Zealand (Bates *et al*., 2002; Jarvis *et al*., 2001; Johnson *et al*., 2003; Trout *et al*., 1998).

A particularly high risk of SHS exposure and its related illnesses has been found amongst gaming workers (American Cancer Society, 2008; Teeters *et al*., 1995; Trout *et al*., 1998). The National Institute for Occupational Safety and Health (NIOSH) conducted a health hazard evaluation of casinos in Atlantic City and found that cotinine levels amongst their employees were 1.85 nanograms per millilitre (ng/mL), which are exceptionally high when compared to surveys of other workers (Trout *et al*., 1998). The prevalence of respiratory and sensory irritation symptoms amongst casino employees is also reported to be generally higher than those amongst bar workers (Pilkington *et al.*, 2007). The particularly high level of exposure to SHS among casino workers does not appear to be related to prevalence of smoking among casino customers, as this has been shown to be similar to the general population (Pritsos *et al.*, 2008). One possible reason for the higher level of SHS exposure among casino workers is that such workers usually work long shifts in smoky environments that often have little or no natural or articulated ventilation (Pilkington *et al.*, 2007). The poor indoor air quality in casinos has been associated with lower levels of worker productivity and job satisfaction and with depression and aggression (Frey and Carns, 1988; Darcy and Lester, 1995) and increased stress (Posner *et al.,* 1985).

Hospitality industry's response to SHS

In recent years, the hospitality industry has tried to accommodate both smoking and non-smoking customers by establishing smoking and non-smoking areas (Drope *et al.*, 2004). As noted previously, this is partly due to fears that smoke-free policies would affect business.

There is evidence that these fears were stoked by the tobacco industry, who sought to promote accommodation as preferable to smoke-free (Drope *et al.,* 2004). The accommodation approach, however, is considered ineffective. This is primarily because when a single ventilation system serves both types of areas, smoke migrates to nonsmoking areas (Drope *et al.,* 2004). As noted by Morrison (1993), when one person smokes in an enclosed space, everyone smokes.

Installations of systems which aim to reduce the negative impacts of SHS to casino workers are also found to have limited utility. For example, the introduction of "air curtains" (air directed upward from a vent in the gambling table situated between the employee and the customers) by the Crown Casino in Melbourne, Australia, claimed to protect employees from exposure to SHS, were not effective at removing SHS from the atmosphere (Wakefield *et al*., 2005).

Exposure to SHS is not only harmful to the health of casino employees and customers. Casino operators are increasingly faced with legal liability for failing to provide a smoke-free environment, resulting in increased operational costs. For example, in New South Wales, an employee successfully received a total of AUD $85,000 compensation for working in a tobacco smoke workplace that exacerbated her asthma condition (Anon, 1992). Similarly, a casino worker in London also received a payout of over 50,000 pounds sterling from a casino company due to the development of asthma which was caused by exposure to SHS at work (BBC News Online, 2003). These cases suggest that casino operators should deal with SHS very carefully in order to prevent costly litigation.

Impacts of workplace smoking bans

As noted previously, the primary purpose of smoking restrictions in the workplace is to protect workers from exposure to SHS. Indeed, evaluation of smoke-free legislation has

found significant improvement in workers' health following the introduction of bans on smoking in the workplace, with reductions in respiratory and sensory irritation symptoms (Allwright *et al.,* 2005; Eisner *et al.,* 1998; Farrelly *et al.,* 2005; Hahn *et al.,* 2005; Palmersheim *et al.,* 2006). However, workplace smoking bans can also influence the behaviour of smokers (Brownson *et al.,* 1997). The introduction of totally smoke-free workplaces are associated with reductions in prevalence of smoking among workers, fewer cigarettes smoked per day per continuing smoker, and increased intention to quit smoking (Brownson *et al.,* 2002; Chapman *et al.,* 1999; Fichtenberg and Glantz, 2002; Gilpin *et al.,* 1999; Gottlieb *et al.,* 1990; Jeffery *et al.,* 1994; Owen and Borland, 1997). Smoking restrictions policy also sends a message that smoking is not socially acceptable (Borland *et al.,* 1999). Smoke-free workplaces therefore protect workers from the negative health effects of SHS and at the same time create an environment that encourages smokers to cut back or quit.

Smoking cessation

There is consistent, strong evidence that quitting smoking results in improved health (Bolliger, 2000; Garfinkel and Stellman, 1988; World Health Organisation, 2003). For example, a reduction in smoking has a positive influence on certain cardiovascular risk markers and quality of life (Bolliger *et al.,* 2002), reduction in cancer risks (Pulerà *et al.,* 1997) and giving birth to a higher birth-weight baby among pregnant women (Li *et al.,* 1993).

While smoking cessation is the best way to prevent the health risks related to tobacco use, it can be extremely difficult to quit smoking due to the addictive properties of nicotine (World Health Organisation, 1996; World Health Organisation, 2003). Various surveys from around the world indicate that approximately one third of smokers attempt to quit each year, however only a small percentage of these are successful (World Health Organisation, 2003). There is some evidence that reduction provides an alternative route to complete cessation,

especially for those smokers who are not ready or willing to quit (Ruiz *et al.,* 1998). Several studies have suggested that smoking reduction may be an effective step towards cessation (Bolliger *et al.,* 2000; Hughes *et al.,* 1999).

The World Health Organisation recommends that supportive environments are developed, to give smokers the best chance at quitting. These supportive environments include not only access to smoking cessation aids such as Nicotine Replacement Therapy, but also provision of smoke-free environments (World Health Organisation, 2003).

Research questions

Based on the literature reviewed, the research questions for this study were stated as:

RQ1: What are the current smoking policies in casinos in Macao, and what is the level of exposure to SHS among workers?

RQ2: What is the current smoking behaviour among casino workers in Macao?

RQ3: How do smokers who work in casinos feel that workplace smoking policies affect their smoking behaviour?

Methodology

The questionnaire and survey

The questionnaire for the study was created by Pilkington et al. (2007) for their study of London casino workers. The tool focused on smoking policies in the respondent's workplace, attitudes towards the smoking policies, perception of SHS, general attitudes towards exposure to SHS, health conditions, and demographic variables. The final section of the questionnaire included an open-ended question to allow respondents to provide additional comments.

The original questionnaire, which was in English, was translated into Chinese for the current study and then back-translated by two experts who are fluent in both Chinese and English (Hsu, Kang and Lam, 2006). A pilot survey was conducted to determine whether respondents might have difficulty understanding the terms on the survey. The survey was conducted between September and December 2008. Researchers were recruited, trained and supervised to carry out the field interviews.

The subjects

Prospective respondents were all casino workers; however this paper focuses only on employees working on the gaming floor. First, casino gaming floor employees were selected because it is representative of an area where totally smoke-free workspace is at present unlikely to happen in Macao. Second, casino gaming floor employees experience high levels of SHS exposure in the work area and are unlikely to move away from their work area apart from scheduled breaks. Third, the gaming area is enclosed without good natural ventilation system.

775 employees working in casinos in Macao were approached to take part in the survey. Trained researchers were stationed near 31 casinos to invite approximately 12-15 employees from each casino to participate in the study. Of the respondents approached, 383 agreed to participate in the survey (response rate of 49.4%). Respondents were interviewed by the researchers who read out the questions to the respondents. The researchers completed the form based on the response given by the employees.

Of the 383 completed questionnaires, 68 were discarded due to numerous missing values or not meeting the criteria for the study. Thus, 315 questionnaires were used for analysis. The dataset was part of a wider study funded by the Institute of the Study of Commercial Gaming at the University of Macau, of which additional results are reported

elsewhere (Wan and Pilkington, 2009). Ethical approval for the research was given by the independent University of Macau research committee, following scrutiny of the research proposal and consideration of ethical issues.

Data analysis

Questionnaire data were coded and entered into SPSS statistical package version 17, before being checked for errors (data cleaning). Initial descriptive analysis (counts, percentages and standard deviations) was conducted to provide summaries of the responses for each questionnaire item. Chi-Square analysis was then undertaken on the categorical data, to determine whether there were statistically significant differences in responses on key questionnaire items by various personal characteristics of the respondents, including sex, smoking status and level of educational attainment. The level of statistical significance was set at $p<0.05$, although in line with best practice, full p-values are provided to enable interpretation of the probability that differences between responses by key personal characteristics were due to chance.

Results

Characteristics of the Respondents

The characteristics of the respondents are presented in Table 1. The sample consists of more males (52.4%, 165/315) than females (47.6%, 150/315). The majority of the respondents (77.2%, 143/315) were below 35 years old, suggesting a relatively young work force. More than 42.9% (135/315) of the respondents had senior secondary school-level qualifications, 19.7% (62/315) had secondary school (form 5) qualifications and 11.4% (36/315) had degree level qualifications. All the respondents worked on the gaming floor and

most of them were dealers (55.9%, 176/315), followed by pit supervisors (32.1%, 101/315) and pit managers (6.3%, 20/315). The majority of the respondents had worked for a casino for less than 6 years (80%, 252/315). Ninety six percent of the respondents worked an average of 48.3 hours per week (S.D. = 4.3) with a range from 36 to 98 hours. Two respondents reported working more than 90 hours a week; however there is no way to verify this information. There was no significant difference in the average length of service in their workplace or the number of hours worked per week between men and women. Around a quarter of the respondents were currently cigarette smokers (24.8%, 78/315), 70.2% (221/315) had never smoked while 5% (16/315) had previously smoked but had quit their smoking habit.

- Insert Table 1 here -

Reported smoking policies in casinos

54% (170/315) of the respondents indicated that customers are allowed to smoke in most or all areas in their casinos (i.e., staff working areas), while 41.6% (131/315) reported that customers could only smoke in designated areas (Table 2). Only 2.9% (9/315) of workers reported that customers could not smoke at all in their casino (i.e. totally smoke-free casino). The vast majority of workers (92.7%, 292/315) reported that workers could only smoke in designated areas of their casino, while only 3.5% (11/315) reported that workers could smoke in most or all areas. As with customer smoking, 2.9% (9/315) of casino workers reported that workers were not allowed to smoke in their workplace.

Frequency and intensity of exposure to SHS in the workplace

In terms of frequeny and intensity of exposure to tobacco smoke while at work, 48.3% (n=152) reported that they were nearly always exposed to SHS, while 41% (n=129) reported that they were often exposed to SHS at work (Table 2). Regarding the intensity of exposure to tobacco smoke, most respondents reported heavy (54%, 170/315), moderate (37.8%, 119/315), or light (7.3%, 23/315) exposure. Only one percent (3/315) reported no exposure to tobacco smoke during their working time; it is possible these people were assigned to serve the non-smoking section of the casino although few casinos divided their gaming halls into smoking and non-smoking areas. Further analysis revealed that 73.7% (112/152) of those who were nearly always exposed to tobacco smoke indicated the exposure as heavy. There were no statistically significant differences in reported frequency and intensity of exposure to SHS by age, gender, level of educational attainment or the other personal characteristics outlined in Table 1.

- Insert Table 2 here -

Smoking behaviour among casino workers in Macao

As reported earlier, 24.8% (78/315) of casino workers reported that they were current smokers. The mean number of cigarettes smoked per day was 10.99, and there was no statistically significant difference in mean cigarettes smoked by men and women (10.89 versus 11.23, p=0.81). Men were statistically significantly more likely than women to report being current smokers (33.9% v 14.7%, p = <0.0001) (Table 3). 67.9% (53/78) of the smokers said that they would like to give up smoking, and men were statistically significantly more likely to say that they would like to give up than women (78.6% v 40.9%, p=0.001). There were no

significance differences in reported smoking status, or willingness to quit, by other personal characteristics.

- Insert Table 3 here -

Perceived impact of smoking policies on workers' smoking

61.5% (48/78) of smokers "agreed" or "agreed strongly" that exposure to other people's tobacco smoke at work makes it harder to quit smoking (Table 3). 26.9% (21/78) of casino workers who smoke said that they minded people smoking near them because it makes it harder for them to quit smoking. If they could not smoke at work, 35.9% (28/78) said that they thought they would try to quit smoking, while 34.6% (27/78) believed that they would smoke less. If no-one was allowed to smoke in their workplace (i.e. a totally smoke-free casino), the proportion of smokers who thought that they would quit increased to 41% (32/78), while 19.2% (15/78) thought that they would smoke less (Table 3). Men were statistically significantly more likely than women to report that they would try to quit smoking if smoking was restricted at work, with women more likely to report that they would smoke less (Table 3). There were no differences in perceived impact of smoking policies on workers' smoking by other personal characteristics.

Discussion

This study found that the vast majority of casinos in Macao allow smoking, and that most workers report being exposed to high levels of SHS in the workplace. Men were more likely than women to report being current smokers, but of those smokers, more men than women reported that they wanted to quit smoking. The majority of casino workers who smoked believed that exposure to SHS at work make it harder to quit smoking, while over a quarter

minded people smoking near them at work because of that reason. Over half of workers believed that they would try to quit smoking if no-one was allowed to smoke in their workplace. The difference in willingness to quit smoking and perceived impact of smoking restrictions on behaviour between men and women is an interesting finding. It may be that the relatively small number of female smokers in Macao's casinos represents a more hard-core, resistant group of smokers, when compared to the larger number of male smokers. More research would be needed however to explore the reasons for this apparent gender difference in attitudes towards quitting.

As outlined in this paper, the risks to health from exposure to SHS are incontrovertible, and on this basis alone, casinos (and their workers) should be included in comprehesive smoke-free legislation. However at present, casino workers in Macao, and in other parts of the world, are being excluded from such measures, which leaves them exposed to high levels of dangerous chemicals contained in SHS. This alone is unacceptable; casino operators have a 'duty of care' to their employees, and require them to do everything reasonably practicable to protect fellow workers from the harm of SHS. Our findings strengthen the case for comprehesive smoke-free legislation, by providing evidence that smokers believe that exposure to SHS at work affects their smoking behaviour, and limits their ability to quit smoking. Therefore, the benefits of smoke-free casinos are potentially two-fold: protecting workers from the harm of SHS, and helping workers who smoke to quit or cut down on their habit. Although our study assessed only workers' perceptions of whether they would try to quit or cut down following smoking restrictions, the evidence reviewed in this paper does suggest that restrictions on smoking in the workplace do result in a reduction in prevalence of smoking among employees.

Smoking bans, as outlined by the World Health Organisation, are part of the supportive environment needed to help smokers quit. However to have the maximum possible

effect, such restrictions should be combined with other measures such as Nicotine Replacement Therapy (NRT) (World Health Organization, 2003). The transtheoretical model proposes that a person trying to quit smoking progresses through five stages: pre-contemplation, contemplation, preparation, action, and maintenance (Abrams *et al.,* 2000). This means psychological preparation is a critical component of the cessation process (Braverman *et al.,* 2007). Therefore, combining smoking bans with the introduction of programs or policy initiatives that offer education and support should help more smokers to quit. Casino management should assist employees at the time of introducing smoke-free legislation by providing smokers with access to NRT and smoking cessation therapy, or at least indicating where smokers could get help elsewhere, such as though the health service.

This study is not without limitations. The sample was not randomly selected, and therefore may not be representative of the views of Macao casino workers as a whole. However the sampling was pragmatic and avoided selection bias where possible, including thorough training of the interviewers. Another limitation is that the study uses self-report data, and it was not possible to verify such data through other means, such as measuring of cotinine levels to validate self-reported exposure to SHS. Our measure of willingness to quit smoking, for example, was a single item measure. It may be that the question used to assess willingness to quit, "would you like to give up smoking", was understood and answered in different ways by different people. The question about how workers thought they would change their smoking behaviour if smoking restrictions were introduced did provide an element of verification, as this too was a measure of willingness to quit. However, it was measuring perceived behaviour change in response to a possible future change in working conditions, which is problematic. Despite these issues, many of the questions used in our survey, including the willingness to quit question, had been validated in previous studies of smoking and workplace smoking, including those examining casinos and casino wokers. A

final limitation to note is that while our study provided a useful quantitative analysis across a cross-section of the casino worker population in Macao, further qualitative analysis would offer more in-depth insights into the employees' attitudes and behaviour relating to smoking and the potential impact of greater restrictions in the workplace.

Conclusions

Despite the limitations noted above, the results presented here add to the growing research literature on the effect of SHS on hospitality workers and the changes in smoking behavior that may be associated with the introduction of smoking restrictions in workplaces. The findings support the case for promoting smoke free workplaces and the results are consistent with findings elsewhere that smoking restrictions are accompanied by a reduction in cigarette consumption. Our findings demonstrate how smoke-free casinos could lead to a healthier workforce, not just due to reduced exposure to dangerous chemicals in SHS, but also from the potential reduction in smoking among workers. The hospitality industry, and policy makers in government, should ensure that casinos, and their workforce, are not excluded from smoke-free legislation.

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