

CHAPTER 1.
UTILISING PSYCHOLOGICAL THEORY TO ACHIEVE PROFESSIONAL
PRACTICE CHANGE

One of the biggest challenges confronting the public health field is the dissemination of research findings and the implementation of efficacious interventions by health professionals (Baer et al., 2007; Gotham, 2006; Grimshaw & Eccles, 2004). Dissemination of research findings and implementation of interventions are critical for evidence-based practice. It maximises the probability of patients receiving the best possible medical treatment, reduces risk of unnecessary or harmful treatment, and substantially improves patient outcomes (Buchan, Sewell, & Sweet, 2004). Ideally, health professionals' treatment of patients should be informed by the best available evidence (Davis et al., 2003). However, multiple and complex barriers often exist to dissemination or implementation. Health professionals are not usually in a position to stay abreast of all of the latest research, and may not be trained to critically appraise the research literature (Grimshaw, Eccles, Walker, & Thomas, 2002). Other barriers may include health professionals' low expectations of positive outcomes, low motivation to change, lack of confidence, skills, and resources, and lack of reinforcement for implementation (Gotham, 2006; Grol & Wensing, 2004).

Attitudinal and motivational barriers to the implementation of interventions may also exist, especially in controversial areas such as alcohol and other drugs. Barriers potentially include feeling that assisting patients to modify their alcohol or other drug consumption is not a legitimate part of their role (Anderson et al., 2004;

Silins, Conigrave, Rakvin, Dobbins, & Curry, 2007) or that individuals who use alcohol or other drugs at risky levels are not deserving of assistance (Skinner, Feather, Freeman, & Roche, 2007). As a result of these barriers, research findings often fail to translate into practice (Davis et al., 2003; Glasgow, Lichtenstein, & Marcus, 2003; Michie et al., 2005). Research from the US and the Netherlands estimates that 30 to 40% of medical treatment does not accord with current evidence and 20 to 25% of medical treatment is unnecessary or potentially harmful (Grimshaw & Eccles, 2004).

There is no single solution to overcoming these barriers (Michie et al., 2005). Strategies employed to improve the implementation of research findings include: encouraging continual professional development for health professionals (Davis et al., 2003); making available systematic reviews of research findings (Grimshaw et al., 2002); disseminating guidelines for best practice (Grimshaw et al., 2002); and implementing behaviour change interventions targeting a particular aspect of a health professional's practice (Michie et al., 2005).

However, while there is a growing body of literature on methods of disseminating research findings and new interventions to health professionals, there has been less attention directed to health professionals' motivations and attitudes and very little of this research has applied psychological theory. Rather, an ad hoc approach to examining self-reported barriers for different professional groups has tended to be employed (e.g., Farmer & Greenwood, 2001; Weller et al., 1992). Michie et al. (2005) note that most interventions designed to alter health professionals' practice have been atheoretical and based on intuitive methods. Consequently, it is not always clear why successful interventions may have changed professionals' behaviour, or why other interventions were unsuccessful. Hence, despite the large number of studies reporting interventions, there is little guidance on what

interventions may be successful for achieving a particular behaviour change (Michie et al., 2005). Michie et al. (2005) argue that psychological theory may improve understanding of behaviour change interventions, and it may help explain how and why interventions are successful or not successful.

One psychological theory that may be useful in this regard is the Theory of Planned Behaviour. The Theory of Planned Behaviour was designed to predict behaviour, aid in the understanding of behaviour, and inform the design of behaviour change interventions (Ajzen, 1991)¹. The program of research presented here applied the Theory of Planned Behaviour to the study of health professionals' behaviour and the development of a professional behaviour change intervention. The research focused on health professionals' frequency of performing particular interventions. Specifically, the research investigated: 1) dental hygienists' identification of patients who smoke and assistance to patients to quit smoking, and 2) Emergency Department nurses' identification of patients at risk of alcohol-related harms and assistance to patients to modify their alcohol consumption. The rationale for addressing these behaviours is outlined below. This is followed by a summary of the research to-date on barriers to the implementation of these interventions among dental hygienists and Emergency Department nurses. Lastly, how application of the Theory of Planned Behaviour may address the gaps in this literature is outlined.

¹ Ajzen recently changed the spelling of his name to Aizen. However, since all references cited have been authored under the spelling 'Ajzen', this spelling is used throughout the thesis to avoid confusion.

Prevention of Smoking- and Alcohol-Related Harms

‘Smoking’, in the context of this thesis, refers to inhalation of tobacco.

Inhalation of other drugs, such as cannabis, were not considered. Alcohol and tobacco are leading causes of death and disease in Australia (Australian Institute of Health and Welfare, 2005a; Chikritzhs et al., 2000). Reducing the mortality and morbidity arising from these two drugs is a major public health priority. An important strategy to reduce these harms is to encourage health professionals to identify patients at risk and to advise or assist them to quit smoking or modify their alcohol consumption (Babor & Kadden, 2005; Edwards, Freeman, & Roche, 2006; Zwar & Richmond, 2006).

Effective, evidence-based brief interventions on smoking cessation and managing alcohol consumption are available for health professionals to deliver to their patients (Bien, Miller, & Tonigan, 1993; Hester & Miller, 1995; Watson, 1999; Wilk, Jensen, & Havighurst, 1997). However, consistent with the difficulties of implementing research findings described above, health professionals’ uptake of these interventions has been modest (Albert, Ward, Ahluwalia, & Sadowsky, 2002; Roche & Freeman, 2004; Warnakulasuriya & Johnson, 1999).

Summarised below are the harms caused by alcohol and smoking and the potential role for health professionals in addressing these harms. In subsequent sections of this chapter, previous research is described which has examined why health professionals’ frequency of addressing these harms is less than optimal, and gaps in this literature are identified.

Smoking-Related Harms

In 2004 in Australia, 19% of males and 16% of females were regular smokers (Australian Institute of Health and Welfare, 2005a). This represents a steady decline in prevalence from 27% of males and 22% of females in 1991 (Australian Institute of Health and Welfare, 2005a), and an even greater decline from the 1950s, when 70% of males and 30% of females were estimated to have smoked (Australian Institute of Health and Welfare, 2006). The decline is attributed to concerted public health efforts to prevent uptake of smoking, increase quit rates among smokers, and apply greater smoking restrictions (Chapman & Wakefield, 2001). Nonetheless, smoking remains the single greatest cause of preventable disease and death in Australia, responsible for 8% of Australia's burden of disease (Australian Institute of Health and Welfare, 2006). Collins and Lapsley (2002) estimated the annual cost of smoking to the Australian community to be over \$21 billion.

Although 75% of smokers have attempted to quit (Lieberman, 2003), and 50% of smokers try to quit each year (Fiore et al., 2000), relapse rates as high as 90% have been reported in studies of smoking cessation (Carmody, 1992; Ockene et al., 2000). These figures indicate that the majority of smokers wish to give up smoking, but may need support in order to successfully quit. Health professionals are in a position to provide support and advice to quit smoking and to inform the patient of the availability of assistance. The involvement of a health professional can considerably improve success rates, and spending less than three minutes with a smoker can double the chance of a successful quit attempt (Fiore et al., 2000; Zwar et al., 2004).

Alcohol-Related Harms

Alcohol is a major contributor to preventable illness and death, and is responsible for over 3,000 deaths and 72,000 hospitalisations per year in Australia (Chikritzhs et al., 2000). The burden of disease and injury caused by alcohol in Australia is 5% for males and 2% for females, although this drops to 2% overall if the potential health benefits of low to moderate alcohol consumption are included (Australian Institute of Health and Welfare, 2006). The financial cost of problems arising from alcohol consumption has been estimated at \$5.5 billion per annum (Collins & Lapsley, 2002). A more recent study conducted by Pidd, Berry, Roche, and Harrison (2006) estimated absenteeism costs associated with alcohol consumption at \$437 million per year rather than the previous estimate of \$32.5 million, indicating that the overall estimated financial cost of alcohol consumption may be considerably greater than previously calculated.

Risk of harms arising from alcohol can be categorised into short term harms arising from single occasions of risky alcohol consumption, and long term harms arising from extended risky levels of consumption (National Health and Medical Research Council (NHMRC), 2001). The emphasis in the present program of research was on those individuals at risk of short term harms associated with alcohol (see in particular Chapters 4 and 5). Short term harms were focused on because previous research has indicated that the majority of alcohol-related harms come not from dependent drinkers, but from the more numerous moderate to low consumers of alcohol who occasionally drink at risky levels (i.e., “binge drinkers”) (Pidd, Berry, Roche et al., 2006; Roche, 1999, p. 121; Roche & Evans, 1998).

The NHMRC (2001) guidelines for the general population define drinking at risky levels for short term harm as seven to ten drinks on any one day for men and

five to six drinks on any one day for women, while drinking at high risk for short term harms is any consumption that exceeds these amounts. Approximately 13% of the population drink at risky or high risk levels for short term harms at least monthly (Australian Institute of Health and Welfare, 2005b). The acute harms that may result from this pattern of drinking include motorist and pedestrian injuries, fall injuries, suicide, assaults, and drowning (Ridolfo & Stevenson, 2001).

Strategies to Address Smoking- and Alcohol-Related Harms

Given the extent of morbidity and mortality caused by smoking and alcohol consumption, it is an important public health goal to reduce the harms associated with these two drugs. Many strategies of proven efficacy exist to combat smoking- and alcohol-related harms including taxation to create price disincentives, smoking restrictions in areas such as bars and restaurants, random breath testing of drivers, and specialist services for the treatment of alcohol or other drug dependence (Loxley, Toumbourou, & Stockwell, 2005). In addition, there is strong evidence supporting the role of health professionals, such as General Practitioners (GPs) and nurses, in preventing harms arising from alcohol, smoking or other drug use (Loxley et al., 2005). In particular, health professionals are well placed to: 1) identify patients at risk of smoking- or alcohol-related harms and 2) assist these patients to reduce their risk of harms. These two behaviours form the focus of this thesis, and are summarised below.

Identifying Patients at Risk of Smoking- or Alcohol-Related Harms

Epidemiological studies have found a high prevalence of smoking and alcohol use in the general population. Health professionals can play a role in identifying

individuals who smoke or consume alcohol at risky levels as a first step towards addressing harms associated with these drugs (Babor & Kadden, 2005; Edwards, Freeman, & Roche, 2006; Zwar & Richmond, 2006).

Screening allows health professionals to identify individuals at risk of smoking- and alcohol-related harms. Screening is the process of asking questions or administering a test in order to identify individuals who are experiencing, or are at risk of, alcohol- or other drug-related problems (Babor & Kadden, 2005). Screening may comprise a questionnaire or a biological measure such as a blood alcohol reading (Babor & Kadden, 2005). Identifying patients at risk can enable the health professional to then intervene with the patient to provide brief advice or assistance (Babor & Kadden, 2005; Loxley et al., 2005).

Advising and Assisting Patients at Risk of Harms

Opportunistic advice and assistance to patients by health professionals is commonly referred to as “brief interventions” (Bien et al., 1993, p. 316). Specifically, brief interventions are defined as short sessions that aim to facilitate change in an individual’s health behaviour, such as quitting smoking or reducing risky alcohol consumption (Roche & Freeman, 2004). Brief interventions have been recommended as a follow up strategy once a health professional has identified an individual who may be at risk of smoking- or alcohol-related harms (Loxley et al., 2005). They can last for between 5 and 30 minutes and include simple advice usually coupled with motivational interviewing techniques (Proudfoot & Teesson, 2000). Brief interventions also provide opportunities to offer individuals written or oral information about the health effects of the drug they are consuming and referrals to

specialised services such as a Quitline or drug and alcohol counsellor (Aalto, Pekuri, & Seppa, 2002; US Public Health Service Report, 2000).

It has been well established that brief interventions can be efficacious as a secondary prevention strategy (Ballesteros, Duffy, Querejeta, Arino, & Gonzalez-Pinto, 2004; Bertholet, Daepfen, Wietlisbach, Fleming, & Burnand, 2005; Litt, 2002a; McEwen, Preston, & West, 2002). One review of smoking cessation interventions (Litt, 2002a) found that general practitioner (GP) interventions doubled the chance of quitting smoking, and were even more successful when combined with pharmacotherapies such as nicotine replacement or bupropion. Interventions from GPs can have successful effects, take only a few minutes, and have the capacity to prevent chronic smoking-related illnesses, making them highly cost effective interventions (McEwen et al., 2002; Richmond, 1996).

The widely endorsed “5As” guidelines provide a general strategy for raising the issue of smoking and advising and assisting patients to quit. The “5As” are:

- Asking about smoking status,
- Assessing readiness to change and nicotine dependence,
- Advising patients to quit,
- Assisting in quitting, and
- Arranging follow up or a referral to a specialised service.

(Beaglehole & Watt, 2004; US Public Health Service Report, 2000; Zwar et al., 2004).

Brief interventions targeting alcohol consumption have also been found to be very effective in changing individuals’ consumption levels (Ballesteros et al., 2004; Bertholet et al., 2005). One meta-analysis (Wilk et al., 1997) reported that heavy drinkers were twice as likely to lower their consumption 6 to 12 months after a brief

intervention than heavy drinkers who received no intervention. Brief interventions have also reduced the number of alcohol-related problems (Richmond, Heather, Wodak, Kehoe, & Webster, 1995), health care utilisation and associated treatment costs (Fleming et al., 2002), and the number of emergency department admissions (Holder & Blose, 1992).

However, despite research supporting the efficacy of brief interventions, and dissemination of guidelines such as the “5As”, health professionals’ implementation of alcohol and smoking interventions is limited, as illustrated below.

Implementation of Screening and Brief Interventions

Previous efforts to enhance health professionals’ provision of screening and brief interventions for smoking and alcohol have largely focused on GPs (Roche & Freeman, 2004). GPs are seen as credible (Pieterse, Seydel, DeVries, Mudde, & Kok, 2001) and are visited by 85% of the general population every year (RACGP National Preventive & Community Medicine Committee, 1998). However, the uptake of brief interventions by GPs has been less than optimal (Edwards, Freeman, Litt, & Roche, 2006; Humair & Ward, 1998; McEwen et al., 2002; Spandorfer, Israel, & Turner, 1999; Zwar & Richmond, 2006). Litt (2002b) has noted that, in the case of smoking, the uptake of brief interventions has not improved in the last decade. In an Australian survey of 1,000 smokers attending GPs (Litt, Pilotto et al., 2003), only 10% had been referred to the Quitline and only 18% had been handed a Quit book.

Similarly, low levels of intervention have been found for alcohol. For example, Degenhardt, Know, Barker, Britt, and Shakeshaft (2005) estimated that GPs intervene with 377,100 patients concerning alcohol each year. This is only a small

proportion of the approximately 1.6 million Australians aged 14 or over who consume alcohol at levels of risk for long term harms, and the approximately 3.4 million Australians aged 14 or over who consume alcohol at risky levels for short term harms at least monthly (Australian Institute of Health and Welfare, 2005b). Spandorfer et al. (1999) found 72% of GPs preferred to refer patients with alcohol-related problems rather than offer brief interventions.

Hence, although brief interventions for smoking and alcohol consumption are effective, implementation of these strategies has been poor. The alcohol and other drug and public health fields have therefore called for research to be undertaken on the barriers experienced by health professionals in identifying and assisting patients who smoke:

Our recent lack of progress in tobacco control is attributable more to the failure to implement proven strategies than it is to a lack of knowledge about what to do ... Studies are urgently needed to identify the social, institutional and political barriers to the more rapid dissemination of these research advances (US Department of Health and Human Services, 2000, p. 436).

Similarly, there have been calls for more attention to the examination of barriers to health professionals' provision of brief alcohol interventions (National Expert Advisory Committee on Alcohol, 2001). Consequently, the current research focused on barriers to uptake of brief interventions. Factors surrounding the effectiveness of brief interventions, such as the dynamics of substance use and behaviour change concerning substance use were not included in the scope of the current research. Rather, the aim of the program of research was to increase the quantity of interventions offered to patients at risk of smoking- or alcohol-related harm from health professionals.

A small body of research has examined GPs' barriers to the provision of brief smoking and alcohol interventions. Research examining barriers to GPs' utilisation of smoking cessation interventions indicates a range of barriers have inhibited greater uptake, including lack of time (Edwards, Freeman, Litt et al., 2006; Gottlieb, Guo, Blozis, & Huang, 2001), difficulty identifying smokers (Gottlieb et al., 2001), lack of available support (Litt, Ling, & McAvoy, 2003; Young & Ward, 2001), lack of financial incentive (Pieterse et al., 2001; Young & Ward, 2001), lack of interest on the part of GPs (Young & Ward, 2001), lack of confidence, skills, and training (Edwards, Freeman, Litt et al., 2006; McIlvain, Backer, Crabtree, & Lacy, 2002; Young, Swartz, Perkins, & Green, 2000), negative attitudes about the merits and efficacy of smoking cessation interventions (McIlvain et al., 2002), and a perception that patients are not interested in quitting (Coleman & Wilson, 1999). GP barriers to the uptake of alcohol consumption interventions include GPs finding it difficult to raise the topic of alcohol (Mowbray & Kessel, 1986; Weller et al., 1992), fearing they may lose patients (Weller et al., 1992), feeling that it is not a legitimate part of their work (Durand, 1994; Roche, Parle, & Saunders, 1996), and feeling there is little they could do to help a patient with alcohol-related problems (Farmer & Greenwood, 2001). Education and training may aid in overcoming some of these barriers (Doran, Duszynski, Beilby, & Mattick, 2006). However, engaging GPs in education and training for smoking- or alcohol-related issues is difficult due to lack of time, available expertise, training sites, and institutional support (Fiellen, Butler, D'Onofrio, Brown, & O'Connor, 2002).

Alternative Intervention Agents

The discouraging levels of involvement among GPs have prompted examination of possible alternative intervention agents. Upskilling other health professionals, in addition to GPs, to deliver interventions targeting alcohol and smoking could have several benefits. Firstly, the more professions that routinely deliver preventive interventions, the greater the number of smokers and individuals consuming alcohol at risky levels who will receive advice or help from at least one health professional, maximising the attendant public health benefits (Fowler, 2001). Secondly, other professionals may not experience as many barriers to implementation as GPs, and hence may be able to achieve greater uptake (Lockwood & Maguire, 2000; Roche & Freeman, 2004). Thirdly, if multiple intervention agents are employed, then patients may receive consistent advice from more than one health professional, which may increase the motivating effects of the advice (Parker, 2003).

Other potential intervention agents to target smoking include dental professionals (Barker, Williams, Taylor, & Barker, 2001; Edwards, Freeman, & Roche, 2006; Trotter & Worcester, 2003) and pharmacists (Aquilino, Farris, Zillich, & Lowe, 2003; Edwards, Freeman, & Gilbert, 2006; Williams, Newsom, & Brock, 2000). Potential intervention agents to target alcohol consumption include practice nurses (Lock, Kaner, Lamont, & Bond, 2002; Owens, Gilmore, & Pirmohamed, 2000), and Emergency Department staff (Charalambous, 2002; D'Onforio & Degutis, 2002; Roche, Freeman, & Skinner, 2006).

The first aim of the present program of research was to examine the potential for two particular health professions to act as intervention agents: dental hygienists and Emergency Department nurses. These two professions may be in a position to make a substantial contribution to the prevention of smoking- and alcohol-related

harms. Specifically, two behaviours were examined per profession (dental hygienists and Emergency Department nurses): 1) identification of at-risk patients and 2) provision of assistance to such patients (for smoking and alcohol respectively). The program of research focused on behaviours for two professions and two different drugs as these were identified as appropriate behaviours to target, and to examine the potential influence of the context in which identification and assistance took place. These alternative intervention agents are intended to complement existing agents and settings of brief interventions, such as GPs, rather than to act as sole providers of brief interventions for smoking or alcohol consumption. The dental surgery and Emergency Department settings may have their own unique barriers to the provision of brief interventions, such as the potential for patients to be tense or anxious when visiting the dental surgery, and for patients at risk of alcohol-related harm to be in an intoxicated state when presenting to the Emergency Department.

There is very limited national and international research on the role dental hygienists or Emergency Department nurses could play in responding to smoking- or alcohol-related harms. Only a small number of studies have examined barriers that exist to greater uptake of brief interventions by these two potential intervention agents. The rationale for selecting these two professions and the available research on barriers to implementation in these professions, are discussed below.

Dental Hygienists and Smoking

The dental surgery is a prime setting for smoking cessation activities (Edwards, Freeman, & Roche, 2006). There is a well established link between smoking and poor oral health, including stained teeth, gum disease, greater tooth loss,

and potentially fatal cancer (Johnson & Bain, 2000; Krall, Dawson-Hughes, Garvey, & Garcia, 1997; Mecklenburg et al., 1996; US Department of Health and Human Services, 2004). Smoking also negatively affects outcomes of dental treatment such as oral surgery, implants, and the treatment of gum disease (Johnson & Bain, 2000; Sanchez-Perez, Moya-Villaescusa, & Caffesse, 2007).

In Australia, 60% of the population visit the dentist at least once per year (Carter & Stewart, 2003), including men and adolescents, who are less likely to visit health professionals such as GPs (Campbell, Sletten, & Petty, 1999; Parker, 2003). The dental team is in a unique position to help many smokers quit through simple, quick and personalised advice and support during routine clinical care (Campbell et al., 1999; Clover, Hazell, Stanbridge, & Sanson-Fisher, 1999; Trotter & Worcester, 2003). They are also ideally placed to refer people who are contemplating quitting to more intensive support such as quit lines (Parker, 2003; Watt, Johnson, & Warnakulasuriya, 2000).

Dental hygienists may be better placed than dentists to provide smoking cessation services (Edwards, Freeman, & Roche, 2006). In a survey of 392 South Australian dental professionals (Edwards, Freeman, & Roche, 2006), dental hygienists reported longer average consultation times than dentists, spending on average 48 minutes with each patient, compared to 32 minutes for dentists. Dental hygienists reported fewer system barriers than dentists, with dentists placing more emphasis than dental hygienists on barriers such as lack of feedback on patient progress, insufficient incentives for time spent, lack of time and lack of reminders of patients' smoking status. Similarly, dental hygienists reported fewer practitioner barriers than dentists, including being more likely to feel that smoking cessation activities were a worthwhile use of their time, and having the confidence to ask patients about smoking

when it was not related to their presenting condition. Dental hygienists were also more confident than dentists in discussing smoking and reported higher rates of intervening with patients who smoke than dentists.

International research has also found that dental hygienists report fewer barriers to smoking cessation activity than dentists (Helgason, Lund, Adolfsson, & Axelsson, 2003). Brief smoking cessation interventions provided by dental hygienists have been found to be effective (Nasry et al., 2006). Nasry et al. (2006) reported that 25% of smokers with chronic gum disease who had received smoking cessation advice from a dental hygienist had quit at the 12 week follow up, which was comparable to more intensive forms of support such as the Quitline (Borland, Balmford, Segan, Livingston, & Owen, 2003).

However, research indicates that dental hygienists' implementation of smoking cessation interventions is limited (Barker et al., 2001; Chambers & Corbin, 1996; Dolan, McGorray, Grinstead-Skigen, & Mecklenburg, 1997; Edwards, Freeman, & Roche, 2006). In particular, assisting patients with quitting and arranging referrals occurs less frequently than asking patients about smoking and advising them to quit (Barker et al., 2001; Chambers & Corbin, 1996; Dolan et al., 1997; Edwards, Freeman, & Roche, 2006).

Little research has identified barriers or facilitators to dental hygienists' implementation of brief smoking cessation interventions. Edwards, Freeman and Roche (2006) found that barriers to Australian dental hygienists' smoking cessation activity included lack of confidence, fear of alienating patients, and low perceived efficacy in regard to helping patients to quit. Chambers and Corbin (1996) surveyed dental hygienists in Iowa and found that the strongest barriers were lack of knowledge of referral sources, patient resistance to discussing smoking, the hygienist's

preparedness to deliver smoking cessation services, and the cost and time required. Similarly, Helgason, Lund, Adolfsson, and Axelsson's (2003) survey of dental hygienists in Sweden revealed that the main barriers perceived by hygienists were lack of knowledge on the subject, time cost of the intervention, lack of reimbursement from the health care system, and a preference to refer the patient on to specialised help.

In summary, only three studies were found internationally that examined dental hygienists' barriers to assisting patients to quit smoking. The studies identified a range of potential barriers. However, the studies were not theory-based, and only one of the three studies (Edwards, Freeman, & Roche, 2006) investigated the relative importance of the different barriers by examining the impact of the perceived barriers on frequency of assisting patients.

Emergency Department Nurses and Alcohol Consumption

The Emergency Department has been identified as a prime setting for brief interventions targeting alcohol consumption (Cherpitel, 2006; Cherpitel et al., 2006; Fleming et al., 2007). The strong link between alcohol and injury is well established (Charalambous, 2002; Cherpitel et al., 2006; Maio, Waller, Blow, Hill, & Singer, 1997; Runge, Garrison, Hall, & Waller, 1999). Consequently, Emergency Department staff are likely to frequently encounter patients experiencing alcohol-related harms in the course of their work (Holloway, Watson, & Starr, 2006; Roche et al., 2006). A meta-analysis of studies conducted in Emergency Departments found approximately 16% of individuals presenting to the Emergency Department scored positive on screening tools for alcohol problems, and 26% presented with a positive blood alcohol

reading (Roche et al., 2006). This contact can provide a ‘teachable moment’ when the patient’s receptiveness to changing their alcohol consumption may be high (Williams, Brown, Patton, Crawford, & Touquet, 2005).

Emergency Department nurses may be particularly well suited to identifying and assisting patients at risk of alcohol-related harms (Cherpitel, 2006; de Crespigny, 2002; Holloway et al., 2006). Nurses are seen as credible and trustworthy by the community, and could play a key role in identifying and assisting patients experiencing alcohol-related harms to modify their alcohol consumption (de Crespigny, 2002). Research also indicates that a significant proportion of patients experiencing alcohol-related harms who present to the Emergency Department will accept and act on advice presented by health professionals (Dinh-Zarr, DiGuseppi, Heitman, & Roberts, 2004; Patton, Crawford, & Touquet, 2003, 2004). Hence, nurses who work in the Emergency Department are well placed to identify individuals at risk of alcohol-related harms, and advise and assist them to modify their alcohol consumption.

At the time of writing, there was no available Australian research on Emergency Department nurses’ barriers to identifying or assisting patients at risk of alcohol-related harms. Three UK studies reported barriers including: insufficient training, perceived risk of offending patients, the need to respond to the patient’s presenting condition, lack of confidence in their effectiveness in helping patients to modify their alcohol consumption, time pressures and staffing issues, patient barriers such as patients’ motivation and physical and mental state, and the lack of support services (Anderson, Eadie, MacKintosh, & Haw, 2001; Brooker, Peters, McCabe, & Short, 1999; Waller, Thom, Harris, & Kelly, 1998). Two US studies reported barriers including: administration time cost, nurses’ comfort in asking patients about alcohol,

cost of training and other costs, and legal implications of documenting suspected alcohol use (Becker et al., 1995; Clifford et al., 1996). Becker et al. (1995) also reported factors that facilitated nurses' identification of patients at risk of alcohol-related harms, including educating nurses about the clinical significance of alcohol use in injured patients, improving resources available to staff and patients to encourage referrals, and providing feedback to nurses about positive results arising from their referrals.

In summary, five studies from the UK and the US were located, but none from Australia, examining Emergency Department nurses' barriers to responding to alcohol-related harms. These studies identified a range of perceived barriers to responding to alcohol-related harms. However, the studies were not theory-based and did not examine the influence of perceived barriers on frequency of assisting behaviours.

Extending Research on Barriers

As illustrated above, much of the existing research on health professionals' responses to alcohol, smoking or other drug use is descriptive in nature and focuses largely on health professionals' opinions, with little or no analysis of which barriers impact most on frequency of assisting patients. While the existing research may provide guidance on what factors to examine, it fails to identify which barriers are of most importance. Research to-date also fails to examine whether it is possible to reduce the impact of barriers, or to provide a theoretical framework for understanding the influence of barriers on frequency of identifying and assisting patients. Moreover, investigating health professionals' motivations and attitudes entails psychological

questions, yet no research appears to have been undertaken which has empirically applied psychological theory to the issue.

A theoretical framework is necessary to move beyond mere identification of factors that are perceived to impact on the frequency with which a behaviour is performed to an understanding of how barriers work to influence behaviour and how such barriers might be addressed. The research presented here is the first application of a psychological theory to dental hygienists' and Emergency Department nurses' provision of brief interventions for smoking or alcohol consumption.

Theory of Planned Behaviour

The Theory of Planned Behaviour (Ajzen, 1991) was identified as a potentially relevant psychological theory with which to examine health professionals' behaviour. The Theory of Planned Behaviour incorporates actors' attitudes, the influence of other individuals and norms, the ability to perform the behaviour and intentions to perform the behaviour in order to predict a particular behaviour (Ajzen, 1991). Hence, the Theory of Planned Behaviour covers a wide range of determinants likely to be relevant to the frequency with which health professionals identify and assist patients at risk of smoking- or alcohol-related harms.

The Theory of Planned Behaviour is a well established and highly researched and utilised psychological theory (e.g., Ajzen, 2001; Armitage & Conner, 2001; Eagly & Chaiken, 1993). It has been applied to a range of behaviours including health behaviours such as dieting (Conner, Martin, Silverdale, & Grogan, 1997) and quitting smoking (Hu & Lanese, 1998). The theory has been widely used to understand and predict behaviours (Armitage & Conner, 2001), and to a lesser extent, as the basis for

behaviour change interventions (Hardeman et al., 2002). A substantial evidence base indicates the Theory of Planned Behaviour may provide a useful theoretical framework for addressing health professionals' barriers to identifying and assisting patients at risk of smoking- or alcohol-related harms.

The second aim of the present research therefore was to apply the Theory of Planned Behaviour to the frequency with which dental hygienists and Emergency Department nurses identify patients at risk of smoking- or alcohol-related harms respectively, and provide assistance to such patients, in order to further the research on barriers affecting these behaviours. The Theory of Planned Behaviour may aid in understanding, predicting and increasing frequency of health professionals' provision of brief interventions for smoking and alcohol.

Conclusion

In this chapter, issues facing professional practice change were presented. In summary, it is argued that previous research on the uptake of evidence-based interventions by health professionals has largely focused on dissemination pathways. Less research has been undertaken to investigate health professionals' attitudes and motivations that can influence implementation of new interventions or findings. Psychological theory may aid the understanding and design of behaviour change interventions targeting health professionals' behaviour. The Theory of Planned Behaviour in particular may be relevant to investigation of this issue as it was designed to predict and understand behaviour and to guide the development of behaviour change interventions.

The first two aims of the program of research were stated: 1) to examine the role of dental hygienists and Emergency Department nurses in the provision of brief interventions for smoking and alcohol consumption respectively, and 2) to apply the Theory of Planned Behaviour to understand and predict these behaviours. In the following chapter, the Theory of Planned Behaviour and how it will be applied to these behaviours is outlined. In Chapter 3, the findings of a meta-analysis undertaken to assess previous applications of the theory to organisational settings are presented. In Chapters 4-6, results are presented from the studies undertaken to apply the Theory of Planned Behaviour to behaviours under examination. The final chapter provides an overview of the key findings from this body of work addressing a theoretically driven approach to professional practice change.

CHAPTER 2.

THE THEORY OF PLANNED BEHAVIOUR

The aim of this program of research was to apply psychological theory in order to predict, understand, and increase the frequency with which dental hygienists identify patients who smoke and assist patients to quit smoking, and the frequency with which Emergency Department nurses identify patients at risk of alcohol-related harms and assist them to modify their alcohol consumption. The previous chapter presented the rationale for targeting these four behaviours, and provided a critical summary of the previous research on barriers to dental hygienists' and Emergency Department nurses' implementation of these behaviours. The previous chapter also highlighted the need to apply psychological theory to the research on barriers, and indicated the potential for the Theory of Planned Behaviour to provide a useful framework for addressing these behaviours. This chapter now details the Theory of Planned Behaviour, support for the theory, how it will be applied to the behaviours that form the focus of this thesis, and introduces the secondary aim of the research, i.e., to examine whether the Theory of Planned Behaviour can account for the influence of organisational variables on behaviour.

The Theory of Planned Behaviour (Ajzen, 1985) is an extension of the earlier Theory of Reasoned Action (Fishbein & Ajzen, 1975). The Theory of Planned Behaviour incorporates the Theory of Reasoned Action, and includes an additional variable, perceived behavioural control (Ajzen, 1985). A summary of the Theory of Reasoned Action is provided below, followed by developments specified in the Theory of Planned Behaviour.

Theory of Reasoned Action

Fishbein and Ajzen (1975) developed the Theory of Reasoned Action in order to understand and predict behaviour. The theory is predicated on the assumption that individuals are rational decision makers, and will behave in a manner consistent with their values and the information available to them. Fishbein and Ajzen (1975) theorised that the immediate determinant of behaviour is an individual's intention to perform the behaviour. In turn, individuals' attitudes towards the behaviour and perceptions of the norms surrounding the behaviour inform individuals' intentions. The Theory of Reasoned Action is summarised in Figure 2 below.

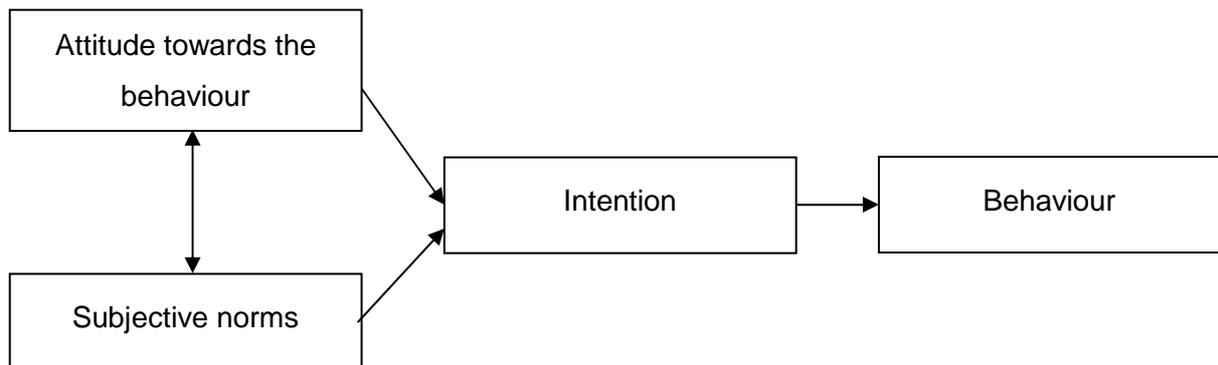


Figure 2. Summary of the Theory of Reasoned Action (Fishbein & Ajzen, 1975)

Behaviour. Fishbein and Ajzen (1975) define behaviour as overt, observable acts that can be studied. Observable behaviour needs to be operationalised as specifically as possible; Fishbein and Ajzen (1975) recommend specifying the action, the context in which the behaviour occurs, the target of the behaviour, and the time the behaviour will occur. For example, operationalising alcohol consumption as

having a drink of alcohol (the action) will likely result in poor predictive power, compared to specifying the behaviour as drinking beer (the target) at home (the context) after work tomorrow (the time). Behaviour can be a single act criterion, such as in the previous example, or, as in the case of the behaviours in this thesis, a repeated observation criterion, where frequency of performance of the behaviour over a specified time period is examined (Ajzen & Fishbein, 1980). In cases where behaviour may involve low behavioural control, such as obtaining a job or achieving a high grade in a class, behaviours can also be classified as goals (Ajzen, 2002a). The behaviours that formed the focus of this research were the performance of strategies to try to help patients quit smoking or manage their alcohol consumption, rather than achieving behaviour change with the patient. Hence, the behaviours were not classified as goals.

Intention. As outlined in Figure 2 above, an individual's intention to perform a behaviour is the most proximal determinant of behaviour, and is influenced by their attitude towards the behaviour, and subjective norms regarding performance of the behaviour. As intentions are the immediate determinant of an individual's behaviour, the specificity of the measure of intention needs to match the specificity of the operationalisation of the behaviour.

There is considerable debate in the literature regarding the nature of intentions. Operationalisations of intentions that have been used include the individual's subjective judgement of the probability that they will perform the behaviour (Fishbein & Ajzen, 1975), intentions to *try* to perform the behaviour (Ajzen, 1985), and motivational desires (Fishbein & Stasson, 1990). The present research adopted Fishbein and Ajzen's (1975) original definition of intentions. Intentions to try were not used, as Ajzen (1991) later argued that intentions to try did not differ statistically

from the original measure of intentions, and that the original, simpler measure should be used in preference to predictions of trying. The motivational desires definition of intentions was not used as Bagozzi's research (Bagozzi, 1992; Bagozzi & Kimmel, 1995) demonstrated that desires are best modelled as precursors to intentions, rather than intentions per se. Additionally, desires may not be the most appropriate operationalisation of intentions in an organisational setting, as emotive connotations may not be applicable to decision making for work behaviours.

Attitude towards the behaviour. Attitude is a commonly used construct in social psychology with widely varying definitions. Fishbein and Ajzen (1975) specify that an attitude is an evaluative or affective dimension associated with a stimulus object, action or event. Attitudes are bipolar, representing either a positive, neutral or negative feeling toward an object, action or event. Since the stimulus in the Theory of Reasoned Action is a particular behaviour, attitudes are argued to be the result of evaluations of, or affective feelings towards, the possible outcomes of performing the behaviour (Fishbein & Ajzen, 1975). For example, an individual may perceive assisting patients to quit smoking as uncomfortable and fruitless. This individual would form a negative attitude towards assisting patients to quit smoking. An individual who perceives the outcome of assisting patients to quit smoking as improved health and wellbeing of the patient, however, may form a positive attitude towards assisting.

Subjective norms. Subjective norms refer to beliefs that people important to the individual, in relation to the behaviour in question, will either approve or disapprove of the behaviour (Fishbein & Ajzen, 1975). These influential individuals or groups are labelled "referents" (Fishbein & Ajzen, 1975, p. 302). Referents may be friends, family, peers, colleagues, supervisors or society in general. Hence, an

individual who feels their supervisor would disapprove of them spending time discussing smoking with a patient may have little intention to discuss smoking, while an individual who feels their colleagues or professional organisation would approve of them discussing smoking may have a stronger intention to discuss smoking.

Underlying beliefs. As these examples of subjective norms illustrate, a set of beliefs underlies the more general construct of subjective norms. While norms represent the overall perception of whether performing the behaviour would be approved or disapproved of, beliefs are more individual cognitions about particular individuals or groups, and these underlying beliefs combine to form the overall subjective norm perception (Fishbein & Ajzen, 1975).

In the example of the professional assisting patients to quit smoking, several underlying beliefs may be involved. The professional's supervisor may approve of the individual spending the time discussing smoking, as may a senior colleague and also the patient. Two other colleagues may disapprove of the professional assisting the patient. Thus, the individual may have beliefs about each of these five referents' approval or disapproval of assisting patients to quit smoking. Fishbein and Ajzen (1975) present an expectancy-value model for calculating the subjective norm belief where the individual weighs each referent's approval or disapproval by their motivation to comply with that referent, and then sums these normative beliefs to form the general subjective norm belief.

Similarly, individuals' attitudes towards behaviours are a result of underlying behavioural beliefs (Fishbein & Ajzen, 1975). While attitude is a general cognitive or affective perception of the behaviour, behavioural beliefs are the individual cognitions or feelings that combine to form the general attitude. Behavioural beliefs concern possible consequences of the behaviour (Fishbein & Ajzen, 1975). For example, an

individual may believe that assisting a patient to quit smoking will result in better, more holistic healthcare (an outcome held in positive regard by the individual), and hence the individual may form a positive attitude towards assisting patients to quit smoking. Alternatively, an individual may believe that assisting patients to quit smoking will lead to an argument with the patient and wasted time (two negative outcomes), and hence may form a negative attitude towards assisting patients to quit smoking. An individual may hold all three of these beliefs. According to the Theory of Reasoned Action, individual behavioural beliefs are combined to form an attitude towards a behaviour in a similar manner to normative beliefs. The individual weighs each evaluation of a possible outcome of the behaviour with the probability that the outcome will eventuate, and then combines these judgements to arrive at an overall attitude towards the behaviour (Fishbein & Ajzen, 1975). Underlying beliefs are crucial to understanding behaviour, as opposed to just predicting behaviour. Identification of beliefs that underlie attitudes and subjective norms allows examination of specific barriers to behaviour and the development of Theory of Planned Behaviour-based behaviour change interventions targeting these beliefs (Fishbein & Ajzen, 1975).

Extending the Theory of Reasoned Action: The Theory of Planned Behaviour

One major limitation of the Theory of Reasoned Action is that the theory only addresses behaviours that are under an individual's complete volitional control, such as voting for a particular candidate or signing a petition (Ajzen, 1991). In the case of behaviours that require resources, skills or opportunities, or involve overcoming obstacles, such as losing weight, having a child, and pursuing a particular career path,

the theory tends to predict behaviour with less precision (Sheppard, Hartwick, & Warshaw, 1988).

The Theory of Planned Behaviour addresses the issue of volitional control by incorporating the construct of perceived behavioural control (Ajzen, 1985). Perceived behavioural control concerns how easy or difficult an individual believes a particular behaviour will be to perform (Ajzen & Madden, 1986). Behavioural control comprises factors internal to the actor, such as knowledge, skills and abilities, as well as factors external to the actor, such as time, opportunity, obstacles, resources, and the cooperation of other people (Ajzen & Madden, 1986). If individuals believe that they have the necessary knowledge, skills, and resources to perform a behaviour, and anticipate few obstacles, then they perceive a high degree of behavioural control. Individuals who perceive they lack skills or resources, or see numerous obstacles to performing the behaviour will perceive low behavioural control.

Perceived behavioural control may be particularly relevant to work behaviours that are shaped by structured work environments, such as the Emergency Department or dental surgery. In such settings, protocols may exist that require or prohibit workers from performing particular behaviours through direct or indirect means. Work environments may involve obstacles unique to organisational settings such as needing the approval or cooperation of colleagues, managers, or patients to perform a behaviour. Given the potential importance of perceived behavioural control in organisational settings, the Theory of Planned Behaviour is more appropriate to the examination of work behaviours than the Theory of Reasoned Action.

Just as behavioural beliefs underlie attitudes, and normative beliefs underlie subjective norms, Ajzen (1991) argues that control beliefs underlie perceived behavioural control. Control beliefs comprise perceptions about obstacles, skills, and

available resources, and are likely to be based on past experience and secondhand information received about the behaviour (Ajzen & Madden, 1986).

Ajzen (1991; Ajzen & Madden, 1986) proposes that perceived behavioural control relates to behaviour in two ways. Firstly, perceived behavioural control has a positive impact on intention (Ajzen & Madden, 1986). An individual who feels that the behaviour will be easy to perform, and perceives few obstacles (i.e., perceives high behavioural control), is more likely to intend to perform the behaviour than an individual who feels the behaviour will be difficult to perform and will be fraught with obstacles (i.e., perceives low behavioural control). Secondly, perceived behavioural control directly predicts behaviour, but only insofar as the perception of behavioural control accurately reflects actual behavioural control (Ajzen, 1991). In other words, actual behavioural control, consisting of the available resources, obstacles, and the actor's skills and abilities, affects behaviour by determining the success of the actor in performing the behaviour. In the absence of the ability to measure actual behavioural control, perceived behavioural control may serve as a substitute predictor if the actor's perception of behavioural control is accurate (Ajzen, 1991).

The Theory of Planned Behaviour and Behaviour Change

The primary goal of research utilising the Theory of Planned Behaviour is often the development of interventions designed to change behaviour, and frequently the main reason for investigating what factors predict behaviour is to endeavour to change the behaviour (Fishbein, Ajzen, & McArdle, 1980). This can especially be seen in the health psychology field where the Theory of Planned Behaviour has been

used extensively to investigate what underlying beliefs need to be targeted to increase particular health protective behaviours or reduce particular risky behaviours (Godin & Kok, 1996; Sutton, 2002).

Fishbein and Ajzen (1975) outline three steps to understanding and predicting behaviour, and designing a behaviour change intervention based on the Theory of Planned Behaviour:

- 1) In the first step, *the behavioural, normative, and control beliefs underlying the behaviour are elicited* from representatives of the targeted population
- 2) In the second step, the modally salient beliefs (the most common beliefs elicited) are used to construct a survey administered to a representative sample of the population. The survey allows *evaluation of which theoretical determinants are most important*, and which underlying beliefs are crucial to the performance of the behaviour
- 3) In the third step, *a behaviour change intervention is designed* to target the beliefs found in the survey to be most predictive of behaviour.

Each step is critical in informing the next, with the behaviour change intervention the end point of the application of the theory. However, the Theory of Planned Behaviour does not offer guidance on how to change behaviour beyond which underlying beliefs should be targeted. There is little discussion of the best way to alter these underlying beliefs.

These three steps were followed in the current program of research to ensure a comprehensive application of the Theory of Planned Behaviour to the studied behaviours. One of the aims (aim 4) of the present research was to design and

evaluate a professional practice change intervention based on the Theory of Planned Behaviour.

Support for the Theory of Planned Behaviour

There is general support for the ability of the Theory of Planned Behaviour to predict and understand behaviour. Empirical studies and meta-analyses have found consistent support for the relationships specified by the theory, and demonstrated the theory's predictive validity (e.g., Armitage & Conner, 2001; Giles & Cairnes, 1996; Godin & Kok, 1996; Nejad, Wertheim, & Greenwood, 2004; Netemeyer, Andrews, & Durvasula, 1993). A meta-analysis by Armitage and Conner (2001) found that the average percentage of variance in behaviour accounted for by the Theory of Planned Behaviour was 27%. Issues of contention have largely concerned definitional and measurement issues and the addition of extra variables, rather than challenges to the underlying theoretical model. Such issues are of particular relevance to the quantitative surveys reported in Chapter 5, and are discussed in that chapter.

Very few studies have applied the Theory of Planned Behaviour to the development of behaviour change interventions according to the three steps described above (Hardeman et al., 2002; Sutton, 2002). Interventions have tended to either not use the Theory of Planned Behaviour to design the intervention or not be based on research which identified the salient underlying beliefs to be targeted. This limitation includes the interventions reported by the authors of the Theory of Reasoned Action and Theory of Planned Behaviour (Fishbein et al., 1980; Fishbein et al., 2001). Eight studies were located that followed or approximated the prescribed three steps. These

studies are summarised in Table 1 below. All eight studies were randomised controlled trials of Theory of Planned Behaviour-based interventions.

Table 1

Studies Applying the Theory of Planned Behaviour in Accordance with Azjen and Fishbein's (1975) 3-Step Methodology

Study	Population	Targeted Behaviour	Intervention	Outcomes
Chatzirantis and Hagger (2005)	High school students	Increase leisure time physical activity	Written persuasive message targeting behavioural beliefs	Increased attitudes, which in turn increased intentions, but did not affect behaviour.
Armitage and Conner (2002)	Hospital workers	Reduce fat intake	Two written persuasive messages targeting 1) behavioural beliefs, and 2) control beliefs	Neither intervention changed the theoretical determinants of behaviour, did reduce fat intake among participants with a high initial fat intake. Hence, the theory could not explain the change in behaviour.
Hoogstraten, De Hann, and Ter Horst (1985)	Health insurance members	Return the included dental care application form	Written persuasive message targeting behavioural beliefs	Increased participants' attitudes, but not behaviour. In fact, rates of behaviour were highest when no persuasive argument was included with the letter. Participants' intentions were not measured.
Murphy and Brubaker (1990)	Male high school students	Testicular self-examination	Video targeting behavioural and normative beliefs	Increased intentions and behaviour, but not attitudes, subjective norms or perceived behavioural control. Hence, the theory did not adequately account for the increases in intentions or behaviour.

Study	Population	Targeted Behaviour	Intervention	Outcomes
Brubaker and Fowler (1990)	Male high school students	Testicular self-examination	Audiotape targeting behavioural and normative beliefs	Increased rates of behaviour, but not intentions or other theoretical determinants. Hence, the theory did not adequately account for increase in behaviour.
Parker, Stradling and Manstead (1996)	Drivers	Reduce speeding	Three separate videos targeting behavioural, normative, and control beliefs	None increased intentions, but the normative beliefs video did increase normative beliefs. Participants' speeding behaviour was not measured.
Crawley and Koballa (1992)	Hispanic-American high school students	Enrol in chemistry	Two interventions: audiotaped persuasive message with or without discussion with parents/guardians	The audiotape only intervention increased attitudes, intentions, and behaviour. However, the intervention involving the audiotape and discussion did not increase attitudes or behaviour, and reduced intentions.
Quine, Rutter, and Arnold (2001)	Adolescent school students	Wear a helmet while cycling	Booklet targeting behavioural, normative, and control beliefs	Improved underlying beliefs and increased intentions and behaviour.

In sum, the results of the studies depicted in Table 1 do not provide strong support for Theory of Planned Behaviour-based interventions. Interventions need to first change the beliefs underlying the behaviour, which should then result in changes to individuals' intentions and behaviour (Ajzen & Fishbein, 1980). Only 2 of the 12 interventions described in the eight studies were successful in changing underlying beliefs, theoretical predictors of behaviour and behaviour in accordance with the theory. Ajzen and Fishbein (2004) argue that successful behaviour change interventions are one of the most important tests of the validity of the Theory of Planned Behaviour, especially if they investigate whether the theory can account for changes in behaviour. The paucity of Theory of Planned Behaviour-based behaviour change interventions, and the mixed results of the research that has been undertaken to-date, are a serious shortcoming of the evidence base for the theory. Further research is needed to evaluate behaviour change interventions based on the Theory of Planned Behaviour in order to test the ability of the theory to inform the design of successful behaviour change interventions. This thesis adds an evaluation of an intervention based on the Theory of Planned Behaviour to this evidence base. Additionally, this research was the first to apply the Theory of Planned Behaviour comprehensively to a behaviour change intervention in the organisational setting.

The current program of research targeted the frequency with which dental hygienists identify patients who smoke and assist patients to quit smoking, and the frequency with which Emergency Department nurses identify patients at risk of alcohol-related harms and assist patients to modify their alcohol consumption. The application of the Theory of Planned Behaviour to these behaviours in the current program of research is discussed below.

Applying the Theory of Planned Behaviour to the Studied Behaviours

The behaviours that form the focus of this thesis, dental hygienists' and Emergency Department nurses' frequency of identifying and assisting patients at risk of smoking- or alcohol-related harms, occur in the work setting. That is, the behaviours are performed by employees at their workplace as part of their job role. As discussed in Chapter 1, previous research has focused on the influence of organisational, practitioner, and patient factors that may influence these behaviours without a guiding theory. Such atheoretical studies are more difficult to interpret and generalise from and hence do not provide an optimal contribution to an overarching framework on how to approach such problems. However, findings from this body of research are valuable in that they highlight the possible importance of factors such as confidence, knowledge, time limitations, and patient resistance (Chambers & Corbin, 1996; Helgason et al., 2003). A potential benefit of applying the Theory of Planned Behaviour to these behaviours may be to expand this knowledge by providing a useful theoretical framework with which to approach the influence of these factors and that may explain how these different variables influence health professionals' responses. By outlining three major influences on individuals' intentions and behaviour, namely attitudes, subjective norms and perceived behavioural control, the theory may be able to identify pathways through which various factors influence health professionals' behaviours. Applying the theory to the organisational setting provides an opportunity to examine the effect of organisational variables on the theoretical determinants of behaviour. Hence, the third aim of this thesis was to examine how organisational factors identified by previous research, such as autonomy and workload, influence behaviour. This is discussed in more detail in Chapter 5.

Applying the Theory of Planned Behaviour to the organisational setting also raises questions about the generalisability of the theory. The Theory of Planned Behaviour and the Theory of Reasoned Action were developed and tested on social and health behaviours, although Ajzen and Fishbein have suggested that the theories are also applicable to the organisational setting:

Our approach is not restricted to a specific behavioral domain ... the [Theory of Reasoned Action] is designed to explain virtually any human behavior, whether we want to understand why a person bought a new car, voted against a school bond issue, *was absent from work*, or engaged in premarital sexual intercourse” (Ajzen & Fishbein, 1980, p. 4, emphasis added).

However, applicability to the organisational setting was not tested when the theory was initially developed and presented.

There are several reasons why the theory’s generalisability to the organisational setting cannot be assumed. A range of factors operate in organisational environments that may not be found in typical social contexts studied in the majority of Theory of Planned Behaviour research, including remuneration for behaviour in the form of commission or salary, a controlled working environment and the specific expectations of supervisors and colleagues (Staw, 2003; Veen & Korver, 1998). Such factors may impact on the ability of the theory to predict behaviour in a number of ways. For example, these factors may remove or reduce the impact of particular predictors specified by the theory. It may be possible that issues of autonomy and workload take precedence in a work environment, and that personal attitudes have little or no effect on intentions to perform work behaviours. Organisational factors could also impact on the accuracy of individuals’ perceptions of their behavioural control, which would reduce the ability of perceived behavioural control to predict

behaviour (Ajzen, 1985). Given the wide range of factors such as legal and procedural issues and reduced autonomy in the organisational environment that may influence the possibility of performing a behaviour, and the potential need to rely on the cooperation of colleagues and/or individuals from outside the organisation such as stakeholders and customers, it is possible that an individual's level of actual behavioural control is more difficult to predict. Hence, perceptions of behavioural control may be less reliable.

Conclusion

This chapter outlined key aspects of the Theory of Planned Behaviour and the support for the theory to-date. In addition to the two aims presented in Chapter 1, two further aims were stated in this chapter: aim 3, to examine the ability of the Theory of Planned Behaviour to account for the influence of organisational factors on behaviour, and aim 4, to design and evaluate a professional practice change intervention based on the Theory of Planned Behaviour.

Previous studies have applied the Theory of Planned Behaviour to work behaviours, but few have addressed the unique aspects of organisational settings that may influence the performance of the theory. Hence, as a first step to assessing the applicability of the theory to the studied behaviours, a meta-analysis was conducted on previous organisational applications. In the following chapter, Chapter 3, the methodology and findings of this meta-analysis are presented. The application of the Theory of Planned Behaviour to dental hygienists' and Emergency Department nurses' identification of patients at risk and provision of assistance to such patients according to Ajzen and Fishbein's (1975) prescribed 3-step methodology is then

presented in Chapters 4-6. The first step comprised qualitative interviews to elicit behavioural, normative and control beliefs (Chapter 4). The findings from the qualitative studies then informed the design and execution of two quantitative surveys which assessed the ability of the theoretical determinants to predict behaviour, identified the factors most predictive of behaviour and assessed the ability of the theory to explain the impact of previously researched barriers on behaviour (Chapter 5). The results of the quantitative surveys then informed the design and implementation of a professional behaviour change intervention. The findings from a randomised controlled trial of this intervention are presented in Chapter 6. In Chapter 7, the success of applying the Theory of Planned Behaviour to the four behaviours is evaluated, and the general conclusions from the program of research and implications for the professional practice change field, are discussed.

CHAPTER 3.

STUDY NO. 1: META-ANALYSIS OF PREVIOUS APPLICATIONS OF THE THEORY OF PLANNED BEHAVIOUR TO THE ORGANISATIONAL SETTING

In Chapter 1, the case was outlined for application of the Theory of Planned Behaviour to dental hygienists' and Emergency Department nurses' provision of brief interventions for smoking and alcohol consumption respectively. In Chapter 2 the support for the Theory of Planned Behaviour to-date was presented, but it was noted that the theory was developed and tested on social and health behaviours, while the current research investigated behaviours in the organisational setting. Hence, before applying the theory to these work behaviours, a meta-analysis was undertaken to examine the level of success of previous studies applying the Theory of Planned Behaviour to the organisational setting. The aims of this meta-analysis were 1) to examine whether the theory was as successful in the prediction of behaviour in the organisational setting as it was for social and health behaviours, and 2) to examine any potential moderating factors that may impact on the expected results of the current application of the Theory of Planned Behaviour. This chapter presents the methodology and findings of the meta-analysis.

Previous Applications to Work Behaviours

The first published empirical test of the application of the Theory of Reasoned Action or Theory of Planned Behaviour to organisational behaviours was Newman's (1974) study of absenteeism and resignation. Newman found that the Theory of Reasoned Action fared poorly when applied to rates of absenteeism and resignation

among employees. Since Newman's (1974) research, a large number of studies have applied the Theory of Reasoned Action and the Theory of Planned Behaviour to organisational behaviours. Behaviours examined have included use of new technology in the workplace (Chau & Hu, 2001; Riemenschneider, Hardgrave, & Davis, 2001), commission of market research (Elliott, Jobber, & Sharp, 1995), attendance at training sessions (Fishbein & Stasson, 1990), and disclosure of information to clients (Kurland, 1996). These studies were conducted with a wide range of professions, including health professionals (Aita & Goulet, 2003; Levin, 1999), teachers (Ballone & Czerniak, 2001; Koballa, 1986), managers (Hill, Mann, & Wearing, 1996; Norman & Bonnett, 1995), army personnel (Ellis & Arieli, 1999; Hom & Hulin, 1981), and clerical staff (Fishbein & Stasson, 1990; Martocchio, 1992).

The majority of these studies concluded that the theory shows strong validity in the organisational setting, as demonstrated by a) successful replication of the relationships specified by the theory, and b) accounting for a substantial amount of variance in the behaviours studied (e.g., Edwards et al., 2001; Elliott et al., 1995; Levin, 1999). However, some researchers reported mixed results (e.g., Hom & Hulin, 1981; Nash, Edwards, & Nebauer, 1993; O'Boyle, Henly, & Larson, 2001), either finding moderate support for the relationships specified by the theory or reporting low predictive power of the theory. Few studies addressed the unique factors that may exist in the organisational setting. To synthesise these mixed results and evaluate the generalisability of the Theory of Planned Behaviour to an organisational setting, a meta-analysis of previous applications to work behaviours was undertaken.

Meta-analytic techniques are used to pool data from multiple studies in order to examine average population effect sizes. Hence, meta-analysis is suited to evaluating theoretical propositions where an appropriate number of relevant studies

exist. Despite a number of studies applying the Theory of Planned Behaviour to work behaviours, to-date a meta-analysis of studies applying the theory to organisational settings has not been conducted. The meta-analysis presented here is the first to examine the Theory of Planned Behaviour's application to work behaviours. The meta-analysis investigated the ability of the Theory of Planned Behaviour to predict work behaviours by examining average effect sizes reported in previous studies. These effect sizes were also compared to a previous meta-analysis of Theory of Planned Behaviour studies (Armitage & Conner, 2001) in order to examine the ability of the theory to predict work behaviours compared to more general social and health behaviours. Previous meta-analyses conducted on the theory, including Armitage and Conner's (2001), are discussed below.

Previous Meta-Analyses

Previous researchers have used meta-analysis to examine the Theory of Planned Behaviour's performance in other domains, such as social psychology (Armitage & Conner, 2001; Sheppard et al., 1988), health behaviours (Godin & Kok, 1996), and condom use (Albarracin, Johnson, Fishbein, & Muellerleile, 2001; Sheeran & Taylor, 1999).

Armitage and Conner's (2001) review is the most recent and most comprehensive meta-analysis of Theory of Planned Behaviour studies. Their meta-analysis covered 185 independent studies and found strong support for the relationships specified by the theory. The current meta-analysis provides a point of comparison to Armitage and Conner's (2001) meta-analysis in order to examine the validity of applying the Theory of Planned Behaviour to the organisational setting.

In addition to estimating average effect sizes for the relationships specified by the theory, meta-analysis also provides the opportunity to examine any potential moderators of these relationships (Field, 2003). Consequently, the meta-analysis also included an analysis of characteristics of studies that potentially moderate the paths in the Theory of Planned Behaviour.

In summary, the aims of this study were:

- 1) to examine how the theory performs in organisational settings,
- 2) to compare the findings to those of Armitage and Conner's (2001) meta-analysis, and
- 3) to identify any factors that may moderate the paths in the theory.

Meta-Analysis and Comparison with Armitage and Conner's (2001) Results

Method

Search Strategy

A search of the literature was conducted in order to find studies which applied either the Theory of Reasoned Action or the Theory of Planned Behaviour to work behaviours. Included studies were required to report an empirical test of either the Theory of Reasoned Action or the Theory of Planned Behaviour. Studies that examined only the belief aspect of the theories (e.g., Riemenschneider et al., 2001) or examined models adapted from the theories (e.g., James, Tripp, Parcel, Sweeney, & Gritz, 2002) were not included. A work behaviour was defined as a behaviour occurring in the organisational setting that was work-specific. Hence, studies that

examined behaviours such as employees exercising at work (e.g., Godin & Gionet, 1991) were not included. Studies with an organisational focus but that were conducted on undergraduate students rather than current workers were also excluded (e.g., some studies in Bell, Harrison, & McLaughlin, 2000). The search was limited to published papers written in English.

The databases PsycINFO, Medline, Cinahl, Eric, and Web of Science were searched using the following search strings in the title, abstract, heading word, table of contents or key concepts fields:

(workplace or organi#atio\$) and (“planned behaviour” or “planned behavior” or “reasoned action”)

and

(staff or employ\$) and (“planned behaviour” or “planned behavior” or “reasoned action”).

In addition, the comprehensive Theory of Planned Behaviour bibliography on Izek Ajzen’s website (Ajzen, 2004) was manually searched for articles involving work behaviours. Additional studies were also gathered from the reference lists of articles, a technique sometimes referred to as ‘pearling’.

Analysis

The meta-analysis was conducted using Hedges and Olkin’s (1985) fixed-effects method, as this was the method employed by Armitage and Conner (2001). The 95% confidence interval for each average correlation coefficient was calculated, using the uncorrected standard error (see Whitener, 1990). The correlation

coefficients for each relationship derived from the two meta-analyses were compared using Cohen's (1977) q statistic, with studies as the sampling units. Similar to Armitage and Conner (2001), Fail-safe N_s (Rosenthal, 1991) were also calculated to investigate the likelihood of publication bias in the results.

Results

A total of 53 studies were located that met the inclusion criteria. Of these, 19 did not include the necessary sample size and correlation matrix information in the published article. In 8 cases, the missing data were supplied by the authors on request. In the remaining 11 cases, the authors could either not be contacted or could not supply the missing data. Hence, data from 42 studies were available to be included in the meta-analysis, covering a wide range of occupations and work behaviours (see Table 2). Of these studies, 20 looked at health and allied professions (48%), including 13 studies on nurses and 5 on GPs/physicians. Nine other studies looked at teachers or academics (21%) and six looked at corporate managers (14%), including marketing directors, managers, environmental managers, and HR managers. Two studies looked at army personnel (5%), and the remaining five studies (17%) looked at other education, business or health professions.

Ten of the 42 organisational studies were included in Armitage and Conner's (2001) meta-analysis. As inclusion of these studies in the comparison would not have been appropriate, the ten studies were removed from the current analysis. This left 32 studies to compare to Armitage and Conner's (2001) results.

Table 2

Studies Applying the Theory of Reasoned Action or the Theory of Planned Behaviour to the Organisational Setting

Study	Occupation	Work behaviour
Ballone & Czerniak (2001)	Teachers	Implement informational strategies
Bell, Harrison & McLaughlin (2000)	Managers/students	Affirmative Action Program-related behaviour
Breslin, Li, Tupker & Sdao-Jarvie (2001)	Addiction counsellors	Adopt an addiction program
Bunce & Birdi (1998)	Physicians	Request hospital autopsies
Burak (1994)	Teachers	Teach HIV/AIDS education
Cordano & Frieze (2000)	Environmental managers	Pollution source reduction activities
Crawley (1990)	Teachers	Use science activities
Czerniak, Lumpe & Haney (1999)	Teachers	Implement thematic units
Czerniak, Lumpe, Haney & Beck (1999)	Teachers	Use educational technology
Dilorio (1997)	Nurses	Care for patients with HIV/AIDS
Elliott, Jobber & Sharp (1995)	Marketing directors	Commission market research
Ellis & Arieli (1999)	Army officers	Report illegal or irregular activities
Faulkner & Biddle (2001)	Mental health professionals	Promotion of physical activity
Fishbein & Stasson (1990)	Non-academic university staff	Attend a training session
Hill, Mann & Wearing (1996)	Managers	Benchmark their organisation
Hinsz & Nelson (1990)	University academics	Search for a new job or resign
Hom & Hulin (1981)	Army personnel	Re-enlist
Hsu & Kuo (2003)	Information systems professionals	Protect private information
Koballa (1986)	Teachers	Use hands-on science activities
Kurland (1996)	Insurance agents	Disclose information to clients
Lambert et al. (1997)	Physicians	Prescribe antibiotics

Study	Occupation	Work behaviour
Laschinger & Goldenberg (1993)	Nurses	Care for HIV positive patients
Levin (1999)	Nurses, laboratory workers	Glove use
Limbirt & Lamb (2002)	Physicians	Use of clinical guidelines
Lumpe, Czerniak & Haney (1998)	Teachers	Use of cooperative learning
Lumpe, Haney & Czerniak (1998)	Teachers	Inclusion of STS in science curriculum
Martocchio (1992)	Blue collar/clerical workers	Take paid absence
Nash, Edwards & Nebauer (1993)	Nurses	Assess patients' pain
Newman (1974)	Nurses and other staff	Absence and resignation
Norman & Bonnett (1995)	Managers	Be assessed for a qualification
O'Boyle, Henley & Larson (2001)	Nurses	Hand-washing
Prestholdt, Lane & Mathews (1987)	Nurses	Turnover
Randall & Gibson (1991)	Nurses	Report a health professional
Renfroe, O'Sullivan & McGee (1990)	Nurses	Documentation behaviour
Riemenschneider, Hardgrave & Davis (2001)	Software developers	Accept IT tools
Ryu, Ho & Han (2003)	Physicians	Share knowledge
Savage, Cullen, Kirchhoff, Pugh & Foreman (1987)	Nurses	Comply with do-not-resuscitate orders
van der Zee, Bakker & Bakker (2002)	HR Managers	Use structured interviews
Vermette & Godin (1996)	Nurses	Home care of patients
Walker, Grimshaw & Armstrong (2001)	GPs	Prescribe antibiotics for a sore throat
Wallace et al. (1997)	Oncology nurses	Provide oral care
Werner & Mendelsson (2001)	Nurses	Restrain older patients

The results of the meta-analysis are shown and compared to those of Armitage and Conner (2001) in Table 3. All correlation coefficients (transformed from Fisher's z) in the current meta-analysis met Cohen's (1977) criteria for a medium (.30) or large (.50) effect size. Fail-safe N s indicate the number of unpublished studies with null results that would be required to cast doubt on the results of the meta-analysis. All Fail-safe N s exceeded the minimum tolerance level.

Table 3

Results of the Meta-Analysis of Organisational Studies Compared to the Results of Armitage and Conner's (2001) Meta-Analysis

Path	Tests	Pooled N	\bar{r}_z (95% CI)	Fail-safe N	Tests (A & C)	r_z (A & C)	q
Attitude → Intention	34 ¹	7,662	.61 (.59 - .64)	43,275	115	.49	.09
Norms → Intention	33	7,070	.42 (.40 - .45)	24,129	137	.34	.07
PBC → Intention	19	3,312	.46 (.42 - .49)	9,229	144	.43	.02
Intention → Behaviour	13	4,230	.59 (.56 - .62)	4,645	48	.47	.09
PBC → Behaviour	5	1,198	.30 (.25 - .36)	178	60	.37	-.06

Note. PBC = Perceived behavioural control, (A & C) = from Armitage and Conner's (2001) meta-analysis, CI = Confidence Interval.

¹Some studies included more than one analysis of a particular relationship, hence the number of tests may exceed the number of studies.

All correlation coefficients (transformed from Fisher's z) met Cohen's guidelines for medium (.30) or large (.50) effects. None of the q statistics for comparing the current correlation coefficients to Armitage and Conner's (2001) results were significant, and all were below Cohen's (1977) .10 standard for a small effect size. This indicates that the performance of the theory in organisational settings is comparable to its performance with social and health behaviours.

The analysis of organisational studies was also conducted including the ten studies that overlapped with Armitage and Conner's (2001) meta-analysis. Examination of these results indicated no substantial differences, with average correlation coefficients not varying by more than .04. The results of this meta-analysis is contained in Appendix A.

Random-Effects Analysis

The majority of meta-analyses conducted on the Theory of Reasoned Action or the Theory of Planned Behaviour have employed fixed-effects methods rather than random-effects methods (e.g., Albarracin et al., 2001; Armitage & Conner, 2001; Sheppard et al., 1988). These two different types of analyses reflect different underlying assumptions about the effect size in the population (Field, 2001; Hunter & Schmidt, 2000). Fixed-effects methods assume that the effect size is constant in the population (i.e. an assumption of homogeneity). Random-effects methods assume the opposite, that the effect size is different throughout the population. The US National Research Council (1992) have argued that for most real-world data, the effect size varies within the population and hence fixed-effects analyses may be less reliable. After conducting a Monte Carlo series of trials using both random-effects and fixed-

effects methods, Field (2001) concluded that Hunter and Schmidt's (1990) random-effects method provided the most accurate estimation of population effect sizes under most conditions.

To achieve the most accurate and reliable analysis, the meta-analysis was conducted a second time using Hunter and Schmidt's (1990) random-effects method. The estimated variance due to sampling error was also calculated. The results of this analysis are shown in Table 4.

Table 4

Results of the Random-Effects Analysis of the Organisational Studies

Path	Tests	Pooled N	\bar{r} (95% CI)	Variance due to sampling error
Attitude → Intention	34	7,662	.59 (.53 - .64)	7.2%
Norms → Intention	33	7,070	.41 (.34 - .47)	9.6%
PBC → Intention	19	3,312	.43 (.33 - .53)	7.7%
Intention → Behaviour	13	4,230	.54 (.41 - .67)	2.9%
PBC → Behaviour	5	1,198	.30 (.26 - .35)	100.0%

Note. PBC = Perceived behavioural control, CI = Confidence interval.

None of the average correlation coefficients varied from the fixed-effects analysis by more than .05. Consistent with Hunter and Schmidt's (1990) findings, the results suggested that the fixed-effects analysis may have slightly overestimated the effect sizes. The proportions of variance attributable to sampling error were low, with the exception of the relationship between perceived behavioural control and

behaviour, indicating the potential presence of moderator variables. The 100% of variance estimated to be due to sampling error for perceived behavioural control and behaviour indicates that .30 may be a good estimate of this relationship in the population, and little variance in effect size was observed in the 5 studies examining this relationship.

Moderator Analyses

Two potential moderators were examined in the current meta-analysis that are particular to the organisational setting: 1) the organisational field in which the study took place, such as health, education, or business, and 2) whether the behaviour examined involved a client. The rationale for investigating these moderators is outlined below.

Cook and Campbell (1979) noted that the diversity of work organisations is a threat to the generalisability of a theory that might be applied to the entire workplace domain. Theories that perform well in explaining the behaviour of factory workers, for example, may perform poorly when attempting to explain the behaviour of counsellors or physicians. Consequently, the performance of the Theory of Reasoned Action and the Theory of Planned Behaviour, as measured by the sample-weighted average correlation coefficients for each path, were assessed according to the organisational field in which the study took place. Studies were allocated to one of three categories: 1) health, 2) education, or 3) business.

According to theory and research on burnout, work that involves dealing with clients, including business clients, students, and patients, can entail unique and difficult stressors (Dollard, Winefield, & Winefield, 2003; Maslach & Jackson, 1984).

People-oriented work may be particularly stressful because the work is focused on the physical, psychological or social needs of clients, which may lead to strong emotional situations involving fear, anxiety, despair, and other stressful emotions (Maslach & Jackson, 1984). It is possible that psychological theories which perform well when dealing with uncomplicated behaviours that do not involve a client do not perform as well when the additional complexities and stressors of working with clients are introduced. Hence, the Theory of Planned Behaviour may more accurately predict intentions and behaviour for studies in which the behaviour does not involve clients or patients than in studies which do. Examining the effect of these potential moderators may provide additional information on how the theory might perform when applied to the behaviours targeted in this thesis, as the behaviours in question occur in the health field and involve clients.

Method

Two independent judges (T.F. and J.S.) coded all studies on the two potential moderators. Inter-coder reliability was assessed using the percentage of agreement. Where the two coders disagreed, the case was discussed until consensus was reached on how to code the study. All studies were retained for the moderator analyses regardless of inclusion in Armitage and Conner's (2001) review.

Examination of moderator variables was conducted according to the method proposed by Hunter & Schmidt (1990). Sample-weighted average correlation coefficients and variances corrected for sampling error were calculated for each category of the moderator variable, and for the total of these subsets. To assess whether the correlation coefficients differed across subsets, 95% confidence intervals

were calculated for the coefficient for each subset, and the overlap in confidence intervals examined.

Results

Hunter and Schmidt (1990) advise that the variable may moderate the relationship if a) the correlation coefficients differ across subsets, and b) there is a reduction in variance corrected for sampling error among subsets compared to the corrected variance for the whole data set. A reduction in variance was assessed by comparing the sample-weighted average of variance across subsets to the variance of the data set as a whole. These criteria were met for both moderators for at least one of the relationships specified by the theory.

Organisational field. The results of the moderator analyses for organisational field are shown in Table 5. Inter-coder agreement was 100%. Two studies on army personnel (Ellis & Arieli, 1999; Hom & Hulin, 1981) were coded as ‘other’ and were not included in this analyses. Studies from health settings produced higher correlation coefficients than studies from business settings for the perceived behavioural control-intentions, intentions-behaviour, and perceived behavioural control-behaviour relationships.

Table 5

Results of the Moderator Analyses for Organisational Field

	Health	Business	Education	Variance (All)	Variance (Subsets)
<u>Attitude-Intentions</u>				.034	.032
Tests	21	11	9		
\bar{r} (95% CI)	.55 (.47-.63)	.55 (.44-.67)	.44 (.33-.54)		
<u>Norms-Intentions</u>				.025	.025
Tests	21	10	9		
\bar{r} (95% CI)	.45 (.38-.52)	.43 (.31-.55)	.41 (.33-.50)		
<u>PBC-Intentions</u>				.043	.031
Tests	13	7	8		
\bar{r} (95% CI)	.45 (.36-.54)	.21 (.08-.35)	.52 (.35-.69)		
<u>Intentions-Behaviour</u>				.056	.042
Tests	8	4	1		
\bar{r} (95% CI)	.54 (.38-.71)	.26 (.12-.40)	.42 (N/C)		
<u>PBC-Behaviour</u>				.013	.006
Tests	4	2	0		
\bar{r} (95% CI)	.30 (.25-.36)	.05 (-.18-.25)	N/C		

Note. CI = Confidence interval. PBC = Perceived behavioural control. N/C =

Not calculable.

While there was variability in the strength of different relationships, all but three path coefficients met Cohen's effect size for a medium (.30) or large (.50) effect. This suggests that the theory is generalisable across different organisational fields, at least the fields of business, education and health. The higher correlation coefficients found for studies in the health field provides additional support for the application of

the Theory of Planned Behaviour to health professionals' behaviour, such as the behaviours investigated in this thesis.

Client involvement. The results of the moderator analysis for client involvement are shown in Table 6. Inter-coder agreement was 96%.

Table 6

Results of the Moderator Analyses for Client Involvement

	Client involved	No client involved	Variance (All)	Variance (Subsets)
<u>Attitude-Intentions</u>			.032	.030
Tests	22	21		
\bar{r} (95% CI)	.49 (.43-.56)	.59 (.51-.67)		
<u>Norms-Intentions</u>			.033	.032
Tests	22	20		
\bar{r} (95% CI)	.43 (.36-.50)	.38 (.29-.46)		
<u>PBC-Intentions</u>			.043	.038
Tests	16	12		
\bar{r} (95% CI)	.48 (.38-.58)	.33 (.22-.45)		
<u>Intentions-Behaviour</u>			.052	.050
Tests	4	10		
\bar{r} (95% CI)	.44 (.35-.54)	.55 (.40-.70)		
<u>PBC-Behaviour</u>			.013	.010
Tests	2	4		
\bar{r} (95% CI)	.34 (N/C) ¹	.21 (.07-.35)		

Note. CI = Confidence interval. PBC = Perceived behavioural control. N/C =

Not calculable.

¹ Confidence interval was not calculable as both studies reported a coefficient of .34.

Although there was little reduction in variance in the subsets, sizable differences in effect sizes were found for some relationships. Studies of behaviours that involved clients reported stronger relationships between perceived behavioural control and intentions compared to studies concerning behaviours that did not involve clients. Studies of behaviours that involved clients also reported weaker relationships between attitudes and intentions, and between intentions and behaviour, compared to studies concerning behaviours that did not involve clients. This may mean that individuals whose work involves clients may be more driven by what is possible to achieve and less by their personal attitudes. Such workers may also experience more difficulty translating their intentions into action because of the involvement of a client, whose compliance and desires will also influence the possibility of performing the behaviour. This explanation suggests that an increase in the effect of perceived behavioural control on behaviour should have been observed. The failure to find an increase may be due to the low number of tests of this relationship (only six in this moderator analysis) and the low variance in effect sizes found in these tests, as evinced by the 100% of variance estimated to be due to sampling error (see Table 4). Alternatively, it may be that either 1) measures of perceived behavioural control are not capturing the array of client issues that may impact on workers' ability to perform the behaviour, or 2) that workers are unable to predict client-related barriers to behaviour, and hence their perceptions of behaviour control do not predict behaviour. The findings indicate that for work behaviours involving clients, such as the four work behaviours that are the focus of this thesis, perceptions of behavioural control may be especially important.

Discussion

This study represents the first meta-analysis of the application of the Theory of Planned Behaviour to the organisational setting. The meta-analysis indicates that the Theory of Planned Behaviour is applicable to the study of work behaviours, yielding results comparable to research on social and health behaviours. Although only published studies were included in the meta-analysis, Rosenthal's (1991) Fail-safe N_s indicate that extremely large numbers of unpublished studies with null results would be required to overturn the findings of the meta-analysis. For all meta-analyses of Theory of Planned Behaviour studies, however, the average path coefficients presented should be interpreted as only indicative of the effect sizes that may occur in the population. Fishbein and Ajzen (Ajzen, 1991; Fishbein & Ajzen, 1975) argue that situational factors, personal characteristics, and aspects of the behaviour will influence the relative impact of the different variables in the model on intentions and behaviour, and this is supported by the heterogeneity of the effect sizes in the analysed studies.

The two moderating factors investigated also had implications for the current program of research. Organisational field and client involvement were found to moderate some of the relationships specified by the theory. Studies conducted in health settings generally yielded higher path coefficients than studies undertaken in business and education settings. This finding lends additional support to applying the Theory of Planned Behaviour to health professionals' behaviour. Applications of the theory to behaviours that involved a client indicated that perceived behavioural control was paramount, with attitudes less predictive of intentions, and intentions less predictive of behaviour. The latter finding suggests that perceived behavioural control may be a particularly relevant factor to investigate in the current program of research.

The moderator analyses, particularly analyses involving behaviour and perceived behavioural control, should be interpreted with caution. Compared to larger meta-analyses (Albarracín et al., 2001; Armitage & Conner, 2001), the power of the current analysis, with 42 studies, was modest. In particular, only 17 data sets included a measure of behaviour, and only six of these measured both behaviour and perceived behavioural control. The number of studies which could not be included due to missing data was disappointing, and highlights the importance of including correlation matrices in journal articles to facilitate the accumulation and synthesis of research findings.

While organisational field and client involvement moderated various relationships specified in the theory, these moderator variables do not account for the mixed results of the studies applying the Theory of Planned Behaviour to the organisational setting, as characteristics of studies that were more likely to result in an unsuccessful application of the theory were not identified. Rather, the meta-analysis indicated that in general, applying the Theory of Planned Behaviour to organisational settings was as successful as applications to social or health behaviours. Future research may wish to examine this issue further by investigating what factors may account for the conflicting findings in existing applications of the theory to organisational settings, for example, by looking at the effects of the measurement issues identified in Armitage and Conner's (2001) meta-analysis.

Conclusion

The results of the meta-analysis support the application of the Theory of Planned Behaviour to the organisational setting in general, and to health

professionals' behaviour specifically. Additionally, the analysis of studies where the behaviour involved a client indicates that perceived behavioural control may be particularly important in addressing these behaviours.

Given the support identified through the meta-analysis, the next phases in the program of research were progressed, and consisted of applying the Theory of Planned Behaviour to dental hygienists' and Emergency Department nurses' identification of patients at risk and provision of assistance to such patients for smoking and alcohol consumption respectively. The following five studies, presented in Chapters 4-6, examined the applicability of the theory to these behaviours according to Ajzen and Fishbein's (1975) suggested 3-step methodology, as outlined in Chapter 2. The first step (Chapter 4) involved two qualitative studies, investigating 1) dental hygienists' and 2) Emergency Department nurses' control, behavioural, and normative beliefs. The second step was two quantitative studies examining the Theory of Planned Behaviour's account of the studied behaviours. The third step was the design, implementation and evaluation of a professional behaviour change intervention based on the theory (Chapter 6).

CHAPTER 4.
STUDIES NO. 2A AND 2B: QUALITATIVE INTERVIEWS TO ELICIT
BEHAVIOURAL, NORMATIVE, AND CONTROL BELIEFS

In Chapter 3 a meta-analysis of previous applications of the Theory of Planned Behaviour to work behaviours was presented. The meta-analysis provided evidence for the applicability of the theory to organisational settings. In the current study (Study 2), and the following two studies (Studies 3 and 4), the Theory of Planned Behaviour was applied to dental hygienists' and Emergency Department nurses' identification of patients at risk and provision of assistance to such patients for smoking and alcohol consumption respectively. The current study is the first step in a 3-step process, and consisted of qualitative interviews with dental hygienists (Study 2a) and Emergency Department nurses (Study 2b).

The two aims of the qualitative interviews were:

- 1) to examine underlying behavioural, normative, and control beliefs regarding identification of at risk patients, and provision of assistance to such patients, and
- 2) to examine what organisational factors may influence performance of the behaviours.

Underlying Beliefs

As underlying beliefs determine attitudes, subjective norms, and perceived behavioural control, and hence ultimately intentions and behaviour, Ajzen (1991) stresses the importance of eliciting salient beliefs. This ensures that the beliefs are

relevant and that the antecedents to intentions and behaviour are accurately measured and understood.

According to Fishbein and Ajzen (1975), behavioural beliefs concerning the potential outcomes of performing the behaviour determine individuals' attitudes toward that behaviour. Normative beliefs concerning the approval or disapproval of people important to the individual determine individuals' perceptions of subjective norms. Ajzen (1991) added perceived behavioural control to the Theory of Planned Behaviour, and hypothesised that control beliefs determine perceived behaviour control. Control beliefs underlie perceptions of factors that may make the behaviour easier or more difficult to perform (Ajzen, 1991).

A qualitative methodology was required in order to elicit these beliefs as no existing literature which had examined dental hygienists' or Emergency Department nurses' underlying beliefs concerning smoking or alcohol could be located. The results of the qualitative analyses were then used to quantitatively assess the ability of the Theory of Planned Behaviour to predict and understand the behaviours examined in the studies presented in Chapter 5.

Organisational Factors

The second aim of the qualitative interviews was to examine which organisational factors may influence identification of, or assistance provided to, patients at risk of smoking- or alcohol-related harms. Any organisational influences mentioned by participants were included in the coding of the interviews. This then allowed for examination of the impact of these organisational factors on attitudes, subjective norms, perceived behavioural control, intentions, or behaviour in the quantitative study.

The method and results for the two studies are presented separately below, and then discussed together.

Study 2a: Dental Hygienists

Method

Participants

A random sample of 75 dental hygienists who were members of the Dental Hygienists' Association of Australia (DHAA) was invited to participate in the qualitative interviews. The DHAA is the professional body representing dental hygienists in Australia, with members in all states and territories. A critical case sampling technique was employed (Grbich, 1999), rather than endeavouring to obtain a sample that was quantitatively representative of the population of dental hygienists. This sampling strategy aimed to represent a wide and diverse range of views among dental hygienists. The data collection process fulfilled the qualitative sampling guideline of continuing with data collection until no new themes emerge from interviews (Grbich, 1999).

Procedures

The mailing address labels for 75 dental hygienists were randomly selected by a member of the DHAA. Participants were mailed information about the study, a consent form inviting them to participate, and a reply paid envelope. Participants who returned a completed consent form were contacted at their home according to the

preferred times indicated on the form. A 20 to 30 minute interview was conducted over the phone and recorded using a telephone recording microphone and dictation transcriber. Participants then received a \$20 gift voucher as reimbursement for their participation in the research. The interviews were transcribed (by T.F.), and all information identifying the participant or their dental surgery was removed.

Materials

A 20 to 30 minute semi-structured interview was used to collect the data. Questions followed Ajzen and Fishbein's (1980) guidelines for eliciting salient behavioural and normative beliefs, expanded to include control beliefs. Two dental hygienists participated in a pilot of the interviews before data collection began. Changes to the questions were made in response to feedback from the pilot participants. The final questions consisted of five sections: 1) background questions, 2) questions concerning asking patients about smoking, 3) questions concerning helping patients to quit smoking, 4) questions concerning individuals or groups who may approve or disapprove of them asking or assisting patients who smoke, and 5) a question on participants' smoking status. A copy of the interview questions is contained in Appendix B.

Background questions. Participants were asked how long they had been working as a dental hygienist, what other staff members they work with, and whether they had received any education or training on helping patients to quit smoking.

Asking about smoking. This section comprised questions on how often participants asked their patients about smoking, the advantages or disadvantages of asking, and factors that made it easier or more difficult for them to ask patients.

Assisting patients to quit smoking. Questions in this section covered actions a dental hygienist could take to help patients quit smoking, whether participants were willing to perform each action, and if so, how often they performed each action. Participants were asked to give the advantages and disadvantages of helping patients quit smoking, and what factors made it easier or more difficult.

Individuals or groups who influence their responses. To reduce repetition, questions about normative referents who may influence participants' responses were asked only once, for identifying and assisting combined. Two questions covered individuals or groups who might influence their responses to patients who smoke. The first question asked participants whether any individuals or groups approved of, or encouraged, them to identify and assist patients who smoke. The second question asked participants whether any individuals or groups disapproved of, or discouraged, them from identifying and assisting patients who smoke.

Smoking status. Dental hygienists were asked whether they were current smokers, and if not, whether they had ever been a regular smoker.

Analysis

Interviews were analysed using thematic analysis (Boyatzis, 1998; Flick, 1998). Two coders (T.F. and P.S.) independently examined the data for themes to improve the reliability of the analysis (Boyatzis, 1998), using the framework of behavioural, normative, and control beliefs for both identifying and assisting.

The analysis consisted of five steps. Firstly, the two coders independently analysed the first five interviews and drafted a coding scheme. Secondly, the draft coding schemes were merged and a preliminary coding scheme agreed upon. Thirdly, the preliminary coding scheme was then applied to the next five interviews by each

coder independently, and both coders noted suggested changes needed to the coding scheme. Fourthly, the coders agreed on changes needed and revised the coding scheme accordingly. Lastly, one coder (T.F.) then applied the revised coding scheme to the remaining 12 interviews. Only minor alterations were made to the revised coding scheme during the last step. The final coding scheme is included in Appendix C. In order to check interpretation, results of the analysis were fed back to the 95% of participants who had indicated they wished to receive the results (Grbich, 1999).

Study 2a Results: Dental Hygienists

Of 75 dental hygienists invited to participate, 22 returned the consent form and participated in the interview, yielding a response rate of 29%. Of the 22 dental hygienists, 21 (95%) were female. This is consistent with the broader Australian dental hygienist labour force, of which male hygienists are estimated to comprise less than 1% (Teusner & Spencer, 2003).

Participants' dental hygiene experience ranged from six months to 28 years ($M = 13.3$ years, $SD = 11.1$ years). Nineteen (86%) dental hygienists had received some form of education or training to help patients quit smoking. The most common forms of training were seminars run by Quit (32% of participants), seminars run by a group other than Quit (36%), undergraduate education (32%), either in university or TAFE, and reading literature on smoking cessation (27%). Some dental hygienists had undergone more than one type of training. Five dental hygienists (23%) worked in more than one surgery. None of the dental hygienists were current smokers; 10 were ex-smokers (45%), and 12 had never smoked (55%).

Dental Hygienists' Identification of Patients Who Smoke

All dental hygienists indicated that they asked patients about their smoking. Estimates of the frequency of asking patients ranged from once per day to 5-6 times per day. Generally, participants used one or more of three actions to identify patients who smoke:

- asking patients about smoking,
- checking patients' medical history, which includes smoking status,
or
- noting from visible signs (e.g., staining) whether or not the patient smokes.

All dental hygienists used at least one of these strategies to identify patients who smoke.

Behavioural beliefs. Advantages and disadvantages of identifying patients who smoke are listed in Table 7. Example quotes from participants for all underlying beliefs for identifying and assisting are included in Appendix D.

Table 7

Behavioural Beliefs for Dental Hygienists' Identification of Patients Who Smoke

Behavioural belief	<i>n</i> (%)
Advantages	
Aids assessment of the patient's oral health and formulation of treatment plan	15 (68%)
Provides an opportunity to discuss smoking	14 (64%)
Contributes to a consistent anti-smoking message from health professionals	3 (14%)
May improve rapport with the patient	1 (5%)
Covers dental hygienist for legal reasons	1 (5%)
Disadvantages	
May detract from rapport with the patient	11 (50%)
Intrudes on the patient	6 (27%)

Control beliefs. Indications of how difficult hygienists found it to ask patients about their smoking varied. Thirty six percent of dental hygienists ($n = 8$) reported having no apprehensions about asking patients about smoking. Factors raised by participants that made identification of patients who smoke easier or more difficult are shown in Table 8.

Table 8

Control Beliefs for Dental Hygienists' Identification of Patients Who Smoke

Control belief	n (%)
If the patient has visible signs of smoking, e.g. nicotine stain	9 (41%)
Knowing how to ask about smoking sensitively	8 (36%)
Anticipating that the patient will not be receptive to discussing smoking	7 (32%)
Rapport with the patient	6 (27%)
If the patient raises smoking	5 (23%)
Patients may lie about their smoking	5 (23%)
If the question is part of general history taking or assessment	3 (14%)
Patients can be anxious or tense in the dental setting	3 (14%)
Having a non-judgemental attitude	2 (9%)

Dental Hygienists' Provision of Assistance to Patients to Quit Smoking

Eight participants (36%) commented on whether they felt assisting patients to quit smoking was part of the dental hygienist's role. Six participants (27%) felt it was part of the dental hygienist's role, while two (9%) believed dental hygienists were not in a position to assist patients to quit smoking. Reasons given for this were that patients may not support the dental hygienist in this role and that patients were unlikely to quit smoking for oral health reasons.

Participants listed actions they could take to help patients who smoke. Strategies mentioned by more than one participant are summarised in Table 9, grouped according to the "5As": Ask, Assess, Advise, Assist, and Arrange (Department of Health and Ageing, 2004).

Table 9

Strategies for Assisting Patients Who Smoke Mentioned by Dental Hygienists

Strategy	<i>n</i> (%)
Assess	
Ask patient if they want to quit	4 (18%)
Advise	
Discuss the dental health effects of smoking	20 (91%)
Show the patient their dental health consequences of smoking	8 (36%)
Discuss the benefits of quitting smoking	4 (18%)
Discuss why they smoke	5 (23%)
Advise patient to quit	4 (18%)
Show the patient photos of possible dental effects	3 (14%)
Advise patient to cut down their smoking	3 (14%)
Assist	
Give the patient Quit materials	16 (73%)
Discuss quitting strategies/options	6 (27%)
Relate a personal story	4 (18%)
Arrange	
Refer patient to the Quitline	10 (46%)
Refer patient to their GP	5 (23%)
Offer or provide follow up	2 (9%)

Note. Only actions suggested by two or more participants are listed.

Several participants mentioned behavioural and control beliefs specific to particular strategies. For example, nine participants (41%) felt that discussing the dental health effects of smoking was most appropriate to the dental setting and their expertise, and five (23%) felt that patients knew about the general health effects of smoking but not the dental health effects. Five participants (23%) mentioned lack of Quit materials or the need to continually re-order material from Quit made giving out

Quit literature more difficult. Three participants (14%) mentioned lack of knowledge of available services as a barrier to referring patients on to specialised services for smoking cessation.

Behavioural beliefs. Potential advantages and disadvantages for provision of assistance to patients to quit smoking are listed in Table 10. Participants reported few disadvantages of assisting patients to quit smoking. Six participants (27%) felt there were no disadvantages associated with assisting a patient to quit smoking.

Table 10

Behavioural Beliefs for Dental Hygienists' Provision of Assistance to Patients to Quit Smoking

Behavioural belief	<i>n</i> (%)
Advantages	
Improve patient's oral health	15 (68%)
Improve patient's general health and lifestyle	14 (64%)
Improve patient's motivation to quit	7 (32%)
Decrease the patient's spending on cigarettes	7 (32%)
Reduce the amount of future work needed with the patient (e.g., removing stain)	7 (32%)
Feeling rewarded from helping the patient quit smoking	6 (27%)
Improve patient's oral aesthetics (e.g., staining)	5 (23%)
Improve patient's dental treatment outcomes	5 (23%)
Improve rapport with the patient	4 (18%)
Improve patient's taste sensation	2 (9%)
Contribute to an anti-smoking message from health professionals	2 (9%)
Getting a clearer picture of the mouth once they quit (as smoking can mask symptoms of gum disease)	2 (9%)
Disadvantages	
Time cost associated with provision of assistance	10 (46%)
Time spent may detract from other work or health promotion	6 (27%)
Diminish rapport with patient	3 (14%)
Patient may not come back to the practice	3 (14%)

Control beliefs. Factors identified by participants as making it easier or more difficult to provide assistance to patients to quit smoking are summarised in Table 11.

Table 11

Control Beliefs for Dental Hygienists' Provision of Assistance to Patients to Quit Smoking

Control belief	n (%)
Patient's receptiveness to discussing smoking	20 (91%)
Knowledge and confidence to discuss smoking	7 (32%)
Amount of time available	7 (32%) ¹
Having multiple visits to build the intervention	6 (27%)
Rapport with the patient	4 (18%)
Having personal experiences or success stories to talk about	4 (18%)
Mood or motivation at the time	3 (14%)
Patients can be anxious or tense in the dental setting	3 (14%)

¹ Three participants (14%) thought they had ample time to assist a patient to quit smoking, while four participants (18%) thought they were constrained by the amount of time available.

Normative Beliefs of Dental Hygienists

Dental hygienists listed which individuals or groups would approve or disapprove of them asking patients about smoking or assisting patients to quit smoking. Responses are summarised in Table 12. Participants most commonly mentioned the dentist or specialist who employed them.

Table 12

Number (and Percentage) of Participants Reporting Individuals or Groups who Approve or Disapprove of Dental Hygienists Identifying Patients Who Smoke and Assisting Patients to Quit Smoking

Individual or group	Approve	Disapprove	Mixed
Employer (e.g., dentist)	12 (55%)	2 (9%)	1 (5%)
Dental professionals	5 (23%)		1 (5%)
Hygiene associations	7 (32%)		
Dental associations	5 (23%)		
Other staff members	8 (36%)		
Medical professionals	9 (41%)		
Quit	13 (59%)		
Cancer Council	2 (9%)		
Patient	1 (5%)	3 (14%)	3 (14%)
Patient's parents/ family	3 (14%)	1 (5%)	
Government	2 (9%)		
Tobacco industry		8 (36%)	

Note. Mixed indicates that the participant felt that some of the referents in this category may approve, while others may disapprove.

Study 2b: Emergency Department Nurses

Method

Participants

A critical case sampling strategy was employed (Grbich, 1999). Emergency Department nurses were invited to participate through various professional and

personal contacts from a range of Emergency Departments. Rural, metropolitan, young, and more senior nurses were invited to participate. The data collection process fulfilled the qualitative sampling guideline of continuing with data collection until no new themes emerged from interviews (Grbich, 1999).

Procedures

Emergency Department nurse managers at various hospitals and nurses known to the researchers were approached and provided with information sheets, consent forms, and reply paid envelopes to distribute among their colleagues who worked in the Emergency Department. In the first instance, nurses were recruited until an equal number of participants to those in Study 2a were located. If emergent themes had not been exhausted using this approach, further participants would have been recruited. The procedures were identical to those for Study 2a: participants were contacted at their home according to the preferred times indicated on the consent form for a 20 to 30 minute interview. The interview was recorded and transcribed (by T.F.) using a telephone recording microphone and dictation transcriber. All information identifying the participant or their hospital was removed. Participants then received a \$20 gift voucher as reimbursement for their participation in the research.

Materials

The semi-structured interview followed the same format as for Study 2a. Two Emergency Department nurses participated in a pilot of the interviews before data collection began and changes to the questions were made in response to feedback from the pilot participants. A copy of the interview questions is contained in Appendix B.

Background questions. Participants were asked how long they had been working in the Emergency Department, what other staff members they work with, and whether they had received any education or training on helping patients to modify their alcohol consumption.

Asking about alcohol. This section comprised questions on how often participants asked their patients about alcohol, the advantages or disadvantages of asking, and factors that made it easier or more difficult for them to ask patients. Participants were also asked whether their Emergency Department had a system for recording patients' alcohol consumption.

Assisting patients to modify their alcohol consumption. Questions in this section covered actions an Emergency Department nurse could take to help patients to modify their alcohol consumption, whether participants were willing to perform each action, and if so, how often they performed each action. Participants were asked to give the advantages and disadvantages of helping patients to modify their alcohol consumption, and what factors made it easier or more difficult.

Individuals or groups who influence their responses. As in Study 2a, to reduce repetition, questions on normative referents who may influence participants' responses were asked only once, for identifying and assisting combined. Two questions covered individuals or groups who might influence their responses to patients at risk of alcohol-related harms. The first question asked participants whether any individuals or groups approved of or encouraged them to identify and assist patients at risk of alcohol-related harms. The second question asked participants whether any individuals or groups disapproved of or discouraged them to identify or assist patients at risk of alcohol-related harms.

Alcohol consumption. According to the NHMRC guidelines (NHMRC, 2001), 11 standard drinks on any one occasion for men and 7 on any one occasion for women constitute drinking at high risk for short term harms. Participants were asked how many times in the last thirty days their alcohol consumption met or exceeded this guideline.

Analysis

The analysis followed the same five steps as for Study 2a (see p. 65), and the data was coded by the same two coders (T.F. and P.S.). The final coding scheme is included in Appendix C.

Study 2b Results: Emergency Department Nurses

Twenty two Emergency Department nurses participated in the study. Because of the methods of recruitment, a response rate was not calculable for this group. Fifteen of the nurses were female (68%) and seven were male (32%). The nurses worked in rural ($n = 5$, 23%) and metropolitan Emergency Departments ($n = 17$, 77%). Two nurses (9%) worked in a women-specific, largely obstetric and gynaecological Emergency Department.

Participants' levels of experience in the Emergency Department ranged from 2 months to 20 years ($M = 6.35$, $SD = 5.94$). Fourteen participants (64%) had received education and training that covered alcohol-related issues. The most common training was an external short course ($n = 7$, 32%), followed by in-service training ($n = 4$, 18%), lectures in undergraduate study ($n = 2$, 9%), and a postgraduate course ($n = 1$, 5%). Ten participants (45%) reported drinking in excess of the NHMRC guidelines

(NHMRC, 2001) for drinking at high risk levels for short term harms on one or more occasions in the last 30 days (range: 1-5 occasions, M = 1.9, SD = 1.3).

Emergency Department Nurses' Identification of Patients At Risk of Alcohol-Related Harms

Less than half the Emergency Department nurses reported having a system to record patients' alcohol consumption ($n = 10$, 45%). The most common system was including the patient's blood alcohol content (BAC) on the assessment form ($n = 5$, 23%). A small proportion of participants reported that there was a system for doctors to record patients' alcohol consumption ($n = 3$, 14%) or that patients' normal alcohol consumption was recorded on a form ($n = 2$, 9%).

Participants' estimates of the frequency with which they asked patients about their alcohol consumption ranged from five to ten times per shift to less than once a month. A number of participants noted that there were more alcohol-related presentations at night and on weekends ($n = 6$, 27%), and one participant (5%) perceived that there were fewer alcohol-related presentations in private Emergency Departments compared to public Emergency Departments. Participants reported asking patients about alcohol consumption in three different contexts, as shown in Table 13.

Table 13

Contexts In Which Emergency Department Nurses Reported Asking Patients About Their Alcohol Consumption

Context	<i>n</i> (%)
Asking patients with visible signs of intoxication	10 (46%)
Asking patients suspected of an alcohol-related problem based on their presenting condition or their history	5 (23%)
Asking when conducting alcohol withdrawal observations	6 (27%)

Participants asked patients about their alcohol consumption using one or more of the following methods:

- 1) breathalysing the patient ($n = 13$, 59%),
- 2) asking quantity/frequency questions about their consumption on that occasion ($n = 8$, 36%),
- 3) asking how much they normally consume ($n = 11$, 50%),
- 4) asking what type of alcohol they have consumed ($n = 2$, 9%), and
- 5) asking when their last drink was ($n = 3$, 14%).

No participants mentioned using screening tools such as the CAGE (Ewing, 1984) or AUDIT (Saunders, Aasland, Babor, de la Fuente, & Grant, 1993).

Behavioural beliefs. Participants identified a number of advantages and disadvantages of asking patients about their alcohol consumption, as shown in Table

14 below. Five participants (23%) believed there were no disadvantages to asking about alcohol. Example quotes from participants for all underlying beliefs for identifying and assisting are included in Appendix D.

Table 14

Behavioural Beliefs for Emergency Department Nurses' Identification of Patients At Risk of Alcohol-Related Harms

Behavioural belief	n (%)
<i>Advantages</i>	
Aid diagnosis/contribute to forming the bigger picture	12 (55%)
Assess and prepare for alcohol withdrawal	11 (50%)
Offer improved care	7 (32%)
Provide opportunity to assess readiness to change	6 (27%)
Anticipate medication or anaesthetic interactions	6 (27%)
Patient may reflect on their alcohol consumption	4 (18%)
Provide opportunity to intervene	3 (14%)
Patient may feel discriminated against	3 (14%)
Document/establish a history	2 (9%)
<i>Disadvantages</i>	
Diminish rapport with the patient	12 (55%)
Elicit a hostile or aggressive reaction	5 (23%)
Embarrass or intrude on the patient	3 (14%)

Control beliefs. There was considerable variability in how easy or difficult participants found it to ask patients about their alcohol consumption. Six participants (27%) indicated that they had no apprehensions about asking patients. Factors that were perceived to make it easier or more difficult to ask are summarised in Table 15 .

Table 15

Control Beliefs for Emergency Department Nurses' Identification of Patients At Risk of Alcohol-Related Harms

Control belief	n (%)
Patient receptiveness to discussing alcohol	10 (46%)
Patient is heavily intoxicated	8 (36%)
Patient has parents or visitors present	8 (36%) ¹
Patients may lie about their alcohol consumption	7 (32%)
Patient is aggressive	6 (23%)
Knowing how to ask about alcohol sensitively	5 (23%)
Having a non-judgemental view of alcohol consumption	4 (18%)
Patient is not conscious or coherent	4 (18%)
Lack of privacy in the Emergency Department	4 (18%)
Rapport with the patient	4 (18%)
Experience in asking patients about alcohol	4 (18%)
Question is part of the general history taking or assessment	3 (14%)
Age difference between nurse and patient	3 (14%) ²
Not appropriate time to ask due to severity of illness or injury	2 (9%)
Time constraints	2 (9%)
Patient has visible signs that they have been drinking	2 (9%)

¹ Seven participants (32%) felt having family present made asking about alcohol more difficult, while one participant (5%) felt it made it easier.

² Being much younger or much older than the patient was rated as a disadvantage.

Emergency Department Nurses' Provision of Assistance to Patients to Modify Their Alcohol Consumption

Five participants (23%) commented on whether or not they felt it was their role to assist patients to modify their alcohol consumption. Three participants (14%) felt that assisting patients to modify their alcohol consumption was part of the role of an Emergency Department nurse, while two (9%) felt it was not part of their role. A few participants reported that they tended to intervene only when the patient's presenting condition was alcohol-related ($n = 2$, 9%). Many participants mentioned that for any intervention to be worthwhile, the patient needs to be motivated to modify their drinking ($n = 8$, 36%).

Strategies to assist patients to modify their alcohol consumption mentioned by two or more participants are summarised in Table 16 according to the "5As": Ask, Assess, Advise, Assist, and Arrange (Department of Health and Ageing, 2004).

Table 16

Strategies for Assisting Patients to Modify Their Alcohol Consumption Mentioned by Two or More Participants

Strategy	Participants who mentioned strategy n (%)
Assess	
Ask the patient if they need help managing their alcohol	2 (9%)
Advise	
Discuss the health consequences of alcohol consumption	6 (27%)
Promote safe drinking to the patient	4 (18%)
Discuss their alcohol consumption in general	3 (14%)
Assist	
Give literature on alcohol to the patient	8 (36%)
Give card for a specialist service to the patient	5 (23%)
Discuss with the patient their options for getting help	3 (14%)
Assist with the patient's alcohol withdrawal	2 (9%)
Arrange	
Refer the patient to a specialist service	17 (77%)
Refer the patient to an in-hospital drug and alcohol unit or nurse	6 (27%)
Refer the patient to a sobering up unit	5 (23%)
Refer the patient to a GP	2 (9%)
Refer the patient to a psychologist/psychiatrist	2 (9%)
Refer the patient to a social worker	2 (9%)

Participants mentioned behavioural and control beliefs specific to particular strategies identified in Table 16. One participant (5%) maintained that discussing the health consequences of alcohol consumption was the most relevant strategy in the Emergency Department, while two participants (9%) questioned the effectiveness of

this strategy. Four participants (18%) believed that a benefit of referral cards or literature on alcohol was that the patients could take them away and read them later when they were sober. Six participants (27%) said they were limited by their knowledge of what services were available, one participant found the need for a referral for patients made it more difficult (5%), and three participants (14%) believed there were not enough specialist services available. Two participants (9%) expressed positive beliefs about referring patients to an in-hospital drug and alcohol unit, saying that drug and alcohol nurses have the passion and the expertise to provide a good service to patients, although two participants (9%) also noted that the unit was only open during the day, making it hard to refer patients out of hours. Two participants (9%) expressed the reservation that while GPs can provide holistic care, they may not have good skills or attitudes concerning alcohol, and in the case of family GPs, may be less private. In addition, one participant (5%) believed homeless patients or patients with limited funds may not be able to access GPs. Two participants (9%) expressed negative views about referring patients to a psychologist or psychiatrist for their alcohol consumption: that they do not provide a timely response, and that a doctor's referral is needed.

Behavioural beliefs. Participants cited many advantages to trying to assist patients to modify their alcohol consumption. Fewer disadvantages were mentioned, and eight participants (36%) did not believe there were any disadvantages to assisting patients to modify their alcohol consumption. Advantages and disadvantages reported by participants are summarised in Table 17 .

Table 17

Behavioural Beliefs for Emergency Department Nurses' Provision of Assistance to Patients to Modify Their Alcohol Consumption

Behavioural belief	<i>n</i> (%)
Advantages	
Improve patient's general health	14 (64%)
Reduce future alcohol-related presentations to the Emergency Department	10 (46%)
Patient may learn to modify their alcohol consumption	6 (27%)
Improve patient's quality of life	5 (23%)
Improve patient's motivation to modify their alcohol consumption	5 (23%)
Increase safety of patients or others	4 (18%)
Reduce patient's spending on alcohol	3 (14%)
Save money on health care expenditure	3 (14%)
Benefits to related family issues	2 (9%)
Disadvantages	
Time cost of intervening	9 (41%)
Time taken may detract from other work	4 (18%)
Violent or aggressive reaction	4 (18%)
Diminish rapport with the patient	2 (9%)

Control beliefs. Participants mentioned several factors that made it easier or more difficult to provide assistance to patients to modify their alcohol consumption, as shown in Table 18.

Table 18

Control Beliefs for Emergency Department Nurses' Provision of Assistance to Patients to Modify Their Alcohol Consumption

Control belief	<i>n</i> (%)
Patient receptiveness to discussing alcohol	14 (64%)
Time constraints	13 (59%)
Workload/Not having enough staff	9 (41%)
Patient is too intoxicated to intervene with	9 (41%)
Feeling patients with alcohol-related problems cannot be helped effectively in the Emergency Department	8 (36%)
Need to attend to patient's presenting condition	7 (32%)
Lack of appropriate skills or training	6 (27%)
Patient is difficult, rude, or aggressive, or has poor hygiene	6 (27%)
Inability to provide follow up in the Emergency Department	5 (23%)
More urgent cases to attend to	4 (18%)
Rapport with the patient	4 (18%)
Age difference between nurse and patient	4 (18%) ¹
Intervention is more suited to, or takes place on ward	3 (14%)
Having a drug and alcohol unit or nurses in the hospital	3 (14%)
Having a non-judgemental approach	3 (14%)
Patient leaves Emergency Department before chance to deliver intervention	3 (14%)
Knowledge on how to intervene and having information	3 (14%)
Motivation at the time	2 (9%)
Motivated by personal experiences	2 (9%)
Patient is too ill to intervene with	2 (9%)

¹ Being much younger or much older than the patient was rated as a disadvantage.

Normative Beliefs of Emergency Department Nurses

Table 19 shows the individuals and groups cited by Emergency Department nurses as influencing their responses to patients who may be at risk of alcohol-related harms. Participants mentioned mainly individuals from within the hospital, such as other medical and nursing staff, senior nurses, and hospital management. Ten participants (46%) indicated that they had not personally received any encouragement to ask patients about their alcohol consumption or to assist patients to modify their alcohol consumption.

Table 19

Number (and Percentage) of Emergency Department Nurses Reporting Individuals or Groups who Approve or Disapprove of Emergency Department Nurses Asking Patients About Their Alcohol Consumption or Assisting Patients to Modify Their Alcohol Consumption

Individual or group	Approve	Disapprove	Mixed
Other medical or nursing staff	10 (45%)	3 (14%)	1 (5%)
Senior nurses	4 (18%)	1 (5%)	
Drug and alcohol nurses	3 (14%)		
Mental health nurses	2 (9%)		
Hospital management	3 (14%)	1 (5%)	
Patient		6 (27%)	1 (5%)
Patient's family or friends	5 (23%)	1 (5%)	1 (5%)
Drug and alcohol services	6 (27%)		
Wider community	4 (18%)		

Note. Only individuals or groups who were mentioned by two or more participants are listed. Mixed indicates that the participant felt that some of the referents in this category may approve, while others may disapprove.

Studies 2a and 2b: Organisational Factors

In addition to eliciting underlying beliefs, the interviews also aimed to identify organisational factors that may potentially impact, positively or negatively, on identifying and assisting behaviour. Organisational factors mentioned by dental hygienists, Emergency Department nurses, or both, included:

1. their knowledge of a policy in their hospital or dental surgery about identifying or assisting patients at risk of smoking- or alcohol-related harms
2. whether or not their co-workers and supervisor were supportive
3. education or training: participants cited education and training they had received and how it had helped their confidence and skills
4. issues of autonomy: how much it was up to them to address smoking or alcohol
5. workload: whether they were too busy to address smoking or alcohol
6. role legitimacy: how legitimate a part of their job they felt addressing smoking or alcohol to be
7. role adequacy: their confidence and skills in addressing the issue of smoking or alcohol.

Discussion

This study identified dental hygienists' and Emergency Department nurses' behavioural, normative, and control beliefs concerning identification of patients at risk and provision of assistance to such patients for smoking and alcohol consumption

respectively. In addition, a range of different behaviours used to identify and assist patients were elicited, and several organisational factors that may be relevant to these four behaviours were identified. These results directly informed the development of the quantitative surveys in Study 3, reported in the following chapter. The findings for dental hygienists and Emergency Department nurses are discussed and compared below.

Comparison of Findings for Dental Hygienists and Emergency Department Nurses

Dental hygienists reported both positive and negative beliefs in regard to identifying patients who smoke and assisting patients to quit smoking. An encouraging finding was that many hygienists were not apprehensive about asking about smoking, all hygienists asked at least some patients, and all were willing to provide some form of intervention to help their patients quit smoking.

Similarly, all Emergency Department nurses were willing to provide some form of intervention to patients that targeted alcohol consumption. However, nurses noted substantial barriers to providing such interventions, including the hectic nature of the Emergency Department, patients' levels of intoxication, and patient receptiveness to discussing their alcohol consumption. Although the majority of nurses worked in Emergency Departments without a system for recording patients' alcohol consumption, all nurse participants reported asking patients about alcohol at least occasionally.

Several similar themes arose in both the dental hygienist and the Emergency Department interviews, including:

- the impact of time constraints and competing priorities,
- the need for knowledge of how to assist patients, and

- issues of patient receptiveness.

Another similarity was that both nurses and hygienists felt that it was necessary to ask about smoking or alcohol to aid diagnosis and assessment of the patient's condition and to assess the implications for treatment (in the case of alcohol, nurses had to guard against possible interactions with medication or anaesthetics, while in the case of smoking, dental hygienists had to assess the likelihood of success for treatments such as dental implants). This finding suggests that members of both professions may already identify a proportion of patients who smoke or are at risk of alcohol-related harms.

Differences in the barriers and facilitators experienced by the two professional groups were also identified, and this has important implications for the generalisability of strategies to improve uptake of interventions among health professionals and across drug types. For example, there were additional concerns about responding to patients who may be intoxicated compared to patients who smoke, including issues of safety, ability to comprehend information and the possibility of aggression.

Another difference between the two study populations was that nurses felt they did not have an opportunity to provide follow up with patients concerning their management of alcohol consumption, while dental hygienists highlighted the benefits of having multiple sessions to develop the smoking cessation intervention and provide follow up.

The different settings (dental surgery vs. Emergency Department) also presented different challenges, with hygienists mentioning that many patients were anxious and tense when visiting the dentist, and nurses mentioning the need to

respond to the urgent medical condition with which the patient presented. It should be noted, however, that as Study 2a examined dental hygienists' responses to smoking in dental surgeries, and Study 2b examined nurses' responses to alcohol consumption in Emergency Departments, it is not possible to confidently attribute differences found between the two studies specifically to the profession, setting or drug type.

As discussed in Chapter One, patients' anxiety in the dental setting, and patients' potential alcohol intoxication when presenting to an Emergency Department, may have negative implications for the effectiveness of any interventions delivered in these settings. Respondents from both professions raised these issues, and cited giving written material to patients, such as Quit brochures for dental hygienists and information on available services for Emergency Department nurses, as a means to address these issues. Provision of written material allowed patients to read through the material at a later date when they may be more relaxed and able to process the information.

Differences identified between the two study populations and organisational contexts supported Azjen's (1991) proposition that underlying beliefs need to be elicited that are specific to the behaviour and population. The differences also indicated a need to develop some specific measures for each group in the following quantitative study (Study 3). The measures to be developed separately related to:

- 1) behaviour,
- 2) education and training, and
- 3) underlying behavioural, normative, and control beliefs.

The development of separate measures was necessary to reflect the different beliefs held by the two professional groups and the different behavioural strategies and sources of training identified in the interviews.

The two studies reported above uncovered important new ground as the first research to examine dental hygienists' and Emergency Department nurses' beliefs concerning identifying and assisting patients at risk of smoking- or alcohol-related harms. The studies involved in-depth qualitative interviews, with appropriately small sample sizes. A critical case sampling strategy was used and the sample sizes were determined by the exhaustion of emergent themes. While both samples were achieved using established qualitative research methods, they may still suffer from self-selection bias. This notwithstanding, a wide range of views were represented in the data collected, and dental hygienists and Emergency Department nurses who participated in the studies held both positive and negative perceptions of the professions' roles in responding to smoking- or alcohol-related harms.

Organisational Factors

A number of organisational factors were identified in the interviews that may influence dental hygienists' or Emergency Department nurses' responses to smoking or alcohol. These included: 1) knowledge of an organisational policy, 2) relevant education or training, 3) autonomy, 4) workload, 5) co-worker support, 6) supervisor support, 7) role legitimacy, and 8) role adequacy. Role legitimacy refers to how legitimate the health professional believes the behaviour to be as part of their work role. Role adequacy refers to the health professionals' confidence and skills in performing the behaviour. Chapter 5 discusses whether role adequacy is conceptually distinct from perceived behavioural control, and explores the organisational factors in more detail. While role legitimacy and role adequacy could be argued to be individual factors rather than organisational factors, these factors are related to professional roles, and for ease of use will be retained under the heading of 'organisational'

factors. What effect these organisational factors may have on behaviour or the theoretical determinants of behaviour was examined in the quantitative surveys reported in Chapter 5.

Conclusion

In this chapter, the results of qualitative interviews with dental hygienists and Emergency Department nurses concerning identification of patients at risk and provision of assistance to such patients for smoking and alcohol consumption respectively were presented. The findings identified dental hygienists' and Emergency Department nurses':

- behavioural beliefs,
- normative beliefs,
- control beliefs, and
- organisational factors that may be relevant to the four behaviours.

These studies were the first step in Fishbein and Ajzen's (1975) 3-step methodology for applying the Theory of Planned Behaviour. The studies alone do not validate the application of the theory. Rather, the findings from the qualitative interviews were critical to the second step, the quantitative surveys of both professional groups. The quantitative surveys then assessed the validity of applying the Theory of Planned Behaviour to the four studied behaviours and examined the influence of the organisational factors on behaviour or the theoretical determinants of behaviour. The methodology and findings from these surveys are presented in the following chapter (Chapter 5).

CHAPTER 5.

STUDIES NO. 3A AND 3B: PREDICTORS OF FREQUENCY OF IDENTIFYING AND ASSISTING BEHAVIOUR: A NATIONAL SURVEY OF DENTAL HYGIENISTS AND EMERGENCY DEPARTMENT NURSES

The two studies presented in this chapter formed the second step in Fishbein and Ajzen's (1975) 3-step methodology in the application of the Theory of Planned Behaviour. The first step was the qualitative studies presented in the previous chapter. Those studies identified:

- 1) dental hygienists' and Emergency Department nurses' behavioural, normative, and control beliefs concerning identification of patients at risk and provision of assistance to such patients,
- 2) organisational factors that may affect these behaviours.

The results from the qualitative studies informed the current two quantitative studies. The quantitative studies were designed to assess the ability of attitudes, social norms, perceived behavioural control, and intentions to predict behaviour, and the effect of organisational factors on these theoretical determinants.

The aim of the two current studies was to:

- 1) examine the ability of the Theory of Planned Behaviour to predict the frequency with which dental hygienists and Emergency Department nurses identify and assist patients at risk of smoking- or alcohol-related harms respectively,

- 2) examine the ability of the Theory of Planned Behaviour to account for the influence of the organisational factors on behaviour, and
- 3) identify the most important determinants of behaviour in order to design an intervention targeting these determinants in the final study.

Behaviours

This study involved an examination of four behaviours: two per profession. For dental hygienists, the behaviours were identification of patients who smoke, including asking the patient if they smoke, checking health forms, or looking for the effects of smoking in the mouth, and provision of assistance to patients to quit smoking using any of the strategies raised in Study Two, including advising patients about smoking, giving out pamphlets or referring them to services such as the Quitline. For Emergency Department nurses, the behaviours were identification of patients at risk of short or long term alcohol-related harms, including breathalysing patients, asking patients how much alcohol they have consumed, or asking about normal levels of consumption and provision of assistance to patients to modify their alcohol consumption using any of the strategies raised in Study Two, including promoting safe drinking, referring patients to a specialist drug and alcohol service or assisting patients with alcohol withdrawal. These behaviours are summarised in Table 20 below.

Table 20

*Identifying and Assisting Behaviours for Dental Hygienists and Emergency**Department Nurses*

	Dental Hygienists	Emergency Department Nurses
Identifying Behaviours	<ul style="list-style-type: none"> • Asking patients if they smoke • Otherwise ascertaining a patient's smoking status (e.g., by checking patient history or looking for signs of smoking in the mouth) 	<ul style="list-style-type: none"> • Asking a patient about their alcohol consumption • Breathalysing a patient or otherwise measuring their blood alcohol
Assisting Behaviours	<ul style="list-style-type: none"> • Advising the patient to quit smoking • Advising the patient to cut down • Discussing the dental health effects of smoking • Showing the patient the effect smoking has had in their mouth • Showing the patient photos of possible dental health effects of smoking • Setting a quit date with the patient • Giving the patient a Quit brochure or pack • Discussing strategies/options for quitting smoking with the patient • Referring the patient to the Quitline • Referring the patient to their GP for smoking • Referring the patient to a pharmacist for smoking • Offering or providing follow up for the patient's smoking 	<ul style="list-style-type: none"> • Asking the patient if they want help modifying their alcohol consumption • Discussing the patient's alcohol consumption • Promoting safe drinking to the patient • Giving pamphlets on alcohol to the patient • Giving a card for a specialist service to the patient for their alcohol consumption • Assisting the patient with their alcohol withdrawal symptoms • Referring the patient to a specialist drug and alcohol service for their alcohol consumption • Referring the patient to an in-hospital drug and alcohol nurse or unit for their alcohol consumption • Referring the patient to a social worker for their alcohol consumption • Referring the patient to a sobering up unit • Referring the patient to their GP for their alcohol consumption • Referring the patient to a psychologist or psychiatrist for their alcohol consumption

The Prediction of Behaviour Within the Theory of Planned Behaviour

As outlined in Chapter 2, the Theory of Planned Behaviour (Ajzen, 1991) proposes that the most proximal predictor of any behaviour is an individual's intention to perform the particular behaviour. Intention in turn is determined by the individual's attitudes towards performing the behaviour, their perceptions about norms surrounding performance of the behaviour, and perceived behavioural control over performing the behaviours. To the extent that the individual's perception of behavioural control is accurate, their perceived behavioural control is also predictive of behaviour. In addition, perceived behavioural control is proposed to interact with intentions, such that when perceived behavioural control is high, intentions are more predictive of behaviour. These relationships were assessed in the current studies for the four behaviours outlined above.

As well as assessing the ability of the theoretical determinants to predict the studied behaviours, the current studies also sought to examine whether the Theory of Planned Behaviour accounted for the influence of organisational variables on behaviour. The rationale for this is discussed below.

Organisational Factors

One of the aims of this program of research was to examine whether the Theory of Planned Behaviour can account for the impact of organisational factors, such as supervisor support and organisational policies, on the behaviours in question. It would be valuable to know through which pathways organisational factors influenced workers' behaviour, for example, whether organisational policies

influenced behaviour by increasing perceptions of normative pressure to perform the behaviour or through perceptions of how easy the behaviour is to perform. Such knowledge would allow interventions to target specific organisational factors based on whether employees' attitudes, subjective norms or perceived behavioural control were most important to the performance of a particular behaviour. For example, the Theory of Reasoned Action has been applied to the study of turnover in order to better understand turnover intentions (Hinsz & Nelson, 1990; Newman, 1974; Prestholdt et al., 1987). Individuals' psychological processes in intention to resign had received little attention until the application of the Theory of Reasoned Action (Prestholdt et al., 1987).

The Theory of Planned Behaviour may explain the pathways through which organisational variables impact work behaviours. Ajzen (1991) argued that the predictor variables contained in the Theory of Planned Behaviour (attitudes towards the behaviour, subjective norms, perceived behavioural control, and intentions to perform the behaviour) are the proximal predictors of behaviour. Any additional, more distal factors, such as training or environmental factors, will only influence behaviour through influencing one of these predictor variables (Conner & Armitage, 1998). If this assumption of the Theory of Planned Behaviour remains valid in the organisational context, then the variables contained in the theory should mediate the impact of the more distal organisational variables, such as supervisor support or organisational policies, on employees' work behaviours. Hence, the Theory of Planned Behaviour may help explain how or why organisational variables influence the work behaviours of employees.

Only five studies were found that applied the Theory of Planned Behaviour to organisational settings and investigated organisational variables. Martocchio (1992)

measured job satisfaction and organisational commitment amongst blue collar and clerical workers at a financial services company and found that they did not predict frequency of absenteeism, but did predict attitudes towards absenteeism. Kurland (1996) applied the Theory of Planned Behaviour to insurance sales agents' intentions to disclose ethically relevant information to clients. Kurland (1996) measured experience, income, type of commission, and professional accreditation, but found that none of the variables predicted intentions. Whether or not these factors influenced attitudes, subjective norms, or perceived behavioural control was not investigated.

Bunce and Birdi (1998) studied junior and senior doctors working in a hospital to examine the influence of autonomy on frequency of requesting hospital autopsies. Doctors' attitudes, subjective norms, perceived behavioural control, intentions, and behaviour all varied according to level of autonomy. O'Boyle, Henly, and Larson (2001) applied the Theory of Planned Behaviour to nurses' hand-washing behaviour in a hospital unit and included a measure of the intensity of activity in the unit (i.e., how busy the work environment was). Intensity of activity was negatively related to hand-washing behaviour, and to a lesser extent, subjective norms. Norman and Bonnett (1995) examined whether or not customer care managers sought assessment to receive a particular vocational qualification. The researchers measured managers' work locus of control, job satisfaction, employment commitment, age, and time in job grade in addition to Theory of Planned Behaviour variables. The theoretical predictors accounted for 31% of the variance in behaviour, while the additional factors measured accounted for a further 15%. However, the study did not report which of the factors contributed to the additional explained variance, so it is unclear which of the factors may be important to include in future research.

None of the studies tested the ability of the theory to mediate the influence of organisational variables on behaviour. However, two of the studies provided some evidence against the ability of the Theory of Planned Behaviour to mediate the influence of organisational factors on behaviour. O'Boyle, Henly, and Larson (2001) found that intensity of activity predicted behaviour, but not intentions or perceived behavioural control, suggesting the Theory of Planned Behaviour did not account for the influence of intensity of activity on nurses' hand-washing behaviour. Norman and Bonnett (1995) found that the Theory of Planned Behaviour did not fully mediate the effects of work locus of control, job satisfaction, employment commitment, age, and time in grade on managers' seeking of assessment to receive a qualification, with these factors explaining 15% of the variance in behaviour in addition to the 31% of variance explained by the theoretical predictors. However, Norman and Bonnett (1995) did not report the amount of variance the organisational variables explained without controlling for the Theory of Planned Behaviour, or whether the factors were related to any of the theoretical predictors, so whether or not partial mediation occurred can not be ascertained. In addition, as mentioned earlier, the study did not report details on which of the factors contributed to the additional explained variance.

In sum, these studies indicate possible roles for several organisational variables, but do not explain how the variables may be incorporated into future applications of the Theory of Planned Behaviour in organisational settings. Further research is needed to examine the pathways through which organisational factors affect workers' behaviour and whether the theory can mediate the effect of these factors on behaviour.

Studies applying the theory to social behaviours have examined the ability of the theory to mediate the effect of distal factors on behaviour in more detail. Such

research has found demographic factors such as age, gender, ethnicity, and occupational group can provide unique contributions to variance in behaviours that is not mediated by theoretical variables (Elliott, Armitage, & Baughan, 2003; Wiggers, de Wit, Gras, Coutinho, & van den Hoek, 2003). Similarly, research in health psychology has found that the theory does not explain the influence of extraversion on exercise behaviour (Courneya, Bobick, & Schinke, 1999; Rhodes & Courneya, 2003; Rhodes, Courneya, & Jones, 2002), of gender on health screening attendance or drink driving (Armitage, Norman, & Conner, 2002), or of multidimensional health locus of control on drink driving, binge drinking, or condom use (Armitage et al., 2002).

Only one study was found that supported the mediation hypothesis. Courneya and McAuley (1995) found that the Theory of Planned Behaviour variables mediated the influence of social support and cohesion on exercise adherence. Perceived behavioural control mediated the effect of social support on intention and attitudes mediated the effect of cohesion on intentions. Hence, there is little evidence to support the Theory of Planned Behaviour's ability to mediate the influence of distal factors, organisational or otherwise, on behaviour. The current studies provided the first test of the theory's mediation of organisational factors. The organisational factors selected for inclusion in the current study are outlined below.

Organisational Factors Chosen for the Current Study

The organisational determinants chosen for the current studies were drawn from both the existing literature and findings from the qualitative interviews reported in Chapter 4. The organisational factors hypothesised to impact on frequency of identifying and assisting patients are role adequacy, role legitimacy, workload,

autonomy, education and training, organisational policy, co-worker support and supervisor support. Each of these factors are discussed below.

Role adequacy and role legitimacy. According to Shaw, Cartwright, Spratley and Harwin's (1978) theory of therapeutic commitment, developed to explain GPs' attitudes towards patients with alcohol-related problems, responding to alcohol or other drug issues requires role adequacy, role legitimacy, and role support. Role adequacy is the health professionals' confidence that they have the skills and knowledge necessary to respond to patients with alcohol- or other drug- related problems. Low role adequacy has been found to be associated with low motivation to assist patients with alcohol- or other-drug related problems, and low satisfaction from assisting such patients (Skinner, Roche, Freeman, & Addy, 2005). Low levels of confidence in skills and knowledge was a strong theme to emerge from Study 2.

Both role adequacy and perceived behavioural control are comparable to Bandura's (1982) construct of perceived self-efficacy. Consequently, whether or not role adequacy and perceived behavioural control are conceptually distinct from each other is arguable. However, while role adequacy reflects health professionals' confidence in their skills, knowledge, and experience, perceived behavioural control accounts for all relevant internal and external barriers and facilitators to identifying or assisting patients. This may include factors such as the cooperation of other individuals, the availability of opportunities to perform the behaviour, and environmental constraints. Hence, role adequacy and perceived behavioural control could be conceptualised as two separate but related constructs.

Role legitimacy concerns whether or not the health professional feels that it is within their role to respond to alcohol- or other drug-related problems (Shaw et al., 1978). Health professionals who feel that responding to alcohol- or other drug-related

problems is 'none of their business', that they do not have the right to intervene with patients, or that patients do not believe they should intervene, have low role legitimacy. Such beliefs were recurrent themes in the dental hygienist and Emergency Department nurse interviews in Study 2. Low levels of role legitimacy have been linked to low motivation to assist patients with alcohol- or other drug-related problems (Skinner et al., 2005), low satisfaction with assisting such patients (Skinner et al., 2005), and poor rates of assisting patients with alcohol- or other drug-related problems (Clement, 1986; Gassman, 2003), including dentists' frequency of assisting patients to quit smoking (Fried & Cohen, 1992).

Co-worker and supervisor support. Shaw et al. (1978) argue that in addition to role adequacy and role legitimacy, health professionals need role support in order to be able to respond to their patients' alcohol- and other drug-related issues. Role support is the availability of help or advice concerning alcohol- and other drug-related issues (Shaw et al., 1978). Research indicates that role support does impact on health professionals' ability to respond to alcohol- and other drug-related issues (Bush & Williams, 1988; Cartwright, 1980; Cartwright & Gorman, 1993; Lightfoot & Orford, 1986). Shaw et al.'s (1978) definition of role support does not distinguish between co-worker support and supervisor support. However, previous research has found these two sources of support are distinct (Karasek, Triantis, & Chaudhry, 1982) and affect responses to alcohol- and other drug-related issues in different ways (Bush & Williams, 1988). Bush and Williams' (1988) survey of GPs found informal peer support exerted a greater effect on GPs' attitudes towards responding to alcohol- and other drug-related issues than formal supervisor support. Co-worker and supervisor support can act as emotional and instrumental resources (Karasek et al., 1982) that may make it easier to perform more challenging behaviours such as assisting patients

who smoke or are at risk of alcohol-related harms. Wider psychological research has also linked social support at work to less strain (Karasek et al., 1982; Schnall, Landsbergis, & Baker, 1994) and increased uptake of new behaviours (Seyler, Holton, Bates, Burnett, & Carvalho, 1998; Taylor, 2000). Social support is argued to act as a buffer against job strain (Karasek et al., 1982; Schnall et al., 1994).

Workload. A hectic work environment was a major barrier reported by Emergency Department nurses in Study 2b and, to a lesser extent, by dental hygienists in Study 2a. O'Boyle et al. (2001) found that workload in a hospital ward impacted negatively on nurses' subjective norms and frequency of hand-washing. Research has found associations between workload and stress, frustration, depression and intentions to quit (Beehr, Jex, Stacy, & Murray, 2000; Spector & Jex, 1998). Workload has also been reported as a barrier to health professionals' uptake of brief interventions for alcohol or other drugs (Durand, 1994; Holmwood, 2002; Weller et al., 1992).

Autonomy. Autonomy is the degree of freedom and discretion available to an employee in their work (Hackman & Oldham, 1976). Autonomy is one of the key job characteristics of Hackman and Oldham's (1976) job characteristics theory, and was identified as most relevant to the current study. According to Hackman and Oldham's (1976) job characteristics theory, high autonomy allows workers to feel responsible for the outcomes of their work, and is one of the core job dimensions necessary for high work motivation, satisfaction, and performance. Hence, autonomy is a crucial aspect of the job environment.

Only one study has investigated the issue of autonomy within a Theory of Planned Behaviour framework. Bunce and Birdi (1998) found that junior doctors with low autonomy had less intention to request autopsies, more negative attitudes, less normative pressure, and lower perceived behavioural control than senior doctors with

high autonomy. While these differences may be due to a number of confounding factors that are likely to differentiate junior doctors from senior doctors in addition to autonomy, such as experience, skills, and knowledge, they nonetheless provide some support for the importance of autonomy as a construct that warrants further investigation.

Education and training. A largely overlooked factor in organisational applications of the Theory of Reasoned Action or Theory of Planned Behaviour is whether workers have received education or training for performing the behaviour. Burak (1994) examined the impact of in-service training on AIDS education on U.S. elementary school teachers' intentions to provide AIDS education to their students and found that in-service training only explained an additional 2% of variance in teachers' intentions over and above the Theory of Planned Behaviour variables. However, relationships between in-service training and attitudes, subjective norms or perceived behavioural control were not investigated.

Previous research has shown that education is a necessary but not sufficient requirement for behaviour change among health professionals (Cockburn, 2004; Davis et al., 1999). Many factors, such as management support, work environment, availability of resources, and the relevance and practicality of training can influence the extent to which education or training can be incorporated into practice (Goldstein & Ford, 2002; Parry, 1997). Nevertheless, education and training has the potential to increase knowledge, confidence, and skills, and hence behaviour.

Organisational policy. Organisational policies which outline desired responses to patients at risk of smoking- or alcohol-related harms as part of routine practice can be pivotal in identifying and assisting at risk patients (Cooke, Mattick, & Campbell, 1998). Cooke et al. (1998) found that staff working in a hospital with a written

organisational policy for smoking cessation interventions were more likely to assist patients to quit smoking and to receive training in smoking cessation. The existence of an organisational policy was the strongest predictor of frequency with which patients were assisted to quit smoking.

Little previous research has examined the pathways through which these organisational variables influence behaviour. The study presented in this chapter examined the ability of intentions, perceived behavioural control, attitudes, and subjective norms to account for the impact of these factors on health professionals' behaviour. The full theoretical model tested in the current study is illustrated in Figure 3. Following this, the method and results for dental hygienists (Study 3a) and Emergency Department nurses (Study 3b) are presented separately, and then discussed together.

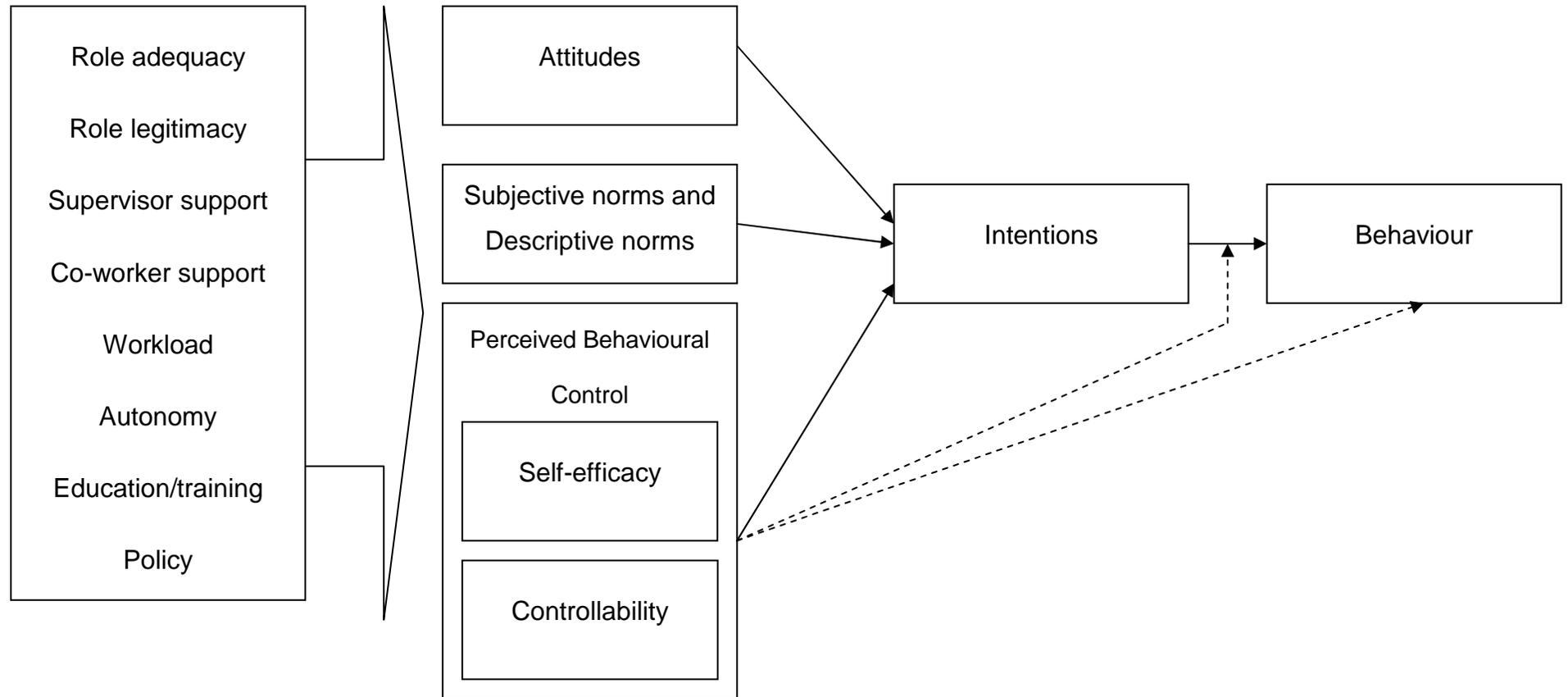


Figure 3. Theoretical model of the Theory of Planned Behaviour and the predicted effects of organisational factors.

Note. The dotted lines represent that perceived behavioural control is predictive of behaviour only insofar as individuals' perceptions of behavioural control reflect actual behavioural control.

Study 3a: Dental Hygienists

Method

Participants

Dental hygienists were recruited through the dental registration board in each state and territory within Australia, with the exception of New South Wales, where participants were recruited through the Dental Hygiene Association. With the exception of the dental hygienists who could not be accessed in New South Wales, the survey mail out included all dental hygienists in Australia. This resulted in a total participant pool of 833. Of these mailed questionnaires, 47 were returned to sender with outdated or incorrect addresses, and two hygienists indicated they were no longer practising, leaving a total of 784 potential participants.

Procedures

An important criticism of the majority of research on the Theory of Planned Behaviour is that behaviour is measured contemporaneously with intentions. Contemporaneous measures of behaviour are highly problematic, as they measure past behaviour rather than future behaviour (Armitage & Conner, 1999; Elliott et al., 2003). Contemporaneous measures are also likely to suffer from consistency biases that artificially inflate relationships between predictor variables and measures of behaviour (Armitage & Conner, 1999; Elliott et al., 2003). Consequently, contemporaneous measures of behaviour can not be seen to test whether the Theory of Planned Behaviour is able to predict future behaviour. To address this limitation, the current studies employed a prospective measure of behaviour, where the frequency

with which dental hygienists and Emergency Department nurses identified and assisted patients was measured one week following measurement of the Theory of Planned Behaviour constructs and other predictor variables.

Participants were mailed an initial questionnaire along with an information sheet about the study, a letter of introduction, and a reply-paid envelope. No identifying information was required and confidentiality and anonymity was assured.

Upon receipt of a completed questionnaire, the address of the participant was detached from the last page of the first questionnaire and a second questionnaire was mailed to this address in order to be received by the participant one week following receipt of the first questionnaire. The second questionnaire measured frequency of behaviour and participants were instructed to complete it for the week they worked following completion of the first questionnaire. The two questionnaires were matched using a unique, anonymous identifying code comprising the first three letters of their mother's maiden name followed by the day of the month of the participant's birth.

Measures

Both the predictor and behaviour questionnaires were divided into two parts: identifying patients who smoke, and assisting patients to quit smoking. The predictor questionnaire was constructed according to Ajzen's (2002b) guidelines for Theory of Planned Behaviour questionnaires. With the exception of measures of behaviour, organisational policy, education and training, and demographic variables, scores for each scale were calculated by averaging responses across items. Negatively worded items were reverse coded. This process yielded scores ranging from 1 (low) to 5 (high). Copies of the questionnaires are included in Appendix E.

In the predictor questionnaire, each section contained direct and indirect measures of attitudes, social norms, and perceived behavioural control and a measure of intention. Items for the indirect measures were drawn from the interviews in the previous study which were conducted in accordance with Ajzen's (2002b) guidelines for eliciting behavioural, normative, and control beliefs. The predictor questionnaire also contained measures of role adequacy, role legitimacy, workload, autonomy, organisational policy, co-worker support, supervisor support, and education and training, and a section on demographic questions.

Intentions. This study adopted Fishbein and Ajzen's (1975) original definition of intentions (see discussion in Chapter 2, p. 25). Intentions to identify patients and intentions to assist patients were measured using one item per behaviour, for example "Over the next week, I intend to assist patients to quit smoking." Responses were recorded on five point Likert scales ranging from (1) strongly disagree to (5) strongly agree.

Direct and Indirect Measures of Attitudes, Subjective Norms and Perceived Behavioural Control

According to the Theory of Planned Behaviour, attitudes, subjective norms, and perceived behavioural control are determined by underlying beliefs (Ajzen, 1991). The primary constructs of attitudes, subjective norms, and perceived behavioural control are often termed the direct measures, and behavioural, normative and control beliefs the indirect measures (Ajzen, 1991). Study 2, reported in Chapter 4 (p. 61), addressed the content of these indirect belief-based measures.

Direct and indirect measures serve two separate functions. Indirect measures provide detailed information yielded on beliefs underlying the impact of the

determinants on intentions and behaviour. Fishbein and Ajzen (1975) emphasise the importance of these underlying beliefs in understanding behaviour and designing interventions targeting behaviour change. Direct measures provide an overall assessment of an individual's attitude towards a behaviour, perceptions of norms surrounding the behaviour and perceived controllability over performing the behaviour.

Direct Measures of Attitudes, Subjective Norms and Perceived Behavioural Control

For all direct measures, the principle of correspondence (Fishbein & Ajzen, 1975) was followed by specifying the target (the patient), action (identifying or assisting patients to quit smoking) and time (“over the next week”). The context (dental surgery) was specified in the introduction to the questionnaire and was deemed not necessary to include explicitly in each item.

Direct measures of attitudes. The direct measures of attitudes consisted of four items which asked whether the behaviour (e.g., “During a consultation, assisting patients to quit smoking is ...”) would be harmful or beneficial, pleasant or unpleasant, good or bad, and valuable or worthless. Responses were recorded on five point semantic differential scales.

Direct measures of perceived behavioural control. Ajzen (1991) originally presented perceived behavioural control as a unidimensional construct, concerning how easy or difficult the actor judged performing the behaviour to be. However, researchers have included issues of autonomy and controllability either alongside or in place of ease or difficulty of performing the behaviour (e.g., Breslin et al., 2001; Conner, Sheeran, Norman, & Armitage, 2000; Faulkner & Biddle, 2001). Ajzen (2002a) later argued that ease or difficulty and controllability were two distinct

dimensions of perceived behavioural control: self-efficacy and controllability, and that researchers could look at perceived behavioural control either as a unitary construct, or as two separate dimensions. Research has indicated that the two dimensions of perceived behavioural control contribute separately to the prediction of intentions and behaviour (Conner & Armitage, 1998; Povey, Conner, Sparks, James, & Shepherd, 2000b; Trafimow, Sheeran, Conner, & Finlay, 2002). Given this research, the self-efficacy and controllability dimensions were analysed separately in order to elucidate the effect of the two different dimensions on behaviour and intention.

The direct measures of perceived behavioural control consisted of five items. Three items tapped the self-efficacy dimension of perceived behavioural control: assessing how easy or difficult it would be to perform the behaviour, how possible or impossible it would be to perform the behaviour and how confident or unconfident they were that they could perform the behaviour (e.g., “Assisting patients to quit smoking is ...”). Two items tapped the controllability dimension of perceived behavioural control: whether or not performing the behaviour was entirely up to them (e.g., “Whether or not I ask patients about their smoking is entirely up to me”) and how much control they had over performing the behaviour (full control – no control) (e.g., “How much control do you have over assisting patients to quit smoking?”). Responses for each item were recorded on a five point scale.

Direct measures of subjective norms. The direct measures of subjective norms consisted of three items. The first two items asked whether the participant felt it was expected of them that they performed the behaviour (strongly agree – strongly disagree) (e.g., “It is expected of me that I ask patients about smoking”) and whether those whose professional opinions the participant valued would approve or disapprove

of them performing the behaviour (e.g. “Those whose professional opinions I value would _____ of me asking patients whether they smoke”). The third item measured descriptive norms in terms of whether the participant perceived that in general, other dental hygienists identified patients who smoke or assisted patients to quit smoking (e.g., “In general, other hygienists assist their patients to quit smoking”). Responses were recorded on five point scales.

Descriptive norms are perceptions of whether or not key referents perform the target behaviour (Conner & McMillan, 1999). Descriptive norms were included in the subjective norms measure because researchers have consistently noted that subjective norms are almost always a substantially weaker predictor of intentions than attitudes, and often, perceived behavioural control (Conner & McMillan, 1999; Godin & Kok, 1996). One possible reason is that the definition of subjective norms as the approval or disapproval of key referents is too narrow (Conner & McMillan, 1999). Descriptive norms may be relevant to subjective norms because behaviours of others may exert normative pressure on individuals to behave in a similar manner (Cialdini, Kallgren, & Reno, 1991; Conner & McMillan, 1999). Descriptive norms have been found to be predictive of intentions to perform behaviours such as smoking (DeVries, Backbier, Kok, & Dijkstra, 1995; Grube, Morgan, & McGree, 1986), exercise behaviour (Okun, Karoly, & Lutz, 2002), healthy eating (Povey, Conner, Sparks, James, & Shepherd, 2000a), and dieting (Conner et al., 1997).

Descriptive norms warrant inclusion in organisational applications of the Theory of Planned Behaviour as they are likely to impact on intentions in the workplace where employees often work in teams, are required to compete with colleagues, for example for commission or promotion, or otherwise have the ability and motivation to evaluate colleagues' behaviour. Consequently, the direct measure of

subjective norms used in the current studies was expanded to include an item measuring descriptive norms.

Indirect Measures of Attitudes, Subjective Norms and Perceived Behavioural Control

The vast majority of studies examining underlying beliefs have used modally salient beliefs, that is, beliefs generally held to be salient in a particular population, drawn from a prior focus group with representatives of the population, or from previous research (e.g., Bell et al., 2000; Chantzisarantis & Hagger, 2005; Limbert & Lamb, 2002; Quine et al., 2001). However, an important criticism of modally salient beliefs is that they only represent beliefs that individuals *may* possibly hold salient, and it may be that for some or all individuals surveyed, the modally salient beliefs are not personally salient (Conner & Armitage, 1998). If beliefs that are not personally salient for a particular individual are used to calculate a particular scale, then the scale is unlikely to accurately reflect the views of the individual.

Instead of using modally salient beliefs, the present studies identified personally salient beliefs for each participant using van der Pligt and de Vries' (1998) methodology. Using this method, participants completed a scale comprised of the modally salient beliefs, and then in a ranking exercise, indicated which beliefs were personally salient. A scale was then constructed individually for each participant using only the beliefs that the individual indicated were personally salient (van der Pligt & de Vries, 1998).

The few studies that have assessed the advantages of using personally salient beliefs have found that scales comprised only of personally salient beliefs are more strongly related to general measures of attitudes and behaviour than modally salient beliefs, and discriminate between groups more effectively than modally salient beliefs

(Budd, 1986; van der Pligt & de Vries, 1998). For example, beliefs about smoking that are personally salient may differ more strongly between smokers and non-smokers compared to modally salient beliefs (Budd, 1986; van der Pligt & de Vries, 1998). Hence, personally salient beliefs may more accurately reflect the beliefs that determine individuals' attitudes, subjective norms and perceived behavioural control.

The additional advantages of using van der Pligt and de Vries' (1998) rating and ranking methodology is that Cronen and Conville's (1975) solution to the issues of using multiplicative composites can be employed, and Ajzen's (1991) controversial optimal rescaling can be avoided. The main concern with the use of multiplicative composites in the Theory of Reasoned Action or the Theory of Planned Behaviour is that a vital assumption of multiplicative composites, that the variables being multiplied have true, rational zero points, is violated (French & Hankins, 2003). The consequence of violating this assumption is that correlations between indirect (involving the multiplicative composites) and direct measures vary as a function of the scales used to measure belief strength and evaluation (French & Hankins, 2003; Hankins, French, & Horne, 2000).

Cronen and Conville (1975) recommend using personally salient beliefs rather than modally salient beliefs, and employing only evaluations of beliefs instead of multiplicative composites. Cronen and Conville (1975) found that when modally salient beliefs were measured, evaluations multiplied by belief strength were more strongly related to the general attitude measure than evaluations alone. However, when personally salient beliefs were used, beliefs strength did not increase the predictive power of the indirect measure of attitude. Cronen and Conville (1975) concluded that evaluation of personally salient beliefs reflected the actual cognitive processes undertaken when forming attitudes, and that the empirical effects of belief

strength were an artefact of using lists of modally salient beliefs. Consequently, it is possible to identify individuals' personally salient beliefs, and sum their evaluations of their salient beliefs to form the indirect measure, rather than using multiplicative composites.

Indirect measures of attitudes. All indirect measures used followed Cronen and Conville's (1975) methodology for measuring personally salient beliefs. The indirect measure of attitudes comprised a list of items (identifying - 8 items; assisting - 11 items) related to possible outcomes of identifying or assisting patients. Example items include "May diminish my rapport with the patient" and "Allows me to assess the patient's oral health". Participants rated each item on a five point scale ranging from (1) very disadvantageous to (5) very advantageous. To measure belief salience, participants then ranked (from one to five) the five outcomes they felt were most important to consider when deciding whether or not to perform the behaviour. Only these top five items were averaged to calculate the indirect attitude score for each participant. Selection of five salient beliefs was a compromise between Fishbein and Ajzen's (1975) guideline of five to nine salient beliefs and van der Plight and Eiser's (1984) guideline of three to five beliefs.

Indirect measures of perceived behavioural control. The indirect measures of perceived behavioural control comprised a list of possible barriers or facilitators for each behaviour (identifying - 9 items; assisting - 8 items). Participants indicated how much easier or more difficult each barrier or facilitator would make performing the behaviour on a five point scale ranging from (1) a lot more difficult to (5) a lot easier. Similar to the indirect measures of attitudes, participants then ranked (from one to five) the five factors they felt were most important to consider, and only these five responses were summed to calculate the indirect measures of perceived behavioural

control. Example items are “The patient has visible signs of smoking” and “The amount of time available in an appointment”.

Indirect measures of subjective norms. The indirect measures of subjective norms comprised a list of nine key referents identified in Study 2. To limit the size of the questionnaire, only one measure of indirect subjective norms was taken that applied to both identifying and assisting. Participants indicated how the key referents would feel about them performing the behaviour on five point scales ranging from (1) strongly approve to (5) strongly disapprove. Similar to the indirect measures of attitudes and perceived behavioural control, participants then ranked (from one to five) the five referents they felt were most important to consider, and only these five responses were summed to calculate the overall indirect measure of subjective norms. Example items are “Other dental hygienists”, “The patient”, and “Health professionals”.

Role adequacy. Role adequacy was measured using the role adequacy subscale of the Alcohol and Alcohol Problems Perception Questionnaire (AAPPQ) (Cartwright, 1980). The wording of the items was altered to reflect smoking rather than alcohol consumption. The scale comprised five items and responses were given on five point Likert scales ranging from (1) strongly agree to (5) strongly disagree. An example item is “I feel I can appropriately advise my patients about smoking and its effects.” Cartwright (1980) demonstrated good internal consistency for the AAPPQ, reporting Cronbach alphas of between 0.7 and 0.9 for the subscales, and presented some evidence of construct validity by indicated improvements in scores on the subscales among participants who attended training on assisting clients with alcohol-related problems. The AAPPQ has been widely used in the alcohol and other drug

field, both to assess attitudes towards alcohol, and adapted to assess attitudes towards other drugs (Abouyanni et al., 2000; Groves & Strang, 2001).

Role legitimacy. Role legitimacy was measured using the role legitimacy subscale of the Alcohol and Alcohol Problems Perception Questionnaire (Cartwright, 1980). The wording of the items was altered to reflect smoking rather than alcohol consumption. The scale comprised four items and responses were given on five point scales ranging from (1) strongly disagree to (5) strongly agree. An example item is “I feel I have the right to ask patients questions about their smoking when necessary.”

Workload. Workload was measured using the role overload subscale of the Michigan Organization Assessment Questionnaire (Cammann, Fichman, Jenkins, & Klesh, 1983). Workload comprised three items with five point scales ranging from (1) strongly disagree to (5) strongly agree. An example item is “I have too much work to do everything well.” The Michigan Organization Assessment Questionnaire is a widely used questionnaire with established reliability and construct validity (Cammann et al., 1983). Cammann et al. (1983) reported a Cronbach’s alpha of .65 for the role overload scale, and demonstrated that it predicted overall, intrinsic and extrinsic job satisfaction with correlation coefficients of -.13, -.20, and -.30 respectively, and was distinct from other task characteristics. Factor analysis indicated that all items in the scale tapped a single factor.

Autonomy. Autonomy was measured using the Freedom subscale of the Michigan Organization Assessment Questionnaire (Cammann et al., 1983). The scale comprised three items, “I have the freedom to decide what I do on my job”, “It is basically my responsibility to decide how my job gets done”, both with five point scales ranging from (1) strongly disagree to (5) strongly agree, and “How much freedom do you have on your job? That is, how much do you decide on your own

what you do on your job?” with a 5 point scale ranging from (1) very little to (5) very much. Cammann et al. (1983) reported a Cronbach’s alpha of .75 for the freedom scale, and demonstrated that it predicted overall ($r = .25$) and intrinsic job satisfaction ($r = .19$). Factor analysis indicated that all items in the scale tapped a single factor.

Education and training. Participants indicated what education or training they had undertaken concerning identifying and assisting patients who smoke by selecting one or more categories from a list. Categories were based on participants’ responses in Study 2 (see Chapter 4) concerning education and training undertaken. Categories included no education or training, TAFE/undergraduate university, seminar run by Quit, other seminar, or other education or training. As a number of participants selected more than one type of education or training, the education and training measure was calculated as the number of different types of education or training experiences reported.

Organisational policy. Participants were asked whether or not their workplace had a policy governing identifying and assisting patients who smoke. Participants who were aware of a policy were asked to give details of the policy.

Co-worker support. Co-worker support was measured using the co-worker support subscale of the Job Content Questionnaire (Karasek et al., 1998). The scale comprised four items, and responses were given on a five point Likert scale ranging from (1) strongly disagree to (5) strongly agree. An example item is “My co-workers are helpful in getting the job done.” The Job Content Questionnaire is a widely used, theory-based instrument with demonstrated reliability and validity (Karasek, 1985; Karasek et al., 1998). In a cross cultural study of the Job Content Questionnaire (Karasek et al., 1998), internal consistency for co-worker support among different samples ranged from .72 to .80, with an average of .75.

Supervisor support. Supervisor support was measured using the supervisor support subscale of the Job Content Questionnaire (Karasek et al., 1998). The scale comprised four items, and responses were given on a five point Likert scale ranging from (1) strongly disagree to (5) strongly agree. An example item is “My supervisor is successful in getting people to work together.” Internal consistencies reported by Karasek et al. (1998) for supervisor support ranged from .80 to .89, with an average of .84.

Demographic variables. Participants were also asked their age, gender, years of experience in dental hygiene, sector (public, private or education), and smoking status (smoker, ex-smoker or never regularly smoked).

Behaviour. The second questionnaire, completed one week following the first questionnaire, measured frequency of identifying patients who smoke and performance of behaviours to assist patients to quit smoking. Participants were also asked to estimate how many patients they had seen in the last week, and how many patients they saw in the last week who they thought smoked.

Identifying patients who smoke. Dental hygienists’ frequency of identifying patients who smoke were assessed using two items: asking a patient about smoking and otherwise ascertaining a patient’s smoking status, such as checking history or looking for visible signs of smoking. Scores from the two items were summed and divided by the number of patients seen in the last week to give a ‘per patient’ measure of identifying.

Assisting patients who smoke. Dental hygienists’ frequency of assisting patients who smoke were assessed using 12 items covering advising and referring patients, giving out Quit material and offering or providing follow up (e.g., “How many times in the last week do you estimate you ... Gave a patient a Quit brochure or

pack?"). Scores from the 12 items were summed and divided by the number of smokers seen in the last week to give a 'per smoker' measure of assisting.

To allow examination of fluctuation in future behaviour that may be due to responding to the questionnaire, the initial predictor questionnaire also included two items measuring frequency of identifying patients in the last week and one item measuring overall frequency of assisting patients in the last week. Three corresponding items in the behaviour questionnaire measured frequency of identifying patients in the last week and overall frequency of assisting patients in the last week.

Prior to data collection, the questionnaires were piloted on a sample of six dental hygienists. Modifications were made to the instructions, layout and wording of items based on feedback from the pilot participants.

Statistical Analyses

Two tests of the Theory of Planned Behaviour were conducted: dental hygienists' (1) identification of patients who smoke, and (2) provision of assistance to patients who smoke. The theoretical models were examined using structural equation modelling. The main advantage of structural equation modelling over standard multiple regression analysis is the ability to test the theoretical model as a whole rather than testing individual path coefficients (Byrne, 2001).

Ajzen recommends that the direct measures of attitudes, subjective norms and perceived behavioural control be used to predict intentions as these measures are consistent with the direct measurement of intentions (Davis, Ajzen, Saunders, & Williams, 2002). The indirect measures can be checked to determine whether they correlate with the direct measures, and then analysed and interpreted independently of

the rest of the model (Davis et al., 2002). This approach was taken in the current study.

Study 3a Results: Dental Hygienists

A total of 362 dental hygienists returned the first questionnaire (46.2%). Of those who returned the first questionnaire, 288 (79.6%) also returned the second questionnaire measuring behaviour, although six (2.1%) could not be matched to the first questionnaire, and nine (3.1%) indicated they had not seen any patients in the intervening week, leaving 273 usable second questionnaires. Analyses not focused on behaviour used the full data set of 362 cases, while analyses involving behaviour used the subset of 273 cases with valid behaviour measures.

The sample comprised 351 females (97%) and 11 males (3%). The mean age was 37.23 (SD = 9.07). The majority of participants worked in the private sector ($n = 306$, 85%), with fewer participants working in the public sector ($n = 36$, 10%), or working in both ($n = 3$, 5%) (3 missing cases). The gender, age, and private/public sector profile of the current sample was not significantly different from the Australian Institute of Health and Welfare's (2005c) dental hygienist labour force estimate (gender: $\chi^2(1, N = 932) = 0.96, p = 0.33$; age: $M = 36.5, t(358) = 1.516, p = .13$; sector: $\chi^2(1, N = 912) = 0.12, p = 0.73$).

The majority of dental hygienists had never regularly smoked ($n = 267$, 73.8%). Fifteen participants (4.1%) were smokers, well below the national prevalence rate of 17% (Australian Institute of Health and Welfare, 2005b) and 78 (21.5%) were ex-smokers (2 missing cases, 0.6%).

Levels of the Theoretical Variables and Organisational Factors

Approximately a quarter of dental hygienists ($n = 98, 27.1\%$) were aware of an organisational policy concerning identifying or assisting patients who smoke. Policies most frequently covered asking about smoking as part of the medical history.

Approximately two thirds of participants had completed smoking cessation education or training ($n = 226, 63\%$). The majority indicated they received this training either during undergraduate studies ($n = 145, 40\%$ of total sample) or from a Quit seminar ($n = 84, 23\%$ of total sample).

The means and standard deviations for the Theory of Planned Behaviour variables and organisational factors are shown in Table 21. Mean scores on all theoretical variables were above the scale midpoint. This indicated generally positive attitudes, strong intentions to perform the behaviour, strong perceptions of approval from others that they should perform the behaviour, and positive evaluations of the ease and possibility of performing the behaviour. Mean scores on the organisational factors were also positive; role adequacy, role legitimacy, autonomy, co-worker support, and supervisor support were high, and workload was low.

Reported frequency of identifying and assisting patients was high, with dental hygienists using approximately one identifying strategy on average per patient visit. Smokers received approximately three intervention strategies on average per visit. To examine potential effects of participation in the study on behaviour, estimated rates of identification and assistance were compared between the initial questionnaire and the second questionnaire. Frequencies of behaviour decreased from the first questionnaire to the second (identifying – Time 1: $M = 25.6, SD = 21.8$, Time 2: $M_2 = 20.7, SD_2 = 22.9, t(286) = 3.62, p < .001$; assisting – Time 1: $M_1 = 6.0, SD_1 = 6.8$, Time 2: $M_2 = 4.8, SD_2 = 4.5, t(246) = 3.20, p = .002$). The direction was opposite to what may be

expected in terms of Hawthorne effects, where behaviour often increases as a result of measurement (Adair, 1984), and may indicate that the dental hygienists had initially overestimated their behaviour, and provided more accurate estimates in the week following the questionnaire.

Table 21

Means and Standard Deviations for Theory of Planned Behaviour Variables and Organisational Factors for Dental Hygienists

Variable	M	SD	Range
Theory of Planned Behaviour Variables			
Identify			
Intention	4.39	1.00	1.00 – 5.00
Self-efficacy	4.16	0.67	1.33 – 5.00
Controllability	3.89	0.77	1.00 – 5.00
Attitude	4.13	0.52	1.00 – 5.00
Subjective norms	4.04	0.56	1.50 – 5.00
Assist			
Intention	3.91	0.94	1.00 – 5.00
Self-efficacy	3.39	0.71	1.33 – 5.00
Controllability	3.35	0.85	1.00 – 5.00
Attitude	3.98	0.55	1.75 – 5.00
Subjective norms	3.68	0.64	1.50 – 5.00
Organisational Factors			
Role adequacy	3.42	0.87	1.00 – 5.00
Role legitimacy	3.87	0.63	2.00 – 5.00
Workload	2.25	0.78	1.00 – 4.67
Autonomy	3.79	0.78	1.33 – 5.00
Amount of education and training	0.77	0.70	0.00 – 3.00
Co-worker support	4.32	0.63	1.00 – 5.00
Supervisor support	4.14	0.76	1.00 – 5.00
Behaviour			
Identify (per patient)	1.03	0.59	0.00 – 2.00
Assist (per smoker)	3.15	2.10	0.00 – 10.50

Note. For all variables except age, amount of education and training, identify, and assist, scales range from 1 (low) to 5 (high). All *ns* ranged from 356 to 362, with the exception of behaviour (*N* = 273 for identify and assist).

Examination of the Ability of the Theory of Planned Behaviour to Predict Behaviour

For the analyses examining prediction of behaviour, only the cases with valid measures of behaviours were used ($n = 273$). Each analysis was also conducted on the full data set, but the results did not substantially differ for any of the analyses.

Appendix F contains the correlation matrices on which the analyses were based.

Testing for interaction effects between intentions and perceived behavioural control requires interaction terms to be included in the analysis. In order to include these interaction terms, scores for intention and the two dimensions of perceived behavioural control were centred by subtracting the mean for the variable from each score (Aiken & West, 1991). Centring reduces the multicollinearity introduced by the interaction terms and makes the path coefficients for the first order terms more meaningful (Aiken & West, 1991).

The full theoretical model was tested first. For both identification and assistance, the controllability dimension of perceived behavioural control was not independently related to intentions or behaviour, and there was no interaction effect between controllability and intentions in the prediction of behaviour. Hence, controllability was not included in the presented analysis. Similarly, supervisor support, experience, workload, and education were not found to be related to behaviour or Theory of Planned Behaviour constructs for identification or assistance, and hence, these factors were removed. The results of the analysis are presented in Figure 4.

Intentions and the self-efficacy dimension of perceived behavioural control predicted behaviour for both identification and assistance. Intention to identify patients who smoke was predicted by attitudes, while intention to provide assistance

to patients to quit smoking was predicted by attitudes, subjective norms, and self-efficacy. A number of organisational factors influenced the theoretical variables. Knowledge of an organisational policy was associated with higher subjective norms. Participants who smoke expressed more negative attitudes than participants who did not smoke. Greater role adequacy (confidence and skills) was associated with more favourable perceptions of the ease of identifying and assisting patients who smoke. Higher role legitimacy was associated with more positive attitudes, perceptions of subjective norms and perceptions of the ease of identifying and assisting patients who smoke. As the organisational factors were expected to be correlated, intercorrelations between the organisational factors were included in the model. To simplify the presentation of Figure 4, the significant intercorrelations are shown in Table 22.

The goodness of fit indices for identification ($\chi^2 (36) = 113.46$ ($p < .001$), NFI = .79, CFI = .84, RMSEA = .09) and assistance ($\chi^2 (36) = 164.13$ ($p < .001$), NFI = .81, CFI = .84, RMSEA = .11) indicated moderately good fit. For comparison, the goodness of fit indices were calculated for models including only the Theory of Planned Behaviour variables, and not the organisational factors. For identification, the fit indices were slightly poorer than when the organisational factors were included: $\chi^2 (6) = 52.86$ ($p < .001$), NFI = .75, CFI = .75, RMSEA = .17. For assistance, there was a small increase in the extent to which the data fit the model: $\chi^2 (6) = 26.83$ ($p < .001$), NFI = .95, CFI = .96, RMSEA = .11.

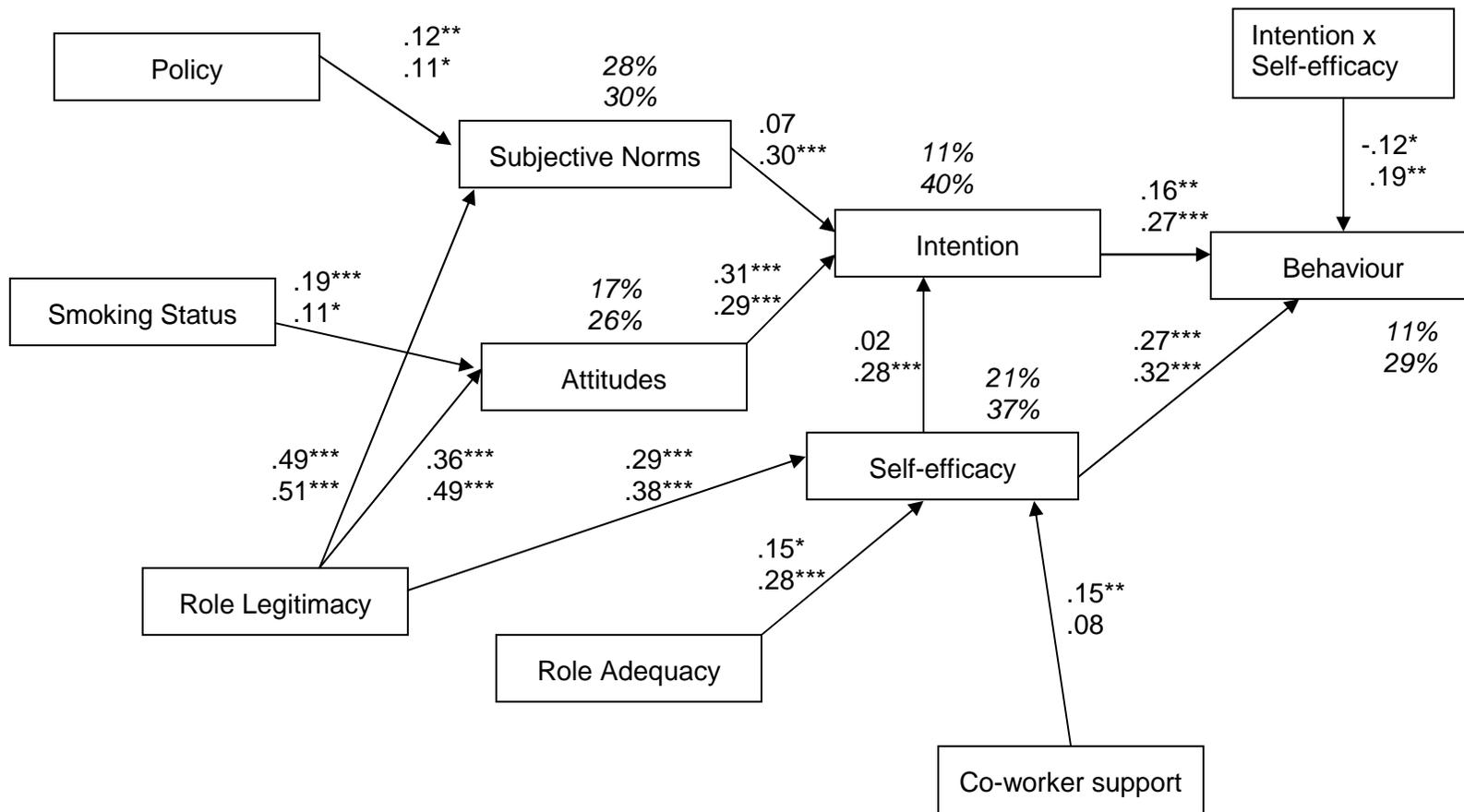


Figure 4. Standardised path coefficients and variance explained for the Theory of Planned Behaviour account of dental hygienists identifying patients who smoke (top coefficients) and assisting patients to quit smoking (bottom coefficients).

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 22

Standardised Path Coefficients for Relationships Between Organisational Variables Included in the Model (N = 273)

Relationship	<i>r</i>
Policy – Coworker support	.18**
Policy – Role legitimacy	.27***
Policy – Role adequacy	.21***
Role legitimacy – Role adequacy	.56***
Role legitimacy – Coworker support	.29***
Role adequacy – Coworker support	.13*

* $p < .05$, ** $p < .01$, *** $p < .001$

Cohen's (1992) indication of effect size, f^2 , was calculated for variance explained in behaviour, where a small effect is .02, a medium effect is .15, and a large effect is .35. Theoretical predictors accounted for a small to medium amount of variance in identifying ($f^2 = .12$) and a large amount of variance in assisting ($f^2 = .41$).

The interactions between intentions and self-efficacy for identification and assistance were explored further by examining the relationship between intentions and behaviour according to level of self-efficacy. For identification, higher levels of self-efficacy were associated with a weaker relationship between intentions and behaviour: at average levels of self-efficacy, the relationship between intentions and behaviour was .16. For one standard deviation below the mean of self-efficacy, the relationship between intentions and behaviour increased to .24. For one standard deviation above the mean of self-efficacy, the relationship between intentions and behaviour decreased

to .08. For assistance, higher levels of self-efficacy were associated with a stronger relationship between intentions and behaviour. For average levels of self-efficacy, the relationship between intentions and assisting behaviour was .27. For one standard deviation below the mean of self-efficacy, the relationship between intentions and behaviour decreased to .14. For one standard deviation above the mean of self-efficacy, the relationship between intentions and behaviour increased to .40.

The ability of the Theory of Planned Behaviour variables to mediate the influence of the organisational factors was assessed using a second structural equation model with additional paths from the organisational variables to behaviour. None of the additional paths were significant for identification or assistance which is consistent with the proposition that the Theory of Planned Behaviour variables mediate the influence of the organisational factors on behaviour. The mediation analyses are contained in detail in Appendix G.

Relationship Between Underlying Beliefs and Direct Measures

The relationships between the underlying beliefs and the direct measures were examined to check the correspondence between the direct and indirect measures. For this analysis, the self-efficacy and controllability items were averaged to create a general perceived behavioural control measure. As shown in Figure 5, behavioural beliefs were associated with the direct measure of attitude and normative beliefs were associated with the direct measures of subjective norms, with medium to large effect sizes observed. Control beliefs were associated with the direct measure of perceived behavioural control for assistance (medium effect size) but not for identification.

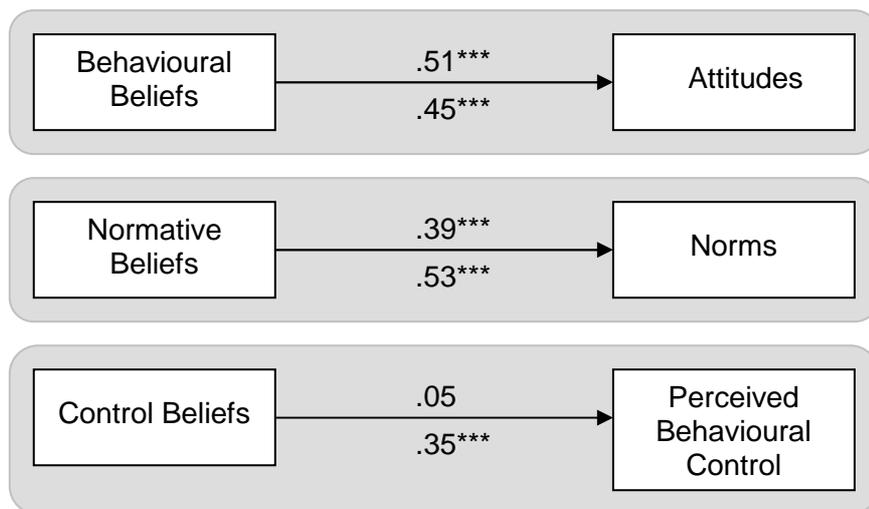


Figure 5. Relationships between underlying beliefs and direct measures for identify (above the line), and assist (below the line), for dental hygienists.

*** $p < .001$.

To examine the ability of the underlying beliefs to predict intentions and behaviour, and the effect of organisational factors on underlying beliefs, the theoretical model was analysed with the indirect, belief-based measures in place of the direct measures of attitude, subjective norms and perceived behavioural control. Path coefficients and goodness of fit indices were consistently lower than for the model assessed using the direct measures.

Study 3b: Emergency Department Nurses

Method

Participants

Emergency Department nurses were recruited through several avenues. Members of the Australian College of Emergency Nursing (N = 202) were mailed out a questionnaire. Three were returned to sender, leaving a participant pool of 199. Questionnaires were also distributed to Emergency Department nurses through nurse managers in A.C.T. (n = 20), Queensland (n = 10), and South Australia (n = 45). In addition, 38 nurses were recruited through staff meetings at a second South Australian hospital (total participant pool = 312). Unique identifiers were checked to ensure no individuals participated twice.

Procedures

The procedures for Study 3b were identical to those used in Study 3a, with the exception of the Emergency Department nurses recruited through staff meetings, who were handed, rather than mailed, the questionnaire, information sheet and letter of introduction at the meeting.

Measures

The measures in Study 3b were largely identical to the measures used in Study 3a (see p. 109). Details of the measures that differed from Study 3a are described below. Copies of the questionnaires are included in Appendix E. The predictor and behaviour questionnaires were divided into two parts: identification of patients at risk

of alcohol-related harm, and provision of assistance to patients to modify their alcohol consumption.

The measure of intentions, and the direct measures of attitudes, subjective norms and perceived behavioural control were identical to the measures employed in Study 3a, with the wording reflecting alcohol rather than smoking. The scales for the indirect measures, however, comprised items reflecting different underlying behavioural, normative, and control beliefs to the beliefs measured in Study 3a, and contained different numbers of items. The belief scales were calculated using the same procedures as in Study 3b.

Indirect measures of attitudes. The indirect measure of attitudes comprised a list of items (identifying - 11 items; assisting - 12 items) related to possible outcomes of identifying or assisting patients. Example items included “May cause a hostile or aggressive reaction” and “Improves the diagnosis and understanding of the patient’s condition”.

Indirect measures of perceived behavioural control. The indirect measures of perceived behavioural control comprised a list of possible barriers or facilitators for each behaviour (identifying - 12 items; assisting - 12 items). Example items were “Having a good rapport with the patient” and “If the patient is heavily intoxicated”.

Indirect measures of subjective norms. The indirect measures of subjective norms comprised a list of ten key referents identified in Study 2b. Example items are “Other nursing staff” and “The patient’s parents/family”.

Organisational factors. Organisational factors were measured using the same scales and items as in Study 3a, with the wording changed to reflect alcohol rather than smoking. For the role adequacy and role legitimacy scales, this corresponded to the original scale items which concerned drinking. The only exception was that

response categories for the education and training measure were altered to reflect the responses of Emergency Department nurse participants in Study 2b. Categories included no education or training, in-service training, external short course, undergraduate nursing studies, postgraduate studies, and other education or training.

Demographic variables. Participants were asked their age, gender, and sector (public, private or education). Participants were also asked about their years of experience in the Emergency Department and their alcohol consumption based on the NHMRC (2001) cut offs for high risk alcohol consumption associated with short term harms. Nurses were asked how many times in the last 30 days they had consumed 11 or more (for men) or 7 or more (for women) standard drinks on any one day.

Behaviour. The second questionnaire, completed one week following the first questionnaire, measured frequency of identifying patients at risk of alcohol-related harms and assisting patients to modify their alcohol consumption. Participants were also asked to estimate how many patients they had seen in the last week.

Identifying patients at risk of alcohol-related harms. The frequency with which Emergency Department nurses identified patients at risk of alcohol-related harms was measured using two items: asking patients about their alcohol consumption and breathalysing patients or otherwise measuring their blood alcohol. Scores from the two items were summed and divided by the number of patients seen in the last week to give a 'per patient' measure of identifying.

Assisting patients at risk of alcohol-related harms. The frequency with which Emergency Department nurses provided assistance to patients to modify their alcohol consumption was measured using 14 items ranging from asking patients if they wanted help managing their alcohol consumption, through advising and referring patients, assisting with alcohol withdrawal symptoms, and giving out business cards

for specialist services or material on alcohol to patients (e.g., “How many times in the last week do you estimate you ... referred a patient to a social worker for their alcohol consumption?”). Scores on the 14 items were summed and divided by the number of patients seen in the last week to give a ‘per patient’ measure of assisting.

The initial questionnaire also included two items measuring frequency of identifying patients in the last week and one item measuring overall frequency of assisting patients in the last week. Three corresponding items in the second questionnaire measured frequency of identifying patients in the last week and overall frequency of assisting patients in the last week.

The questionnaires were piloted on a sample of six Emergency Department nurses prior to data collection, and changes were made in response to feedback.

Statistical Analyses

Two tests of the Theory of Planned Behaviour were conducted: Emergency Department nurses’ (1) identification of patients at risk of alcohol-related harms, and (2) provision of assistance to patients to modify their alcohol consumption. The theoretical models were examined using path analysis. Path analysis was chosen for Emergency Department nurses as the sample size for nurses did not allow for structural equation modelling methods.

Study 3b Results: Emergency Department Nurses

Of the 312 questionnaires distributed to Emergency Department nurses, 125 were returned (40%). Of the 125 participants, 79 also returned the second questionnaire (63%). Four of these (5%) could not be matched to the first

questionnaire, and four participants (5%) indicated they had not worked in the Emergency Department in the intervening week, leaving 71 valid cases. For three cases, the total number of patients seen was not recorded. The average number of patients seen (59 patients) was used as the denominator for the 'per patient' measures of behaviour. Analyses not focused on behaviour used the full data set of 125 cases, while analyses involving behaviour used the subset of 71 cases with valid behaviour measures.

The sample comprised 17 males (14%) and 106 females (86%) (2 missing cases). The proportion of males and females was not significantly different to the Australian Institute of Health and Welfare's (2005d) nursing labour force estimate ($\chi^2(1, N = 236,767) = 0.04, p = 0.84$). The mean age was 37.02 (SD = 10.00), which was lower than the mean age for the nursing labour force estimate ($M = 43.1, t(122) = -6.74, p < .001$) (Australian Institute of Health and Welfare, 2005d). This could reflect a lower mean age for all Emergency Department nurses compared to the total population of nurses. The vast majority of participants worked in the public sector ($n = 115, 96\%$), with few working in private ($n = 4, 3\%$) or both public and private ($n = 1, 1\%$, 5 missing cases). The proportion of nurses working in the public and private sectors were not available in the labour force estimates.

Thirty two participants (26%) reported consuming alcohol at a high risk level on at least one occasion in the last 30 days (4 missing cases). The number of occasions of high risk drinking ranged from 1 to 15 ($M = 3.28, SD = 3.50$). This exceeded the national prevalence rate of 13% (Australian Institute of Health and Welfare, 2005b) for risky or high risk drinking at least monthly combined (i.e., the cut off for the national prevalence rate was for a lower category of risk: 7 standard drinks for males or 5 standard drinks for females on any one occasion), and the 9.2%

prevalence rate of risky or high risk drinking for short term harms among health and welfare associate professionals reported by Pidd, Berry, Harrison et al. (2006).

Levels of the Theoretical Variables and Organisational Factors

Approximately two thirds of participants ($n = 86$, 69%) had undertaken education or training to assist patients to modify their alcohol consumption, with in-service training most frequently reported ($n = 48$, 38%). Thirty one percent of participants were aware of a policy in their hospital which covered asking patients about alcohol or assisting patients to modify their alcohol consumption ($n = 34$, 14 missing cases). Participants indicated that policies most commonly covered asking patients about alcohol or breathalysing patients on admission. However, this was not seen as mandatory, but dependent on time available.

The means and standard deviations for the Theory of Planned Behaviour variables and organisational factors are shown in Table 23. Mean scores on all theoretical variables were above the scale midpoint, with the exception of the controllability dimension of perceived behavioural control for assisting. This indicated generally positive attitudes, strong intentions to perform the behaviours, strong perceptions that others would approve of them performing the behaviours, and positive perceptions of the ease of performing the behaviours. For identifying, participants generally felt it was in their control whether or not to perform the behaviour, but for assisting, participants felt more that external factors controlled whether or not they could assist patients. Average levels of role legitimacy, autonomy, workload, co-worker support, and supervisor support were high, while average levels of role adequacy were below the scale midpoint.

Participants reported using an identifying strategy on average once for every three patients, and averaged 0.63 assisting strategies per patient. To examine potential effects of participation in the study on behaviour, estimated rates of identification and assistance were compared between the initial questionnaire and the second questionnaire. Frequencies of behaviour had increased from the week before the questionnaire (identifying: $M_1 = 9.6$, $SD_1 = 12.4$, $M_2 = 16.6$, $SD_2 = 26.9$, $t(71) = -2.88$, $p = .005$, assisting: $M_1 = 3.5$, $SD_1 = 6.7$, $M_2 = 7.0$, $SD_2 = 12.3$, $t(69) = -2.41$, $p = .019$). This finding is consistent with the Hawthorne effect as reported behaviour increased potentially as a result of measurement (Adair, 1984).

Table 23

Means and Standard Deviations for Theory of Planned Behaviour Variables and Organisational Factors for Emergency Department Nurses

Variable	M	SD	Range
Theory of Planned Behaviour Variables			
Identify			
Intention	3.78	.80	1.00 – 5.00
Self-efficacy	3.72	.62	2.60 – 5.00
Controllability	3.38	.81	1.50 – 5.00
Attitude	3.74	.42	2.75 – 5.00
Subjective norms	3.65	.63	2.50 – 5.00
Assist			
Intention	3.57	.82	1.00 – 5.00
Self-efficacy	3.11	.58	1.20 – 4.50
Controllability	3.00	.73	1.00 – 4.50
Attitude	3.94	.47	2.75 – 5.00
Subjective norms	3.40	.65	2.00 – 5.00
Organisational Factors			
Role adequacy	2.74	.87	1.00 – 5.00
Role legitimacy	3.44	.64	1.00 – 5.00
Workload	3.22	.85	1.00 – 5.00
Autonomy	3.25	.72	1.00 – 5.00
Amount of education and training	.91	.76	0.00 – 4.00
Co-worker support	4.02	.59	2.00 – 5.00
Supervisor support	3.54	1.01	1.00 – 5.00
Behaviour			
Identify (per patient)	.31	.34	0.00 – 1.36
Assist (per patient)	.63	.94	0.00 – 4.90

Note. For all variables except age, amount of education and training, identify, and assist, scales range from 1 (low) to 5 (high). All Ns ranged between 121-125 with the exception of behaviour (N = 71 for identify and assist).

Examination of the Ability of the Theory of Planned Behaviour to Predict Behaviour

The correlation matrix on which the path analysis was based is contained in Appendix F. The results of the path analysis examining the prediction of identifying and assisting patients are shown in Figure 6. No variables significantly predicted identifying or assisting patients. Theoretical predictors explained a small to medium amount of variance for identifying ($f^2 = .11$) and a small amount of variance for assisting ($f^2 = .07$). The sole predictor of intentions for both identifying and assisting was subjective norms.

Awareness of an organisational policy predicted subjective norms for identifying and assisting, and also attitudes towards identifying. Role legitimacy predicted attitudes and subjective norms for both behaviours, and also predicted self-efficacy for identifying. Co-worker support predicted attitudes towards identifying, and role adequacy predicted self-efficacy for assisting. Supervisor support predicted attitudes to identifying and assisting.

No other organisational factors impacted on the variables in the model. Additional regression analyses examined the influence of organisational factors on behaviour (contained in Appendix G). For both identifying and assisting, no organisational factors were directly related to behaviour which supports the role of the Theory of Planned Behaviour variables as the most proximal determinants of behaviour.

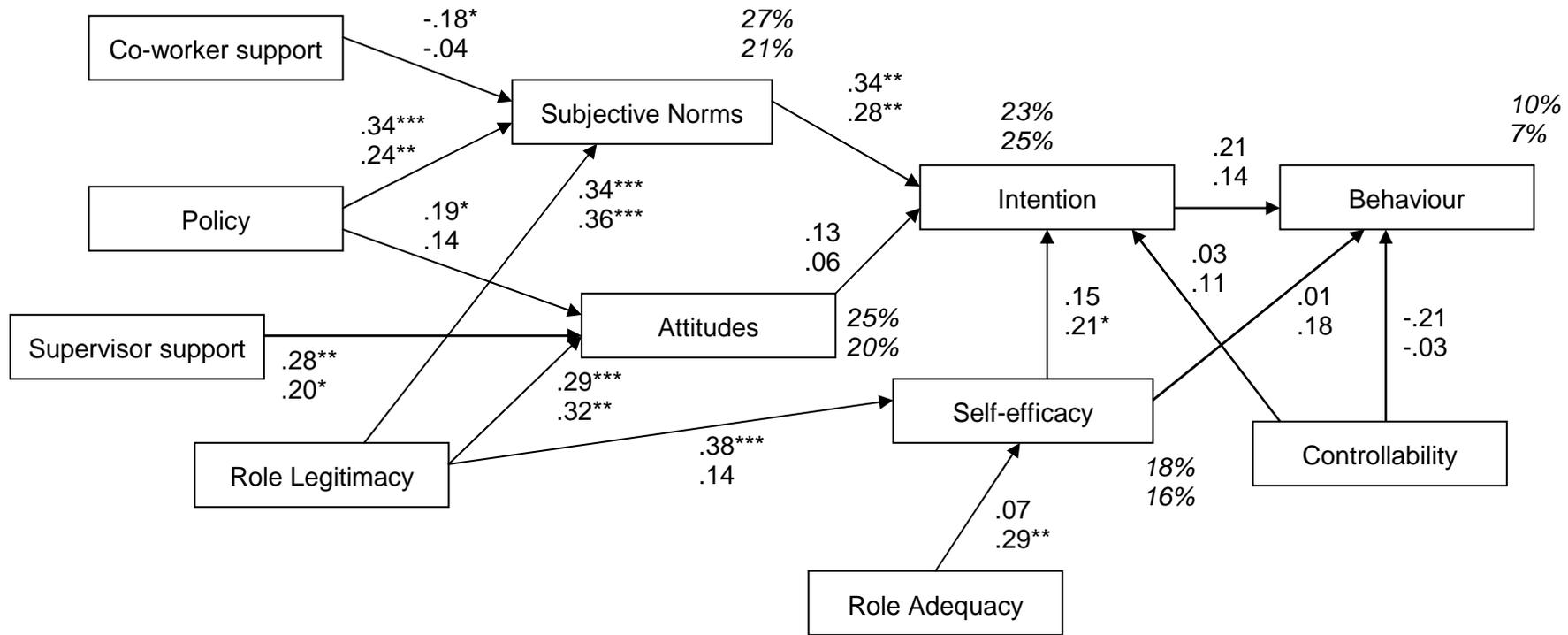


Figure 6. Standardised betas for the regression analysis of Emergency Department nurses identifying (top coefficients) and assisting (bottom coefficients) patients.

* $p < .05$, ** $p < .01$, *** $p < .001$

Relationship Between Underlying Beliefs and Direct Measures

The relationships between the underlying beliefs and the direct measures were examined to check the correspondence between the direct and indirect measures. For this analysis, the self-efficacy and controllability items were averaged to create a general perceived behavioural control measure. As shown in Figure 7, behavioural beliefs, normative beliefs, and control beliefs were correlated with the direct measures of attitudes, subjective norms and perceived behavioural control respectively. Effect sizes ranged from just below medium to large.

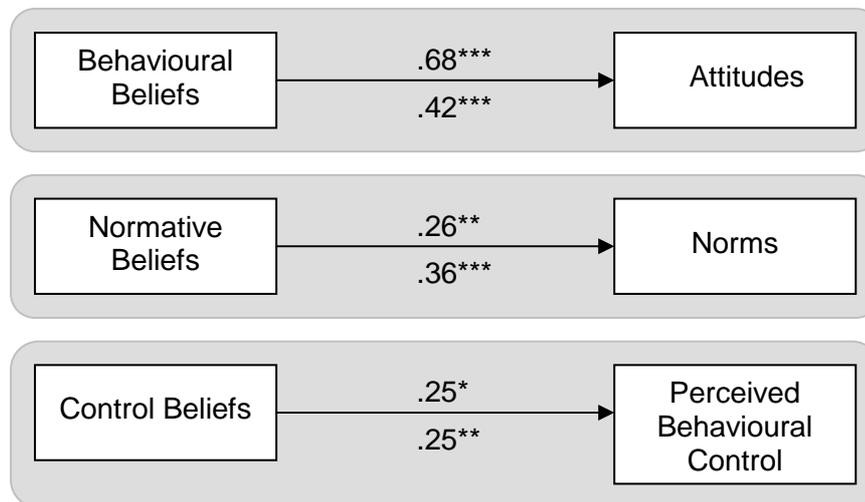


Figure 7. Relationships between underlying beliefs and direct measures for identify (above the line) and assist (below the line) for Emergency Department nurses.

* $p < .05$, ** $p < .01$, *** $p < .001$

Discussion

The aims of Study 3 were to assess:

- 1) whether the Theory of Planned Behaviour variables predicted the frequency with which dental hygienists and Emergency Department nurses identified

patients at risk and provided assistance to such patients for smoking and alcohol consumption respectively,

- 2) which factors were most predictive of frequency of behaviour, and
- 3) whether the Theory of Planned Behaviour could account for the influence of organisational factors on behaviour.

These studies formed the second step in the application of the Theory of Planned Behaviour to these behaviours, and were designed to inform the third step, a behaviour change intervention targeting frequency of behaviour. The extent to which the Theory of Planned Behaviour was able to predict the four specified behaviours is discussed below.

Factors Predictive of Frequency of Behaviour

The Theory of Planned Behaviour predicted the frequency with which dental hygienists identified and assisted patients who smoke in Study 3a. Intentions and the self-efficacy dimension of perceived behavioural control explained a small to medium amount of variance in frequency of identifying patients who smoke, and a large amount of variance in assisting patients who smoke. An interaction effect was found for intentions and self-efficacy on dental hygienists' frequency of assisting. A smaller interaction effect was also found for identifying, but in an opposite direction to that predicted, as higher levels of self-efficacy were associated with a weaker relationship between intentions and behaviour. This is the opposite direction to that specified by Ajzen (1991), and was a small effect (.12), hence this finding may be due to chance. Alternatively, it may indicate that self-efficacy was a more powerful predictor of

behaviour than intentions in such a way that when self-efficacy was high, it reduced the predictive ability of intentions.

For assisting patients, when self-efficacy was high there was a medium correlation between intentions and behaviour, but when self-efficacy was low, there was no correlation. Hence, self-efficacy can be seen as a pre-requisite for hygienists who wish to assist patients to quit smoking. Self-efficacy was also more predictive of behaviour than intentions for both identifying and assisting, and for assisting patients, self-efficacy was also predictive of intentions. These findings suggest that self-efficacy is a pivotal factor for dental hygienists to assist their patients to quit smoking. This is consistent with the findings from the only other Australian survey of dental hygienists on the issue of assisting patients to quit smoking, which indicated that confidence was the most important predictor of behaviour (Edwards, Freeman, & Roche, 2006).

The results for Study 3b were less straightforward than for Study 3a, and more difficult to interpret. The Theory of Planned Behaviour did not adequately predict Emergency Department nurses' frequency of identifying or assisting patients in Study 3b. Neither intentions nor perceived behavioural control predicted frequency of either behaviour. Subjective norms were the major predictor of intentions for both identifying and assisting, and subjective norms were predicted by knowledge of an organisational policy, co-worker support, and role legitimacy.

It was unclear which factors could be targeted to improve Emergency Department nurses' frequency of behaviour. Perceptions of norms surrounding identifying and assisting patients at risk of alcohol-related harms could be improved by implementation of organisational policies, targeting workers' sense of role legitimacy and improving co-worker support networks among nurses. However, given that the relationship between intentions and behaviour was not supported for nurses, an

improvement in subjective norms may not necessarily translate into improvement in frequency of behaviour. Further investigation is required to ascertain what factors may enhance Emergency Department nurses' frequency of identifying patients at risk of alcohol-related harms and assisting patients to modify their alcohol consumption.

The controllability dimension of perceived behavioural control did not predict intentions or behaviour for dental hygienists. However, for Emergency Department nurses, the path coefficient for the influence of controllability on identifying behaviour was a small to medium effect, and may have reached significance with a larger sample size. The lack of predictive ability of controllability may indicate that this dimension of perceived behavioural control is not as important to behaviour or intentions as self-efficacy, at least for dental hygienists. The standard deviations for dental hygienists' perceptions of controllability were higher than those for self-efficacy, suggesting the results were not due to lack of variance in participants' perceptions of controllability. This finding highlights the importance of considering the two dimensions of perceived behavioural control separately in order to understand the factors influencing behaviour.

The theoretical model included descriptive norms based on previous research and their potential importance found in the qualitative interviews, and separated the self-efficacy and controllability dimensions on perceived behavioural control based on previous research indicating they operate independently (Conner & Armitage, 1998; Povey et al., 2000b; Trafimow et al., 2002). These additions are included in a recently developed two factor model of the Theory of Planned Behaviour (Ajzen & Fishbein, 2005; Conner & Sparks, 2005). The two factor model also included distinction of instrumental attitudes (cognitive judgements) and affective attitudes (emotional responses) (Lawton, Conner, & Parker, 2007). This was not included in the current

model, and future research could examine the potential role of these two types of attitudes in the formation of workers' intentions.

Organisational Factors

One of the aims of Study 3 was to examine whether the Theory of Planned Behaviour accounted for the influence of organisational factors on health professionals' behaviour. To this end, the studies also included assessment of the influence of organisational variables on behaviour and the theoretical predictors of behaviour, and whether the Theory of Planned Behaviour mediated the influence of organisational factors on behaviour. For Study 3a, a range of organisational factors influenced the theoretical determinants of dental hygienists' behaviour, including the presence of an organisational policy addressing assistance to patients to quit smoking, and dental hygienists' smoking status, role legitimacy, role adequacy, and level of support from co-workers.

A similar pattern was evident for Emergency Department nurses in Study 3b. Role legitimacy, role adequacy, co-worker and supervisor support, and knowledge of an organisational policy all influenced theoretical determinants. Contrary to the effect of smoking status on dental hygienists' attitudes, however, personal alcohol consumption did not predict any of the nurses' theoretical determinants of behaviour.

Participants' experience in their current job role, workload, or education or training undertaken to assist patients to quit smoking or modify their alcohol consumption did not influence behaviour or the theoretical determinants of behaviour for either profession. These factors may not have influenced frequency of identification or assistance. Alternatively, despite the use of well-researched measures, the failure to find relationships may have been due to the scales for these variables not adequately

tapping the organisational factor. The lack of relationships between education or training and behaviour or Theory of Planned Behaviour variables supports research indicating that training may not necessarily result in changes to work practice, and that workplace factors such as available co-worker or supervisor support, or the presence of organisational policies, can influence workers' ability to transfer training into practice (Goldstein & Ford, 2002).

The current study provided support for the mediation hypothesis of the Theory of Planned Behaviour. The influence of all organisational factors on behaviour was mediated by Theory of Planned Behaviour variables. Hence, while the importance of role adequacy, role legitimacy, and co-worker support provides support for Shaw et al.'s (1978) model of therapeutic commitment, these factors appear to affect behaviour through influencing attitudes, subjective norms, and perceived behavioural control. Similarly, the importance of an organisational policy accords with previous research (Cooke et al., 1998). The current findings suggest that organisational policies affect behaviour through increasing perceptions of norms surrounding the behaviour, and also potentially through increasing their attitudes towards performing the behaviour.

Comparison of Dental Hygienists and Nurses

The Theory of Planned Behaviour's account of dental hygienists' frequency of identifying and assisting patients who smoke was more successful than the theory's account of Emergency Department nurses' frequency of identifying and assisting patients at risk of alcohol-related harms. More of the theoretical relationships were supported, including the interaction between intentions and self-efficacy, and a greater amount of variance in behaviour was predicted for dental hygienists compared to nurses. Path coefficients were uniformly weaker for Emergency Department nurses than

for dental hygienists. However, the failure to obtain a large enough sample size for nurses in Study 3b may partially explain the modest findings for this group. With a larger sample, some of the standardised path coefficients may have reached significance. Future research with Emergency Department nurses may consider methods and avenues for recruiting larger numbers of participants.

The results for the two groups diverge on several other important points. Firstly, the findings for dental hygienists emphasise the role of the self-efficacy dimension of perceived behavioural control, while the findings for nurses emphasise the importance of subjective norms. The greater emphasis on subjective norms among Emergency Department nurses may reflect the fact that nurses work in a group setting, while dental hygienists largely work alone with the patient.

Beliefs underlying attitudes, subjective norms, and perceived behavioural control measured in the questionnaires were different for hygienists and nurses, and there was little similarity in regard to which beliefs emerged as the most critical. This difference is important, and highlights the need to research a target population's underlying beliefs before designing a behaviour change intervention rather than generalising from other settings. In contrast to findings in relation to underlying beliefs in Study 2, findings for the impact of organisational factors were similar between nurses and hygienists. This may indicate that certain organisational factors, such as available support and organisational policies, have similar effects across a range of health professionals' prevention behaviours. Replication of these findings in further studies targeting different health professionals and different behaviours would provide more evidence for this possibility. This finding suggests the potential to identify particular organisational factors that could be beneficial for many professional practice change efforts to address.

Implications for the Behaviour Change Intervention

The present surveys were undertaken to inform a behaviour change intervention targeting factors found to be most predictive of frequency of behaviour. The findings indicated that the Theory of Planned Behaviour was most successful in predicting dental hygienists' frequency of assisting patients to quit smoking. The results suggested that an intervention based on the Theory of Planned Behaviour would be more likely to be effective to increase dental hygienists' frequency of assisting patients to quit smoking. Hence, this behaviour/professional group was chosen as the focus for the intervention subsequently undertaken and reported in the following chapter (Chapter 6).

The major predictor of frequency of assisting patients to quit smoking was the self-efficacy dimension of perceived behavioural control. Hence, the intervention was designed to target dental hygienists' perceptions of the ease or difficulty of assisting patients to quit smoking.

Underlying Beliefs

Underlying beliefs are central to the development of Theory of Planned Behaviour-based behaviour change interventions (Fishbein & Ajzen, 1975). Interventions need to be developed to target salient beliefs that underlie important predictors of behaviour. In order to test the strength of the relationship between the underlying beliefs and the direct measures of the theoretical constructs, the correlations between the direct and indirect measures were examined. Correlations were not as large as has been previously found in the literature. The relationships between attitudes and behavioural beliefs, and subjective norms and normative beliefs were generally large for both dental hygienists and Emergency Department nurses, while correlations between

perceived behavioural control and control beliefs were more modest. Critically for the intervention reported in Chapter 6, the relationship between the direct measure of perceived behavioural control and the underlying control beliefs was of medium strength for dental hygienists' provision of assistance. It may be that Cronen and Conville's (1975) method of rating then ranking beliefs results in lower correlations between the direct and indirect measures. Despite the fact that Cronen and Conville (1975) published their suggested methodology over 30 years ago, no other Theory of Planned Behaviour studies could be found which had implemented this method, so this possible explanation could not be evaluated.

Cronen and Conville's (1975) method eliminates the 'expectancy' dimension of expectancy-value scales and replaces it with a measure of belief salience. This may cause confusion for participants if expectancy is not measured at all. In particular, feedback from Emergency Department nurse participants in Study 3b indicated some confusion, especially around behavioural beliefs. Participants were asked to rate how advantageous or disadvantageous different outcomes were, however they appeared to expect and prefer to be asked how likely each outcome was. In some cases, participants had crossed out the provided scale anchors and replaced them with anchors reflecting expectancy. In these cases the data were recorded as missing data. Hence, future research may wish to include expectancy measures if only to eliminate this confusion.

Alternatively, the low correlations may be due to the fact that many of the beliefs, particularly control beliefs, were heavily patient-dependent. For example, analysis of correlation coefficients for individual control beliefs with perceived behavioural control indicated that items to do with patient factors, such as if the patient is receptive, tended to have lower correlations with perceived behavioural control. It may be the case that such patient factors are important, but that because they vary from

patient to patient, there was less of a relationship between ratings of these factors and the global perceptions of ease or difficulty required for the direct measure.

Amount of Variance Explained in Behaviour

One of the shortcomings of the ability of the Theory of Planned Behaviour to predict the behaviours was the low amount of variance explained in behaviour. Armitage and Conner's (2001) meta-analysis found on average of 27% of the variance in behaviour was explained by the Theory of Planned Behaviour. The amount of variance explained in dental hygienists' provision of assistance exceeded this mean effect size, while the variance explained in the remaining three behaviours fell below the mean effect size.

It is feasible that the current research did not take into account the full range of contextual factors that may influence health professionals' frequency of performance of these behaviours. For example, it is possible that for Emergency Department nurses, the hectic and unpredictable work environment, where staff are required to respond to many and varied urgent presentations, had a considerable impact on their ability to identify and assist patients at risk of alcohol-related harms. Emergency Department nurses may not be able to anticipate the impact of such environmental factors on their ability to perform behaviours, and therefore may not be able to account for their influence on actual behavioural control (Levin, 1999; Renfroe et al., 1990). Perceived behavioural control can only predict behaviour insofar as individuals' perceptions of behavioural control accurately reflect actual behavioural control (Ajzen, 1991). Hence, inaccuracies in Emergency Department nurses' perceptions of behavioural control, or an inability to anticipate behavioural controls may reduce the ability of perceived behavioural control to predict behaviour. In another study applying the Theory of Planned Behaviour to a

busy hospital environment, O'Boyle et al. (2001) measured nurses' hand-washing behaviour and found intensity of unit activity was more predictive of rates of hand-washing than intentions or perceived behavioural control. The authors concluded that intensity of activity impacted on actual behavioural control, and nurses could not predict this in their perceptions of behavioural control. The unpredictable nature of such factors may place limitations on the ability of perceived behavioural control to predict behaviour, and hence while this does not provide evidence against the theory, it may limit the usefulness of the theory in settings such as the Emergency Department. Future research could examine measurement of perceived behavioural control in this setting and investigate potential methods for incorporating the unpredictable and high pressure nature of the Emergency Department in the prediction of behaviour. Similarly, the influence of Emergency Department protocols and policies on nurses' actual behavioural control may not have been adequately captured in the measurement of organisational policy, or the controllability dimension of perceived behavioural control.

Three measurement issues may have contributed to the modest amounts of variance accounted for in both studies. Firstly, inaccuracy in the behaviour measure due to self-report and recall issues may have reduced the variance explained in behaviour. Research has suggested that health professionals may over-estimate the extent of preventive behaviours they perform with their patients on self-report recall measures (Wilson & McDonald, 1994). The limitations of self-report and recall may account for one of the differences found between Study 3a and Study 3b. In Study 3a, dental hygienists' levels of behaviour decreased from the week before the questionnaire to the week after the questionnaire, while in Study 3b, nurses' levels of behaviour increased. It is possible that nurses' motivation to address alcohol increased in the week following the questionnaire, while dental hygienists, who already had a fairly high level of

addressing smoking, became more accurate at reporting their behaviour through focusing on the issue in the intervening week.

Secondly, there was a "violation of scale correspondence" (Sutton, 1998, p. 1328) between the perceived behavioural control dimension scales, which were measured using two or three item scales ranging from 1 to 5, the intention scale, which was measured using a one item scale ranging from 1 to 5, and the behaviour measures which were multiple item scales with no upper limit. Such a large difference in the possible variance in the scales restricts the amount of variance intentions or perceived behavioural control dimensions could possibly share with the behaviour measure. Courneya (1994) notes that such a violation is very common in Theory of Planned Behaviour research and results in reduced predictive ability. However, corresponding measures for intentions and behaviour may not always be possible, especially in cases, such as the current study, where behaviours are counted, or when behaviour can only be measured as a dichotomous variable, i.e., performed/not performed. In many cases of Theory of Planned Behaviour research, therefore, lack of scale correspondence and the resulting attenuation may need to be acknowledged and accepted.

A third measurement problem relating to intentions is restriction of range. As the means and standard deviations for the intention measures show, very few participants in either study selected disagree or strongly disagree for any of the measures of intention. For all four intention measures, less than 10% of participants disagreed or strongly disagreed. The resulting restriction in range is likely to lead to reduced predictive ability (Sackett & Yang, 2000). The questionnaires were clearly presented as concerning identification of and assistance to patients who smoke or are at risk of alcohol-related harms, and response rates for both professions were moderate. Hence, the range restriction is most likely due to self-selection, with those individuals

who may have selected disagree or strongly disagree not participating in the survey. For both nurses and dental hygienists, a similar restriction in range was seen for self-efficacy and, to a lesser extent, controllability for identifying patients, but no range restriction was evident for self-efficacy or controllability for assisting patients. However, these measurement problems are limitations of the majority of Theory of Planned Behaviour research, and hence may not explain the difference between the average effect sizes found in previous research and the effect sizes found in this study.

Conclusion

This chapter reported Study 3, which tested the Theory of Planned Behaviour's ability to predict behaviour, as well as the theory's ability to account for the influence of organisational factors on behaviour. The Theory of Planned Behaviour predicted dental hygienists' frequency of providing assistance, with self-efficacy emerging as the most important factor in the prediction of this behaviour. The theory was less able to predict dental hygienists' frequency of identifying patients or Emergency Department nurses' frequency of identifying or assisting. The role of the Theory of Planned Behaviour variables as the most proximal predictors of behaviour was supported for all behaviours, as the theoretical variables mediated the influence of organisational factors on behaviour.

The two studies were the second step in a 3-step application of the Theory of Planned Behaviour to the behaviours under examination. The third step in this process is a behaviour change intervention targeting frequency of behaviour. Based on the findings of these studies, the intervention in Study 4 targeted dental hygienists'

frequency of providing assistance, focusing on self-efficacy. The methodology and results of this intervention are described in the following chapter.

CHAPTER 6.

STUDY NO. 4: A RANDOMISED CONTROLLED TRIAL OF AN INTERVENTION TARGETING DENTAL HYGIENISTS' FREQUENCY OF ASSISTING PATIENTS TO QUIT SMOKING

The professional behaviour change intervention reported in this chapter formed the final stage of the program of research. The study involved a randomised controlled trial of a Theory of Planned Behaviour-based intervention targeting dental hygienists' frequency of assisting patients to quit smoking. The study was designed to assess the ability of the Theory of Planned Behaviour to inform professional behaviour change interventions.

The design and evaluation of a professional behaviour change intervention based on the Theory of Planned Behaviour is the final step in Fishbein and Ajzen's (1975) 3-step methodology for applying the theory. Ajzen and Fishbein (2004) argue that the evaluation of interventions based on the Theory of Planned Behaviour provides a critical test of the theory. A randomised controlled trial of an intervention allows manipulation of theoretical predictors of behaviour, which provides a stronger test of the causal pathways specified by the theory than can be achieved with a cross-sectional survey. Hence, this study involved the design and evaluation of an intervention based on the Theory of Planned Behaviour and was informed by the previous studies.

The meta-analysis presented in Chapter 3 highlighted the potential importance of perceived behavioural control for work behaviours involving clients. Subsequently, qualitative interviews (Study 2, reported in Chapter 4) were used to elicit relevant behavioural, normative, and control beliefs for dental hygienists and Emergency

Department nurses, and to examine which organisational factors may be relevant to the behaviours of interest. The quantitative surveys undertaken in Study 3 (Chapter 5) indicated that of the behaviours and professions studied, the Theory of Planned Behaviour was most successful in predicting dental hygienists' frequency of assisting patients to quit smoking. Consistent with the results of the meta-analysis, the self-efficacy dimension of perceived behavioural control was the most important predictor.

The purpose of the current study was to design and conduct an intervention targeting these factors in order to determine if:

- 1) an intervention based on the Theory of Planned Behaviour is more effective than a placebo intervention, and
- 2) any changes in behaviour are predicted by the Theory of Planned Behaviour variables.

The study involved a randomised controlled trial of an intervention, thus providing the most rigorous test of the Theory of Planned Behaviour in this program of research. The intervention is held to be based on the Theory of Planned Behaviour because the factor targeted by the intervention, dental hygienists' self-efficacy, is a Theory of Planned Behaviour construct and its selection was based on a study of the Theory of Planned Behaviour's account of dental hygienists' frequency of assisting patients to quit smoking. In developing the intervention, the three steps prescribed by Fishbein and Ajzen (1975) were followed. The few previous trials of Theory of Planned Behaviour-based interventions that approximated this 3-step methodology were previously described in Chapter 2 (see Table 1, p. 34), and are briefly summarised here.

Previous Theory of Planned Behaviour-Based Interventions

Eight studies were located which tested a Theory of Planned Behaviour-based intervention. In total these eight studies reported on 12 interventions. The results of these studies were mixed. Two interventions, a study by Quine et al. (2001), and one of Crawley and Koballa's (1992) two interventions, supported the Theory of Planned Behaviour, finding increases in the theoretical determinants and in behaviour and intentions. However, no characteristics of the interventions or methodology were apparent that may have distinguished these two interventions from other, less successful interventions.

Of most concern to the Theory of Planned Behaviour are the four interventions that increased behaviour, but not the theoretical variables (Armitage & Conner, 2002; Brubaker & Fowler, 1990; Murphy & Brubaker, 1990). The findings of these interventions suggest that the improvements observed in behaviour could not be explained by the theory, as corresponding increases were not found in the theoretical determinants of behaviour. The authors either suggested that the findings could be attributed to non-theory-specific positive effects of the interventions (Armitage & Conner, 2002), or that the interventions targeted underlying beliefs that determined behaviour, but that were not captured by the theoretical model (Brubaker & Fowler, 1990; Murphy & Brubaker, 1990).

Four interventions increased theoretical determinants but not behaviour or intentions (Chantzisarantis & Hagger, 2005; Crawley & Koballa, 1992; Hoogstraten et al., 1985; Parker et al., 1996). A further two (reported in Parker et al., 1996) did not succeed in changing determinants or intentions (behaviour was not measured). These results are less problematic for the theory than the previous group of interventions because they do not challenge the causal relationships. The results for Chatzisarantis

and Hagger (2005), Crawley and Koballa (1992), and Hoogstraten et al. (1985) may be attributable to the studies not researching which factors were most predictive of behaviour. Lack of knowledge of which factors were most crucial to the performance of behaviour may have resulted in less important factors being targeted in the interventions (Sutton, 2002). Alternatively, the interventions may have lacked enough potency to achieve behaviour or intervention change. Increases in the theoretical determinants may not have been large enough to achieve changes in intentions or behaviour. As Sutton (2002) and Armitage and Conner (2002) note, because the theoretical determinants only explain a proportion of the variance in behaviour, an increase in a theoretical determinant will produce a smaller increase in behaviour. The resulting increase in behaviour may be too small to detect. Potential causes of low potency in these interventions may have been insufficient intensity (for example, the short, media campaign style videos used in Parker et al., 1996) or messages that were not sufficiently persuasive. For example, Hoogstraten et al. (1985) argued that the length of the persuasive message used in their intervention may have prevented participants from engaging in the content.

In summary, the findings of previous Theory of Planned Behaviour-based intervention studies suggest that it may be important to assess what factors are most predictive of behaviour, and to target these factors in the intervention. The findings also suggest that the intervention needs to be of sufficient potency to achieve change in behaviour as well as change in the theoretical determinants. The design of the current study was informed by these considerations, and also adds to the above body of research by providing the first evaluation of a Theory of Planned Behaviour-based intervention targeting work behaviours.

The present study involved an intervention targeting dental hygienists' frequency of assisting patients to quit smoking. Previous behaviour change interventions, not based on the Theory of Planned Behaviour, have targeted dental professionals' provision of assistance to patients who smoke, and these are discussed below.

Previous Interventions Targeting Dental Professionals' Assistance to Patients to Quit Smoking

Four interventions targeting dental professionals' provision of assistance to patients to quit smoking were located. Albert, Ahluwalia, Ward, and Sadowsky (2004) described an academic detailing intervention to increase dentists' frequency of helping patients to quit smoking. Importantly, only participants' perceived barriers to assisting patients to quit smoking were discussed, not the behavioural outcome of the trial. Barriers reported included dental professionals' concerns over patient confidentiality, lack of patient cooperation, beliefs that few patients smoked, and dental professionals' lack of knowledge about assisting patients to quit smoking.

Wood, Cecchini, Nathason, and Hiroshige (1997) conducted office-based smoking cessation training with dentists, dental hygienists, and dental assistants. The training comprised a 90 minute seminar on smoking cessation and a follow up phone call two weeks later. The researchers found that the training resulted in increased frequency of advising and assisting patients at the three month follow up. In a similar study, Havlicek, Stafne and Pronk (2006) provided dental clinics who expressed interest in providing brief smoking cessation interventions with two 2-hour training sessions. The training increased prescription of nicotine replacement therapies and bupropion, referrals to and enrolments in telephone-based smoking cessation counselling programs,

knowledge of behaviour change, and use of the “5As”. Prescription rates were compared to 12 clinics who did not receive the training, and clinics which received the training showed increased frequency of prescribing nicotine replacement therapies and bupropion. However, neither intervention was theory-based, so it is difficult to understand what factors were responsible for the behaviour change. It may have been that the training sessions increased normative pressure on participants to perform the behaviour, or the training may have improved their self-efficacy in discussing smoking with patients. Additionally, due to the lack of control groups, the potential for the findings to be due to measurement issues or external influences can not be ruled out.

Only one randomised controlled trial of an intervention targeting dental professionals’ smoking cessation activity was located. Cohen et al. (1987) randomly assigned 50 dentists to either a control condition, which involved a one hour lecture and booklet on helping patients to quit smoking, or to one of three intervention conditions, which involved the same lecture and booklet with the addition of either reminder stickers for patient notes, access to free nicotine gum to patients, or both. The presence of reminder stickers on patient notes and availability of free nicotine gum increased the time dentists spent on smoking cessation activities and increased the proportion of smokers who were asked about their smoking, advised to quit and asked about setting a quit date. Increased behaviour was most prominent in the group that received both reminder stickers and access to free nicotine gum. However, similar to the two previous studies discussed, the intervention was not theory-based and so there is little indication as to what factors caused the behaviour change. There was no discussion of why reminder stickers and free nicotine gum were chosen or why they increased behaviour.

In summary, previous interventions have lacked theoretical investigation into what mechanisms were responsible for increasing behaviour. Examination of what

factors increase behaviour is important in order to inform future interventions aiming to increase behaviour, and to understand why an intervention was or was not successful. The aim of the current study was to address this gap by applying the Theory of Planned Behaviour to the design and evaluation of an intervention targeting dental professionals' provision of smoking cessation assistance.

Factors Targeted in the Intervention

The structural equation model for dental hygienists (Study 3a) indicated that the primary predictor of assisting behaviour was the self-efficacy dimension of perceived behavioural control. Pre-existing levels of dental hygienists' intentions to assist patients to quit smoking were high ($M = 3.91$ on a 5 point scale), and intentions explained less variance than self-efficacy in behaviour (7%). Hence it was deemed that it would be difficult to achieve behaviour change through targeting intentions. Rather, the results of Study 3a suggested that hygienists' intentions to assist patients are high, but that levels of self-efficacy are reducing their ability to translate those intentions into behaviour. Specifically, self-efficacy directly predicted intention and behaviour, and interacted with intention in the prediction of behaviour, such that when perceptions of behavioural control were high, intentions were more predictive of behaviour. Hence, self-efficacy formed the target for the behaviour change intervention.

However, Sutton (2002) notes that perceived behavioural control is only a proxy predictor of behaviour in place of actual behavioural control. Hence, interventions need to target actual behavioural control and not just perceptions in order to succeed in changing behaviour. To increase participants' levels of self-efficacy, the organisational factors that predicted self-efficacy in Study 3a, role adequacy and role legitimacy, and the most important control beliefs underlying self-efficacy were targeted.

To examine which control beliefs were most predictive of self-efficacy for assisting patients to quit smoking, mean ratings for control beliefs were examined (see Table 24). The ratings of the different beliefs were used instead of the correlations between the different beliefs and the direct measure of perceived behavioural control because of the potential shortcomings of these correlations, as described in Chapter 5 (see p. 151).

Table 24

Mean Ratings for Control Beliefs for Dental Hygienists Assisting Patients to Quit

Smoking

Control Belief (Assisting Patients to Quit Smoking)	M (SD)
Having personal experiences or success stories to talk about	4.24 (.73)
Having regular appointments with the patient	4.25 (.69)
The amount of time available in an appointment	4.14 (.84)
Patients tend to be anxious or tense in the dental setting	2.28 (.78)
If the patient is not receptive to discussing smoking	1.48 (.71)
Having a good rapport with the patient	4.42 (.64)
Having the confidence and knowledge to talk about smoking	4.59 (.62)

The factor rated as most important in making it more difficult to assist patients to quit smoking was the control belief ‘lack of patient receptiveness’. This control belief was targeted in the intervention. The factor rated as most important in making it easier to assist patients to quit smoking was the control belief ‘having the confidence and knowledge to talk about smoking’. However, this control belief may not be

conceptually distinct from role adequacy, which was also targeted in the intervention. Hence, the second most important control belief rated as making assisting easier, 'having a good rapport with the patient', was targeted instead.

In summary, the four factors found to be most relevant to dental hygienists' self-efficacy were: role adequacy, role legitimacy, rapport with the patient, and patient receptiveness. These four factors were targeted in the intervention in order to increase dental hygienists' behavioural control and frequency of assisting patients to quit smoking. It was predicted that the frequency of assisting patients to quit smoking would increase among the dental hygienists who participated in the intervention. It was further predicted that the increase in behaviour would be explained by increases in self-efficacy and intentions, which in turn would be explained by increases in the four predictors of self-efficacy that the intervention targeted.

Intervention Format

The current study used academic detailing as the basis for the behaviour change intervention. There are a number of strategies for changing self-efficacy that have been found to be effective. Academic detailing was chosen for this study because it was developed specifically to target health professionals' behaviour (Soumerai & Avorn, 1990), and it was deemed to be most appropriate and practical strategy to involve dental hygienists from many different surgeries. Academic detailing, also called educational outreach, is an intervention where a trained worker visits a health professional, face to face, at their place of work to provide education on a specific topic (Thomson O'Brien et al., 1997). Detailing was originally developed by pharmaceutical companies as a marketing strategy to promote their products (Soumerai & Avorn, 1990). Academic detailing has since been applied to GPs' over-prescribing or incorrect prescribing of

medications and health professionals' correct management of common health problems and performance of prevention activities (Thomson O'Brien et al., 1997). Numerous reviews of the literature support the efficacy of academic detailing as a technique for promoting behaviour change in health professionals (Anderson & Jane-Llopis, 2004; Gill et al., 1999; Grol & Grimshaw, 2003; Sohn, Ismail, & Tellez, 2004; Thomson O'Brien et al., 1997; Tu & Davis, 2002). These reviews indicate that academic detailing can result in improvements of up to a 50% in the targeted behaviour for activities such as the delivery of preventive care (Thomson O'Brien et al., 1997).

Method

Participants

All dental hygienists registered with the Dental Board of South Australia who had a South Australian mailing address (n = 192) were sent information about the study, a letter inviting them to participate, and a consent form with a reply paid envelope. As an incentive, each package included a booklet on stress and burnout, an explanation of rates of burnout among hygienists and how the booklet may help. In addition, participants were advised that participation was worth one hour of continuing education points (approved by the Victorian branch of the Dental Hygienist Association of Australia).²

² While continuing education is not mandatory for dental hygienists in South Australia, achieving 65 such points allowed hygienists to enter into a competition run by Oral B and the Dental Hygienist Association of Australia for attendance at the next International Symposium on Dental Hygiene up to the value of \$4,500.

In addition to the mail out, dental hygienists known to the academic detailer were approached and a “snowball” recruitment method was used where participants referred on colleagues interested in participating. All participants met the inclusion criteria. Participants were randomly allocated to either group ‘A’ or ‘B’ using a random number generation spreadsheet. The academic detailer then determined which group received the intervention and which group received the control intervention by tossing a coin. The researcher was blind to group allocation when entering and analysing data.

Procedures

The current study was a randomised controlled trial comparing a Theory of Planned Behaviour-based intervention to a placebo intervention that was not evidence- or theory-based. Having a closely matched placebo intervention allowed examination of whether the Theory of Planned Behaviour framework and prior research into salient underlying beliefs adds to the efficacy of an intervention over and above other positive effects that can be expected, such as potentially increasing frequency of behaviour through focusing the participants’ attention on the behaviour and social desirability effects.

The experimental and control interventions were based on Soumerai and Avorn’s (1990) principles of academic detailing, including 1) researching the motivations of the target professional group, 2) employing a credible educator, 3) allowing discussion of both the positive and negative aspects of the behaviour, 4) promoting active learning through two-way communication, 5) repeating and reinforcing the main points of the intervention, and 6) using brief graphic print materials. The motivations of the dental hygienists had been previously researched in Studies 2a and 3a (see Chapters 4 and 5). A credible educator was used as the academic

detailer: the interventions were run by an academic detailer qualified as a dental hygienist and counsellor who had experience counselling and supporting oral health professionals and was known to many dental hygienists in this role. In both interventions, positive aspects of assisting patients to quit smoking, such as improving the patient's dental health and the success of dental treatment, and negative aspects, such as dealing with patients who are not receptive to advice on smoking, were discussed. The interventions were highly interactive, as the interventions were partly directed by the participants' concerns, questions and experiences. Key points were repeated and reinforced at the end of the intervention and in two follow up phone calls. All participants were given short, graphic print materials on assisting patients to quit smoking produced by the Dental Practice Education Research Unit at Adelaide University and QuitSA. These included a flowchart of the "5As", a pamphlet on the dental health effects of smoking, and a 'Products to Help You Quit' fact sheet on available nicotine replacement therapies and Zyban. A copy of these materials is contained in Appendix H.

Both the experimental and control interventions comprised three sessions: one face to face, conducted at the participant's workplace, lasting approximately 20 to 30 minutes, and two subsequent phone calls lasting approximately 5 to 10 minutes. The first phone call was scheduled approximately two weeks after the first session, and the second call approximately one week after the first call. An exception to this occurred with four rural participants who either met with the academic detailer outside their workplace, or received the initial session over the phone rather than face to face.

The academic detailer received two days of "Quitskills" smoking cessation training from QuitSA. In addition, the academic detailer was provided with literature on academic detailing principles and techniques and on the oral health effects of smoking.

Scripts for the intervention and control participants were devised with the help of the academic detailer, and these were practiced with staff members of the Adelaide University Dental School, who provided feedback on the scripts.

The initial face to face session differed between the experimental and control groups. The content of these initial sessions is described below. The second and third sessions were the same for both interventions, comprising five to ten minute phone calls from the academic detailer. Participants were asked if they had seen any smokers in the intervening period, what actions they had taken with those smokers and whether any questions, issues or difficulties had arisen. The academic detailer gave positive reinforcement for any behaviour relating to assisting patients to quit smoking, and discussed any issues or questions with the participant.

Intervention. In the face to face session in the experimental group, the academic detailer delivered content targeting role legitimacy, role adequacy, rapport with the patient, and patient receptiveness. How these issues were targeted is described below.

Role legitimacy is the belief that assisting patients to quit smoking is a legitimate part of the dental hygienist's role (Shaw et al., 1978). The intervention was designed to increase participants' belief in the legitimacy of addressing smoking as part of their role. The academic detailer discussed the effects of smoking on the mouth and how it interferes with the success of dental treatment of patients who smoke. Just prior to the study, a new graphic warning on cigarette packets about mouth cancer was introduced, and this warning was also discussed. The educator suggested that patients may be aware of the link between smoking and their oral health, and that they may ask about smoking in their appointment. It was emphasised that what the dental hygienist was prepared to do with patients was up to them, but that they could think about the need to inform their patients about the importance of smoking in dental health and

dental treatment. The printed materials provided to participants were also used as evidence that addressing smoking is widely seen as part of the dental professional's role.

Role adequacy refers to the confidence and skills of the dental hygienist in assisting patients to quit smoking (Shaw et al., 1978). Role adequacy was targeted by providing printed materials to dental hygienists to improve their knowledge of smoking, including the effects of smoking on the mouth, and what pharmaceutical and other options were available to help patients. To increase participants' skills in discussing smoking with patients, an article by Stafne and Bakdash (2000) was used to illustrate example approaches to raising and discussing the topic. The academic detailer emphasised the dental hygienists' expert knowledge of dental health and how this could be used to talk confidently about the dental health effects of smoking. Participants were also asked to discuss any particular aspects of assisting patients to quit smoking that they were least confident about so that these issues could be addressed.

The first control belief the intervention targeted was the need to have good rapport with the patient before discussing smoking. To address this barrier, the academic detailer discussed techniques for building rapport with patients and how to bring up the issue of smoking sensitively and place it in the context of their oral care, then assess their reaction. The academic detailer also discussed building rapport with the patient over several appointments, and developing the discussion on smoking over those appointments.

The second control belief the intervention targeted was that patients may not be receptive to discussing smoking. To reduce this barrier, the academic detailer emphasised findings from surveys of smokers which indicate high rates of wanting to quit (e.g., Miller & Kriven, 2001) to increase dental hygienists' understanding that

many patients may be receptive to discussing quitting smoking. The academic detailer also discussed strategies for tailoring the discussion of smoking to match the level of patient receptiveness, with particular reference to Stafne and Bakdash's (2000) article. The latter includes examples of different conversations with patients based on varying levels of receptiveness to discussing quitting smoking. This encouraged dental hygienists to tailor discussions according to patient receptiveness, rather than seeing receptiveness as a barrier to discussing smoking.

Control intervention. The control intervention focused on coping with stress and burnout. The participants were informed that the intervention was targeting worker stress because stress had been found to be a major factor influencing dental hygienists' ability to assist patients to quit smoking. Stress and burnout were chosen for the content of the control intervention as in Study 3a, workload, an important component of stress and burnout, was not found to be a significant predictor of behaviour or the theoretical predictors of behaviour for this professional group (see Chapter 5). Additionally, the content could still be of general benefit to control participants.

For the first session in the control intervention, the academic detailer focused on general issues of stress, such as scheduling, ergonomics, and strategies to cope with stress. Participants in the control intervention received the same smoking cessation materials as participants in the experimental intervention, with the exception of Stafne and Bakdash's (2000) article, which was used specifically as a tool to address the targeted factors in the experimental group. All participants in the control group were debriefed at follow up and were provided with Stafne and Bakdash's (2000) article and notes detailing the content of the experimental intervention.

Only a small number of dental hygienists participated in the study from the same dental surgery as another participant. Discussion with these participants following the

intervention indicated that the dental hygienists worked in separate rooms in the surgery, that they had not discussed the intervention with each other, and that no contamination had occurred between control and experimental groups.

All participants completed three questionnaires: pre-intervention, post-intervention, and follow up. Participants completed the pre-intervention questionnaire immediately prior to the first intervention session. On completion of the full intervention, participants were mailed the post-intervention questionnaire with a reply paid envelope. Two months following the completion of the intervention, participants were mailed the follow up questionnaire with a reply paid envelope. The pre-intervention, post-intervention and follow up questionnaires for each participant were linked using the same anonymous code as in Study 3a (see Chapter 5), comprising the first three letters of the participant's mother's maiden name, followed by the day of the month of the participant's birth. The pre-tests were marked with an A or a B by the academic detailer. To reduce the possibility of bias, the analysis was conducted blind; the academic detailer did not reveal which group received the intervention until the analysis was complete.

Measures

The pre-intervention, post-intervention and follow up questionnaires measured participants' behaviour in the last week, role legitimacy, role adequacy, rapport with the patient, patient receptiveness, the self-efficacy dimension of perceived behavioural control, and intentions. With the exception of the two control beliefs of rapport with the patient and patient receptiveness, all variables were measured in the same manner as for Study 3a. A copy of each of these questionnaires is contained in Appendix I.

Behaviour. Participants responded to 12 items on advising and referring patients, giving out Quit material and offering or providing follow up. For each item, participants were asked to estimate how many times they had performed that activity in the last week. Participants were also asked to estimate how many patients they had seen in the last week who they thought smoked. Responses were summed across behaviour items and then divided by the estimated number of smokers seen in the last week to yield a 'per smoker' measure of total behaviour.

Role legitimacy. Role legitimacy was measured using the role legitimacy subscale of the Alcohol and Alcohol Problems Perception Questionnaire (Cartwright, 1980). The wording of the items was changed to reflect smoking rather than alcohol consumption. The scale comprised four items and responses were given on five point scales ranging from (1) strongly disagree to (5) strongly agree. Scores across items were averaged to calculate an overall score for role legitimacy.

Role adequacy. Role adequacy was measured using the role adequacy subscale of the Alcohol and Alcohol Problems Perception Questionnaire (Cartwright, 1980). The wording of the items was changed to reflect smoking rather than alcohol consumption. The scale comprised five items and responses were given on five point Likert scales ranging from (1) strongly disagree to (5) strongly agree. Scores across items were averaged to calculate an overall score for role adequacy.

Rapport with the patient and patient receptiveness. The control beliefs of needing rapport with the patient and patient receptiveness were measured with one item each. Participants were asked "To what extent do the following two issues discourage you from trying to assist patients to quit smoking?" followed by "Needing a rapport with the patient" and "If the patient is not receptive to discussing smoking". Scores

ranged from (1) “not at all” to (5) “very much”. Scores were reverse coded so that high scores indicated participants found the issues less discouraging.

Self-efficacy. Three items with five point semantic differential response scales tapped self-efficacy: assessing how easy or difficult it would be to perform the behaviour, how possible or impossible it would be to perform the behaviour and how confident or unconfident they felt. Scores across items were averaged to calculate an overall score for self-efficacy.

Intention. Intention was measured with one item: “I intend to assist patients to quit smoking.” Responses were given on five point Likert scales ranging from (1) strongly disagree to (5) strongly agree.

Results

Eighty two dental hygienists consented to participate in the study (response rate = 43%). No information was available on non-responders. All participants completed the pre-intervention questionnaire and completed the full extent of the experimental ($n = 46$) or control ($n = 36$) intervention³. Sixty five dental hygienists (79%) returned the post-intervention questionnaire: 35 in the experimental condition and 30 in the control condition. The main analysis was conducted on these 65 cases. The remaining 17 participants received a reminder phone call but failed to return the questionnaire. Of the 65 dental hygienists for whom post-test data was available, 35 returned the follow up questionnaire two months later (54%).

³ The number of participants allocated to each group were not equal due to the randomisation and allocation methods used. Due to the design of the paperwork, potential participants were randomly allocated before agreeing to participate in the study.

Pre-Intervention to Post-Intervention Comparison

To evaluate the effectiveness of the intervention, post-intervention means were compared between experimental and control participants using ANCOVAs controlling for pre-intervention scores, as recommended by Vickers and Altman (2001). The results of the ANCOVA analyses and the means and standard deviations for the pre- and post-intervention scores for experimental and control participants are shown in Table 25 below. Pre-intervention means for intentions, self-efficacy, role adequacy and role legitimacy were above the midpoint, indicating high levels of these constructs among participants. Control beliefs were rated below the midpoint, indicating that participants found the need for good rapport with the patient and the potential for dealing with patients with low receptiveness discouraged them from trying to assist patients to quit smoking.

Table 25

Means (and Standard Deviations) for Pre- and Post-Intervention Scores for Experimental (n = 35) and Control (n = 30) Participants, and ANCOVA Results Comparing Post-Intervention Scores Between Control and Experimental Groups Controlling For Pre-Intervention Scores

Variable	Control		Experimental		ANCOVA F (df1, df2)
	Pre	Post	Pre	Post	
Intention	4.37 (.62)	4.03 (.96)	4.09 (.79)	4.17 (.57)	2.08 (1, 62)
Self-Efficacy	3.12 (.61)	3.29 (.53)	3.31 (.59)	3.21 (.48)	1.45 (1, 62)
Role adequacy	3.66 (.94)	3.67 (.88)	3.26 (.70)	3.55 (.62)	0.96 (1, 63)
Role legitimacy	3.82 (.70)	3.88 (.76)	3.68 (.75)	3.75 (.63)	0.16 (1, 63)

Receptiveness	2.17 (1.09)	1.97 (.98)	2.23 (.97)	2.29 (1.12)	1.37 (1, 61)
Patient rapport	2.37 (1.50)	2.10 (1.29)	2.26 (1.12)	2.53 (1.11)	3.66 (1, 61)
Behaviour	4.42 (3.90)	4.52 (3.04)	3.53 (2.79)	3.88 (2.58)	0.12 (1, 59)

Note. df = Degrees of freedom. For all F values, $p > .05$.

For all variables, with the exception of self-efficacy, small increases were evident in the experimental group. However, none of the post-intervention variables differed significantly between control and experimental participants after controlling for pre-intervention scores. A differential increase in patient rapport in the experimental group, however, approached significance ($p = 0.06$). The trend for patient rapport indicates it may have decreased in the control group and increased in the experimental group.

The ANCOVA analyses tested for differential changes from pre-intervention to post-intervention. Since the control group also received academic detailing and printed materials, paired sample t-tests were conducted on the group as a whole (see Table 26).

Table 26

Paired Sample T-Test Analyses of Behaviour and Theoretical Predictors for Experimental and Control Groups Combined (N = 65)

Variable	Pre-Intervention	Post-Intervention	t (df)
Intention	4.22 (.72)	4.13 (.77)	.85 (63)
Self-efficacy	3.22 (.61)	3.25 (.50)	-.31 (63)
Role adequacy	3.45 (.84)	3.60 (.75)	-2.11 (64)*
Role legitimacy	3.74 (.73)	3.81 (.69)	-.87 (64)

Patient receptiveness	2.19 (1.03)	2.14 (1.06)	.33 (62)
Patient rapport	2.29 (1.30)	2.33 (1.20)	-.34 (62)
Behaviour	3.89 (3.37)	4.17 (2.80)	-.89 (60)

* $p < .05$

As Table 26 shows, when the experimental and control groups were combined, a small but significant increase in role adequacy from pre-intervention to post intervention was observed.

Two of the four targeted factors, role adequacy and role legitimacy, had high pre-intervention levels. Pre-intervention level of role adequacy correlated $-.61$ with degree of change in role adequacy ($n = 35$, $p < .001$). The lower the initial level of role adequacy, the greater the improvement in role adequacy a participant was likely to report following the intervention. Similarly, pre-intervention level of role legitimacy correlated $-.61$ with degree of change in role legitimacy ($n = 35$, $p < .001$). The lower the initial level of role legitimacy, the greater the degree of improvement in role legitimacy the participant was likely to report. These findings suggest that ceiling effects may be present. That is, overall changes in role adequacy and role legitimacy may not have been sizable because the majority of participants in the experimental group had relatively high (above the midpoint) pre-existing levels of role adequacy (65%) and role legitimacy (76%). The average increase in role adequacy among participants in the experimental group with pre-intervention levels of role adequacy below the midpoint was 1.06 (SD = 0.82). The average increase in role legitimacy among participants with pre-intervention levels of role legitimacy below the midpoint was 1.00 (SD = 0.64).

Follow Up

To evaluate the long term effect of the intervention, mean scores for control and experimental participants were compared at the two month follow up using ANCOVAs controlling for pre-test scores. Since there were no significant differences at post-intervention, post-intervention scores were not controlled for. The means and standard deviations for the follow up scores for the control and experimental groups and the results of the ANCOVAs are shown in Table 27 below. As indicated by the ANCOVAs, none of the variables differed between experimental and control groups after controlling for pre-intervention levels. This finding is not surprising given no changes were observed immediately following the intervention. The differential trend observed in patient rapport at post-intervention was not evident at follow up.

Table 27

Means (and Standard Deviations) for the Two Month Follow Up Measures of Theoretical Predictors and Behaviour for Control (N = 22) and Experimental (N = 13) Participants, and ANCOVA Results Comparing Follow Up Scores Between Control and Experimental Participants Controlling for Pre-Intervention Scores

Variable	Control	Experimental	F (df ₁ , df ₂)
Intention	4.31 (.48)	3.95 (.90)	1.09 (1, 33)
Self-efficacy	3.36 (.54)	3.37 (.46)	0.15 (1, 33)
Role adequacy	4.02 (.77)	3.54 (.65)	0.11 (1, 33)
Role legitimacy	3.98 (.56)	3.67 (.93)	1.33 (1, 33)
Patient receptiveness	2.38 (1.26)	2.00 (.89)	1.83 (1, 32)
Patient rapport	2.77 (1.36)	2.14 (.96)	2.15 (1, 32)
Behaviour	4.72 (3.65)	4.13 (2.12)	0.25 (1, 32)

Note. For all F values, $p > .05$.

A second whole group paired t-test analysis was conducted on role adequacy at follow up compared to pre-intervention. The role adequacy increases observed at post-intervention were maintained at follow up ($t(34) = 2.96, p = .006$). No other differences emerged.

Discussion

This study involved a randomised controlled trial of a Theory of Planned Behaviour-based intervention targeting dental hygienists' frequency of provision of

assistance to patients to quit smoking. The two aims of this study were to see if the intervention was successful in increasing behaviour, and whether the Theory of Planned Behaviour variables predicted change in behaviour.

Outcome of the Intervention

Although post-intervention scores for the experimental group were generally in the desired direction, no statistically significant changes were found. While a trend was observed at post-intervention for the experimental group participants to report increased patient rapport compared to the control group, this trend was not significant, and the trend was not apparent at the two month follow up. Hence, the intervention did not succeed in increasing dental hygienists' frequency of assisting their patients to quit smoking or any of the targeted theoretical predictors of behaviour relative to the control group. The whole group analysis suggested the lack of difference between the experimental and control groups was not due to increases in the control group. The only overall gain identified in this analysis was a small increase in role adequacy. This may be attributable to the printed materials received and the general positive effects of academic detailing. The increase in role adequacy remained at follow up.

Since the intervention did not succeed in increasing the theoretical predictors of behaviour, the intervention could not provide a test of the Theory of Planned Behaviour. There are several possible factors that could explain why the intervention did not increase levels of role adequacy, role legitimacy, patient receptiveness or patient rapport. Possible explanations include ceiling effects, external influences, insufficient intervention potency, inappropriate change agent, lack of intervention fidelity, and lack of power. Each of these potential contributors is described in more detail below.

Ceiling effects. One potential explanation for the lack of improvement in role adequacy and role legitimacy among the experimental group is that pre-intervention levels of these variables were high. Hence, there was limited scope for the intervention to achieve increases in levels of role adequacy and role legitimacy. Strong correlations between pre-intervention levels and degree of change after the intervention provide support for this explanation. These correlations suggested that participants in the experimental group who had higher pre-intervention levels of role adequacy or role legitimacy were less likely to demonstrate change in these variables. Pre-intervention levels of intentions and behaviour were also high, suggesting little scope to achieve increases (see Table 25). Such ceiling effects are a common phenomenon reported in health professional practice change research (Foy et al., 2002; Jamtvedt, Young, Kristoffersen, O'Brien, & Oxman, 2006). Professional practice change interventions have been found to be more effective when baseline levels and participants' motivation are lower (Foy et al., 2002; Jamtvedt et al., 2006). Courneya, Conner, and Rhodes (2006) also note that ceiling effects are common in Theory of Planned Behaviour research.

The high pre-intervention levels, particularly for role legitimacy, may be attributable to sample self-selection bias, as dental hygienists who felt smoking was a legitimate part of their role, and who had some confidence and skills in assisting patients to quit smoking, may have been more likely to participate in the intervention. Future professional interventions could consider different means of recruiting participants that may overcome the potential for self-selection bias. The potential participant pool for the current study was only 192 dental hygienists (the population of dental hygienists in the state of South Australia). For health professionals with larger populations, ceiling effects could be avoided, and greater behaviour change could

potentially be achieved, by screening potential study participants and selecting only those with low levels of behaviour and motivation.

Subsequent to the implementation of the current intervention, Courneya et al. (2006) published a study on methods to increase the variability in the measurement of Theory of Planned Behaviour constructs that may otherwise suffer from ceiling effects. In a study applying the Theory of Planned Behaviour to exercise behaviour, Courneya et al. (2006) presented four potential scale response formats that increased the variability in responses, including extending the scale to 7 or 11 points, including more extreme endpoints “phenomenally”, and truncating the half of the scale which received fewer responses. Such scales may improve the ability of future research to detect change in particular constructs.

Despite the strength of the relationship between self-efficacy and intentions and behaviour among dental hygienists, a case could be made to target other variables in the model to avoid ceiling effects. If the average level for the main predictor of intentions or behaviour (in this case, self-efficacy) was high, it could be argued that less central predictors of intentions or behaviour may achieve greater behaviour change if average levels of these predictors are lower, and therefore have greater scope for improvement. However, in the current research, dental hygienists’ average levels of attitudes and subjective norms concerning assisting patients to quit smoking were in fact even higher than for self-efficacy (see Table 21, p. 125). Consequently, no other predictors emerged as potential targets for intervention for dental hygienists’ frequency of assisting patients to quit smoking.

Alternatively, it could be argued that selecting Emergency Department nurses for the intervention instead of dental hygienists may have avoided ceiling effects, as the levels of the theoretical predictors of behaviour observed in Study 3b (see Table 23, p.

139) were lower than for dental hygienists in Study 3a (see Table 21, p. 125). However, as discussed in Chapter 5, it was unclear from the findings of Study 3b what factors could be targeted in an intervention to improve nurses' identifying or assisting behaviour.

Despite the potential for ceiling effects, the high levels of role adequacy, role legitimacy, intentions and behaviour among the dental hygienist participants are encouraging. These high levels suggest that at least a proportion of dental hygienists are identifying and assisting patients who smoke and feel it is important and not too difficult to do so.

External influences. Another possible explanation for the lack of difference between the experimental and control groups is the impact of an external factor. At the time of the study, a national Quit media campaign which focused on mouth cancer due to smoking was launched. The campaign consisted of graphic warning labels on cigarette packets and a television advertisement displaying a woman affected by mouth cancer. The campaign was controversial, with extensive media coverage surrounding the warning labels and television advertisements (e.g., Gilchrist, 2005; Powell, 2006). The campaign was particularly controversial in South Australia, where the current study was conducted, with substantial media coverage of an attempted introduction of cigarette packet covers to hide the warning labels (Barry, 2006; Owen, 2006a, 2006b). This campaign may have increased levels of awareness both among dental professionals and patients about the link between smoking and oral health. Quit also disseminated a fact sheet about the mouth cancer campaign among health professionals, which may have further increased awareness of the oral health effects of smoking among dental professionals. Appendix J includes the Quit fact sheet and selected newspaper articles concerning the campaign and cigarette packet covers. Additionally, an unpublished

survey of smokers by QuitVictoria (Harper, 2007) indicates that not all smokers accepted the veracity of the advertisement. This may have led to an increased number of smoking patients discussing the oral health effects of smoking with dental professionals. These increases would have occurred immediately prior to and during the intervention for both the control and experimental groups.

The timing of the Quit media campaign targeting oral cancer may have influenced the outcomes of the intervention. As described above, this campaign created considerable controversy, particularly in South Australia, and would have increased the saliency of the link between smoking and oral health among both dental professionals and the general public. This campaign would have affected dental hygienists immediately prior to, and during, their participation in the intervention. While the effects of the campaign on dental hygienists, their attitudes towards their role in assisting patients to quit smoking, and their frequency of assisting patients to quit smoking are unknown, these effects would have influenced the experimental and control groups equally. This may have reduced the ability of the study to identify post-intervention differences between the two groups. The awareness raised by the campaign may also have contributed to the high pre-intervention role adequacy and role legitimacy scores of participants.

Another potential external influence that may have contributed to the lack of predicted changes is contamination and fatigue effects due to Studies 2a and 3a. Dental hygienists in the experimental or control groups in Study 4 were not surveyed about their participation in these two prior studies. It is possible that these studies influenced participants' role legitimacy by highlighting the issue of addressing smoking in the dental setting. Participation in these studies may also have motivated dental hygienists to seek training or information about assisting patients to quit smoking.

Dental hygienists may also have experienced fatigue effects from participating in prior studies in this program of research. Fatigue effects may have contributed to self-selection bias in the current sample, as dental hygienists who were more committed to assisting patients to quit smoking may have participated. Fatigue may also have reduced dental hygienists' receptiveness to the intervention if they did participate in the current study.

Such contamination and fatigue effects may also affect future research that applies Fishbein and Ajzen's (1975) 3-step methodology, as this requires three studies to be conducted on one population. Future research following this methodology could select larger study populations and measure participation in the previous steps in order to monitor the potential for contamination and fatigue effects.

Intervention potency. A further consideration is whether the intervention applied in the experimental group had sufficient potency to achieve significant behaviour change over the control group. As noted earlier, insufficient potency may have been a contributing factor to the failure to find increases in behaviour in previous Theory of Planned Behaviour-based interventions. Other Theory of Planned Behaviour-based interventions have also failed to find increases in theoretical predictors (Armitage & Conner, 2002; Chantzisarantis & Hagger, 2005; Hoogstraten et al., 1985; Parker et al., 1996). The current intervention may have also lacked sufficient potency. The lack of increase in role adequacy and role legitimacy may have been due to the already high pre-intervention levels of these variables. However, pre-intervention levels for the control beliefs concerning patient rapport and patient receptiveness were lower than levels for role adequacy and role legitimacy, indicating that participants did find these two issues discouraging. The intervention did not succeed in increasing perceptions of these two barriers. This suggests that the intervention may not have been intensive or

effective enough to substantially alter dental hygienists' feelings about these two issues. Future interventions may wish to enhance the intervention components to fully assess their effectiveness and consider a more time-intensive intervention. Michie et al.'s (2005) review of behaviour change interventions, however, indicated that the relationship between intensity of intervention and outcome is not clear. How much time is required of a professional for an adequate professional behaviour change intervention is an important question for the professional practice change field, and will need to be balanced against evaluations of the cost-effectiveness of the intervention. As mentioned in Chapter 1, factors external to the intervention may also influence successful implementation, such as reimbursement, supervisor requirements and treatment protocols. Such factors need to be considered to maximise the potential impact of interventions on professional practice change.

Inappropriate change agent. The success of academic detailing is contingent upon the credibility and suitability of the change agent (Soumerai & Avorn, 1990). A potential reason for the failure to increase the targeted factors in the intervention may have been the inappropriateness of the change agent. Soumerai and Avorn (1990) cite neutral professional groups, school-based academics and expert consultants as appropriate change agents for academic detailing interventions targeting health professionals. Some of the change agents employed in the studies in Thomson O'Brien et al.'s (1997) review of academic detailing interventions targeting health professionals included clinical pharmacists and physician-educators. The change agent employed in the current study was a professional from the Adelaide University Dental School with degrees in both dental hygiene and counselling and was carefully trained in the intervention protocol. The educator had experience counselling dental hygienist students, was known to many of the participants in this role, was personable, and had

good inter-personal skills. Given this match with the principles of academic detailing, it seems unlikely that the educator was an inappropriate change agent.

Lack of intervention fidelity. Another potential reason for lack of intervention effectiveness may have been that the in-situ application of the intervention lacked total fidelity to the procedures devised for the intervention (Baer et al., 2007). Lack of fidelity could result from the needs of participants, such as participants rescheduling appointments due to workload, sick leave, or recreational leave, or diverting the focus of the conversation during the face to face sessions or follow up phone calls.

Alternatively, it could have been caused by the change agent deviating from the scripts or procedures (for example, skipping components if the recipient is assumed to be knowledgeable or skilled in these areas), or from environmental barriers such as interruptions at the place of work. Debriefing with the academic detailer, however, indicated that rescheduling, interruptions and other deviations occurred with only a minority of participants. Hence, while it is not possible to fully verify this, there is no evidence to suggest that lack of intervention fidelity may have contributed excessively to the outcome of the intervention.

Lack of power. The recruitment strategy for the intervention included all registered dental hygienists in South Australia, and a response rate of 43% was achieved. Sixty two dental hygienists participated in the study and completed the pre- and post-intervention questionnaires. This sample size was adequate to have a power of .80 to detect large effects, but was less than Cohen's (1992) requirements for a power of .80 to detect medium or small effects. Hence, it is possible that the intervention had moderate effects that were not detectable in the analysis. However, to achieve a power of .80 to detect medium effects, a sample size of 128 participants would have been needed. A sample of this size was not feasible given the potential participant pool was

only 192 dental hygienists. A target of sixty participants was set to achieve a power of .80 for large effects with the understanding that the study may not be powerful enough to identify small to medium effects. Nevertheless, the effect sizes observed in the study were small to very small. Hence, even with a larger sample, it is unlikely that significant differences between the intervention and control groups would have been found.

Of the factors discussed above that may have influenced the outcomes of the intervention, the most likely reasons for lack of predicted changes are ceiling effects from the high pre-intervention levels of some variables, in combination with the external influence of the high profile Quit media campaign. These factors may have substantially reduced the ability of the intervention to produce the expected differences between the experimental and control groups. To address these limitations in future work, replication of the study could be undertaken in another jurisdiction with a larger number of dental hygienists. Further research evaluating the current intervention or other, similar interventions, may shed more light on the factors that influence the success of behaviour change interventions targeting dental professionals' provision of assistance to patients who smoke.

Support for Theory of Planned Behaviour-Based Interventions

As the current intervention could not provide a test of the Theory of Planned Behaviour, Quine et al.'s (2001) intervention and one of Crawley and Koballa's (1992) two interventions remain the only trials to provide full support for a Theory of Planned Behaviour-based intervention. Given the importance Ajzen and Fishbein (2004) place on evidence provided by trials of interventions, this lack of support is a serious shortcoming in the evidence base for the Theory of Planned Behaviour. Further trials of

Theory of Planned Behaviour interventions are needed to provide more support for the theory's ability to inform behaviour change interventions and, importantly, to examine why some interventions are successful while others are not.

Conclusion

This chapter presented a randomised controlled trial of a professional intervention targeting dental hygienists' frequency of assisting patients to quit smoking. The academic detailing intervention targeted four factors found in Study 3a (see Chapter 5) to predict frequency of assisting patients to quit smoking. The intervention resulted in small but not statistically significant improvements. Overall, the intervention was not successful in increasing the theoretical predictors of behaviour, and hence could not provide a test of the Theory of Planned Behaviour. There are several potential factors that may have contributed to the failure to increase the theoretical predictors of behaviour. The most likely factors are the external influences of a concurrent Quit media campaign targeting the oral health effects of smoking, and ceiling effects which may have existed for some variables due to high pre-intervention levels, thus precluding scope for significant change. The Theory of Planned Behaviour's ability to inform successful behaviour change interventions, therefore, remains supported by little research.

CHAPTER 7.

GENERAL DISCUSSION

The program of research presented in this thesis applied the Theory of Planned Behaviour to dental hygienists' and Emergency Department nurses' provision of brief interventions for smoking and alcohol consumption respectively. It is unique in a number of respects. In particular, it is the first research to: 1) apply the Theory of Planned Behaviour to these behaviours, 2) examine the ability of the theory to account for the influence of organisational factors on behaviour, and 3) implement a Theory of Planned Behaviour-based behaviour change intervention in an organisational setting.

The research comprised a meta-analysis of previous applications of the theory to organisational settings (Study 1) followed by three empirical studies corresponding to Fishbein and Ajzen's (1975) 3-step methodology for applying the Theory of Planned Behaviour. The three steps in the application of the theory were qualitative interviews eliciting underlying beliefs (Study 2), quantitative surveys testing the Theory of Planned Behaviour's account of the behaviours of interest (Study 3), and a trial of a Theory of Planned Behaviour-based professional practice change intervention (Study 4).

The program of research was designed to address four aims. These were to:

- 1) examine the role of dental hygienists and Emergency Department nurses in the provision of brief interventions for smoking and alcohol consumption respectively,
- 2) assess the ability of the Theory of Planned Behaviour to understand and predict health professionals' identifying and assisting behaviour,

- 3) assess the ability of the theory to account for the influence of organisational factors on workers' behaviour, and
- 4) design and evaluate a Theory of Planned Behaviour-based professional practice change intervention.

How the research met each of these aims, and the implications of the findings to the wider field of professional practice change, are discussed below.

Aim #1: Examine the Role of Dental Hygienists and Emergency Department Nurses in the Prevention of Smoking- and Alcohol-Related Harms

The first aim of this program of research was to examine the delivery of interventions by two different health professions: dental hygienists and Emergency Department nurses. The research highlighted the contribution these two professions could make to the prevention of smoking- and alcohol-related harms respectively. Quantitative, nationwide surveys of both professions, undertaken in Study 3, provided findings relevant to these professions' roles. In this study, participants' scores on role legitimacy and subjective norms for both professions were above the midpoint, indicating that participants felt that providing brief interventions for smoking or alcohol was part of their profession's role, and that they received approval and encouragement for these behaviours from important professional groups. The behaviour measure in Study 3 asked participants to estimate the number of patients they intervened with in the past week. Analysis of these responses indicated that in one week, the 273 dental hygienists who completed this measure intervened with an estimated total of 1,394 patients concerning smoking. The 71 Emergency Department nurses who completed the behaviour measure intervened with an estimated total of 488 patients concerning

alcohol. These numbers demonstrate the considerable public health benefits to be gained from supporting these two professions to deliver brief interventions targeting smoking or alcohol.

While the results may overestimate the actual frequency with which patients are identified and assisted due to self-selection biases, the results nevertheless indicate considerable potential for the prevention of smoking and alcohol-related harm if all dental hygienists and Emergency Department nurses were supported in this role. If future public health efforts provided this support, these two professions could make a substantial contribution to the number of people in the community receiving assistance from health professionals to quit smoking or modify their alcohol consumption.

A key goal of the current program of research, however, was to move beyond a descriptive account of the behaviours and potential barriers to a theory-driven analysis of factors that influence these professions' delivery of brief interventions for smoking and alcohol consumption. This goal is reflected in the following three aims, which concerned the application of the Theory of Planned Behaviour to understand, predict, and change these behaviours.

Aim #2: Assess the Ability of the Theory of Planned Behaviour to Understand and Predict Health Professionals' Identifying and Assisting Behaviour

To examine a theoretically-driven approach to enhancing health professionals' practice, the Theory of Planned Behaviour was applied to dental hygienists' and Emergency Department nurses' identifying and assisting behaviour. A Theory of Planned Behaviour framework was used in the qualitative studies undertaken in Study 2 to elicit dental hygienists' and Emergency Department nurses' underlying beliefs. This provided valuable insight into the factors that may prevent or facilitate performance of

identifying or assisting behaviours. The study identified important issues such as participants' concerns over their rapport with the patient, and the benefits to routine care of asking patients about smoking or alcohol.

A quantitative test of the ability of the Theory of Planned Behaviour to predict participants' identifying and assisting behaviour was provided in Study 3. The theoretical model predicted dental hygienists' provision of assistance to patients to quit smoking, but was less successful in predicting identification of patients who smoke or Emergency Department nurses' identifying or assisting behaviour. The results of the analysis of dental hygienists' responses supported the finding from the meta-analysis that identified perceived behavioural control as an important predictor of frequency of identifying and assisting. For Emergency Department nurses, subjective norms were more influential. The prominent role of subjective norms may be due to the group setting within which Emergency Department nurses work, and the need to work as part of a team in a busy work environment.

The Theory of Planned Behaviour only accounted for a relatively small proportion of variance in frequency of identifying and assisting. The exception to this was the large amount of variance explained in dental hygienists' frequency of assisting patients to quit smoking. The more modest results for Emergency Department nurses may be due to not capturing the barriers formed by the hectic nature of Emergency Department work, which may reduce nurses' opportunities to translate their intentions into actions. Perceived behavioural control and the workload measure may not have accurately assessed this issue, or it may be that Emergency Department nurses find the influence of the hectic work environment difficult to predict and therefore are unable to factor it into their assessment of behavioural control. Previous applications of the

Theory of Planned Behaviour to nurses' behaviour have also acknowledged this possibility (Levin, 1999; Renfroe et al., 1990).

The amount of variance explained for dental hygienists' assisting behaviour, and the findings of the meta-analysis, indicate that the theory has been found to successfully predict behaviour in a range of other organisational settings. The unique barriers to performing prevention behaviours in the Emergency Department are an important issue to address given the crucial nature of the work undertaken in this setting. Identification of these barriers using a Theory of Planned Behaviour framework could provide further support for the theory. Identification of these factors could also contribute substantially to professional practice change efforts targeting the Emergency Department.

Important differences were found in underlying beliefs and the factors that predicted behaviour between dental hygienists and Emergency Department nurses. For example, self-efficacy was the most important predictor of behaviour for dental hygienists, while subjective norms may have been a more important theoretical determinant for Emergency Department nurses. These differences suggest that findings cannot be assumed to generalise to other health professionals, health care settings, or behaviours. What the program of research does indicate is the potential utility in applying the Theory of Planned Behaviour to health professionals' behaviour and the ability of the theory to explain the influence of organisational factors on health professionals' behaviour. Extending the research to other health professional behaviours, such as frequency of conducting preventive screening or providing interventions targeting illicit drug-related harms or other health issues, and to other health professionals such as pharmacists and GPs, would widen the evidence base for the applicability of the theory to health professionals' behaviour and efforts to increase uptake of such behaviours. The meta-analysis included several studies applying the

Theory of Planned Behaviour to other health professional behaviours, with encouraging results.

A second way the Theory of Planned Behaviour may be able to contribute to the understanding of health professionals' behaviour is through accounting for the influence of organisational factors on workers' behaviour. This was explored in the third aim of the thesis, discussed below.

Aim #3: Assess the Ability of the Theory of Planned Behaviour to Account for the Influence of Organisational Factors on Workers' Behaviour

An important and unique aspect of this program of work was the third aim which addressed the extent to which the Theory of Planned Behaviour could account for organisational influences on workers' behaviour. The qualitative interviews undertaken in Study 2 indicated a range of organisational factors that may potentially impact on identifying and assisting behaviour. These organisational factors included role legitimacy, role adequacy, autonomy, workload, organisational policy, education and training, co-worker support, and supervisor support. Study 3 then assessed the ability of the Theory of Planned Behaviour to account for the influence of these organisational factors on behaviour. The ability of the Theory of Planned Behaviour variables to account for the influence of organisational factors on behaviour was supported, as the Theory of Planned Behaviour variables fully mediated the influence of organisational factors on participants' behaviour. The key findings were that role legitimacy influenced attitudes, subjective norms, and self-efficacy; role adequacy influenced self-efficacy; and that presence of an organisational policy influenced perceptions of norms. Co-worker and supervisor support also influenced theoretical predictors.

The ability of the Theory of Planned Behaviour to account for the effects of organisational factors on behaviour highlights the considerable potential contribution the theory could make to the design of workplace interventions. Understanding how organisational factors work to influence behaviour is essential in planning and designing behaviour change interventions in the workplace. For example, for both dental hygienists and Emergency Department nurses, knowledge of an organisational policy was associated with increased subjective norms. Although causal relationships can only be inferred, as the survey was cross-sectional and non-experimental, these findings nonetheless suggest that implementation of a policy in an organisation may only influence workers' perceptions of subjective norms surrounding the behaviour. Hence, organisations would therefore be advised to also deliver interventions targeting workers' attitudes and perceived behavioural control to ensure performance of the behaviours required by the policy.

The ultimate goal in predicting and understanding health professionals' behaviour is to change the behaviour. The end goal of the current program of research was to increase the frequency with which the two professions provided brief smoking or alcohol interventions to their patients. Examination of the Theory of Planned Behaviour's ability to inform professional practice change formed the fourth aim of the research, and this aim is discussed below.

Aim #4: Design and Evaluate a Theory of Planned Behaviour-Based Professional Practice Change Intervention

The fourth aim of the current program of research was to examine the ability of the theory to inform professional practice change interventions. A randomised controlled trial of a Theory of Planned Behaviour-Based intervention targeting dental

hygienists' provision of assistance to patients to quit smoking was undertaken in Study 4. The behaviour change intervention was designed to target dental hygienists' self-efficacy using academic detailing principles. The intervention was compared to a control intervention which replicated the academic detailing procedure but focused on general issues of stress and burnout rather than role legitimacy, role adequacy, and the two control beliefs.

The intervention did not succeed in increasing the experimental group participants' role adequacy, role legitimacy, or the two control beliefs relative to the control group. A trend for increased patient rapport in the experimental group approached significance at post-intervention, but this trend did not remain at follow up. The lack of change in the experimental group was attributed to ceiling effects for role adequacy and role legitimacy, and the external influence of a high profile Quit media campaign targeting the oral health effects of smoking that coincided with the intervention. Because the intervention did not increase behaviour or the targeted predictors of behaviour, the study could not provide a test of the theoretical pathways.

The majority of previous Theory of Planned Behaviour-based interventions have also been unsuccessful in increasing behaviour, theoretical determinants, or both (Armitage & Conner, 2002; Chantzisarantis & Hagger, 2005; Hoogstraten et al., 1985; Parker et al., 1996). This highlights that while the Theory of Planned Behaviour can aid in the identification of factors to target in behaviour change interventions, the theory provides limited guidance on how to successfully alter these factors. While the theory can aid in the identification of which underlying beliefs to target, it provides no guidance on how to alter these beliefs. The lack of effect found for the current intervention, and the low success rate of previous Theory of Planned Behaviour-based

interventions, indicates this is an important aspect that needs to be addressed if the theory is to provide a useful framework for effective behaviour change interventions.

Armitage and Conner (2002) and Sutton (2002) also argue that because the Theory of Planned Behaviour only accounts for a proportion of variance in a given behaviour, achieving increases in the theoretical determinants of behaviour may not result in significant behaviour change. This may reflect the real world difficulties inherent in attempts to change behaviour using interventions of limited intensity and duration. There are few methodologically rigorous Theory of Planned Behaviour-based interventions reported in the literature with which to support the ability of the theory to inform successful behaviour change interventions. Successful Theory of Planned Behaviour-based interventions, particularly in organisational settings, that provide a test of the causal pathways specified in the theory are needed. Without such interventions, the Theory of Planned Behaviour can not be considered to have adequate empirical support in this regard.

Conclusion

The purpose of applying the Theory of Planned Behaviour to health professionals' provision of brief interventions for smoking and alcohol was to examine contributions the theory could make to understanding and addressing barriers to the transfer of research findings into practice and achieving professional practice change. The ability of the Theory of Planned Behaviour to account for the influence of organisational factors on behaviour, and to identify important predictors of behaviour in organisational settings may provide valuable insight into factors that need to be targeted to achieve these goals and to successfully address health professionals' behaviour.

However, two significant issues reduce the capacity of the theory to contribute meaningfully to professional practice change and research transfer efforts. Firstly, the theory did not predict Emergency Department nurses' behaviour. Further research is needed to investigate the factors that influence behaviour in hectic settings such as the Emergency Department that were not adequately captured in this application of the Theory of Planned Behaviour. Secondly, significant increases were not observed in the factors targeted by the intervention. As a result, there remains little research supporting the ability of the Theory of Planned Behaviour to inform successful behaviour change interventions. If these two issues could be addressed, the scope of the theory to extend research on barriers to these goals could be substantial. Such advances could yield considerable improvements in evidence-based patient care and ultimately in health outcomes in the community.

REFERENCES

References marked with an asterisk indicate studies included in the meta-analysis in Chapter 3.

- Aalto, M., Pekuri, P., & Seppa, K. (2002). Primary health care professionals' activity in intervening in patients' alcohol drinking: A patient perspective. *Drug and Alcohol Dependence, 66*, 39-43.
- Abouyanni, G., Stevens, L. J., Harris, M. F., Wickes, W. A., Ramakrishna, S. S., Ta, E., et al. (2000). GP attitudes to managing drug- and alcohol-dependent patients: A reluctant role. *Drug and Alcohol Review, 19*, 165-170.
- Adair, J. G. (1984). The Hawthorne effect: A reconsideration of the methodological artifact. *Journal of Applied Psychology, 69*, 334-345.
- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage.
- Aita, M., & Goulet, C. (2003). Assessment of neonatal nurses' behaviors that prevent overstimulation in preterm infants. *Intensive and Critical Care Nursing, 19*, 109-118.
- Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhl & J. Beckmann (Eds.), *Action-control: From cognition to behavior* (pp. 11-39). Heidelberg: Springer.
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior & Human Decision Processes, 50*, 179-211.

- Ajzen, I. (2001). Nature and operation of attitudes. *Annual Review of Psychology*, 52, 27-58.
- Ajzen, I. (2002a). Perceived behavioral control, self-efficacy, locus of control, and the Theory of Planned Behavior. *Journal of Applied Social Psychology*, 32, 1-20.
- Ajzen, I. (2002b). Constructing a TPB questionnaire: Conceptual and methodological considerations. Retrieved 23rd June, 2004, from <http://www-unix.oit.umass.edu/~ajzen/pdf/tpb.measurement.pdf>
- Ajzen, I. (2004). The Theory of Planned Behaviour: A bibliography. Retrieved January 15, 2004, from <http://people.umass.edu/ajzen/tpbrefs.html>
- Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice-Hall.
- Ajzen, I., & Fishbein, M. (2004). Questions raised by a Reasoned Action approach: Comment on Ogden (2003). *Health Psychology*, 23, 431-434.
- Ajzen, I., & Fishbein, M. (2005). The influence of attitudes on behavior. In D. Albarracin, B. T. Johnson & M. P. Zanna (Eds.), *The handbook of attitudes*. Mahwah, NJ: Erlbaum.
- Ajzen, I., & Madden, T. J. (1986). Prediction of goal-directed behavior: Attitudes, intentions, and perceived behavioral control. *Journal of Experimental Social Psychology*, 22, 453-474.
- Albarracin, D., Johnson, B. T., Fishbein, M., & Muellerleile, P. A. (2001). Theories of reasoned action and planned behavior as models of condom use: A meta-analysis. *Psychological Bulletin*, 127, 142-161.
- Albert, D., Ahluwalia, K., Ward, A., & Sadowsky, D. (2004). The use of 'academic detailing' to promote tobacco-use cessation counseling in dental offices. *Journal of the American Dental Association*, 135, 1700-1706.

- Albert, D., Ward, A., Ahluwalia, K., & Sadowsky, D. (2002). Addressing tobacco in managed care: A survey of dentists' knowledge, attitudes and behaviours. *American Journal of Public Health, 92*, 997-1001.
- Anderson, P., & Jane-Llopis, E. (2004). How can we increase the involvement of primary health care in the treatment of tobacco dependence? A meta-analysis. *Addiction, 98*, 299-312.
- Anderson, P., Kaner, E., Wutzke, S., Funk, M., Heather, N., Wensing, M., et al. (2004). Attitudes and managing alcohol problems in general practice: An interaction analysis based on findings from a WHO collaborative study. *Alcohol and Alcoholism, 39*, 351-356.
- Anderson, S., Eadie, D. R., MacKintosh, A. M., & Haw, S. (2001). Management of alcohol misuse in Scotland: The role of A & E nurses. *Accident and Emergency Nursing, 9*, 92-100.
- Aquilino, M. L., Farris, K. B., Zillich, A. J., & Lowe, J. B. (2003). Smoking-cessation services in Iowa community pharmacies. *Pharmacotherapy, 23*, 666-673.
- Armitage, C. J., & Conner, M. (1999). The theory of planned behaviour: Assessment of predictive validity and 'perceived control'. *British Journal of Social Psychology, 38*, 35-54.
- Armitage, C. J., & Conner, M. (2001). Efficacy of the theory of planned behaviour: A meta-analytic review. *British Journal of Social Psychology, 40*, 471-499.
- Armitage, C. J., & Conner, M. T. (2002). Reducing fat intake: Interventions based on the Theory of Planned Behaviour. In D. Rutter & L. Quine (Eds.), *Changing health behaviour: Intervention and research with social cognition models*. Philadelphia: Open University Press.

- Armitage, C. J., Norman, P., & Conner, M. T. (2002). Can the theory of planned behaviour mediate the effects of age, gender and multidimensional locus of control? *British Journal of Health Psychology*, 7, 299-316.
- Australian Institute of Health and Welfare. (2005a). *Statistics on drug use in Australia 2004*. AIHW cat. no. PHE 62. Canberra: AIHW.
- Australian Institute of Health and Welfare. (2005b). *2004 National Drug Strategy Household Survey: First results*. AIHW cat. no. PHE 37. Canberra: AIHW (Drug Statistics Series No. 13).
- Australian Institute of Health and Welfare. (2005c). *Dental hygienist labour force in Australia, 2003*. Adelaide: AIHW Dental Statistics and Research Unit.
- Australian Institute of Health and Welfare. (2005d). *Nursing and midwifery labour force 2003*. Canberra: AIHW.
- Australian Institute of Health and Welfare. (2006). *Australia's Health 2006*. Cat. No. AUS 73. Canberra: AIHW.
- Babor, T. F., & Kadden, R. M. (2005). Screening and interventions for alcohol and drug problems in medical settings: What works? *Journal of Trauma - Injury, Infection and Critical Care*, 59, S80-S87.
- Baer, J. S., Ball, S. A., Campbell, B. K., Miele, G. M., Schoener, E. P., & Tracy, K. (2007). Training and fidelity monitoring of behavioral interventions in multi-site addictions research. *Drug and Alcohol Dependence*, 87, 107-118.
- Bagozzi, R. P. (1992). The self-regulation of attitudes, intentions, and behavior. *Social Psychology Quarterly*, 55, 178-204.
- Bagozzi, R. P., & Kimmel, S. K. (1995). A comparison of leading theories for the prediction of goal-directed behaviours. *British Journal of Social Psychology*, 34, 437-461.

- Ballesteros, J., Duffy, J. C., Querejeta, I., Arino, J., & Gonzalez-Pinto, A. (2004). Efficacy of brief interventions for hazardous drinkers in primary care: Systematic review and meta-analyses. *Alcoholism: Clinical & Experimental Research*, 28, 608-618.
- Ballone, L. M., & Czerniak, C. M. (2001). Teachers' beliefs about accommodating students' learning styles in science classes. *Electronic Journal of Science Education*, 6, 1-41.
- Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist*, 37, 122-147.
- Barker, G. J., Williams, K. B., Taylor, T. S., & Barker, B. F. (2001). Practice behaviours of alumni trained as students in tobacco use cessation interventions. *Journal of Dental Hygiene*, 75, 165-169.
- Barry, E. (2006, 1 May). Smoker warning cover-up. *MX*, p. 9.
- Beaglehole, R. H., & Watt, R. G. (2004). *Helping smokers stop: A guide for the dental team*. London: Health Development Agency.
- Becker, B., Woolard, R., Nirenberg, T. D., Minugh, P. A., Longabaugh, R., & Clifford, P. R. (1995). Alcohol use among subcritically injured emergency department patients. *Academic Emergency Medicine*, 2, 784-790.
- Beehr, T. A., Jex, S. M., Stacy, B. A., & Murray, M. A. (2000). Work stressors and coworker support as predictors of individual strain and job performance. *Journal of Organizational Behavior*, 21, 391-405.
- Bell, M. P., Harrison, D. A., & McLaughlin, M. E. (2000). Forming, changing, and acting on attitude toward affirmative action programs in employment: A theory-driven approach. *Journal of Applied Psychology*, 85, 784-798.

- Bertholet, N., Daeppen, J.-B., Wietlisbach, V., Fleming, M., & Burnand, B. (2005). Reduction of alcohol consumption by brief alcohol intervention in primary care: systematic review and meta-analysis. *Archives of Internal Medicine*, *165*, 986-995.
- Bien, T. H., Miller, W. R., & Tonigan, J. S. (1993). Brief interventions for alcohol problems: A review. *Addiction*, *88*, 315-336.
- Borland, R., Balmford, J., Segan, C., Livingston, P., & Owen, N. (2003). The effectiveness of personalized smoking cessation strategies for callers to a Quitline service. *Addiction*, *98*, 837-846.
- Boyatzis, R. E. (1998). *Transforming qualitative information: Thematic analysis and code development*. Thousand Oaks, CA: Sage.
- Breslin, C., Li, S., Tupker, E., & Sdao-Jarvie, K. (2001). Application of the Theory of Planned Behavior to predict research dissemination. *Science Communication*, *22*, 423-437.
- Brooker, C., Peters, J., McCabe, C., & Short, N. (1999). The views of nurses to the conduct of a randomised controlled trial of problem drinkers in an accident and emergency department. *International Journal of Nursing Studies*, *36*, 33-39.
- Brubaker, R. G., & Fowler, C. (1990). Encouraging college males to perform testicular self-examination: Evaluation of a persuasive message based on the revised Theory of Reasoned Action. *Journal of Applied Social Psychology*, *17*, 1411-1422.
- Buchan, H., Sewell, J. R., & Sweet, M. (2004). Translating evidence into practice. *Medical Journal of Australia*, *180*, S43.

- Budd, R. J. (1986). Predicting cigarette use: The need to incorporate measures of salience in the theory of reasoned action. *Journal of Applied Social Psychology, 16*, 663-685.
- Bunce, D., & Birdi, K. (1998). The theory of reasoned action and theory of planned behaviour as a function of job control. *British Journal of Health Psychology, 3*, 265-275.
- Burak, L. J. (1994). Examination and prediction of elementary school teachers' intentions to teach HIV/AIDS education. *AIDS Education and Prevention, 6*, 310-321.
- Bush, R. A., & Williams, R. J. (1988). Generalist health and welfare workers' response to alcohol related problems: role legitimacy and the need for role-support, and example from an Australian rural community. *Drug and Alcohol Dependence, 22*, 105-111.
- Byrne, B. (2001). *Structural equation modeling with AMOS: Basic concepts, applications, and programming*. Mahwah, N.J.: Lawrence Erlbaum Associates.
- Cammann, C., Fichman, M., Jenkins, G. D., Jr., & Klesh, J. R. (1983). Assessing the attitudes and perceptions of organizational members. In S. E. Seashore, E. E. Lawler, III., P. H. Mirvis & C. Cammann (Eds.), *Assessing organizational change: A guide to methods, measures and practices*. New York: Wiley.
- Campbell, H. S., Sletten, M., & Petty, T. (1999). Patient perceptions of tobacco cessation services in dental offices. *Journal of the American Dental Association, 130*, 219-226.
- Carmody, T. P. (1992). Preventing relapse in the treatment of nicotine addiction: Current issues and future directions. *Journal of Psychoactive Drugs, 24*, 131-158.

- Carter, K., & Stewart, J. (2003). *National Dental Telephone Interview Survey 2002*. Adelaide, South Australia: AIHW Dental Statistics and Research Unit.
- Cartwright, A. K. J. (1980). The attitudes of helping agents towards the alcoholic client: The influence of experience, support, training and self-esteem. *British Journal of Addiction, 75*, 413-431.
- Cartwright, A. K. J., & Gorman, D. M. (1993). Processes involved in changing therapeutic attitudes of clinicians toward working with drinking clients. *Psychotherapy Research, 3*, 95-104.
- Chambers, A. K., & Corbin, D. E. (1996). Tobacco control activities of Iowa dental hygienists. *Journal of Community Health, 21*, 375-387.
- Chantzisarantis, N. L. D., & Hagger, M. S. (2005). Effects of a brief intervention based on the Theory of Planned Behavior on leisure-time physical activity participation. *Journal of Sport and Exercise Psychology, 27*, 470-487.
- Chapman, S., & Wakefield, M. (2001). Tobacco control advocacy in Australia: Reflections on 30 years of progress. *Health Education and Behavior, 28*, 274-289.
- Charalambous, M. P. (2002). Alcohol and the accident and emergency department: A current review. *Alcohol and Alcoholism, 37*, 307-312.
- Chau, P. Y. K., & Hu, P. J. H. (2001). Information technology acceptance by individual professionals: A model comparison approach. *Decision Sciences, 32*, 699-719.
- Cherpitel, C. J. (2006). Screening and brief intervention for alcohol problems in the Emergency Room: Is there a role for nursing? *Journal of Addictions Nursing, 17*, 79-82.
- Cherpitel, C. J., Ye, Y., Bond, J., Rehm, J., Cremonte, M., Neves, O., et al. (2006). The effect of alcohol consumption on Emergency Department services use among

- injured patients: A cross-national emergency room study. *Journal of Studies on Alcohol*, 67, 890-897.
- Chikritzhs, T., Jonas, H., Heale, P., Stockwell, T., Dietze, P., Hanlin, K., et al. (2000). *Alcohol caused deaths and hospitalisations in Australia, 1990-1997*. Perth: National Drug Research Institute.
- Cialdini, R. B., Kallgren, C. A., & Reno, R. R. (1991). A focus theory of normative conduct: A theoretical refinement and reevaluation of the role of norms in human behavior. *Advances in Experimental Social Psychology*, 24, 201-234.
- Clement, S. (1986). The identification of alcohol-related problems by General Practitioners. *British Journal of Addiction*, 81, 257-264.
- Clifford, P. R., Sparadeo, F., Minugh, P. A., Nirenberg, T. D., Woolard, R., Longabaugh, R., et al. (1996). Identification of hazardous/harmful drinking among subcritically injured patients. *Academic Emergency Medicine*, 3, 239-245.
- Clover, K., Hazell, T., Stanbridge, B., & Sanson-Fisher, R. (1999). Dentists' attitudes and practice regarding smoking. *Australian Dental Journal*, 44, 46-50.
- Cockburn, J. (2004). Adoption of evidence into practice: Can change be sustainable? *Medical Journal of Australia*, 189, S66-S67.
- Cohen, J. (1977). *Statistical power analysis for the behavioral sciences*. New York: Academic Press.
- Cohen, J. (1992). A power primer. *Psychological Bulletin*, 112, 155-159.
- Cohen, S. J., Christen, A. G., Katz, B. P., Drook, C. A., Davis, B. J., Smith, D. M., et al. (1987). Counseling medical and dental patients about cigarette smoking: The impact of nicotine gum and chart reminders. *American Journal of Public Health*, 77, 313-316.

- Coleman, T., & Wilson, A. (1999). Factors associated with the provision of anti-smoking advice by general practitioners. *British Journal of General Practice*, *49*, 557-558.
- Collins, D. J., & Lapsley, H. M. (2002). *Counting the costs: Estimates of the social costs of drug abuse in Australia in 1998-9*. Canberra: Commonwealth Department of Health and Ageing.
- Conner, M., & Armitage, C. J. (1998). Extending the theory of planned behavior: A review and avenues for further research. *Journal of Applied Social Psychology*, *28*, 1429-1464.
- Conner, M., Martin, E., Silverdale, N., & Grogan, S. (1997). Dieting in adolescence: An application of the theory of planned behaviour. *British Journal of Health Psychology*, *1*, 315-325.
- Conner, M., & McMillan, B. (1999). Interaction effects in the theory of planned behaviour: Studying cannabis use. *British Journal of Social Psychology*, *38*, 195-222.
- Conner, M., Sheeran, P., Norman, P., & Armitage, C. J. (2000). Temporal stability as a moderator of the relationships in the theory of planned behavior. *British Journal of Social Psychology*, *39*.
- Conner, M., & Sparks, P. (2005). The theory of planned behaviour and health behaviours. In M. Conner & P. Norman (Eds.), *Predicting health behaviour: Research and practice with social cognition models* (2nd ed., pp. 170-222). Maidenhead: Open University Press.
- Cook, T. D., & Campbell, D. T. (1979). *Quasi-experimentation: Design and analysis issues for field settings*. Boston: Houghton Mifflin.

- Cooke, M., Mattick, R. P., & Campbell, E. (1998). The influence of individual and organizational factors on the reported smoking intervention practices of staff in 20 antenatal clinics. *Drug and Alcohol Review, 17*, 175-185.
- * Cordano, M., & Frieze, I. H. (2000). Pollution reduction preferences of U.S. environmental managers: Applying Ajzen's theory of planned behavior. *Academy of Management Journal, 43*, 627-641.
- Courneya, K., & McCauley, E. (1995). Cognitive mediators of the social influence-exercise adherence relationship of the Theory of Planned Behavior. *Journal of Behavioral Medicine, 18*, 499-515.
- Courneya, K. S. (1994). Predicting repeated behavior from intention: The issue of scale correspondence. *Journal of Applied Social Psychology, 24*, 580-594.
- Courneya, K. S., Bobick, T. M., & Schinke, R. J. (1999). Does the theory of planned behavior mediate the relationship between personality and exercise behavior. *Basic and Applied Social Psychology, 21*, 317-324.
- Courneya, K. S., Conner, M., & Rhodes, R. E. (2006). Effects of different measurement scales on the variability and predictive validity of the "two-component" model of the theory of planned behavior in the exercise domain. *Psychology and Health, 21*, 557-570.
- * Crawley, F. E., III. (1990). Intentions of science teachers to use investigative teaching methods: A test of the theory of planned behavior. *Journal of Research in Science Teaching, 27*, 685-697.
- Crawley, F. E., & Koballa, T. R. J. (1992). Hispanic-American students' attitudes towards enrolling in high school chemistry: A study of planned behaviour and belief-based change. *Hispanic Journal of Behavioral Sciences, 14*, 469-486.

- Cronen, V. E., & Conville, R. L. (1975). Fishbein's conception of belief strength: A theoretical, methodological, and experimental critique. *Speech Monographs*, 42, 143-150.
- * Czerniak, C. M., Lumpe, A. T., & Haney, J. J. (1999). Science teachers' beliefs and intentions to implement thematic units. *Journal of Science Teacher Education*, 10, 123-145.
- * Czerniak, C. M., Lumpe, A. T., Haney, J. J., & Beck, J. (1999). Teachers' beliefs about using educational technology in the science classroom. *International Journal of Educational Technology*, 1, 1-18.
- D'Onforio, G., & Degutis, L. C. (2002). Screening and brief intervention for alcohol problems in the Emergency department: A systematic review. *Academic Emergency Medicine*, 9, 627-638.
- Davis, D., Evans, M., Jadad, A., Perrier, L., Rath, D., Ryan, D., et al. (2003). The case for knowledge translation: Shortening the journey from evidence to effect. *British Medical Journal*, 327, 33-35.
- Davis, D., Thomson O'Brien, M., Freemantle, N., Wolf, F., Mazmanian, P., & Taylor-Vaisey, A. (1999). Impact of formal continuing medical education: Do conferences, workshops, rounds, and other traditional continuing education activities change physician behaviour or health care outcomes? *The Journal of American Medical Association*, 282, 867.
- Davis, L. E., Ajzen, I., Saunders, J., & Williams, T. (2002). The decision of African American students to complete high school: An application of the Theory of Planned Behaviour. *Journal of Educational Psychology*, 94, 810-819.
- de Crespigny, C. (2002). Alcohol and other drug issues in Australia: No place to hide. *Drug and Alcohol Professional*, 2, 9-18.

- Degenhardt, L., Knox, S., Barker, B., Britt, H., & Shakeshaft, A. (2005). The management of alcohol, tobacco and illicit drug use problems by general practitioners in Australia. *Drug and Alcohol Review, 24*, 499-506.
- Department of Health and Ageing. (2004). *Smoking cessation guidelines for Australian general practice*. Canberra: Australian Government.
- DeVries, H., Backbier, E., Kok, G., & Dijkstra, M. (1995). The impact of social influences in the context of attitude, self-efficacy, intention, and previous behavior as predictors of smoking onset. *Journal of Applied Social Psychology, 25*, 237-257.
- * Dilorio, C. (1997). Neuroscience nurses' intentions to care for persons with HIV/AIDS. *Journal of Neuroscience Nursing, 29*, 50-55.
- Dinh-Zarr, T., DiGuseppi, C., Heitman, E., & Roberts, I. (2004). Interventions for preventing injuries in problem drinkers (Cochrane Review). In *The Cochrane Library, Issue 3*. Chichester, UK: John Wiley & Sons.
- Dolan, T. A., McGorray, S. P., Grinstead-Skigen, C. L., & Mecklenburg, R. (1997). Tobacco control activities in US dental practices. *Journal of the American Dental Association, 128*, 1669-1679.
- Dollard, M. F., Winefield, A. H., & Winefield, H. R. (Eds.). (2003). *Occupational stress in the service professions*. London: Taylor and Francis.
- Doran, C. M., Duszynski, K. M., Beilby, J. J., & Mattick, R. P. (2006). Use of pharmacotherapies for the management of addictive behaviours in Australian clinical practice. *Addictive Behaviors, 31*, 1947-1958.
- Durand, M. A. (1994). General practice involvement in the management of alcohol misuse: Dynamics and resistances. *Drug and Alcohol Dependence, 35*, 181-189.

- Eagly, A. H., & Chaiken, S. (1993). *The psychology of attitudes*. Orlando, FL, US: Harcourt Brace Jovanovich College Publishers (1993) xxii, 794 pp.
- Edwards, D., Freeman, T., & Gilbert, A. (2006). Pharmacists' role in smoking cessation: An examination of current practice and barriers to service provision. *International Journal of Pharmacy Practice*, 14, 1-3.
- Edwards, D., Freeman, T., Litt, J., & Roche, A. M. (2006). GPs' confidence in and barriers to implementing smoking cessation activities: Compared to dentists, dental hygienists and pharmacists. *Australian Journal of Primary Health*, 12, 117-125.
- Edwards, D., Freeman, T., & Roche, A. M. (2006). Dentists' and dental hygienists' role in smoking cessation: An examination and comparison of current practice and barriers to service provision. *Health Promotion Journal of Australia*, 17, 145-151.
- Edwards, H. E., Nash, R. E., Najman, J. M., Yates, P. M., Walsh, A. M., McDowell, J. K., et al. (2001). Determinants of nurses' intention to administer opioids for pain relief. *Nursing & Health Sciences*, 3, 149-159.
- Elliott, M. A., Armitage, C. J., & Baughan, C. J. (2003). Drivers' compliance with speed limits: An application of the Theory of Planned Behaviour. *Journal of Applied Psychology*, 88, 964-972.
- Elliott, R., Jobber, D., & Sharp, J. (1995). Using the theory of reasoned action to understand organizational behaviour: The role of belief salience. *British Journal of Social Psychology*, 34, 161-172.
- Ellis, S., & Arieli, S. (1999). Predicting intentions to report administrative and disciplinary infractions: Applying the Reasoned Action model. *Human Relations*, 52, 947-967.

- Ewing, J. A. (1984). Detecting alcoholism: The CAGE questionnaire. *Journal of the American Medical Association*, 252, 1905-1907.
- Farmer, R., & Greenwood, N. (2001). General practitioners' management of problem drinkers- attitudes, knowledge and practice. *Drugs: Education, Prevention and Policy*, 8, 119-129.
- Faulkner, G., & Biddle, S. (2001). Predicting physical activity promotion in health care settings. *American Journal of Health Promotion*, 16, 98-106.
- Field, A. P. (2001). Meta-analysis of correlation coefficients: A Monte Carlo comparison of fixed- and random-effects methods. *Psychological Methods*, 6, 161-180.
- Field, A. P. (2003). The problems in using fixed-effects models of meta-analysis on real-world data. *Understanding Statistics*, 2, 105-124.
- Fiellen, D. A., Butler, R., D'Onofrio, G., Brown, R. L., & O'Connor, P. G. (2002). The physician's role in caring for patients with substance use disorders: Implications for medical education and training. In M. R. Haack & H. Adger (Eds.), *Strategic plan for interdisciplinary faculty development: Arming the nation's health professional workforce for a new approach to substance use disorders*. Rhode Island: Association for Medical Education and Research in Substance Abuse.
- Fiore, M. C., Bailey, W. C., Cohen, S. J., Dorfman, S. F., Goldstein, M. G., Gritz, E. R., et al. (2000). *Treating tobacco use and dependence: Clinical practice guideline*. Rockville, MD: US Department of Health and Human Services.
- Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley.
- Fishbein, M., Ajzen, I., & McArdle, J. (1980). Changing the behaviour of alcoholics: Effects of persuasive communication. In I. Ajzen & M. Fishbein (Eds.),

Understanding attitudes and predicting social behaviour. Englewood Cliffs, NJ: Prentice-Hall.

Fishbein, M., Hennessy, M., Kamb, M., Bolan, G. A., Hoxworth, T., Iatesta, M., et al. (2001). Using intervention theory to model factors influencing behavior change: Project RESPECT. *Evaluation & the Health Professions*, 24, 363-384.

Fishbein, M., & Stasson, M. (1990). The role of desires, self-predictions, and perceived control in the prediction of training session attendance. *Journal of Applied Social Psychology*, 20, 173-198.

Fleming, E. A., Gmel, G., Bady, P., Yersin, B., Givel, J. C., Brown, D., et al. (2007). At-risk drinking and drug use among patients seeking care in an Emergency Department. *Journal of Studies on Alcohol*, 68, 28-35.

Fleming, M. F., Mundt, M. P., French, M. T., Manwell, L. B., Stauffacher, E. A., & Barry, K. L. (2002). Brief physician advice for problem drinkers: Long-term efficacy and benefit-cost analysis. *Alcoholism: Clinical and experimental research*, 26, 36-43.

Flick, U. (1998). *An introduction to qualitative research*. Thousand Oaks, CA: Sage.

Fowler, G. (2001). Proven strategies for smoking cessation; adopting a global approach. *European Journal of Public Health*, 10, 3-4.

Foy, R., MacLennan, G., Grimshaw, J., Penney, G., Campbell, M., & Grol, R. (2002). Attributes of clinical recommendations that influence change in practice following audit and feedback. *Journal of Clinical Epidemiology*, 55, 717-722.

French, D. P., & Hankins, M. (2003). The expectancy-value muddle in the theory of planned behaviour--and some proposed solutions. *British Journal of Health Psychology*, 8, 37-55.

- Fried, J. L., & Cohen, L. A. (1992). Maryland dentists' attitudes regarding tobacco issues. *Clinical Preventive Dentistry*, *14*, 10-16.
- Gassman, R. A. (2003). Medical specialization, profession, and mediating beliefs that predict stated likelihood of alcohol screening and brief intervention: Targeting educational interventions. *Substance Abuse*, *24*, 141-155.
- Gilchrist, I. (2005, 30 November). Graphic quit images. *MX*, p. 5.
- Giles, M., & Cairnes, E. (1996). Church attendance in Northern Ireland: Catholics and Protestants compared. *Journal of Community & Applied Social Psychology*, *6*, 299-305.
- Gill, P. S., Makela, M., Vermeulen, K. M., Freemantle, N., Ryan, G., Bond, C., et al. (1999). Changing doctor prescribing behaviour. *Pharm World Sci*, *21*, 158-167.
- Glasgow, R. E., Lichtenstein, E., & Marcus, A. C. (2003). Why don't we see more translation of health promotion research to practice? Rethinking the efficacy-to-effectiveness transition. *American Journal of Public Health*, *93*, 1261-1267.
- Godin, G., & Gionet, N. J. (1991). Determinants of an intention to exercise of an electric power commission's employees. *Ergonomics*, *43*, 1221-1230.
- Godin, G., & Kok, G. (1996). The theory of planned behavior: A review of its applications to health-related behaviors. *American Journal of Health Promotion*, *11*, 87-98.
- Goldstein, I. L., & Ford, J. K. (2002). *Training in organisations* (4th ed.). Belmont, CA: Wadsworth.
- Gotham, H. J. (2006). Advancing the implementation of evidence-based practices into clinical practice: How do we get there from here? *Professional Psychology-Research and Practice*, *37*, 606-613.

- Gottlieb, N. H., Guo, J. L., Blozis, S. A., & Huang, P. P. (2001). Individual and contextual factors related to family residents' assessment and counseling for tobacco cessation. *Journal of the American Board of Family Practice, 14*, 343-351.
- Grbich, C. (1999). *Qualitative research in health: An introduction*. St Leonards, NSW: Allen & Unwin.
- Grimshaw, J. M., & Eccles, M. P. (2004). Is evidence-based implementation of evidence-based care possible? *Medical Journal of Australia, 180*, S50-S51.
- Grimshaw, J. M., Eccles, M. P., Walker, A. E., & Thomas, R. E. (2002). Changing physicians' behaviour: What works and thoughts on getting more things to work. *Journal of Continuing Education in the Health Professions, 22*, 237-243.
- Grol, R., & Grimshaw, J. (2003). From best evidence to best practice: effective implementation of change in patients' care. *Lancet, 362*, 1225-1230.
- Grol, R., & Wensing, M. (2004). What drives change? Barriers to and incentives for achieving evidence-based practice. *Medical Journal of Australia, 180*, S57-S60.
- Groves, P., & Strang, J. (2001). Why do general practitioners work with opiate misusers?: A qualitative study of high and low activity general practitioners. *Drugs: education, prevention and policy, 8*, 131-139.
- Grube, J. W., Morgan, M., & McGree, S. T. (1986). Attitudes and normative beliefs as predictors of smoking intentions and behaviours: A test of three models. *British Journal of Social Psychology, 25*, 81-93.
- Hackman, J. R., & Oldham, G. R. (1976). Motivation through the design of work: Test of a theory. *Organizational Behavior and Human Performance, 16*, 250-279.

- Hankins, M., French, D., & Horne, R. (2000). Statistical guidelines for studies of the theory of reasoned action and the theory of planned behaviour. *Psychology & Health, 15*, 151-161.
- Hardeman, W., Johnston, M., Johnston, D. W., Bonetti, D., Wareham, N. J., & Kinmonth, A. L. (2002). Application of the Theory of Planned Behaviour in behaviour change interventions: A systematic review. *Psychology and Health, 17*, 123-158.
- Harper, T. (2007, February). *Tobacco use in Australia*. Paper presented at the Tobacco use prevention and cessation for oral health professionals, Melbourne, Australia.
- Havlicek, D., Stafne, E., & Pronk, N. P. (2006). Tobacco cessation interventions in dental networks: A practice-based evaluation of the impact of education on provider knowledge, referrals, and pharmacotherapy use. *Preventing Chronic Disease [serial online], 3*, 1-7. Available from: http://www.cdc.gov/pcd/issues/2006/jul/2005_0226.htm.
- Hedges, L. V., & Olkin, I. (1985). *Statistical methods for meta-analysis*. San Diego, CA: Academic Press.
- Helgason, A. R., Lund, K. E., Adolfsson, J., & Axelsson, S. (2003). Tobacco prevention in Swedish dental care. *Community Dentistry and Oral Epidemiology, 31*, 378-385.
- Hester, R. K., & Miller, W. R. (1995). *Handbook of alcoholism treatment approaches: Effective alternatives (2nd ed)*. Boston: Allyn and Bacon.
- Hill, M., Mann, L., & Wearing, A. J. (1996). The effects of attitude, subjective norm and self-efficacy on intention to benchmark: A comparison between managers with experience and no experience in benchmarking. *Journal of Organizational Behavior, 17*, 313-327.

- Hinsz, V. B., & Nelson, L. C. (1990). Testing models of turnover intentions with university faculty. *Journal of Applied Social Psychology, 20*, 68-84.
- Holder, H. D., & Blose, J. O. (1992). The reduction of health care costs are associated with alcoholism treatment. *Journal of Studies on Alcohol, 53*, 293-302.
- Holloway, A. S., Watson, H. E., & Starr, G. (2006). How do we increase problem drinkers' self-efficacy? A nurse-led brief intervention putting theory into practice. *Journal of Substance Use, 11*, 375-386.
- Holmwood, C. (2002). Alcohol-related problems in Australia: Is there a role for general practice? *Medical Journal of Australia, 177*, 102-103.
- Hom, P. W., & Hulin, C. L. (1981). A competitive test of the prediction of reenlistment by several models. *Journal of Applied Psychology, 66*, 23-29.
- Hoogstraten, J., De Hann, W., & Ter Horst, G. (1985). Stimulating demand for dental care: An application of Ajzen and Fishbein's Theory of Reasoned Action. *European Journal of Social Psychology, 15*, 401-414.
- * Hsu, M.-H., & Kuo, F.-Y. (2003). The effect of organization-based self-esteem and deindividuation in protecting personal information privacy. *Journal of Business Ethics, 42*, 305-320.
- Hu, S.-C., & Lanese, R. R. (1998). The applicability of the theory of planned behavior to the intention to quit smoking across workplaces in Southern Taiwan. *Addictive Behaviors, 23*, 225-237.
- Humair, J. P., & Ward, J. (1998). Smoking-cessation strategies observed in videotaped general practice consultations. *American Journal of Preventive Medicine, 14*, 1-8.
- Hunter, J. E., & Schmidt, F. L. (1990). *Methods of meta-analysis: Correcting error and bias in research findings*. Newbury Park, CA: SAGE.

- Hunter, J. E., & Schmidt, F. L. (2000). Fixed effects vs random effects meta-analysis models: Implications for cumulative research knowledge. *International Journal of Selection and Assessment*, 8, 275-292.
- James, A. S., Tripp, M. K., Parcel, G. S., Sweeney, A., & Gritz, E. R. (2002). Psychosocial correlates of sun-protective practices of preschool staff toward their students. *Health Education Research*, 17, 305-314.
- Jamtvedt, G., Young, J. M., Kristoffersen, D. T., O'Brien, M. A., & Oxman, A. D. (2006). Audit and feedback: Effects on professional practice and health care outcomes. *The Cochrane Database of Systematic Reviews*, 2006, Art. No. CD000259.
- Johnson, N. W., & Bain, C. A. (2000). Tobacco and oral disease. *British Dental Journal*, 189, 200-206.
- Karasek, R. A. (1985). *Job Content Questionnaire: User's guide*. Lowell, MA: University of Massachusetts.
- Karasek, R. A., Brisson, C., Kawakami, N., Houtman, I., Bongers, P., & Amick, B. (1998). The Job Content Questionnaire (JCQ): An instrument for internationally comparative assessments of psychosocial job characteristics. *Journal of Occupational Health Psychology*, 3, 322-355.
- Karasek, R. A., Triantis, K. P., & Chaudhry, S. S. (1982). Coworker and supervisor support as moderators of associations between task characteristics and mental strain. *Journal of Occupational Behavior*, 3, 181-200.
- Koballa, T. R. (1986). Teaching hands-on science activities: Variables that moderate attitude-behavior consistency. *Journal of Research in Science Teaching*, 23, 493-502.

- Krall, E. A., Dawson-Hughes, B., Garvey, A. J., & Garcia, R. I. (1997). Smoking, smoking cessation and tooth loss. *Journal of Dental Research*, *76*, 1653-1659.
- Kurland, N. B. (1996). Sales agents and clients: Ethics, incentives, and a modified Theory of Planned Behaviour. *Human Relations*, *49*, 51-74.
- Lambert, B. L., Salmon, J. W., Stubbings, J., Gilomen-Study, G., Valuck, R. J., & Kezlarian, K. (1997). Factors associated with antibiotic prescribing in a managed care setting: An exploratory investigation. *Social Science and Medicine*, *45*, 1767-1779.
- * Laschinger, H. K. S., & Goldenberg, D. (1993). Attitudes of practicing nurses as predictors of intended care behavior with persons who are HIV positive: Testing the Ajzen-Fishbein Theory of Reasoned Action. *Research in Nursing & Health*, *16*, 441-450.
- Lawton, R., Conner, M., & Parker, D. (2007). Beyond cognition: Predicting health risk behaviors from instrumental and affective beliefs. *Health Psychology*, *26*, 259-267.
- Levin, P. F. (1999). Test of the Fishbein and Ajzen models as predictors of health care worker's glove use. *Research in Nursing & Health*, *22*, 295-307.
- Lieberman, J. (2003). Where to for tobacco regulation: Time for new approaches? *Drug and Alcohol Review*, *22*, 461-469.
- Lightfoot, P. J. C., & Orford, J. (1986). Helping agents' attitudes towards alcohol-related problems: situations vacant? A test and elaboration of a model. *British Journal of Addiction*, *81*, 749-756.
- Limbert, C., & Lamb, R. (2002). Doctors' use of clinical guidelines: Two applications of the Theory of Planned Behaviour. *Psychology, Health & Medicine*, *7*, 301-310.

- Litt, J. (2002a). One GASP doesn't make a CHAMP: The evidence for implementation of smoking cessation in the GP setting. In A. M. Roche & J. McDonald (Eds.), *Catching Clouds: Exploring Diversity in Workforce Development in the Alcohol and Other Drugs Field. 2002 Workforce Development Symposium Proceedings* (pp. 55-71). Adelaide: National Centre for Education and Training on Addiction.
- Litt, J. (2002b). How to provide effective smoking cessation advice in less than a minute without offending the patient. *Australian Family Physician*, 31, 1087-1094.
- Litt, J., Ling, M. Y., & McAvoy, B. (2003). How to help your patients quit: practice-based strategies for smoking cessation. *Asia Pacific Family Medicine*, 2, 175-179.
- Litt, J. C. B., Pilotto, L., Young, R., Ruffin, R., Wade, T., Edwards, D., et al. (2003). *GPs Assisting Smokers Program II: Effective smoking cessation strategies - putting it in to practice*. Paper presented at the 1st Australian Tobacco Control Conference, Melbourne.
- Lock, C. A., Kaner, E., Lamont, S., & Bond, S. (2002). A qualitative study of nurses' attitudes and practices regarding brief alcohol intervention in primary health care. *Journal of Advanced Nursing*, 39, 333-342.
- Lockwood, A., & Maguire, F. (2000). General Practitioners and nurses collaborating in general practice. *Australian Journal of Primary Health Interchange*, 6, 19-29.
- Loxley, W. M., Toumbourou, J. W., & Stockwell, T. (2005). A new integrated vision of how to prevent harmful drug use. *Medical Journal of Australia*, 182, 54-55.
- * Lumpe, A. T., Czerniak, C. M., & Haney, J. J. (1998). Science teacher beliefs and intentions regarding the use of cooperative learning. *School Science and Mathematics*, 98, 123-132.

- * Lumpe, A. T., Haney, J. J., & Czerniak, C. M. (1998). Science teacher beliefs and intentions to implement science-technology-society (STS) in the classroom. *Journal of Science Teacher Education, 9*, 1-24.
- Maio, R. F., Waller, P. F., Blow, F. C., Hill, E. M., & Singer, K. M. (1997). Alcohol abuse/dependence in motor vehicle crash victims presenting to the emergency department. *Academic Emergency Medicine, 4*, 256-262.
- Martocchio, J. J. (1992). The financial cost of absence decisions. *Journal of Management, 18*, 133-152.
- Maslach, C., & Jackson, S. E. (1984). Burnout in organisational settings. *Applied Social Psychology Annual, 5*, 133-155.
- McEwen, A., Preston, A., & West, R. (2002). Effect of a GP desktop resource on smoking cessation activities of general practitioners. *Addiction, 97*, 595-597.
- McIlvain, H. E., Backer, E. L., Crabtree, B. F., & Lacy, N. (2002). Physician attitudes and the use of office-based activities for tobacco control. *Family Medicine, 34*, 114-119.
- Mecklenburg, R. E., Greenspan, D., Kleinman, D. V., Manley, M. W., Niessen, L. C., Robertson, P. B., et al. (1996). Tobacco effects in the mouth. Washington, DC: National Cancer Institute.
- Michie, S., Johnston, M., Abraham, C., Lawton, R., Parker, D., & Walker, A. (2005). Making psychological theory useful for implementing evidence based practice: A consensus approach. *Quality and Safety in Health Care, 14*, 26-33.
- Miller, C., & Kriven, S. (2001). *Progress in tobacco control in South Australia: Summary of key findings from the 2000 health omnibus survey*. Adelaide, South Australia: Tobacco Control Research & Evaluation.

- Mowbray, A., & Kessel, N. (1986). Alcoholism and the general practitioner. *British Journal of Psychiatry, 148*, 697-700.
- Murphy, W. G., & Brubaker, R. G. (1990). Effects of a brief theory-based intervention on the practice of testicular self-examination by high school males. *Journal of School Health, 60*, 459-464.
- Nash, R., Edwards, H., & Nebauer, M. (1993). Effect of attitudes, subjective norms and perceived control on nurses' intention to assess patients' pain. *Journal of Advanced Nursing, 18*, 941-947.
- Nasry, H. A., Preshaw, P. M., Stacey, F., Heasman, L., Swan, M., & Heasman, P. A. (2006). Smoking cessation advice for patients with chronic periodontitis. *British Dental Journal, 200*, 258-261.
- National Expert Advisory Committee on Alcohol. (2001). *Alcohol in Australia: Issues and strategies*. Canberra: Commonwealth of Australia.
- National Research Council. (1992). *Combining information: Statistical issues and opportunities for research*. Washington, DC: National Academy Press.
- Nejad, L. M., Wertheim, E. H., & Greenwood, K. M. (2004). Predicting dieting behaviour by using, modifying, and extending the Theory of Planned Behaviour. *Journal of Applied Social Psychology, 34*, 2099-2131.
- Netemeyer, R. G., Andrews, J. C., & Durvasula, S. (1993). A comparison of three behavioral intention models: The case of Valentine's Day gift-giving. *Advances in Consumer Research, 20*, 135-141.
- Newman, J. E. (1974). Predicting absenteeism and turnover: A field comparison of Fishbein's model and traditional job attitude measures. *Journal of Applied Psychology, 59*, 610-615.

- NHMRC. (2001). *Australian Alcohol Guidelines: Health Risks and Benefits*. Canberra: Commonwealth of Australia.
- Norman, P., & Bonnett, C. (1995). Managers' intentions to be assessed for national vocational qualifications: An application of the Theory of Planned Behavior. *Social Behavior and Personality, 23*, 59-68.
- O'Boyle, C. A., Henly, S. J., & Larson, E. (2001). Understanding adherence to hand hygiene recommendations: the theory of planned behavior. *American Journal of Infection Control, 29*, 352-360.
- Ockene, J. K., Mermelstein, R. J., Bonollo, D. S., Emmons, K. M., Perkins, K. A., Voorhees, C. C., et al. (2000). Relapse and maintenance issues for smoking cessation. *Health Psychology, 19*, 17-31.
- Okun, M. A., Karoly, P., & Lutz, R. (2002). Clarifying the contribution of subjective norm to predicting leisure-time exercise. *American Journal of Health Behavior, 26*, 296-305.
- Owen, M. (2006a, 1 June). Smokes covers morally wrong - Gago. *The Advertiser*, p. 7.
- Owen, M. (2006b, 31 May). SANFL chief's wife in smoking battle. *The Advertiser*, p. 1.
- Owens, L., Gilmore, I. T., & Pirmohamed, M. (2000). General Practice Nurses' knowledge of alcohol use and misuse: A questionnaire survey. *Alcohol and Alcoholism, 35*, 259-262.
- Parker, D., Stradling, S. G., & Manstead, A. S. R. (1996). Modifying beliefs and attitudes to exceeding the speed limit: An intervention study based on the Theory of Planned Behavior. *Journal of Applied Social Psychology, 1996*, 1-19.
- Parker, D. R. (2003). A dental hygienist's role in tobacco cessation. *International Journal of Dental Hygiene, 1*, 105-109.

- Parry, S. B. (1997). *Evaluating the impact of training*. Alexandria, VA: American Society for Training and Development.
- Patton, R., Crawford, M., & Touquet, R. (2003). Impact of health consequences feedback on patients accepting advice about alcohol consumption. *Emergency Medical Journal*, 20, 451-452.
- Patton, R., Crawford, M., & Touquet, R. (2004). Hazardous drinkers in the accident and emergency department - Who accepts advice? *Emergency Medical Journal*, 21, 491-492.
- Pidd, K., Berry, J. G., Harrison, J. E., Roche, A. M., Driscoll, T. R., & Newson, R. S. (2006). *Alcohol and work: Patterns of use, workplace culture and safety*. Injury research and statistics series number 28. AIHW cat no. INJCAT 82. Adelaide: AIHW.
- Pidd, K. J., Berry, J. G., Roche, A. M., & Harrison, J. E. (2006). Estimating the cost of alcohol-related absenteeism in the Australian workforce: the importance of consumption patterns. *Medical Journal of Australia*, 185, 637-641.
- Pieterse, M. E., Seydel, E. R., DeVries, H., Mudde, A. N., & Kok, G. J. (2001). Effectiveness of a minimal contact smoking cessation program for Dutch General Practitioners: A randomized controlled trial. *Preventive Medicine*, 32, 182-190.
- Povey, R., Conner, M., Sparks, P., James, R., & Shepherd, R. (2000a). The theory of planned behaviour and healthy eating: Examining additive and moderating effects of social influence variables. *Psychology and Health*, 14, 991-1006.
- Povey, R., Conner, M., Sparks, P., James, R., & Shepherd, R. (2000b). Application of the theory of planned behaviour to two dietary behaviours: Roles of perceived control and self-efficacy. *British Journal of Health Psychology*, 5, 121-139.

- Powell, R. (2006, 2 April). Enough to make you very sick; Shocking images to turn smokers off their habit. *Canberra Times*, p. 8.
- Prestholdt, P. H., Lane, I. M., & Mathews, R. C. (1987). Nurse turnover as reasoned action: Development of a process model. *Journal of Applied Psychology*, *72*, 221-227.
- Proudfoot, H., & Teesson, M. (2000). *Investing in drug and alcohol treatment*. Sydney: National Drug and Alcohol Research Centre.
- Quine, L., Rutter, D. R., & Arnold, L. (2001). Persuading school-age cyclists to use safety helmets: Effectiveness of an intervention based on the Theory of Planned Behaviour. *British Journal of Health Psychology*, *6*, 327-345.
- RACGP National Preventive & Community Medicine Committee. (1998). *Putting prevention into practice: Guidelines for the implementation of prevention in the general practice setting*. Melbourne: RACGP.
- * Randall, D. M., & Gibson, A. M. (1991). Ethical decision making in the medical profession: An application of the Theory of Planned Behavior. *Journal of Business Ethics*, *10*, 111-122.
- Renfroe, D. H., O'Sullivan, P. S., & McGee, G. W. (1990). The relationship of attitude, subjective norm, and behavioral intent to the documentation behavior of nurses. *Scholarly Inquiry for Nursing Practice*, *4*, 47-60.
- Rhodes, R. E., & Courneya, K. S. (2003). Relationships between personality, an extended theory of planned behaviour model and exercise behaviour. *British Journal of Health Psychology*, *8*, 19-36.
- Rhodes, R. E., Courneya, K. S., & Jones, L. W. (2002). Personality, the theory of planned behavior, and exercise: The unique role of extraversion's activity facet. *Journal of Applied Social Psychology*, *32*, 1721-1736.

- Richmond, R. (1996). Retracing the steps of Marco Polo: From clinical trials to diffusions of interventions for smokers. *Addictive Behaviors, 21*, 683-697.
- Richmond, R., Heather, N., Wodak, A., Kehoe, L., & Webster, I. (1995). Controlled evaluation of a general practice-based brief intervention for excessive drinking. *Addiction, 90*, 119-132.
- Ridolfo, B., & Stevenson, C. (2001). *The quantification of drug-caused mortality and morbidity in Australia, 1998*. Canberra: Australian Institute of Health and Welfare.
- Riemenschneider, C. K., Hardgrave, B. C., & Davis, F. D. (2001). Explaining software developer acceptance of methodologies: A comparison of five theoretical models. *IEEE Transactions on Software Engineering, 28*, 1135-1145.
- Roche, A. M. (1999). Binge drinking: The definitional dilemmas. *Health Promotion Journal of Australia, 9*, 128-132.
- Roche, A. M., & Evans, K. R. (1998). The implications of drinking patterns for primary prevention, education and screening. In M. Grant & J. Litvak (Eds.), *Drinking patterns and their consequences*. Washington: Taylor & Francis.
- Roche, A. M., & Freeman, T. (2004). Brief interventions: Good in theory but weak in practice. *Drug and Alcohol Review, 23*, 11-18.
- Roche, A. M., Freeman, T., & Skinner, N. (2006). From data to evidence, to action: Findings from a systematic review of hospital screening studies for high risk alcohol consumption. *Drug and Alcohol Dependence, 83*, 1-14.
- Roche, A. M., Parle, M. D., & Saunders, J. B. (1996). Managing alcohol and drug problems in general practice: A survey of trainees' knowledge, attitudes and educational requirements. *Australian and New Zealand Journal of Public Health, 20*, 401-408.

- Rosenthal, R. (1991). *Meta-analytic procedures for social research* (Revised ed.). Thousand Oaks, CA: Sage.
- Runge, J. W., Garrison, H. G., Hall, W. L., & Waller, A. (1999). Prevalence of alcohol abuse or alcohol dependency in patients treated for motor vehicle crash injury. *Academic Emergency Medicine*, 6, 490-491.
- * Ryu, S., Ho, S. H., & Han, I. (2003). Knowledge sharing behavior of physicians in hospitals. *Expert Systems with Applications*, 25, 113-122.
- Sackett, P. R., & Yang, H. (2000). Correction for range restriction: An expanded typology. *Journal of Applied Psychology*, 85, 112-118.
- Sanchez-Perez, A., Moya-Villaescusa, M. J., & Caffesse, R. G. (2007). Tobacco as a risk factor for survival of dental implants. *Journal of Periodontology*, 78, 351-359.
- Saunders, J. B., Aasland, O. G., Babor, T. F., de la Fuente, J. R., & Grant, M. (1993). Development of the Alcohol Use Disorders Identification Test (AUDIT): WHO collaborative project on early detection of persons with harmful alcohol consumption: II. *Addiction*, 88, 791-804.
- * Savage, T. A., Cullen, D. L., Kirchhoff, K. T., Pugh, E. J., & Foreman, M. D. (1987). Nurses' responses to do-not-resuscitate orders in the neonatal intensive care unit. *Nursing Research*, 36, 370-373.
- Schnall, P. L., Landsbergis, P. A., & Baker, D. (1994). Job strain and cardiovascular disease. *Annual Review of Public Health*, 15, 381-411.
- Seyler, D. I., Holton, E. F., III, Bates, R. A., Burnett, M. F., & Carvalho, M. A. (1998). Factors affecting motivation to transfer training. *International Journal of Training and Development*, 2, 2-16.

- Shaw, S., Cartwright, A. K. J., Spratley, T., & Harwin, J. (1978). *Responding to drinking problems*. London: Croom Helm.
- Sheeran, P., & Taylor, S. (1999). Predicting intentions to use condoms: A meta-analysis and comparison of the theories of reasoned action and planned behavior. *Journal of Applied Social Psychology, 29*, 1624-1675.
- Sheppard, B. H., Hartwick, J., & Warshaw, P. R. (1988). The Theory of Reasoned Action: A meta-analysis of past research with recommendations for modifications and future research. *Journal of Consumer Research, 15*, 325-343.
- Silins, E., Conigrave, K. M., Rakvin, C., Dobbins, T., & Curry, K. (2007). The influence of structured education and clinical experience on the attitudes of medical students towards substance misusers. *Drug and Alcohol Review, 26*, 191-200.
- Skinner, N., Feather, N. T., Freeman, T., & Roche, A. M. (2007). Stigma and discrimination in health care provision to drug users: The role of values, affect and deservingness judgments. *Journal of Applied Social Psychology, 37*, 163-186.
- Skinner, N., Roche, A. M., Freeman, T., & Addy, D. (2005). Responding to alcohol and other drug issues: The effect of role adequacy and role legitimacy on motivation and satisfaction. *Drugs: Education, Prevention and Policy, 12*, 449-463.
- Sohn, W., Ismail, A. I., & Tellez, M. (2004). Efficacy of educational interventions targeting primary care providers' practice behaviors: an overview of published systematic reviews. *Journal of Public Health Dentistry, 64*, 164-172.
- Soumerai, S. B., & Avorn, J. (1990). Principles of educational outreach ('academic detailing') to improve clinical decision making. *Journal of the American Medical Association, 263*, 549-556.

- Spandorfer, J. M., Israel, Y., & Turner, B. J. (1999). Primary care physicians' views on screening and management of alcohol abuse: Inconsistencies with national guidelines. *Journal of Family Practice, 48*, 899-902.
- Spector, P. E., & Jex, S. M. (1998). Development of four self-report measures of job stressors and strain: Interpersonal Conflict at Work Scale, Organisational Constraints Scale, Quantitative Workload Inventory, and Physical Symptoms Inventory. *Journal of Occupational Health Psychology, 3*, 356-367.
- Stafne, E. E., & Bakdash, B. (2000). Tobacco cessation intervention: How to communicate with tobacco using patients. *Journal of Contemporary Dental Practice, 1*, 1-11.
- Staw, B. M. (2003). Dressing up like an organization: When psychological theories can explain organizational action. In L. L. Thompson (Ed.), *The social psychology of organizational behavior: Key readings* (pp. 11-21). New York: Psychology Press.
- Sutton, S. (1998). Predicting and explaining intentions and behavior: How well are we doing? *Journal of Applied Social Psychology, 28*, 1317-1338.
- Sutton, S. (2002). Using the theories of reasoned action and planned behaviour to develop health behaviour interventions: Problems and assumptions. In D. R. Rutter & L. Quine (Eds.), *Changing health behaviour: Intervention and Research with Social Cognition Models* (pp. 193-208). Buckingham: Open University Press.
- Taylor, M. (2000). Transfer of learning in workplace literacy programs. *Adult Basic Education, 10*, 3-20.
- Teusner, D. N., & Spencer, A. J. (2003). *Dental Labour Force, Australia 2000. AIWH Cat. No. DEN 116*. Canberra: Australian Institute of Health and Welfare.

- Thomson O'Brien, M. A., Oxman, A. D., Davis, D. A., Haynes, R. B., Freemantle, N., & Harvey, E. L. (1997). Educational outreach visits: Effects on professional practice and health care outcomes. *The Cochrane Database of Systematic Reviews*, Art. No. CD000409.
- Trafimow, D., Sheeran, P., Conner, M., & Finlay, K. A. (2002). Evidence that perceived behavioural control is a multidimensional construct: Perceived control and perceived difficulty. *British Journal of Social Psychology*, *41*, 101-121.
- Trotter, L., & Worcester, P. (2003). Training for dentists in smoking cessation intervention. *Australian Dental Journal*, *48*, 183-189.
- Tu, K., & Davis, D. (2002). Can we alter physician behavior by educational methods? Lessons learned from studies of the management and follow-up of hypertension. *Journal of Continuing Education in the Health Professions*, *22*, 11-22.
- US Department of Health and Human Services. (2000). *Reducing tobacco use: A report of the Surgeon General*. Atlanta, Georgia: US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health.
- US Department of Health and Human Services. (2004). *The health consequences of smoking: A report of the Surgeon General*. Atlanta, GA: US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health.
- US Public Health Service Report. (2000). A clinical practice guideline for treating tobacco use and dependence. *Journal of the American Medical Association*, *283*, 3244-3254.

- van der Plight, J., & Eiser, J. R. (1984). Dimensional salience, judgment and attitudes. In J. R. Eiser (Ed.), *Attitudinal judgment* (pp. 43-63). New York, NY: Springer-Verlag.
- van der Pligt, J., & de Vries, N. K. (1998). Belief importance in expectancy-value models of attitudes. *Journal of Applied Social Psychology, 28*, 1339-1354.
- * van der Zee, K. I., Bakker, A. B., & Bakker, P. (2002). Why are structured interviews so rarely used in personnel selection? *Journal of Applied Psychology, 87*, 176-184.
- Veen, P., & Korver, T. (1998). Theories of organization. In P. J. D. Drenth, H. Thierry & C. J. de Wolff (Eds.), *Handbook of work and organizational psychology, vol 4: Organizational psychology* (2nd ed., pp. 5-37). East Sussex: Psychology Press.
- * Vermette, L., & Godin, G. (1996). Nurses' intentions to provide home care: The impact of AIDS and homosexuality. *AIDS Care, 8*, 479-488.
- Vickers, A. J., & Altman, D. G. (2001). Analysing controlled trials with baseline and follow up measurements. *British Medical Journal, 323*, 1123-1124.
- * Walker, A. E., Grimshaw, J. M., & Armstrong, E. M. (2001). Salient beliefs and intentions to prescribe antibiotics for patients with a sore throat. *British Journal of Health Psychology, 6*, 347-360.
- * Wallace, K. G., Koeppel, K., Senko, A., Stawiaz, K., Thomas, C., & Kosar, K. (1997). Effect of attitudes and subjective norms on intention to provide oral care to patients receiving antineoplastic chemotherapy. *Cancer Nursing, 20*, 34-41.
- Waller, S., Thom, B., Harris, S., & Kelly, M. (1998). Perceptions of alcohol-related attendances in accident and emergency departments in England: A national survey. *Alcohol and Alcoholism, 33*, 354-361.

- Warnakulasuriya, K. A. A., & Johnson, N. W. (1999). Dentists and oral cancer prevention in the UK: Opinions, attitudes and practices to screening for mucosal lesions and to counselling patients on tobacco and alcohol use: Baseline data from 1991. *Oral Diseases*, 5, 10-14.
- Watson, H. E. (1999). Minimal interventions for problem drinkers: A review of the literature. *Journal of Advanced Nursing*, 30, 513-519.
- Watt, R. G., Johnson, N. W., & Warnakulasuriya, K. A. A. S. (2000). Action on smoking: Opportunities for the dental team. *British Dental Journal*, 189, 357-360.
- Weller, D. P., Litt, J. C. B., Pols, R. G., Ali, R. L., Southgate, D. O., & Harris, R. D. (1992). Drug and alcohol related health problems in primary care - what do GPs think? *Medical Journal of Australia*, 156, 43-48.
- * Werner, P., & Mendelsson, G. (2001). Nursing staff members' intentions to use physical restraints with older people: Testing the theory of reasoned action. *Journal of Advanced Nursing*, 35, 784-791.
- Whitener, E. M. (1990). Confusion of confidence intervals and credibility intervals in meta-analysis. *Journal of Applied Psychology*, 75, 315-321.
- Wiggers, L. C. W., de Wit, J. B. F., Gras, M. J., Coutinho, R. A., & van den Hoek, A. (2003). Risk behaviour and social-cognitive determinants of condom use among ethnic minority communities in Amsterdam. *AIDS Education and Prevention*, 15, 430-447.
- Wilk, A. I., Jensen, N. M., & Havighurst, T. C. (1997). Meta analysis of randomised control trials addressing brief interventions in heavy alcohol drinkers. *Journal of General Internal Medicine*, 12, 274-283.

- Williams, D. M., Newsom, J. F., & Brock, T. P. (2000). An evaluation of smoking cessation-related activities by pharmacists. *Journal of the American Pharmacists Association, 40*, 366-370.
- Williams, S., Brown, A., Patton, R., Crawford, M. J., & Touquet, R. (2005). The half-life of the 'teachable moment' for alcohol misusing patients in the emergency department. *Drug and Alcohol Dependence, 77*, 205-208.
- Wilson, A., & McDonald, P. (1994). Comparison of patient questionnaire, medical record and audio tape in assessment of health promotion in general practice consultations. *British Medical Journal, 309*, 1483-1485.
- Wood, G. J., Cecchini, J. J., Nathason, N., & Hiroshige, K. (1997). Office-based training in tobacco cessation for dental professionals. *Journal of the American Dental Association, 128*, 216-218.
- Young, J. M., & Ward, J. E. (2001). Implementing guidelines for smoking cessation advice in Australian general practice: Opinions, current practices, readiness to change and perceived barriers. *Family Practice, 18*, 14-20.
- Young, R., Swartz, M., Perkins, B., & Green, A. (2000). Smoking cessation: Building on general practice expertise. *Current Therapeutics, 41*, 63-67.
- Zwar, N., Richmond, R., Borland, R., Stillman, S., Cunningham, M., & Litt, J. C. B. (2004). *Smoking cessation guidelines for Australian general practice*. Canberra: Commonwealth Department of Health and Ageing.
- Zwar, N. A., & Richmond, R. L. (2006). Role of the general practitioner in smoking cessation. *Drug and Alcohol Review, 25*, 21-26.