DSM-IV alcohol use disorders in Australia: validity, prevalence and treatment seeking

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DSM-IV ALCOHOL USE DISORDERS IN AUSTRALIA: VALIDITY, PREVALENCE AND TREATMENT SEEKING

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A thesis submitted in accordance with the requirements for admission to the degree of Doctor of Philosophy

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STATEMENT OF CANDIDATE'S CONTRIBUTION TO THE RESEARCH

The empirical research reported in this thesis is based on analyses of data from the Australian National Survey of Mental Health and Wellbeing which was collected in 1997. The data was obtained as a confidentialized unit record file. The candidate was responsible for the preparation of this unit file for analysis. All of the research, including the data analyses and preparation of the written reports, was conceived and carried out by the candidate.

DECLARATION OF ORIGINALITY

I hereby declare that this submission is my own work and to the best of my knowledge it contains no materials previously published or written by another person, or substantial proportions of material which have been accepted for the award for any other degree or diploma at UNSW or any other educational institution, except where due acknowledgement is made in the thesis. Any contribution made to the research by others, with whom I have worked at UNSW or elsewhere, is explicitly acknowledged in this thesis.

I also declare that the intellectual content of this thesis is the product of my own work, except to the extent that assistance from others in the project's design and conception or in style, presentation and linguistic expression is acknowledged.

Heather Proudfoot   22 August, 2006

ABSTRACT

Alcohol use disorders are common and make a significant contribution to the burden of disease throughout the world. This is especially true among the younger age groups. Although these disorders are common, evidence suggests that those affected do not seek help for their disorders.

In order to understand this, reviews of the treatment literature and the epidemiological data on prevalence and correlates of alcohol use disorders and treatment seeking are presented. These reviews confirm that effective treatments exist and that screening in primary care can be efficacious. The reviews also highlight deficits such as the need for more epidemiological evidence on the validity of DSM definitions of alcohol use disorders and for more Australian data on the prevalence and correlates of the disorders and related treatment seeking. This thesis sets out to address these deficits applying sophisticated statistical techniques to data from a large nationally representative Australian sample.

A confirmatory factor analysis of the eleven criteria that specify alcohol dependence and abuse examined the validity of DSM-IV definitions of alcohol use disorders and the best solution was found to be a single factor, not two as currently defined. These findings question the bi-axial nature of alcohol use disorders that has underpinned their definition since the publication of DSM-III-R in 1987.

Data from this national sample also confirm that, in line with research from other western countries, Australians have high levels of alcohol use disorders, especially amongst males and younger people. Also no association was found between alcohol dependence and treatment seeking, and young people were least likely to seek treatment. However, a relatively large proportion of young people who drink had been in contact with their GPs in the past year; demonstrating that there is ample opportunity for screening and referral for treatment for alcohol use disorders in this vulnerable group.

This research has found that although alcohol disorders are not necessarily associated with disability, there are those who can benefit from treatment. It suggests that outcomes for such individuals may be improved by better specification of disorders as well as improved access to best treatments.

ACKNOWLEDGEMENTS

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ABBREVIATIONS

Criteria for DSM-IV Alcohol Use Disorders

DSM-IV Diagnosis	Criterion Abbreviation	Description
Alcohol Dependence	TOLERANCE	Tolerance to the effects of alcohol; need more to get desired effect
	WITHDRAWAL	Withdrawal syndrome, or alcohol or similar substance taken to avoid or relieve withdrawal symptoms
	LARGER	Alcohol is taken in larger amounts or for longer periods than required
	CUT DOWN	Persistent desire, or unsuccessful efforts to cut down
	TIME SPENT	A great deal of time spent obtaining, using or recovering from the effects of alcohol
	GIVE UP	Reduction in important social, occupational or recreational activities because of alcohol use
	CONTINUE	Continued use despite awareness of alcohol use causing physical or psychological problems
Alcohol Abuse	MAJOR ROLE	Failure to fulfil obligations, important activities at work, school or home because of alcohol use
	HAZARD	Recurrent use in physically dangerous situations eg driving, operating machinery
	LEGAL	Recurrent alcohol-related legal problems
	SOCIAL	Recurrent use despite awareness of alcohol use causing social or interpersonal problems

Other Abbreviations

AUDIT	Alcohol Use Disorders Identification Test
CAGE	Cut down, Annoyed, Guilty, Eye-opener
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CI	Confidence Interval
CIDI	Composite International Diagnostic Interview
DIS	Diagnostic Interview Schedule
DSM-III	Diagnostic and Statistical Manual 3rd Edition
DSM-III-R	Diagnostic and Statistical Manual 3rd Edition Revised
DSM-IV	Diagnostic and Statistical Manual 4th Edition
EFA	Exploratory factor Analysis
NSMHWB	National Survey of Mental Health and Wellbeing
NEMESIS	Netherlands Mental Health Survey and Incidence Study
NESARC	National Epidemiologic Survey on Alcohol and Related Conditions
OR	Odds Ratio
RMSEA	Root Mean Square Error of Approximation
SCID	Structured Clinical Interview for DSM-III-R
SF-12	Short Form - 12
WRMR	Weighted Root Mean square Residual
WLSMV	Weighted Least-Square with Mean and Variance Correction Estimator

CHAPTER 1: INTRODUCTION

Portions of this chapter have been reported elsewhere.

Part or all of the review of treatments for alcohol disorders was reported in:
- *Heather Proudfoot and Maree Teesson (2000) NDARC Technical Report No. 91:* ***Investing in Drug and Alcohol Treatment****. NDARC: Sydney.*
- *Heather Proudfoot and Maree Teesson (2001)* ***Investing in alcohol treatment Part one: screening and assessment.*** *Drug & Alcohol Findings, Issue 6 Winter 2001, pp4-7. The Findings Partnership: London.*
- *Heather Proudfoot, Maree Teesson and Mike Ashton (2002)* ***Investing in alcohol treatment Part 2: brief interventions.*** *Drug & Alcohol Findings, Issue 7 Spring 2002, pp20-24. The Findings Partnership: London.*
- *Maree Teesson and Heather Proudfoot (2002) Chapter in National Alcohol Research Agenda, entitled* ***Interventions for Alcohol Dependence, Abuse and Excessive Drinking.*** *Commonwealth Department of Health and Ageing: Canberra.*

The 'Models of Treatment Seeking Section" was reported in:
- *Heather Proudfoot and Maree Teesson (2001) NDARC Technical Report NO. 122:* ***Who Seeks Treatment for Alcohol Dependence? Findings from the Australian National Survey of Mental Health & Wellbeing.*** *NDARC: Sydney.*

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Introduction

Alcohol use imposes significant costs on both individuals and society in terms of mortality and disability. Indeed, the Australian Burden of Disease study (Mathers & Vos, 1999) found that the net harm due to alcohol use disorders was 2% of the total burden in health. The impact on males and young people was even larger. In males alcohol use disorders were the third leading contributor to years of life lost to disability, contributing 4.9% to the total. For people in the 15-24 years age group alcohol use disorders were equal with road accidents as the leading contributor to disease burden (both 9% of total).

Despite the high level of burden that alcohol disorders impose, international epidemiological studies have found that few people with such disorders seek or receive treatment (Bijl & Ravelli, 2000; Kessler et al., 2001). Various reasons for this have been suggested, including (1) problems of assessment and diagnosis (Bijl & Ravelli, 2000) and (2) limited availability and access to effective treatments (Weisner & Schmidt, 1995).

With regard to assessment and diagnosis, it is important that diagnostic systems can be shown to be valid and reliable. They play an essential role in evidence-based medical research and practice because they specify the needs of particular patients in a treatment setting; ensure meaningful communication between researchers and clinicians; and improve our understanding of disorders based on quality research (Maisto & Saitz, 2003). Various researchers in the alcohol field have suggested that the 'gold standard' (alcohol use disorder diagnosis), against which we measure efficacy of screeners and assessment tools, is itself deficient (Caetano, 1996; Langenbucher et al., 2000; Langenbucher, Morgenstern, Labouvie, Miller, & Nathan, 1996; Maisto & Saitz, 2003). Meyer (2001) also points to a paucity of research on the validity of alcohol use diagnoses, highlighting the need for more research to improve current diagnostic tools for alcohol use disorders. This thesis provides important and unique research evidence regarding the validity of the DSM-IV alcohol use diagnoses (APA, 1994).

A second issue identified by researchers which may impact treatment seeking is the availability and accessibility of treatment services. When considering requirements of treatment services and access issues in general, it is important to firstly specify the level of disorder in the population so that the need for services can be determined. Prior research has demonstrated that the rate of alcohol use disorders is high in many developed countries. There is considerable variation in levels of disorder and harm due to alcohol use across these countries, but as yet levels of DSM-IV alcohol disorders have not been established for Australia, and it cannot be assumed that prevalence levels and correlates in other countries are applicable to Australia. Thus there is a need to examine the epidemiological data from Australia on the prevalence and correlates of alcohol use disorders in order to inform decisions on provision of services in this country. It is also important to assess the level of service usage by Australians with alcohol disorders, and ascertain the characteristics of the individual as well as the system which impact these levels. All these factors are examined in the following chapters.

The Australian National Survey of Mental Health and Wellbeing (NSMHWB, Teesson, Hall, Lynskey, & Degenhardt, 2000) provides a unique opportunity to address these research issues. Based on a stratified random sample of over 10,000 Australians, it provides data on psychiatric diagnoses, disability and service usage over a 12 month period. Through detailed analyses of this survey this thesis will address three empirical questions in this Australian context:

- How well are DSM-IV alcohol use disorders specified?
- What are the prevalence and correlates of DSM-IV alcohol use disorders in Australia? and
- What are the prevalence and correlates of treatment-seeking for alcohol dependence in Australia?

The following sections provide further background to the studies presented in the thesis.

The Validity of Alcohol Use Disorders

The term alcohol dependence was first defined by Edwards and colleagues (1981; , 1976) as a number of psychological and physiological factors associated with impaired control over alcohol use. In a later publication Edwards (1986) referred to

the 'bi-axial concept' where dependence as described above constitutes one axis of the syndrome and alcohol-related problems formed the other. These papers had a significant impact on the more recent diagnostic formulations of alcohol use disorders in DSM (III-R and IV) and ICD-10 (Hughes, 2002). In DSM Alcohol Abuse and Dependence are seen as two independent categorical constructs based on responses to eleven criteria. These criteria are listed and defined at the front of this thesis (pxiv).

Although researchers in the field have argued that current DSM-IV definitions of alcohol use disorders have performed well in providing a useful standard for research and clinical purposes (e.g. Bucholz et al., 1995; Feingold & Rounsaville, 1995a; Harford & Muthén, 2001), deficiencies have also been noted. In particular Hasin (2003) and Hasin and colleagues (2003) have commented on the relative unreliability of the abuse diagnosis as has Langenbucher and colleagues (2000). Langenbucher et al also question the appropriateness of two alcohol diagnoses. They argue that the hierarchical decision rule that there is no abuse diagnosis when dependence has ever been diagnosed is inconsistent with the notion of independence of the two diagnoses. Conversely it implies continuity of severity between abuse and dependence. Wagner et al (2002) in reviewing the validity of alcohol diagnoses for adolescents, also point to the implied progression in severity between abuse and dependence due to the inclusion of the hierarchical decision rule. The assumption of continuity in severity suggests that there is a single factor underlying the two diagnoses.

The focus on specifying alcohol use disorders has been largely on ensuring that they are reliable and reliability has improved over the past quarter century (Hasin, 2003). On the other hand research on validity of the current (categorical) diagnoses has been somewhat neglected (Meyer, 2001). Furthermore, Maisto and Saitz (2003) point out that there are various failures of the current DSM-IV definitions in meeting validity requirements. They state that: "alcohol use disorder diagnoses are not based in etiology for the most part, establishing a diagnosis does not lead to prescriptive treatment, alcohol use disorder categories are not homogeneous, and there is no specified laboratory test that gives evidence for the presence of an alcohol use disorder (although work is being done in the area)." There has also been much discussion around the relevance of the current formulations of alcohol use disorders for adolescents and young adults, amongst whom there is the highest prevalence of

currently-defined disorder (Chung, Martin, Armstrong, & Labouvie, 2002; Fulkerson, Harrison, & Beebe, 1999; Harrison, Fulkerson, & Beebe, 1998; Wagner, Lloyd, & Gil, 2002; Winters, Latimer, & Stinchfield, 1999). Similarly it has been suggested that it is not clear whether current definitions are equally valid for both males and females (Dawson & Grant, 1993; Nelson & Wittchen, 1998).

Thus it is important that more information is gathered on the validity of current DSM definitions of alcohol use disorders in order to provide consistent and up-to-date information for both clinical and research purposes.

Epidemiology of Alcohol Use Disorders

Early formulations of alcohol use disorders were based on observations of clinical populations, but alcohol is not just a problem for those attending treatment. As seen from burden of disease research it has major implications on a community-wide basis. Thus definitions of alcohol use disorders need to be able to discern problem drinkers in the community as well as assist in specifying in-depth treatment needs. The DSM and ICD and their operationalisations into standardised interviews such as the Composite International Diagnostic Interview (CIDI, Teesson, Hall, Lynskey, & Degenhardt, 2000; World Health Organization, 1996) have been used widely in large-scale epidemiological surveys. Such epidemiological research provides evidence on the prevalence of alcohol use disorders and associated correlates in the community. Research carried out in western countries over the past 25 years has revealed that alcohol use disorders are among the most common psychiatric diagnoses.

The first epidemiological surveys of mental disorders that also measured alcohol use disorders were the Epidemiological Catchment Area surveys carried out in the early 1980s in the United States (ECA, Robins & Regier, 1991). These surveys sampled a randomly selected group within five defined population areas in the US. DSM-III alcohol use disorders were the second most prevalent of all current mental disorders (6.3%); the most prevalent being phobias (8.8%). In the US these surveys have been followed by the National Comorbidity Survey (NCS, Kessler, 1994), the National Longitudinal Alcohol Epidemiologic Survey (NLAES, Grant, 1997b), and the National Epidemiologic Survey on Alcohol and Related Disorders (NESARC, Grant

et al., 2004b). All of these studies used nationally representative samples and structured interviews designed to assess DSM alcohol abuse and dependence.

Few large epidemiological studies measuring alcohol use disorders have been conducted outside the US. In 1993 in the UK a national probability sample was selected for the National Psychiatric Comorbidity Survey of Great Britain (Farrell et al., 2003). Twelve questions from the 1991 US National Alcohol Survey assessed dependence on alcohol. Scores of 3 or more were classified as dependent. This definition would approximate the current DSM definitions but cannot be considered equivalent as they did not operationalise the exact DSM criteria (Paykel, Abbott, Jenkins, Brugha, & Meltzer, 2003). The Netherlands Mental Health Survey and Incidence Study (NEMESIS) was carried out in the Netherlands in 1996 on a nationally representative sample and using DSM-IV criteria to assess alcohol use disorders.

Table 1.1 presents twelve-month prevalences of alcohol abuse and dependence obtained in the nationally representative studies in the US, UK and The Netherlands. The data from the UK are included here as they are the only nationally obtained figures for the UK, a country which has had a singular impact on the development of the Australian culture, including its drinking culture (Midford, 2005).

Table 1.1: National epidemiological surveys measuring 12-month alcohol abuse and dependence

Country	Study	Age Range (years)	Year	DSM-IV Alcohol Abuse (12 mo)	DSM-IV Alcohol Dependence (12 mo)
US	NCS (DSM-III-R)	15-54	1990-1992	2.5	7.2
	NLAES (DSM-IV)	18+	1991-1992	3.0	4.4
	NESARC (DSM-IV)	18+	2001-2002	4.6	3.8
UK	NMS (non-DSM)	16-64	1993	not obtained	5.0
Netherlands	NEMESIS (DSM-IV)	18-64	1996-1999	4.6	3.7

As shown in Table 1.1 there is considerable variability both within the US and between countries. However, there are several factors that must be taken into account when comparing these findings. The NCS used the DSM-III-R rather than the DSM-IV and sampled ages 15-54 years only. As the prevalence of dependence tends to decline with age, their figures would be expected to be higher than for studies which sample older age groups as well. NLAES and NESARC which were based on DSM-IV, and all adults, had comparable findings with a slight decline in dependence over the 10-year period and a moderate increase in abuse (Grant et al., 2004a). The Netherland-based NEMESIS study had comparable findings to NESARC, but excluded the over 65 year age group (Bijl, Ravelli, & van Zessen, 1998). Again, because older people are less likely to be dependent, it would be expected that if they had included older adults, their figures would be slightly lower than those found in NESARC. As mentioned the UK figure for dependence is not based on an exact DSM formulation, but falls within the range of those found in the US and the Netherlands. In summary, approximately 1 in 25 adults in these countries has a current (12-month) diagnosis of alcohol dependence.

All the epidemiological research to date has found that young males predominate amongst those with dependence. For example the ECA found that 12% of men and 2% of women had experienced past year alcohol use disorders. However, there is more recent evidence to indicate that young women are reducing the gap in terms of their over use of alcohol (McPherson, Casswell, & Pledger, 2004; Zilberman, Tavares, & el-Guebaly, 2003). Currently there is no comprehensive published data on the prevalence of DSM-IV alcohol use disorders in Australia. Yet it is important that such data is available in order to assist with decisions on the need for treatment services as well as providing important information to the public on correlates and risks associated with alcohol use disorders. It is also of value to be able to compare across countries as well as between particular time periods within a country, in order to further inform policy decisions in the area. This thesis presents findings from the NSMHWB on DSM-IV prevalence and correlates of alcohol use disorders in Australia; in particular the results for age and gender sub-groups.

Identification of the extent of alcohol use disorders in the community informs policy decisions regarding how best to deal with the associated problems. Following is a

discussion of some of the issues around prevention, treatment and public health policy with regard to alcohol use disorders in Australia.

Treatment-seeking for Alcohol Use Disorders

The Need for Treatment Services Alongside Public Health Policy

As for all medical conditions, it is important that valid treatments are available to alleviate the physical, social and psychological harms of alcohol use disorders. However not all people with such disorders will seek or receive treatment. Indeed it has been argued from various perspectives that not everyone with such a disorder *should* receive specialised treatment (Finney & Monahan, 1996; Hall & Teesson, 2000; Mattick & Jarvis, 1993). The ECA found that alcohol use disorders commence early in adulthood with the large majority of dependent individuals experiencing their first symptoms before the age of 30. However, half of those who had ever experienced a symptom of dependence had not done so in the past year and the average experience of any alcohol symptoms was less than five years. In fact, overall epidemiological surveys have found that approximately half of all those who have an alcohol use disorder will recover without being treated (Helzer, Burnam, & McEvoy, 1991).

Using data from the NESARC study, Dawson and colleagues (2005) examined the current status and treatment history of all those in their sample who had had a dependence diagnosis prior to the past year. They found that approximately 25% remained dependent in the current year while another 10.5% still had symptoms of abuse. Thus, some 65% no longer had a DSM-IV alcohol use disorder. Of this group approximately 48% had not received treatment. Of those who had been abstainers for at least five years or who had had no dependence or abuse symptoms for at least 5 years, 28% had no treatment. Even with this more stringent test of recovery, more than one quarter of those who have been dependent at some time in their lives will remit, and remain thus, without treatment.

Given that many individuals with alcohol use disorders may remit without harm to themselves and others, it becomes difficult to justify universal implementation of costly treatments. Research has also found that many with mild disorders do not see

themselves as in need of treatment and would resist intervention (Grant, 1997a). However, the harms due to alcohol misuse are great and there is a clear need to implement policies aimed at reducing these harms. Firstly, resources may be better directed towards public health policies which address reduction of alcohol consumption in general, and, in particular, cultural attitudes to drinking, especially in hazardous situations. Although there has been popular and political resistance to implementation of policies that may restrict the availability or increase the cost of alcohol, there has been some success of such policies as random breath testing and public education on reducing the harms associated with alcohol misuse (Flaherty, Homel, & Hall, 1991; Homel, 1989, 1993).

Despite such public policy efforts, the burden of disease data suggest that harmful and hazardous use of alcohol remains a significant problem in our society (Mathers & Vos, 1999). As with other mental disorders, there is a need for a civil society to provide effective and accessible treatment services, so that those with more intractable disorders - who are putting their health and social lives at risk - are given the opportunity to recover from their disorder. Effective and accessible treatment services are an important part of the overall armamentaria for addressing such harms. It is thus important that valid and reliable strategies for treating alcohol use disorders are provided to assist those who, wittingly or unwittingly, need help to control or stop their drinking. Yet little research has been done to identify the level of need in Australia in order that policies can be established to best tackle this need.

Across all developed countries where research has been done, consulting a medical practitioner for any mental disorder is low compared with physical disorders and, amongst mental disorders, receiving treatment for substance use disorders has the lowest consultancy rate of all (Andrews, Issakidis, & Carter, 2001). Evidence from clinical surveys overseas suggests that those with alcohol disorders tend not to recognise that they have any problems with alcohol or a need for treatment (Bardsley & Beckman, 1988; Cunningham, Sobell, Sobell, Agrawal, & Toneatto, 1993; Thom, 1986, 1987) and community surveys also suggest that general practitioners (GPs) are reluctant to enquire about alcohol problems and thus to treat them or to refer on to specialist services (Commander, Odell, Williams, Sashidharan, & Surtees, 1999;

Edwards, Hawker, Hensman, Petro, & Williamson, 1973; Hingson, Mangione, Meyers, & Scotch, 1982).

Thus, even if valid and reliable assessment and treatment strategies are in place, it is important to clarify who seeks treatment and what propels them towards treatment services in the Australian context. To this end, and again using data from the Australian NSMHWB, this thesis examines the prevalence and correlates of treatment seeking amongst alcohol dependent individuals in Australia; in relation to both specialist service use as well as the use of GP services by those diagnosed with alcohol dependence.

Before examining the epidemiological data on prevalence and correlates of treatment seeking for alcohol use disorders, it is important to first of all establish whether treatments for alcohol use disorders are indeed effective. Thus, the following section provides a review of the literature addressing the effectiveness of treatments for alcohol use disorders.

Do Interventions for Alcohol Use Disorders Work?

There is considerable evidence that there are effective treatments for alcohol use disorders, although, in the past these were not as rigorously applied as they are today (Miller & Wilbourne, 2002). Parts of the following review are published in a Technical Report written by Proudfoot and Teesson (2000) that critically reviewed all treatments for substance use disorders. For each main treatment area, searches were made of the Psychinfo, Medline and Embase databases. These searches were supplemented by scanning the reference lists of review articles and treatment outcome studies for any further important outcome studies. Any newer data from more recent good quality reviews and relevant research is also included and referenced.

Treatment activities cover a range of strategies including brief interventions, pharmacotherapies, motivational enhancement, social skills training, behavioural management, cognitive therapies and therapies involving the family and community groups. However, treatment does not occur in isolation. Suitable screening and assessment procedures need to be in place in order to ensure that those people with

alcohol problems are identified and placed appropriately in a treatment setting. Thus before reviewing the various treatments available for alcohol use disorders, it is important to examine how valid are current screening procedures in identifying such disorders, as well as to determine the relevance of the particular types of treatment settings available. The use of detoxification, although not a treatment of itself, is often a necessary preparation for treatment and will also be reviewed prior to considering specific interventions.

Treatment Setting

Previous reviews of treatment settings for alcohol treatment have concluded that there is no evidence for the superiority of inpatient over outpatient treatment of alcohol abuse (Finney, Hahn, & Moos, 1996; Mattick & Jarvis, 1993). The exception is that there are some types of patients, particularly those who are homeless, who might be more effectively treated in inpatient settings. A more recent study (Klein, di Menza, Arfken, & Schuster, 2002) found that intensive outpatient programs showed the highest completion rates and individuals with more substance-related problems tended to opt for these more intensive programs. It also found that patients with more substance abuse problems and more prior treatment attempts had lower completion rates in outpatient settings than in more intensive settings. In particular, homeless people had higher retention rates in residential settings and lower in outpatient settings compared with people who were not homeless. Although these findings in general relate to all substance abuse, they support earlier suggestions that those with little social support may be best served in residential settings. It is also of interest that a certain amount of appropriate 'self-matching' goes on when people are allowed to opt for a particular type of treatment setting. This agrees with the argument put by Stanton Peele (1996) that treatment may work best when it is voluntary and the client chooses the type of treatment and setting they prefer. This proposition obtains support from the large Project MATCH study which found that equivalent results were obtained for different treatment programs where participants' attributes were matched to treatment type (Project MATCH Research Team (Project MATCH Research Team, 1997).

Screening and Assessment

Assessment for alcohol problems can range from brief screening interviews by general health care workers, which may then lead to early intervention; to in-depth measures of a broad range of psychosocial functioning which are required to formulate and evaluate ongoing structured treatment programs.

Brief Screening

It is not only the detection of the condition of alcohol dependence that is the legitimate subject of screening programs. In fact, the costs to the community from lost productivity and the provision of health, welfare and legal services for people who are neither dependent nor consume large amounts of alcohol, far outweigh the costs of chronic alcoholism (Rydon, Redman, & Sanson-Fisher, 1988; Spurling & Vinson, 2005). Hence there has been a realisation in recent years that screening and treating for hazardous but non-dependent alcohol use will lead to considerable benefits both economically and in terms of the well-being of individuals in society (Gomel, Saunders, Burns, Hardcastle, & Sumich, 1994; Moore, 1994; Roche, Hotham, & Richmond, 2002).

Standardised methods of screening for excessive drinking include use of clinical examinations, testing for biological markers and use of standard questionnaires. Standard clinical examinations which involve identifying physical signs of excessive alcohol consumption such as dilated facial capillaries, bloodshot eyes and coating of the tongue, have been found to be accurate for detecting alcohol dependence but are not sensitive enough for detecting signs of hazardous, non-dependent drinking (Mattick & Jarvis, 1993). The most widely used biological markers for alcohol abuse are carbohydrate-deficient transferrin (CDT), gamma glutamyltransferase (GGT) and mean corpuscular volume (MCV). Several studies have provided good evidence that use of these markers is neither as accurate nor cost-effective as self-report questionnaires. (Aertgeerts, Buntinx, Ansoms, & Fevery, 2002; Alte, Luedemann, Rose, & John, 2004; Arndt & Keller, 2004; Bernadt, Mumford, & Murray, 1984; Mattick & Jarvis, 1993; Schorling & Buchsbaum, 1997; Sobell, Agrawal, & Sobell, 1999).

A range of standard questionnaires has been designed to screen for alcohol abuse in medical practices and hospitals as well as in the work place and general counselling settings. The evidence strongly supports the efficacy of routine screening for alcohol use disorders in primary care settings and the use of standardised screeners such as the AUDIT (Alcohol Use Disorders Identification Test, Saunders, Aasland, Babor, Fuente, & Grant, 1993) and CAGE (felt need to Cut down?, Annoyed by others criticising drinking? felt Guilty about drinking, and need for an early morning Eye-opener? Mayfield, McLeod, & Hall, 1974). These instruments screen for hazardous but not necessarily dependent alcohol use. It is important that such screening instruments to discriminate accurately between those who drink at risky levels and those who do not. Otherwise those who are wrongly identified as in need of treatment (false positives) are subject to further invasive and costly assessment, and those who are not identified by the screener (false negatives) continue to suffer untreated (Proudfoot & Teesson, 2000).

Maisto and Saitz (2003) completed an overview of alcohol screeners in primary care and concluded that the CAGE and AUDIT were the most widely validated screening instruments for alcohol problems in primary care. They point out that, although CAGE is conveniently brief, the research suggests that it may be less sensitive to at-risk drinking, particularly in the elderly, as well as obtaining poorer results for females and ethnic groups in some studies. In contrast the AUDIT was developed to perform better in these sub-groups and the research supports this. They suggest that AUDIT should be self-administered in order to offset time constraints for the primary care giver.

The above reviewers have agreed that evidence strongly supports the effectiveness of routine screening for alcohol abuse in primary care settings. Standard screening measures such as AUDIT and CAGE should be used for screening purposes, using cut-off points that take into account the sub-population under consideration.

Assessment and Treatment Planning

Whilst brief screening devices are useful for early detection and proactive intervention in general health care settings, more comprehensive assessment procedures are needed in specialised treatment settings for chronic alcoholics. In this

context the assessment interview is seen as serving two functions. The first is to obtain information on specific client problems, which will assist in planning treatment goals and strategies, and the second is to establish a rapport between therapist and client (Mattick & Jarvis, 1993).

As well as measuring essential background information such as drinking history and sociodemographic variables, the comprehensive assessment should also assess motivation to change and current levels of dependence. Research has found that motivation to change is an important predictor of treatment outcome (Prochaska & DiClemente, 1986; Shand, Gates, Fawcett, & Mattick, 2003).

Variables such as level of drinking; level of dependence; physical effects of alcohol use; and psychiatric comorbidity can be reliably assessed (Proudfoot & Teesson, 2000). Such measures are important to assist in defining treatment goals, level and intensity of treatment, as well as informing the client therapist relationship and patient feedback.

The recent review by Dawe and colleagues (2002) lists valid instruments for this purpose. Maisto and Saitz (2003) also listed specific diagnostic instruments that have demonstrated utility for:
- planning of treatment setting, intensity and outcome goals;
- identification of co-occurring psychiatric disorders;
- management of treatment of the alcohol withdrawal syndrome;
- providing evidence of an abuse diagnosis; and
- patient feedback.

Thus comprehensive assessment at treatment entry has been shown to be an important and valid part of the treatment process.

Withdrawal Management

Withdrawal management is the term given to the process by which alcohol and drug dependent persons withdraw from alcohol in a supervised way so that physical and psychological symptoms are minimised. The symptoms of withdrawal are generally opposite to the action of the drug and, in the case of alcohol can be life-threatening.

The severity of alcohol and drug withdrawal depends on such factors as level and duration of use, concomitant other drug use, the general health and nutritional state of the person, as well as the detoxification setting (Mattick & Jarvis, 1993).

Recent research and reviews (Blondell, 2005; Proudfoot & Teesson, 2000; Williams & McBride, 1998) find that supervised withdrawal alone is of benefit to the individual as it provides respite from the physical damage which is a direct consequence of heavy alcohol usage. However, in order to maintain this benefit, withdrawal needs to be augmented by treatment to prevent relapse to drinking.

Appropriately supported home wirthdrawal appears to be as effective as inpatient detoxification, even for severely dependent alcoholics. In fact home withdrawal has been rated as 4 to nearly 20 times less expensive and is the preferred treatment setting for those undergoing detoxification. Where outpatient care is not feasible, specialised detoxification units providing ambulatory and non-medicated care are cheaper and at least as effective as standard hospital inpatient care. Inpatient withdrawal management is warranted where the severity of dependence and associated complications are high and where there are few social supports to assist withdrawal at home. Research has shown that long-lasting benzodiazepines can be used if needed, to combat the symptoms of withdrawal (Blondell, 2005; Mayo-Smith, 1997; Williams & McBride, 1998).

Specific Interventions

Pharmacotherapies

Over the past 50 years, drug therapy for the treatment of alcohol abuse has typically involved use of antidipsotropic drugs such as disulfiram and calcium carbamide. More recently and with the improved understanding of brain neurobiology, new pharmacological treatments for alcohol abuse have been proposed and tested.

Reviewers agree that more research is needed on the appropriate applications of all pharmacotherapies currently being considered for the treatment of alcoholism and that this research needs to be more rigorous (Mann, 2004; Mariani & Levin, 2004). The risks associated with disulfiram, along with the poor research findings for this

drug indicate that there is a need to replace it in the repertoire of treatments for alcohol dependence (Schuckit, 1996; Zernig, Fabisch, & Fabisch, 1997). Of the newer pharmacotherapies, support is growing for the use of the GABA agonist acamprosate and the opioid antagonists naltrexone and nalmefene (McGovern & Carroll, 2003; Miller & Wilbourne, 2002). These drugs are recommended for use with moderate to severely dependent users. They should not be used to treat alcohol dependence where the patient is opiate dependent or using opiates for pain relief. They are also contraindicated if the patient is pregnant or lactating, or has liver or renal impairment (Shand, Gates, Fawcett, & Mattick, 2003).

Evidence that antianxiety and antidepressant drugs help reduce drinking is poor. However SSRIs may have a role to play with depressed alcoholics. Pharmacotherapies should be used in conjunction with psychotherapies to assist in the prevention of relapse (Proudfoot & Teesson, 2000).

Brief Interventions

Brief interventions provide short-duration treatment for clients identified by screening as drinking at hazardous or harmful levels. Babor (1994) describes a typical brief intervention as consisting of structured therapy of short duration (5-30minutes), which is offered to help the individual to cease or reduce drinking. Brief interventions encompass a variety of treatment approaches including health education, self-management training, group therapy, social skills training, simple advice (either direct or through manuals), and motivational interviewing.

It is generally agreed that brief interventions are most appropriately carried out in primary health-care settings, because these are accessed by a large proportion of the general population on a regular basis (WHO Brief Intervention Study Group, 1996). Being unsolicited, brief interventions contrast with more intensive treatments which tend to be sought out by the client, or by others on behalf of the client.

Brief interventions are effective in reducing alcohol consumption in those with mild to moderate problems with alcohol and brief interventions of a motivational, non-confronting style appear most effective. A positive attitude towards change by both those who abuse alcohol and those who implement interventions at primary care

centres is essential for their success. GPs need to be convinced of the efficacy of brief interventions, trained in their implementation, and able to identify when to implement them. Patients need to be ready to change, or at least amenable to consider change (Proudfoot & Teesson, 2000).

Social Skills Training

An underlying assumption of social skills training is that alcohol consumption has become a preferred way of coping with unpleasant situations and feelings (Chaney, 1989). Social skills training aims to provide alternative behavioural strategies that compensate for social skills deficits. Social skills training generally includes communication skills, effective listening techniques, problem solving, and assertiveness training. Given the complexity of alcohol problems, social skills training is usually applied in conjunction with other interventions such as pharmacotherapy (Volpicelli et al., 1997) and other broad spectrum treatment programs. Reports of social skills training alone are much less common.

There is consistent evidence that social skills training is an important and effective component of alcohol treatment (Proudfoot & Teesson, 2000). However, given the complexity of alcoholism, social skills training is not expected to be effective on its own, but rather seen as a valid component of broad-spectrum treatment programs. Further, social skills based prevention programs in schools have had inconsistent findings (Foxcroft, Ireland, Lister-Sharp, Lowe, & Breen, 2002; Proudfoot & Teesson, 2000).

Behaviourally-Oriented Marital/Family/Community Interventions

The purpose of family and marital therapy is to engage significant others in the rehabilitation of individuals who abuse alcohol. There are various types of family therapy which have been trialled: systems, interactional, behavioural and spouse-directed (Mattick & Jarvis, 1993). The contingency-based community reinforcement approach (CRA) developed by Azrin et al (1996) also aims to engage those close to the affected person in a behaviourally-oriented approach to treatment.

Family/marital behavioural interventions are effective but no more effective than individual therapy. The community reinforcement approach has shown greater

promise but because research findings in general require replication from more than one source, further research by other research teams is required (Proudfoot & Teesson, 2000).

Cue Exposure

Cue exposure involves exposing clients to alcohol-related cues such as the sight, smell and taste of alcohol, or to the setting where they would usually drink, and, in the case of abstinence-training, not permitting them to drink. Where controlled drinking is the aim, then they would be permitted a restricted amount to drink in the presence of alcohol-related cues. Cue exposure is not considered a purely behavioural activity as it is assumed that cognitions such as self-confidence to resist will also be reinforced through exposure associated with abstinence or controlled drinking (Bradizza, Stasiewicz, & Maisto, 1994).

Cue exposure is an effective component of controlled drinking programs. Because it directly addresses cues for drinking it may prove a cost-effective addition to programs that would normally require additional relapse prevention training (Proudfoot & Teesson, 2000).

Cognitive-Behavioural Interventions

Cognitive behavioural therapy (CBT) aims to teach individuals how to control their responses to their environment through improving social, coping and problem-solving skills. In relation to alcohol problems, it forms the basis of some of the more effective therapies already discussed e.g. brief interventions (including motivational interviewing), social skills training and community reinforcement. Stress management is another term that is subsumed under the broad heading of CBT because CBT in its various forms empowers the individual to control environmental stressors.

Current research and expert opinion agree that behavioural self-control as taught through CBT is an effective treatment for alcohol abuse and it appears that CBT may be most effective with problem drinkers who are nondependent. CBT has been shown to have more durable effects than other interventions, improving response beyond the actual treatment setting, possibly because of its ability to improve coping skills in

general. CBT is particularly adaptable for non-direct interventions such as correspondence and computer training. CBT for depression has the potential to improve drinking outcomes - reflecting the interdependence of these two psychiatric conditions (Proudfoot & Teesson, 2000).

Motivational Enhancement Therapy (MET)

This approach is based on the stages of change model of Prochaska and Di Clemente (1992) and involves non-directive guidance of the thinking of the client to a point where they perceive that they want to change their drinking behaviours.

Reviewers tend to agree that MET is an effective treatment (McGovern & Carroll, 2003; Miller & Wilbourne, 2002) although quality of control of the treatment needs improvement in future research on this modality.

Other Interventions

The Quality Assurance Project (QAP,Mattick & Jarvis, 1993) concluded that some other interventions had potential but insufficient evidence to recommend them at that time. Examples in this category are covert sensitisation, AA and acupuncture. More recently twelve-step facilitation as outlined by AA when manual-based was found to be as effective as MET in Project MATCH (1997). There is little support for other interventions in the research literature (Miller & Wilbourne, 2002).

Summary

In summary effective screening processes and treatments are available for alcohol use disorders. There remains a need to publicise this fact in the general community and with GPs in particular and to assist GPs to build on the research and improve current practices.

Much research has been done on the nature of treatment seeking in general. Models have been suggested which incorporate such issues as perceived need for treatment and availability of treatment services. Thus, in order to provide a fuller explanation of why treatment is rarely sought for alcohol use disorders, the following section provides an examination of models of treatment seeking and related research.

Models of Treatment Seeking

The reasons that individuals, who acknowledge that they have significant health problems, do not seek treatment for these problems have been the subject of much research, and various models have been proposed to describe treatment seeking behaviour. These models refer to system variables and a brief description of the Australian health care system is presented here.

In Australia, healthcare is shared between the federal Government and the States and Territories. Where there is not an emergency, private GPs are the frontline of medical services to the community. In an emergency or out-of-hours, hospital emergency rooms are available on a 24-hour basis. GPs are funded federally by universal cover (Medicare) where a GP can choose to bulk bill – i.e. charge what the Government repays them, in which case the client has no costs for a visit. If they charge in excess of the Medicare repayment, the client ultimately has to pay the difference. Access to specialist services is through the GP – a client cannot access specialist services directly. Emergency rooms have universal funding and are available to all but are mainly found in the larger cities. They are also often overcrowded and difficult to access. GPs who bulk bill are also becoming more scarce which has impacts for the poor and people living in rural and remote areas in Australia (Elliot, 2002).

Models of treatment seeking can incorporate such system variables as well as personal variables such as severity of illness (need), sociodemographic factors, motivational and belief factors. Three models which feature in the literature are described below.

Aday and Andersen's Framework of Access to Health Care

Aday and Andersen (1974) proposed one of the first comprehensive frameworks of access to health care (Figure 1.1). Their model encompasses both structural and personal variables which are categorised as either manipulable or not vulnerable to change (immutable). Further, in this framework, health policy is seen as operating

Figure 1.1: Aday & Andersen's Framework of Access to Health Care

HEALTH POLICY
Financing
Education
Manpower
Organization

CHARACTERISTICS OF HEALTH DELIVERY SYSTEM

Resources
- Volume
- Distribution

Organization
- Entry
- Structure

CHARACTERISTICS OF POPULATION AT RISK

Predisposing
- Mutable
- Immutable

Enabling
- Mutable
- Immutable

Need
- Perceived
- Evaluated

UTILIZATION OF HEALTH SERVICES
Type
Site
Purpose
Time Interval

CONSUMER SATISFACTION
Convenience
Costs
Coordination
Courtesy
Information
Quality

through characteristics of the health delivery system and the population at risk to influence the outcome variables: health service utilization and consumer satisfaction. However, within the population at risk there are some variables which are immutable. Predisposing variables such as age, sex, marital status, previous health behaviour, education, ethnicity, family structure and enabling factors such as residential mobility and urban-rural status are examples. Need in this model refers to illness level, both as seen by the individual and measured clinically (diagnosis). In contrast, values regarding health and illness are predisposing variables which are manipulable, either directly, or indirectly through changes to the characteristics of the system. These include such factors as general health care beliefs, attitudes, health knowledge and concern about health. Similarly, income, usual source of care, ease of getting care and insurance cover are enabling variables which are manipulable.

Many of these characteristics of the population are influenced directly by characteristics of the system. In particular ease of obtaining care can be influenced by how resources are spread within the system between, for example, general practice and specialist, inpatient and outpatient or urban and rural services.

Utilization of health services in a general sense is viewed by the Aday and Andersen model as being the outcome of interactions between variables within the health care system, characteristics of the individual and satisfaction with prior experience (which would include experiences of others that they know who have used services.)

Becker et al's Health Beliefs Models

The Health Beliefs Model (HBM) was firstly proposed to explain and assist research on population responses to the need for immunization or preventative care (Figure 1.2). It attempts to explain behaviour based on a value-expectancy model where positive health behaviours are related to an individual's assessment of perceived susceptibility, severity of the illness threat, benefits seen in taking action and where costs and barriers are not deemed prohibitive (Hays, 1985). Becker et al (1977) reviewed the various psychosocial models of health-related behaviours and incorporated them into an expanded HBM which they broadened to include any illness-related behaviour (Figure 1.3). Cues to action are not given the prominence they were in the model for preventive action, but would be subsumed under enabling

factors and illness symptoms in the revised model. The revised model also specifically includes the concept of motivation. This model proposes that positive compliant responses to health risk situations result from personal readiness variables (motivations, assessment of risk of illness and assessment of safety and value of treatment) interacting with modifying and enabling variables such as demographics, actual treatment effects and requirements, satisfaction with prior experiences, commitment required, relationships with service staff and social or professional pressure/advice.

Figure 1.2: Original Health Beliefs Model (from Becker et al. 1977)

INDIVIDUAL PERCEPTIONS   **MODIFYING FACTORS**   **LIKELIHOOD OF ACTION**

Demographic Variables **(race, ethnicity, etc) Sociopsychological Variables** (personality, social class, peer & reference group pressure, etc)

Perceived benefits **of preventive action** Minus Perceived **barriers**

Perceived Susceptibility **to Disease 'X'** Perceived Seriousness (**Severity**) of Disease 'X'

Perceived Threat of Disease 'X'

Likelihood of Taking Recommended Preventive Health Actions

Cues to Action
Mass media campaigns
Advice from others
Reminder postcard from physician or dentist
Illness of family member or friend
Newspaper or magazine article

READINESS TO UNDERTAKE RECOMMENDED COMPLIANCE BEHAVIOR	MODIFYING & ENABLING FACTORS	COMPLIANT BEHAVIORS

Motivations

-Concern about (salience of) health matters in general

-Willingness to seek and accept medical direction

-Intention to comply

-Positive health activities

Value of illness threat reduction

Subjective estimates of:

-Susceptibility or re-susceptibility (incl. belief in diagnosis)

-Vulnerability to illness in general

-Extent of possible bodily harm

-Extent of possible interference with social roles

Presence of (or past experience with) symptoms

Probability that compliant behavior will reduce the threat

Subjective estimates of:

-The proposed regimen's safety

-The proposed regimen's efficacy to prevent, delay or cure (incl."faith in doctors and medical care" and "chance of recovery")

Demographic (very young or old)

Structural (cost, duration, complexity, side-effects, accessibility of regimen, need for new patterns of behavior)

Attitudes (satisfaction with visit, physician, other staff, clinic procedures and facilities)

Interaction (length, depth, continuity, mutuality of expectation, quality and type of doctor-patient relationship, physician agreement with patient, feedback to patient)

Enabling (prior experience with action, illness or regimen, source of advice and referral (incl. social pressure))

Likelihood of:

Compliance with preventive health recommendations and prescribed regimens: e.g., screening, immunizations, prophylactic exams, drugs, diet, exercise, personal and work habits, follow-up tests, referrals and follow-up appointments, entering or continuing a treatment program

Goldberg & Huxley's Model of Pathways to Care

In contrast to the comprehensive models proposed above, Goldberg & Huxley's Pathways to Care model (1980) focuses on system variables which affect help-seeking and describes the levels of care and filters to these levels within the health system (Figure 1.4). It sees the individual proceeding through a series of filters which can lead ultimately to inpatient care. It provides a context for exploring structural barriers to care at various levels within the system. Thus according to this model, no progress to care can occur if there is no recognition of a problem (filter 1) and no referral to specialist services can occur if the case is not recognised at the primary care level (filter 2), and so on.

Figure 1.4: Goldberg & Huxley's Pathways to Care Model

LEVEL 5 – inpatient care

↑

FILTER 4 - admission

↑

LEVEL 4 – specialist service use

↑

FILTER 3 - referral

↑

LEVEL 3 – primary care, conspicuous morbidity

↑

FILTER 2 – case recognition

↑

LEVEL 2 – primary care, total morbidity

↑

FILTER 1 – decision to consult

↑

LEVEL 1 - community
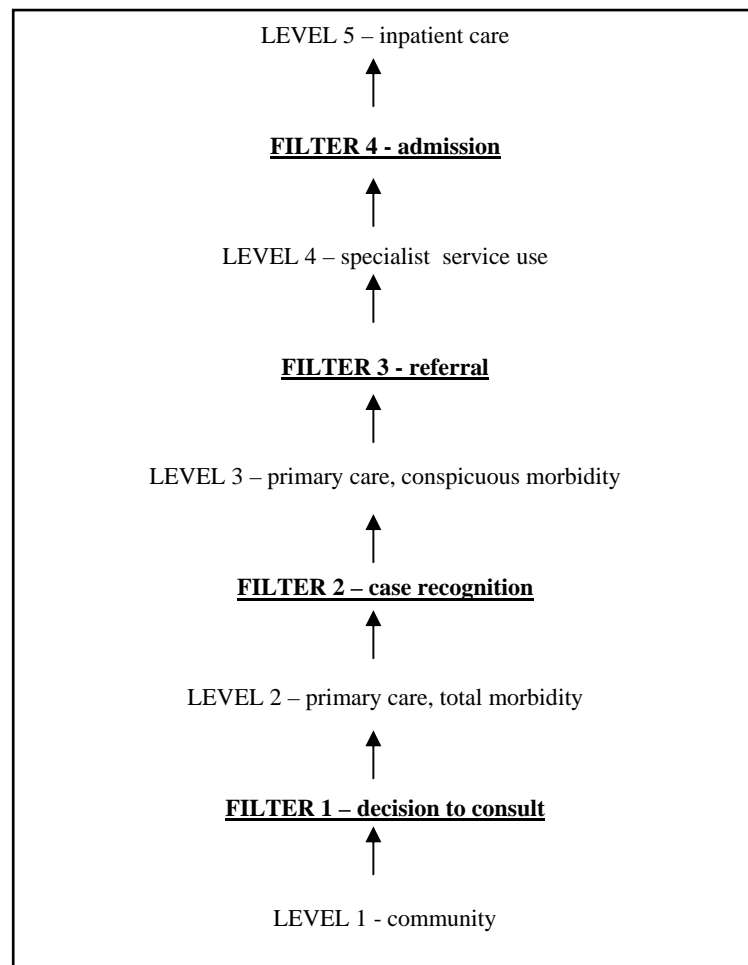
Commentary

Weisner and Schmidt (1995) provide a comprehensive summary and review of access to alcohol treatment services in the US. They invoke both the Health Beliefs Model and Aday and Andersen's framework, which they summarise as providing three levels of explanation for treatment seeking: individual (illness, beliefs, social), organisational (structural or 'gatekeeping') and socio-cultural (public norms and cultural change). In addition they discuss the need for multiple entries to care, recognising that many people with alcohol problems also have comorbid psychiatric disorders which means they may come to treatment through mental health services. They emphasise the accessibility of primary care and the role it could play in attracting people to services who may otherwise be reluctant. In particular, women have tended to underutilize specialist services, so that outpatient screening and treatment may be more attractive to them.

The review by Weisner and Schmidt also points to the differing effects found in the literature for social networks. Some studies have found that social networks encourage treatment seeking, while others have found that they discourage it by protecting the individual from the consequences of problem drinking. As discussed below, social networks may also operate differentially for males and females. Such interactional effects mean that an examination of simple relationships between treatment seeking and the individual factors hypothesised to influence treatment seeking may not be very revealing. They may also explain some of the inconsistencies found in the research reviewed later in this chapter.

Overall the Health Beliefs Model tends to emphasise the personal cognitive rather than structural variables which promote and enable appropriate health-seeking behaviours. Aday and Andersen's model attempts to identify and categorize variables which are structurally-based or individually-based, as well as identifying those factors which are amenable to manipulation through a broad-based health policy. The models are compatible with each other and similar predictions would be generated by each. Differences exist only in their emphases on structural versus personal/functional variables.

As it concentrates on structural variables, Goldberg and Huxley's Pathways to Care model would fit within the category 'Characteristics of Health Delivery System' in the broad model proposed by Aday and Andersen. However, the first filter – the decision to consult – is what the whole Health Beliefs Model attempts to explain.

The pathways to care model is based on the British health care system which is similar to that in Australia but it is likely that, in other countries (such as the US), progress through the system may be quite different. In particular, referral from GPs to specialist services may not be as common in the US where there is currently a push for a greater emphasis on triage by primary carers to obtain a more cost effective medical system (Forrest, 2003; Phillips, 2005). This is reflected in the type of research reported from the US and summarised in below, where researchers are concerned with the sorts of variables (both personal and structural) which encourage or discourage people to seek specialist treatment for their alcohol problems. Multiple entries to care as discussed by Weisner and Schmidt has implications for Goldberg and Huxley's pathways to care model in that people may enter directly from the community through the first filter or they may enter via other filters through, for example, the mental health services. They may also proceed directly to specialist care rather than via primary care.

The research to date has been very much centred on the US which has quite a different health system structure from that of Australia (Blendon, Schoen, DesRoches, Osborn, & Zapert, 2003). For example, Beckman and Kocel (1982) suggest that individuals will seek help for their alcohol-related problems provided they perceive the problem and are aware of and willing to use appropriate services. In Australia, where 80% of adults see their primary care physician (GP) at least once a year, there are considerable opportunities for the GP to screen for and identify alcohol use disorders, where a patient may not have been aware of the presence of such a disorder. Furthermore, the accessibility of outpatient treatment including brief interventions as alternatives to inpatient treatment, changes the direction that research on access to care could take – at least within the Australian context.

This does not mean that variables which are proposed by the models are not applicable to Australia at this time. It may simply mean that with different points of

access to health care, research will find relatively different levels of importance for the variables in the model.

Research on treatment seeking for alcohol use disorders which relates to these models is summarised in the following section.

Research on Prevalence and Correlates of Treatment seeking for Alcohol Use Disorders

Little research has been done on the prevalence of treatment seeking for those with alcohol problems in representative population samples. Data from the US based National Comorbidity Survey (NCS, Wu, Kouzis, & Leaf, 1999) found that only 14.5% of those with a non-comorbid alcohol use disorder and 32.2% with comorbid disorders sought treatment for their mental health problems in the past 12 months. The Netherlands NEMESIS study (Bijl & Ravelli, 2000) also found low levels of mental health service use for those with an alcohol use disorder alone (17%), whilst amongst those with any mental disorder some 34% sought treatment.

In relation to correlates of treatment seeking, Chapter 1 reviewed the models of treatment seeking and provided a brief summary of the relevant research in the area. The following section provides a more detailed summary of these findings. Generally the Health Beliefs (Becker et al., 1977) and Goldberg and Huxley's Pathways to Care (Goldberg & Huxley, 1980) models are referenced as they specify in greater detail, variables which would also be subsumed under the broader descriptors used in the Aday and Andersen model.

Clinical Populations

Research in clinical populations, which directly assesses models of help-seeking behaviour for alcohol-related problems, is quite scarce and generally poorly specified in reports of studies. It is important to note that conclusions regarding system variables cannot be generalised as the studies have been carried out in different countries with different health care systems.

Beckman and Kocel (1982) studied aspects of the treatment delivery system in the US as they relate to women entering all 53 alcohol treatment agencies in two counties in

California. They recorded structural variables of the agencies and the proportion of their clientele over a 12 month period who were women. They found that women tended to choose agencies that had higher proportions of professional staff and female staff, had fewer minority group participants and had more services for treating and caring for children. They also found that the attitude of treatment providers did not differ according to gender of clients and that services with higher proportions of women tended to get their clients from sources other than professionals. They concluded that the structure and attitudes of treatment agencies have an important role in shaping community attitudes and response to alcohol problems. They also proposed an adaptation of the Health Beliefs Model (HBM, Becker et al., 1977) to alcohol treatment behaviours, arguing that structural variables may be easier to manipulate in order to indirectly influence the personal beliefs that lead to initiation and maintenance of treatment. However, interpretation of this study's findings is limited as not all of the variables considered are specified; no multivariate analyses were conducted to control for confounding factors; and the number of clients within each agency was not controlled for.

Rees and Farmer (1985) in the UK came to the same conclusion regarding the importance of structural variables. They studied the effects of receiving a message designed to influence health beliefs based on the HBM and designed to increase participants' concern about the physical and social consequences of heavy drinking. There were 120 subjects in the study (60 each in treatment and control groups) who were obtained from consecutive referrals to a treatment program in Manchester. They found no difference in attendance between the two groups. The only factor predicting attendance was length of wait – the shorter the wait the more likely were participants to attend. This had been found in other research as well and suggests again that it may be easier to change system variables rather than personal variables in order to influence treatment seeking behaviour. However this study cannot be considered a very stringent test of the HBM. There is no information about whether people actually read the message, nor about whether the beliefs themselves had changed.

While structural variables play an important role in treatment seeking, some studies also highlight the importance of individual variables. Thom (1986, 1987) reported a study which focused on sex differences in treatment seeking for alcohol problems in a

sample of 25 men and 25 women entering treatment in the UK, and selected on a relatively random basis. They were asked what prevented them from seeking help previously when they knew they had a problem, and it was found that the major barrier to treatment was a failure to recognize the problem (reported by 60% of the sample). This finding is common throughout the literature. Although providing useful qualitative data, this study did not provide good quantitative evidence of the relative importance of the identified variables. Thom found that the women in the study were less likely than men to see alcohol as their main problem, even though they were equally dependent. Women tended to see alcohol abuse as a coping response to other life problems. Furthermore, their spouses appeared to support this notion that drinking was not their main problem, whilst this was not the case for men. Men had more difficulties asking for help, possibly due to 'masculinity threats'. Women regarded the 'alcoholic' or 'having drinking problems' label as more stigmatizing or embarrassing and were reluctant to mention it to their primary care physicians. There were no significant differences in terms of access, but this notion is difficult to assess in a sample that has shown it will access treatment.

Bardsley and Beckman (1988) in the US compared health beliefs of problem drinkers in treatment (204 men matched to 203 women) with those not in treatment (101 women and 102 men) as a direct test of the HBM. They found that only perceived severity and cues to action (aware of 'hitting bottom' emotionally, conflicts with friends and family, and physical symptoms of drinking) differentiated those in treatment from those who were not. The samples appear to have been selected in an unbiased manner and all in the study had to meet either DSM-III criteria for dependence or abuse, or evidenced clear impairment in social or occupational functioning. The variables measured were perceived severity, perceived susceptibility, perceived treatment effectiveness, cues to action, background variables and symptom severity. However, measurement of these variables (apart from the last two) depended on single or few questions whose reliability and validity had not been assessed.

In an attempt to determine whether barriers to treatment are the same for those who have never sought treatment and those who have, Cunningham et al (1993) studied three groups of alcohol abusers in Toronto, Canada: self-change alcohol abusers

(n=92); untreated, unresolved alcohol abusers (n=62); and alcohol and drug abusers currently in treatment (n=192). They tested five reasons (individual and structural) for delaying or not seeking treatment: embarrassment/pride; inability to share problems; stigma; negative attitudes towards treatment; and monetary costs. They also asked for any other reasons. Each reason was rated on a 5-point scale on how much influence it had in preventing treatment seeking.

Amongst the three alcohol abuse groups they found the following differences:

- the self-change group was older than the other two groups;
- the in-treatment group was more educated and had a shorter history of problems;
- the self-change and untreated groups endorsed 'no problem/need for help' more often than those in treatment (outpatients);
- the self-change and untreated groups endorsed 'wanted to handle problem on own' more;
- outpatient and untreated groups endorsed costs more than did self-changers;
- outpatients endorsed 'stigma' more than self-changers (even though they were the ones who attended treatment);
- untreated patients endorsed ignorance of treatment availability more than outpatients; and
- there were no differences in the number of categories endorsed by any of the groups.

The authors conclude that there is a need to increase alcohol abusers' awareness of the dangers of heavy alcohol use, in an effort to change this individual factor's influence on treatment seeking. The desire to handle the problem on their own could reflect a lack of faith in treatments or the importance of self-determination to these individuals. Overall it appears that current treatment is stigmatising and alcohol abusers believe that it will reflect negatively on them. Thus there is a need to change structural variables such as public perceptions of alcohol abuse and ease of access to treatment by providing a wider range of services that would be more acceptable to those with alcohol abuse problems. They suggest that prospective studies are needed

to determine whether attitudes to treatment are a product of experience in treatment or not.

In a later study Cunningham and co-workers (1994) looked at the effects of 'cognitive appraisal' which involves evaluating the pros and cons of heavy alcohol/drug abuse and how this affects treatment seeking. Subjects were assessed for level of dependence and asked to indicate which of ten reasons influenced their treatment seeking and how much they influenced their treatment seeking. The ten reasons were:

- evaluating pros and cons of heavy abuse;
- warning from spouse/other;
- hitting rock bottom;
- experience of a traumatic event;
- part of a major lifestyle change;
- saw someone drunk/high;
- physician warning;
- knew someone who quit/reduced;
- health problems; and
- religious experience.

One-way analyses of variance were used to ascertain how important each reason was in their decision to do something about their drug or alcohol problem. Overall, 'weighing the pros and cons', 'hitting rock bottom' and experiencing a major lifestyle change (negative) were predictive of entry and completion of treatment. This study suffers from uncorrected repeated hypothesis-testing and use of statistical procedures which are not particularly informative. They conclude that reasons for seeking treatment could be useful in the process of treatment matching.

Table 1.2 summarises findings from the clinical studies in terms of predisposing, enabling and need variables as described in the Health Beliefs model.

As can be seen clinical research in this area has been fraught with problems. Studies have tended to not use standardised measures of alcohol problems or diagnosis, and frequently do not present a full account of all variables under consideration. They

tend to suffer from non-random subject selection as well as making multiple comparisons without correcting for Type I error. Many could also be criticised because they did not use sophisticated statistics to determine the true relationships of variables to treatment seeking. Poor use of statistics frequently involves using simple correlations where the influence of some important variables will be masked by the presence of others, and where multiple regression techniques would clarify relationships more correctly. Similarly not taking into account loss of subjects to a study (attritional bias) or number of statistical tests carried out to ascertain significance (Bonferroni correction) can seriously compromise a study's findings.

Research using randomly selected community samples provides much better opportunities for studying the relative importance of the variables proposed to influence help seeking. In such studies conclusions can legitimately be drawn about the population from which the sample has been drawn. This allows more accurate assessment of important variables without the restrictions of highly selective sampling as arises in clinical studies. A summary of such research is provided in the next section.

Table 1.2: Factors influencing treatment seeking: Summary of research findings from clinical studies

Variable	Measured by	Study
PREDISPOSING		
sex	women compared with men	Thom, 1986, 1987 (+) for primary; - for specialist)
attitudes/ general health care beliefs	embarrassment/stigma	Cunningham 1993 (+); Thom, 1986, 1987 (- more for women);
	can solve on own	Cunningham 1993 (-)
	negative attitudes towards treatment	Bardsley 1988 (=)
	beliefs about risks of heavy drinking	Rees 1985 (=); Cunningham 1994 (+)
	beliefs about personal illness susceptibility	Bardsley 1988 (=)
	symptom severity	Bardsley 1988 (+)
education	level of formal schooling reached	Cunningham 1993 (+)
ENABLING		
social pressure	influence of family and friends	Thom 1986,1987 (- for women) Bardsley 1988 (+)
ease of getting care	knowledge of treatment availability	Cunningham 1993 (+)
	length of wait until treatment	Rees 1985 (-)
	cost	Cunningham 1993 (=)
NEED		
perceived illness level	recognition of having a problem	Thom 1986,1987 (+); Cunningham 1993 (+)
	failure to recognise alcohol as <u>main</u> problem	Thom 1986,1987 (- more for women)
	perceived severity of alcohol problems (includes notion of 'hitting bottom' emotionally)	Bardsley 1988 (+); Cunningham 1994 (+)
	time with problem	Cunningham 1993 (-)

(+) increase in variable is associated with an increase in treatment seeking; (=) no difference found

(-) increase in the variable means a decline in treatment seeking.

Studies Using Data from Small Community Surveys

The first two studies reported here (Bannenberg, Raat, & Plomp, 1992; Weisner, 1993) compare results from community surveys with clinical populations, while the last two present data from surveys designed specifically to assess treatment seeking behaviours for alcohol problems in a general community setting (Commander, Sashidharan, Odell, & Surtees, 1997; Hingson, Mangione, Meyers, & Scotch, 1982).

In The Netherlands, Bannenberg and co-workers (1992) compared problem drinkers applying for treatment (n=146) with those identified in a general population survey not in treatment (n=153) to determine which variables predicted entry to treatment. The variables considered were age, sex, marital status, employment status, alcohol consumption, alcohol problems, other drug use and health status. They measured odds ratios but did not use logistic regression to control for other variables when assessing the effect of each variable. They found that all variables apart from gender predicted treatment entry. The largest odds ratio was found for number of problems. In an attempt to control for level of drinking they analysed a sub-group separately - the very excessive drinking group – which showed significant odds ratios for age, sex, marital and employment status. They then concluded that irrespective of alcohol consumption, number of problems is the most important variable - problems appear to mount over time until the individual reaches 'rock bottom', when help is sought. They hypothesize that reaching 'rock bottom' reflects a loss of support from family and employers and conclude that alcohol treatment should therefore concentrate on problems and not just consumption levels. This study loses some credibility because of the quality of the statistics used. It would have been more appropriate to use logistic regression to properly control for the variables under consideration.

A further study using treatment intakes is reported by Weisner (1993). She compared problem drinkers who were consecutive intakes to treatment (n=316), with those not in treatment who had been identified in a household sample survey (n=202) in the same area in the US. Number of problems was used as a measure of "diagnosis", and predisposing, enabling and need variables identified by Aday and Anderson's model were considered. She identified those variables in the literature which predispose to treatment seeking such as number of problems, age (older), marital status

(unattached) and unemployment. Social relationships can have an influence but it can be in either direction i.e. some social groups encourage treatment seeking whilst others prefer to look after their own. This study examined the relationships amongst variables and compared men and women.

Weisner found that lifetime general treatment history, ethnicity and employment were major contributors to the model for women; while for men the most important variables were social consequences, treatment history and employment. Individual predisposing variables provided a unique contribution to the model for women, while the individual predisposing, need and enabling domains all contributed to the model for men.

In another community-based survey, Hingson et al (1982) followed up 271 people from a probability sample of the Boston (US) Standard Metropolitan Statistical Area interviewed in 1977 and re-interviewed in 1979. The 271 participants consisted of 226 from the original sample who said that they had 'ever had a drinking problem' in 1977 (i.e. 39%) and another 45 who had not reported this in 1977 but did so in 1979. Thus the respondents decided if they had a drinking problem – no definition was provided. The purpose of the study was to test the HBM. Factors assessed included feelings of susceptibility to illness, severity of illness in terms of health and lifestyle if contracted, perceived effectiveness of health interventions and diagnoses, barriers/negatives of treatment and cues to action such as mass media campaigns, peer pressure and the influence of health care providers.

When they compared variables which distinguished those who did and did not seek help they found that help-seeking was predicted by perceived severity of alcohol problems, experience of health problems, problems at work or with friends and family due to drinking, number of life areas affected and belief that one was an 'alcoholic' (just significant). On the other hand variables which did not predict help-seeking in this study included demographic variables, frequency and amount of drinking, feelings of loss of control over drinking, beliefs about efficacy of treatment, belief that overcoming the problem would improve one's life, believing that problems would get worse without treatment, belief in being able to overcome problems on own, and believing that it would improve one's marriage (which didn't fit with the

finding that those who seek help are those who believe drinking problems have negative effects on relationships).

Very few believed that going to treatment is stigmatizing, that staff don't treat you well or that treatment is difficult to find and these did not differentiate treatment seekers. Beliefs that the individual has little control over drinking were associated with greater help seeking; yet belief in alcoholism as a physical disease did not predict treatment seeking. From discriminant analyses, they found that by far the most predictive variable in help-seeking was number of life problems. This was followed by belief in whether people can control their drinking.

They also found that GPs tended to ignore alcohol problems. Only 45% of those who had ever had a problem had been asked by their GPs about their drinking and 25% encouraged to cut down or advised of the health hazards of drinking. Questioning by GPs was not related to seriousness of problem. The only variable predictive of GP counseling was whether the person felt they had health problems as a consequence of their drinking.

This study suffers from the problems of poor definition of alcohol problem and a very low follow-up rate, and its findings are generally at odds with those of other studies reported here, especially with regard to the importance of demographic variables in help-seeking. Most other studies reviewed found significant effects of age, sex, marital and employment status, yet this study found no effects for these variables (e.g. Bannenberg, 1992; Bland, 1997; Weisner, 1993).

In another study which used general community data, Commander et al (1999) looked at access to care in a poor district in the UK with reference to Goldberg & Huxley's Pathways to care model. They were interested to ascertain whether there was differential access to services for different demographic sub-groups.

There were three sources of information for this study. The first involved a community survey of alcohol use disorders from a randomly generated sample, using CAGE (Mayfield, McLeod, & Hall, 1974) to identify disorder and asking about demographic details. They had to pay £10 to each participant to improve the response

rate achieved in their pilot study. The second stage took a representative sample of primary care patients in a designated week who were also given the same screen, as well as their GPs completing (blindly) a WHO questionnaire which assessed problems and diagnoses in the same patients. Finally, all patients in treatment for alcohol use disorder in specialist addiction or psychiatric services on a particular day and over the following 6 months were assessed for morbidity using ICD-10 diagnoses as well as obtaining demographic and clinical data.

They found that only half of those with alcohol use disorders in the community ever consulted a primary care physician and only half of those with an alcohol use disorder who consulted a GP were identified as such. They also concluded that men and women were equally likely to consult the GP and be referred to specialist services for any disorder, but women were less likely to have their alcohol problem recognized by the GP.

They also found that young people were least likely to consult, have problems detected and to be referred to specialists. Similarly ethnic minorities were overlooked in identification and referral processes in primary care. They commented that they got similar findings to Edwards et al (1973) 20 years earlier who found only 10-20% of those with alcohol use disorders were in contact with appropriate services and, after two decades GPs, whilst being the main filter to reaching specialist services, continued to have comparable low referral rates after two decades.

The authors suggest that possible confounding factors would be low numbers in some groups and that CAGE may not be a good screen. This study could also be criticised because of the very basic statistical analyses used. They did not control for other variables when looking at the effects of specific variables and thus failed to determine best estimates of their true contributions to treatment seeking behaviour.

Table 1.3 summarises findings from these community surveys again in relation to predisposing, enabling and need variables as described in the Health Beliefs Model.

Table 1.3: Factors influencing treatment seeking: Summary of research findings from community surveys

Variable	Measured by	Study
PREDISPOSING		
age	age	Commander 1999 (+)
sex	women compared with men	Bannenberg 1992 (=); Hingson 1982 (=); Commander 1999 (=);
marital status/family structure	more frequently divorced	Bannenberg 1992 (+)
	currently living with someone	Hingson 1982 (=)
employment status	unemployed or disabled	Bannenberg 1992 (+); Hingson 1982 (=); Weisner 1993 (+)
ethnicity	ethnic/not	Weisner 1993 (+ for women); Commander 1993 (-)
attitudes/ general health care beliefs	embarrassment/stigma	Hingson 1982 (=)
	can solve on own	Hingson (=)
	belief in loss of control	Hingson 1982(=)
	belief that overcoming will improve one's life	Hingson 1982 (=)
	beliefs about efficacy of treatment	Hingson 1982 (=)
	belief that one cannot control drinking (but not belief in disease model)	Hingson 1982 (+)
previous health behaviour	number of previous treatment episodes	Weisner 1993 (+)
ENABLING		
social pressure	influence of family and friends	Weisner 1993 (+ for men)
recognition of problem by GP	report of such recognition	Commander 1999 (- for women)
NEED		
perceived illness level	recognition of having a problem	Hingson 1982 (+)
	perceived severity of alcohol problems (includes notion of 'hitting bottom' emotionally)	Bannenberg 1992 (+) Hingson 1982 (+)
	number of social/life problems	Hingson 1982 (+); Bannenberg 1992 (+)
	alcohol consumption	Hingson 1982 (=);Bannenberg 1992 (+)
	number of life areas affected	Hingson 1982 (+)
	other drug use	Bannenberg 1992 (+)
	health problems	Bannenberg 1992 (+);Hingson 1982 (+)

(+) increase in variable is associated with an increase in treatment seeking; (=) no difference found

(-) increase in the variable means a decline in treatment seeking.

Evidence from Recent Epidemiological Surveys

The remaining four studies present results from general population surveys assessing mental health prevalence and service usage in national samples and include some results already extracted from the Australian NSMHWB. Epidemiological surveys can provide a rich source of data on prevalence of illness and illness behaviours as they randomly sample the whole of the population and thus allow conclusions to be drawn about whole-population attitudes and behaviour. Recommendations from such surveys have considerable importance because large sample sizes and application of appropriate statistical techniques allow for greater confidence in the generalisability of the conclusions drawn.

A recent Canadian study (Bland, Newman, & Orn, 1997) examined the first filter in Goldberg & Huxley's filters to care model, which is the decision to consult, by analysing the demographic and clinical factors determining help-seeking in those with any psychiatric disorder. Thus they did not analyse alcohol disorders separately. They used a random sample of households in Edmonton, Alberta, Canada and assessed for DSM-III diagnoses using the Diagnostic Interview Schedule (DIS ,Robins, Helzer, Croughan, Williams, & Spitzer, 1981). There were two stages in the study: in the first stage 3956 participants were administered the DIS; in the second stage, at an average of 2.8 years later, they were administered the DIS and their health service usage was measured (n=1964, also random within the original sample). They used sophisticated statistical techniques which controlled for other variables under consideration and applied appropriate weightings to their sample. Amongst demographic variables they found only sex (females) and age (younger) and widowed/separated/divorced were predictive of health service usage. They found that education and income level did not predict help-seeking and that over one-third of those seeking help had no diagnosis. Comorbidity was highly predictive of service usage.

Wu and co-workers (1999) analysed the data from the US National Comorbidity Survey (NCS) which surveyed a stratified random sample of adults aged 18-54 (n=5393). The NCS used a modified CIDI to establish DSM-III-R diagnoses. Past-year and life-time diagnoses and past-year service use were measured. The objective of this study was to compare the treatment seeking behaviour of individuals with

comorbid psychiatric disorders (including substance abuse) with those with a single or 'pure' disorder.

They found overall that there was low service usage with 14.5% of those with a pure alcohol disorder, 32.2% with comorbid alcohol and mental disorders, 27.3% with psychiatric disorders only (single and multiple diagnosis), 11% with lifetime disorders only and 7% of those with no psychiatric disorder seeking help for mental health or substance abuse problems in the past year. These groups were found to differ on demographic variables which were then controlled for in logistic regression analyses to isolate effects due to membership of each of the four sub-samples examined (they excluded the lifetime problems group from these diagnoses). They found that those with comorbid disorders were more likely to use services than those with single alcohol or single psychiatric disorders. There was no significant difference in service use between the pure alcohol disorder group and those in the other psychiatric disorders group with only one disorder. Nor was there a difference in service usage between those with comorbid alcohol and mental disorders and those with two or more other comorbid mental disorders. Thus those with alcohol use disorders behave in a similar way regarding treatment seeking to those with other psychiatric disorders.

For the 'pure' alcohol group only a history of self-medication predicted service use. In the comorbid alcohol and mental disorders group, being aged 36-44 years, being separated, widowed or divorced, having legal problems, being in middle and lower income groups, and having at least three dependence symptoms predicted service use.

They concluded that the low service usage found in this survey implies that greater efforts are needed to reduce barriers to treatment for all psychiatric disorders. Thus they considered that system variables had an important impact on service usage.

This study highlights the significance of psychiatric comorbidity as a variable in treatment seeking. As depicted in the Health Beliefs Model, number of perceived problems as expressed by comorbidity in this survey, impacts on the "perceived threat" of alcoholism.

Bijl and Ravelli (2000) analysed data from a national survey sample in the Netherlands to ascertain the probability of people with different psychiatric disabilities seeking professional help, and to ascertain whether needs were met. They surveyed a multistage, stratified random sample of 18-64 year olds and had a response rate of 69.7% (7147 persons). They used CIDI-Auto (Peters & Andrews, 1995) to determine DSM-III-R diagnoses for the past 12 months and SCID (Spitzer, Williams, Gibbon, & First, 1990) to confirm psychotic illness. Participants were also asked about any care they sought and whether they felt they needed care.

They found 23.5% had one or more disorders in the past 12 months and 8.2% had an alcohol use disorder. Amongst the 23.5% with any disorder 34% sought professional care, whilst 17.5% of those with alcohol use disorders sought such care. Primary care was sought most frequently for all disorders apart from schizophrenia. Women with alcohol use disorders tended to seek care more than men but this was true only for primary care and outpatient mental health care (percentages not provided). They used logistic regression to ascertain odds of those with particular disorders seeking care, controlling for sex, age and comorbidity. Alcohol and drug-related problems did not predict usage of any form of care. Comorbidity sharply increased probability of care seeking (55% sought care).

They also carried out multivariate logistic regressions to ascertain the contribution made by demographic characteristics to care seeking, controlling for sex, age and diagnosis. Odds ratios were relatively low. They found that age was not a predictor of mental health care use which is contrary to results from Commander et al (1999), which found older people sought more help for alcohol problems. However the Commander et al study did not use regression analyses to control for effects of other variables under consideration. Also, Bland (1997) found that younger people were more prone to seek help, but this was for all mental health problems.

Bijl and Ravelli also found that women were more likely to use primary care for any disorder (95% CI for OR=1.32-1.91) but not specialist care; that those with an education beyond 11 years were more likely to seek specialist care for any disorder, but not primary care; and that living in an urban compared with a rural setting predicted more primary care, but not mental health care. Overall, the highest

predictors for mental health service usage were living alone and having more than 16 years education. Single parents, the unemployed and disabled and those living alone were most likely to seek any service help.

Seventeen per cent expressed an unmet need for psychiatric help. Women, those with mood disorders and those with comorbid conditions expressed highest levels of unmet need in that they said that they wanted treatment but were unable to obtain it.

They found that some 40% of those who sought mental health care did not meet criteria for a mental disorder and suggested some possible explanations: (1) overmet need - too many with mild disorders using mental health services when they could go to primary care; (2) exclusion of Axis II disorders which constitute a significant proportion of the mentally disabled; and/or (3) DSM diagnoses do not take sufficient account of functioning which the authors consider to be an important link between diagnosis and need. This notion has some support from a recent report which analysed data from the Australian NSMHWB (Korten & Henderson, 2000) and found that around half the disability days lost due to mental health problems were accounted for by those with symptoms but no diagnosis of disorder. These individuals may well account for the 40% with no diagnosis who sought mental health care. Furthermore, as summarized below, Meadows et al (2000) argue cogently that service use may serve a preventive and relapse-prevention function for those who are currently considered well.

Although Bijl and Rivelli did not specifically address these variables, they suggested that reasons for not seeking care when meeting diagnoses (with special reference to alcohol use disorders) were: (1) stigma; (2) severity of functional limitations may not be great especially for non-chronic conditions with good social support; (3) DSM diagnoses for alcohol problems may be invalid as they do not predict pathology; (4) excessive use of alcohol is widely tolerated and problems are denied past the point of pathology; and (5) treatments for depressive and anxiety disorders are more 'sophisticated' than those for substance abuse, especially for those with comorbid substance use and other psychiatric conditions.

In Australia Meadows et al (2000) analysed the data from the NSMHWB with particular reference to perceived need for mental health services from the consumer perspective. The NSMHWB addressed five service type categories:

- Information about mental illness, its treatments and available services

- Medication – medicines or tablets

- Counseling – any of psychotherapy, CBT, counseling to talk about problems,

- Social interventions – help to sort out housing or money problems,

- Skills training - help to improve ability to work, etc or to look after self or home

The study looked at patterns of service usage for those with disorders who used services, those without disorders and used services and those with a disorder but no service use. They found that of those with a CIDI diagnosis, the majority (two-thirds) did not seek help and a significant proportion (about one-third) of those who used services had no current diagnosis.

Overall 13.8% expressed a need for mental health services and 7.4% with a diagnosis saw no need and did not seek help. Those who had a diagnosis and did not seek help had much lower perceived needs than those who sought help (whether with a diagnosis or not). Those without a diagnosis and sought help tended to have their needs met best. The odds of needs being met for any service type for the whole population were 0.69 (0.63-0.77 95% CI). They also found the anomaly that 0.4% of the population met criteria and saw no need for service use but sought help. They suggested that this could have been mandated.

The authors comment that those who are apparently well and using services could be those in remission – that is, have no current symptoms but legitimately need continued care. Also preventive strategies may involve help seeking so that this again is a legitimate use of services for the currently well. Overall, service use tended to be associated with perceived need, so behaviour and cognition are consonant.

They found that counseling was the most frequently unmet perceived need. The likelihood of need for medication being met was much higher than for counseling

needs (4.06 compared with 1.06). Similarly, social and skills needs were not as well met as medication needs. These could reflect the funding structure of the Australian health care system where medications tend to be reimbursed whilst counseling and social skills training tend not to be.

They concluded that most people with a mental illness do not want help, so the approach to this group needs to be cautious. Similarly, services provided to the apparently well, may in fact be well justified. It should be emphasised that these data apply to the broad range of mental illnesses and not specifically to alcohol use disorders which will be the subject of this present paper.

As with clinical studies and small sample surveys, research on treatment seeking in population surveys has tended to concentrate on predisposing, enabling and need variables as described in the Health Beliefs Model and findings are summarised in Table 1.4.

Table 1.4: Factors influencing treatment seeking: Summary of research findings from epidemiological studies

Variable	Measured by	Study
PREDISPOSING		
age	age	Bland 1997 (-)*; Wu 1999 (=); Bijl 2000 (=)*
sex	women compared with men	Bland 1997 (+)*; Wu 1999 (=); Bijl 2000 (+ for primary and outpatient specialist; = for inpatient)*
marital status/family structure	currently living with someone	Bland 1997 (-)*; Wu 1999 (-); Bijl 2000 (- for specialist)*
	single parent	Bijl 2000 (+)*
	student or living with parents	Bijl 2000 (- for primary)*
employment status	unemployed or disabled	Bijl 2000 (+)*
education	level of formal schooling reached	Bland 1997 (=)*; Bijl 2000 (+ for specialist, = for primary)*
ENABLING		
ease of getting care	referral by GP to specialist	Wu 1999 (- for women; - for younger)
urban-rural status	living in urban setting	Bijl 2000 (+ for primary; = for specialist))*
economic	higher income	Bland 1997 (=)*; Wu 1999 (-); Bjil 2000 (=)*
NEED		
perceived illness level	recognition of having a problem	Meadows 2000 (+)*
assessed level of illness	diagnosis	Bijl 2000 (=)
	number of dependence symptoms	Wu 1999 (+)
	presence of comorbid psychiatric conditions	Bland 1997 (+)*; Wu 1999 (+); Bijl 2000 (+)*

* based on general psychiatric or health disorder rather than alcohol disorder population; (+) increase in variable is associated with an increase in treatment seeking; (=) no difference found

(-) increase in the variable means a decline in treatment seeking.

Summary of Research Findings on Treatment Seeking Behaviour

In essence only studies which relate to "Characteristics of the Population at Risk" in Aday and Andersen's model have been subjected to scrutiny. It is difficult to carry out meaningful research on the other arm of their model, 'Characteristics of the Health Delivery System', as this currently would involve comparing health care systems in different countries or implementing different models of care in comparable community areas within one country. There is also some opportunity to study the effects of these variables when a country introduces change or diversity within the same system.

As discussed above less weight should be given to the clinical studies reviewed because of methodological problems. This applies to a lesser extent to the data from localized community surveys. In summary, from the studies reviewed it can be summarized that the following *predisposing* factors increase the probability of treatment seeking for mental health and/or drug and alcohol use problems:

- being female;
- living in a dyadic or family relationship;
- being unemployed or disabled;
- being more highly educated;
- symptom severity (clinical study only); and
- having sought treatment on previous occasions (local survey only).

Evidence regarding the effects of age, perceived stigma associated with treatment seeking and the perceived efficacy of treatment, is unclear or neutral.

Enabling variables studied in clinical settings and small surveys include social pressure, which was found to have a positive impact on treatment seeking for drug and alcohol problems among men but negative among women. One large epidemiological study found GP recognition of a problem and referral on was less likely for women and younger people. A similar result for women was found in a small community survey as well. Living in an urban setting meant greater access to care whilst the impacts of income and cost were equivocal. Single clinical studies found that waiting longer and not knowing about services tended to decrease treatment seeking.

In terms of *need* variables, several studies found that not recognizing that one has a problem (understandably) keeps people out of treatment. Perceived or assessed level of severity of illness was also a significant factor bringing people to treatment, as was having other related mental, social and physical health problems.

Outline of Thesis

This present chapter has discussed issues associated with the definition of alcohol use disorders, effectiveness of treatments, and treatment seeking for such disorders. It highlights that despite the existence of effective treatments, people with alcohol problems do not tend to seek or receive treatment for these problems. In an effort to understand why this happens, three significant gaps in the research in this area have been identified. The first focuses on the validity of the current DSM-IV diagnoses for alcohol use disorders, upon which assumptions about the need for treatment are based. Questions are raised regarding the validity of these diagnoses and the need for stronger statistical evidence on the two-factor hierarchical model underpinning such diagnoses. In order to assess the validity of the current model for determining a DSM-IV alcohol diagnosis, Chapter 2 is devoted to confirmatory factor analyses of the 11 DSM-IV criteria, both within population sub-groups and for the population as a whole. Although much research has been done on the dimensionality of the alcohol diagnoses, none thus far has assessed the exact DSM-IV criteria using sophisticated statistical analyses of data from a large national sample.

A second gap is identified in research on the prevalence and correlates of alcohol use disorders in Australia; again an important indicator of the need for treatment for these disorders. Chapter 3 provides this information from the only nationally representative survey of psychiatric disorders completed in Australia to date (NSMHWB). Because prior research has identified significant variations in prevalences of alcohol use disorders in age and gender sub-samples, these groups have been analysed separately.

Finally, following a discussion arguing that treatments for alcohol disorders are necessary, and a review of the literature which indicates that treatments are effective, a summary of models of treatment seeking and of outcomes of research in the alcohol

area has been presented. Research on treatment seeking for alcohol use disorders is scarce and data from Australia even more so. In order to understand factors which are likely to drive Australians to treatment for their alcohol problems, Chapters 4 and 5 analyse NSMHWB data to determine whether and how often those with a DSM-IV diagnosis of alcohol dependence access specialist and GP services (Chapters 4 and 5 respectively). Chapter 4 provides a unique insight into the barriers and inducements to any specialist treatment for alcohol use disorders in Australia, relating findings to current treatment seeking models. Chapter 5 examines in particular the use of GP services by those with alcohol dependence, providing original Australian data on the impacts of alcohol use disorders on primary care.

Chapter 6 will then summarise what this thesis has revealed with regard to the patterns and prevalences of alcohol problems in Australia, the validity of the DSM-IV diagnostic system, and treatment seeking in the general population for alcohol problems.

Three questions will be answered by this thesis:
- How well are DSM-IV alcohol use disorders specified?
- What are the prevalence and correlates of alcohol use disorders in Australia? and
- What are the prevalence and correlates of treatment-seeking for alcohol dependence in Australia?

CHAPTER 2: THE STRUCTURE OF ALCOHOL USE DISORDERS IN THE AUSTRALIAN COMMUNITY

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Introduction

This chapter aims to explore the latent structure of DSM-IV alcohol use disorders by examining the relationship between the abuse and dependence criteria using confirmatory factor analysis (CFA) on a national survey sample. Alcohol dependence was originally formulated as a number of psychological and physiological factors associated with diminished control over alcohol use (Edwards, 1986; Edwards & Gross, 1976). In contrast, alcohol abuse reflects the negative social consequences and physical hazards of alcohol use. The DSM-IV specifies 11 criteria for alcohol use disorders (see Table 2.1). Dependence is measured by seven criteria, at least three of which must be endorsed for a diagnosis to be established. Abuse is measured by four criteria, and a diagnosis is made if at least one criterion is endorsed (and a diagnosis of dependence is absent).

Although dependence on alcohol has support as a reliable unitary construct (Bucholz et al., 1995; Feingold & Rounsaville, 1995b; Langenbucher et al., 2000; Morgenstern, Langenbucher, & Labouvie, 1994), abuse has not found a similar level of support (e.g. Feingold & Rounsaville, 1995b; Hasin, Li, McCloud, & Endicott, 1996; Hasin & Paykin, 1999; Langenbucher et al., 2000). Thus, compared with the literature on alcohol dependence, less is known about the validity of alcohol abuse and its implementation in widely used diagnostic schemes.

Prior Research on the 2-Factor model of Substance Use Disorders
A limited number of studies have been carried out to clarify the dependence-abuse categorisation, although most have focussed on clinical populations and employed a range of factor analytic techniques with inconsistent results. Feingold and Rounsaville (1995a) characterise current DSM-IV definitions of substance use disorders as being qualitative, in that they describe abuse and dependence as different types of disorder rather than different degrees of disorder. They define an alternative 'quantitative' view where the disorder is a single syndrome, with abuse a milder version of dependence. In this particular study they compared the validity of the qualitative and quantitative models using CFA on responses from 521 subjects from drug treatment, general psychiatric and community samples. They considered a range

of psychoactive substances – alcohol, cocaine, cannabis, opiates and sedatives, but used 10 of the 11 current criteria. Their findings lend support to the quantitative model in that abuse reflected a milder form of disorder than dependence. They also found a single factor solution was psychometrically equivalent to a two factor solution for all drug groups tested, apart from opiates. In another study also using clinical samples, Langenbucher et al (2004) found that there were serious structural problems with the 2-factor approach to substance use disorders as diagnosed in DSM-IV.

The WHO cross-national study by Nelson et al (1999) tested the seven DSM-IV dependence and four abuse criteria for alcohol using CFA, with a mixed sample from the community and treatment centres. With this sample they found a two-factor solution no better than the one-factor solution; but when they 'trimmed' the data of extreme respondents (those who responded NO to all criteria or YES to 10 or 11 criteria) they found the two-factor solution superior.

Studies using representative population samples have also arrived at diverging conclusions regarding the appropriateness of the current 2-factor definitions of alcohol use disorders. Some studies have found evidence for two separate, although related factors (Harford & Muthén, 2001; Muthén, Grant, & Hasin, 1993) while others have identified single dimensions. For example, Hasin et al (1994) found that a two factor model fitted the criteria best but the two factors correlated .98, leading the authors to conclude that the one-factor solution was most appropriate. In a national sample study of cannabis use disorders, Teesson and co-workers (2002) found one- and two-factor solutions were of equivalent validity but as they correlated at .99 the single factor solution was the most parsimonious.

Table 2.1: Definition of the 11 Criteria for DSM-IV Alcohol Use Disorders

DSM-IV Diagnosis	Criteria	Description
Alcohol Dependence	**TOLERANCE**	Tolerance to the effects of alcohol; need more to get desired effect
	WITHDRAWAL	Withdrawal syndrome, or alcohol or similar substance taken to avoid or relieve withdrawal symptoms
	LARGER	Alcohol is taken in larger amounts or for longer periods than required
	CUT DOWN	Persistent desire, or unsuccessful efforts to cut down
	TIME SPENT	A great deal of time spent obtaining, using or recovering from the effects of alcohol
	GIVE UP	Reduction in important social, occupational or recreational activities because of alcohol use
	CONTINUE	Continued use despite awareness of alcohol use causing physical or psychological problems
Alcohol Abuse	**MAJOR ROLE**	Failure to fulfil obligations, important activities at work, school or home because of alcohol use
	HAZARD	Recurrent use in physically dangerous situations eg driving, operating machinery
	LEGAL	Recurrent alcohol-related legal problems
	SOCIAL	Recurrent use despite awareness of alcohol use causing social or interpersonal problems

The status of the abuse criteria is not clear. The DSM-III substance abuse committee (Rounsaville, Spitzer, & Williams, 1986) viewed abuse as a diagnosis that should be reserved for individuals referred to treatment because of episodic drug use who had not yet developed a pattern of behaviours indicative of dependence. In contrast, the DSM-IV conceptualises abuse as the negative social consequences and role impairment associated with substance use. DSM-IV uses a hierarchical decision rule where abuse cannot be diagnosed in the presence of dependence. This suggests that the two diagnoses are not independent and that they in fact form part of the one single continuum of severity (Langenbucher et al., 2000; Wagner, Lloyd, & Gil, 2002). Research by Hasin and colleagues has found the DSM-IV diagnosis of abuse to be relatively unreliable (Hasin, 2003; Hasin et al., 2003).

Population Sub-Groups

Prior research has suggested that the diagnosis of alcohol use disorders may be differentially applicable in age and gender sub-groups. In particular, these definitions were developed for the adult population and it is unclear how well they apply to young adults (Dawson, 1996; Wagner, Lloyd, & Gil, 2002; Winters, Latimer, & Stinchfield, 1999). Because young males predominate amongst those with alcohol use disorders, and because they do not see such disorders as disabling (Bijl & Ravelli, 2000; Kessler et al., 2001), it is of interest to examine properties of the criteria for dependence and abuse within gender and age sub-groups. In particular, current formulations of dependence and abuse may not best predict risk in the population or within sub-populations. It may be that the diagnoses as specified by DSM-IV are more or less applicable to a particular sub-sample. For example if young males are more likely to be classified as dependent on the basis of particular criteria that are less severe, then it would follow that they are less likely to see themselves as disabled and seek care for their alcohol problems. In order to assist in clarifying this, part of the present study is devoted to an analysis of severity levels of criteria within sub-groups, while Chapter 3 examines the relative prevalences of disorders and individual criteria within sub-groups.

The present chapter applies the methods of Muthén (1996) to examine the factor structure of DSM-IV alcohol use disorders in the Australian National Survey of

Mental Health and Wellbeing (NSMHWB, Teesson, Hall, Lynskey, & Degenhardt, 2000). The NSMHWB is a study of a large and representative sample of the general population. A detailed description of this study is provided below and elsewhere (Teesson, Hall, Lynskey, & Degenhardt, 2000). A further aim of this paper is to examine where each criterion discriminates the most. Given current formulations of DSM-IV it is hypothesised that the abuse criteria should discriminate at a lower (or less severe) level, while the dependence criteria should discriminate at a higher level.

The aims of the present study are:

1. to ascertain whether a one-factor model or a 2-factor model best describes alcohol abuse and dependence in the community, and to examine the relative severity of all 11 criteria using confirmatory factor analysis; and

2. to examine prevalences and factor structures in age and gender sub-groups in the expectation that the criteria would behave similarly across sub-groups.

Method

The NSMHWB was carried out in 1997 on a randomised stratified sample of Australians aged 18 years and older (Henderson, Andrews, & Hall, 2000). Approximately 13,600 private dwellings in Australia were selected from which one person over the age of 18 was asked to participate in an interview. A modified version of the Composite International Diagnostic Interview (CIDI, Teesson, Hall, Lynskey, & Degenhardt, 2000; World Health Organization, 1996) was developed for the survey and administered by trained staff. The CIDI has been used in a range of epidemiological studies, and has been shown to be a reliable and valid survey instrument (Peters & Andrews, 1995; Wittchen, 1994). A total of 10,641 respondents were interviewed giving a 78% response rate. The survey collected such information as basic demographics as well as measures of both DSM-IV and ICD-10 psychiatric disorders, including alcohol use disorders. Questioning was restricted to symptoms in the last 12 months. Alcohol abuse and dependence were assessed in all persons who had consumed at least 12 alcoholic drinks in the past 12 months. The 11 DSM-IV alcohol use disorders criteria are listed in Table 2.1.

Statistics

Whereas exploratory factor analysis (EFA) reduces a set of intercorrelated variables to a meaningful set of factors, confirmatory factor analysis (CFA) assesses how well a particular number of factors fit the data. EFAs suggest solutions using various assumptions with no means of objectively comparing the alternative outcomes. CFA produces a set of fit indices for a solution and these can be used to evaluate the model being tested. The dichotomous (YES/NO) criteria in CFA are considered to be indicators of an underlying continuous trait – in this case alcohol use disorder.

The DSM-IV diagnostic formulations and relative severity of criteria were examined using the M*plus* program (Muthén & Muthén, 1998). This software estimates a matrix of tetrachoric correlations between symptom criteria. Although several programs are available to carry out CFA, M*plus* is able to do such analyses where the data is in categorical form. M*plus* assumes simple random sampling, but Muthén et al. (Muthén, Grant, & Hasin, 1993) argue that M*plus* is applicable for use with complex

samples because it uses multivariate analyses which are less sensitive to complex sampling than univariate methods. Because the data is dichotomous, M*plus* uses tetrachoric rather than Pearson product-moment correlations for its input matrix.

A further issue to consider is selection of appropriate tests of model fit. Studies are emerging which test the appropriateness of various fit indices for particular sample and data types, using Monte Carlo simulation techniques. Kaplan and Ferguson (1999) examined the effect of weighting in structural equation models and concluded that the chi-square goodness of fit index is most affected, while other indices of fit are less affected. The chi-square statistic has been found to be over-sensitive to trivial differences in large samples, where unique variances tend to be small (Browne, MacCallum, Kim, Andersen, & Glaser, 2002). For binary data such as that used in this study Yu (2002) recommends use of the Comparative Fit Index (CFI), the Root Mean Square Error of Approximation (RMSEA) and the Weighted Root-Mean-Square Residual (WRMR). Recommended cut-off points for these measures are: CFI > .96, RMSEA < .05 and WRMR>.9. The Comparative Fit index (CFI), Root Mean Square Error of Approximation (RMSEA) and the Weighted Root Mean Square Residual (WRMR) are therefore also reported in this chapter.

Firstly, two confirmatory factor analyses were conducted on the whole sample using M*plus*. The fit of both models was then examined using WLSMV estimation. WLSMV uses weighted least-square parameter estimates from the diagonal of the weight matrix. These methods are recommended for categorical variables by Muthén and Muthén (2001) on the basis of simulation studies and follow a long line of research on the structures of symptoms (Muthén 1989; Muthén et al 1993).

In order to assess the severity levels of individual criteria, threshold statistics were extracted from the modelling process. These thresholds indicate the value of the latent variable at which the criterion discriminates best between those who do and do not meet the criterion. Criteria with low thresholds discriminate at the less severe end of the factor or underlying trait whilst higher thresholds indicate criteria which discriminate at the more severe end of the trait.

In order to study age and gender effects four sub-groups of the population were identified: males younger than 35, females younger than 35, males 35 and over and females 35 and over. These gender/age sub-populations were examined separately in a further CFA using Multiple Group Analysis (Muthén & Muthén, 1998) to ascertain how well the criteria and the abuse-dependence dichotomy applied to each sub-group.

Results

Whole Sample

The results of the model fitting procedure for the whole sample testing both one- and 2-factor solutions are summarised in Table 2.2. This table lists the standardised factor loadings linking the observed symptom criteria to latent factors; the CFI, RMSEA and WRMR goodness of fit tests; and for the two-factor model, the estimated correlation between the two latent factors.

Both the one- and two-factor models showed an adequate fit to the data, with no evidence of significant departures from the model assumptions. For both models the CFI was well above the recommended cut-off of .95, RMSEA values well below the recommended .06 cut-off and WRMR greater than .9. Thus it is not possible to distinguish between the two models based on measures of goodness of fit.

Although both models provide an adequate fit to the data, the two-factor model produced an extremely high correlation between the factors of abuse and dependence (.95). Given this high correlation between the factors, the most parsimonious model for the DSM-IV criteria is a one-factor model, which assumes the four abuse and seven dependence criteria are indicators of a single underlying dimension representing level of alcohol use disorder.

Factor loadings linking the eleven abuse and dependence criteria to the latent factor were moderate to high, ranging from .66 for LEGAL to .93 for GIVEUP. The lower factor loading linking legal problems (0.66) suggests that this criterion may have only limited reliability/validity as a measure of an underlying vulnerability to alcohol use disorders.

With a single factor model, estimates of the factor loading and thresholds can be transformed into the parameterisation used in Item Response Theory Criterion Characteristic Curves (see Muthén & Lehman, 1985, Equations 7 and 8). The relative thresholds of individual DSM-IV criteria may be illustrated using criterion (item)

Table 2.2: Standardised factor loadings, thresholds and tests of model fit for 1- and 2-factor models of abuse and dependence for alcohol (n=7746)

	1-factor model		2-factor model	
	Factor Loadings	Threshold	Factor 1 Loadings	Factor 2 Loadings
TOLERANCE	.72	1.31	.72	
WITHDRAWAL	.82	1.83	.82	
LARGER	.85	1.05	.85	
CUTDOWN	.78	1.18	.78	
TIMESPENT	.90	1.93	.90	
GIVEUP	.93	2.27	.94	
CONTINUE	.83	1.75	.83	
MAJOROLE	.82	2.04		.85
HAZARD	.77	2.06		.79
LEGAL	.66	2.27		.67
PERSONAL	.80	2.24		.83
Factor Correlation			.95	
CFI	.993		.994	
RMSEA	.014		.014	
WRMR	1.005		.956	

characteristic curves. These are shown in Figure 2.1 for each of the 11 criteria. The threshold values listed for the 1-factor solution indicate where on the underlying trait the criterion discriminates, and allow comparisons across criteria. Thus, from table 2.2 it can be seen that TOLERANCE, LARGER, CUTDOWN (all dependence criteria) discriminate at the less severe end of the factor, whilst WITHDRAWAL, TIMESPENT, GIVEUP and the four abuse criteria tend to discriminate at the more severe end of the underlying factor. These threshold values are in turn direct reflections of the prevalences of the criteria, based on the reasoning that endorsement of a less prevalent criterion is likely to be more indicative of actual disorder than endorsement of a highly prevalent criterion.

The item (criterion) characteristic curves (Figure 2.1) show the relationship between the latent trait in standard deviation units (x-axis) and the probability that a particular criterion is endorsed (y-axis). The curve for each criterion is defined by its factor loading (gradient) and threshold (horizontal placement). Thus the steeper curves such as LARGER, GIVEUP and TIMESPENT are those criteria with highest factor loadings; whilst curves displaced further to the right (GIVEUP, LEGAL, SOCIAL, HAZARD and MAJORROLE) are criteria which discriminate at the more severe end of the latent trait. This is best judged by observing where these curves cross the cut-off point indicating the prevalence rate of alcohol use disorders in this sample (8.2% - dotted vertical line in figure 2.1).

Figure 2.1: Item characteristic curves for alcohol criteria

Alcohol Use Disorder Item Characteristic Curves
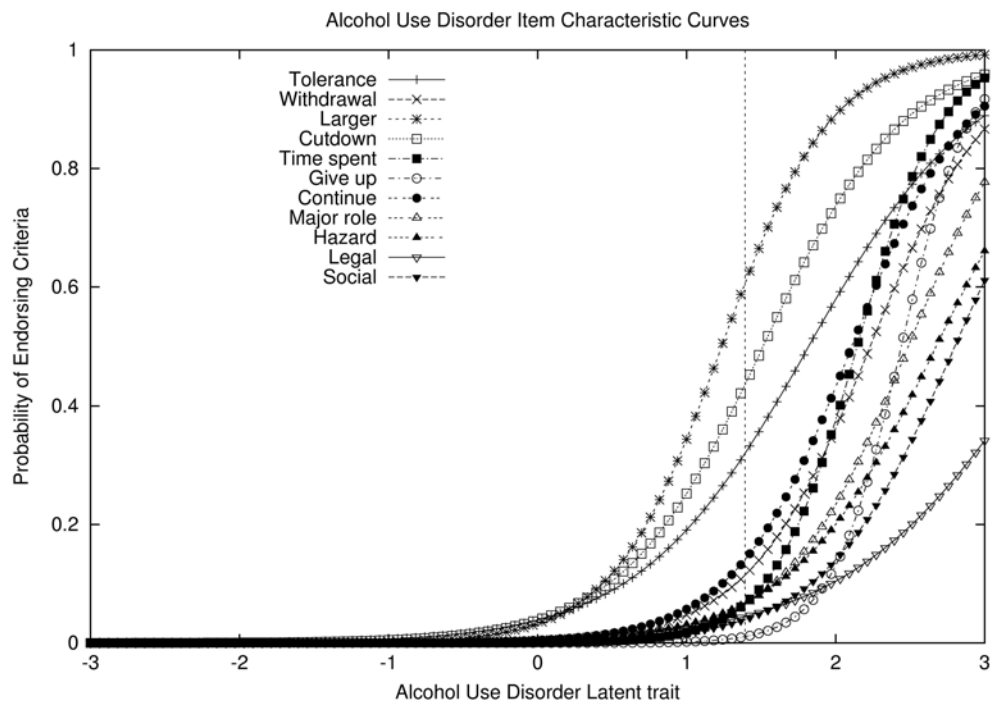
Age and Gender Sub-Groups

Full summary tables for multiple group CFA are contained in the Appendix to this chapter. The one- and two-factor solutions were similar and the factor intercorrelations for the two factor solution remained high (.930 to .982), with those for the younger groups highest. All models fit well according to both the CFI and RMSEA statistics but less well for the WRMR statistic. Factor loadings remained moderately high, although those for LEGAL in the male sub-groups and TOLERANCE in the younger groups were only moderate.

Table 2.3 lists the factor loadings with a single factor from the Multiple Group CFA. Apart from GIVEUP, where there was no difference, older males and females had higher factor loadings than the younger groups across all criteria. Factor loadings for females tended to be slightly higher overall than for males. In particular they were very much higher for the two abuse criteria HAZARD and LEGAL.

The level at which the criteria discriminate on the latent variable, as measured by the thresholds for the one-factor solutions, remain in the same relative order for the sub-groups as for the whole sample of drinkers (Table 2.4). However, their magnitudes vary across sub-groups, with markedly lower thresholds for young males and markedly higher for older females. Thus, an older female meeting these criteria would tend to have a more severe form of disorder than a younger male.

Table 2.3: Sub-group factor loadings for the one–factor model of abuse and dependence symptoms for alcohol

	Males 18-34 n=1205	Females 18-34 n=1359	Males 35+ n=2737	Females 35+ n=2445
TOLERANCE	.59	.62	.76	.81
WITHDRAWAL	.77	.76	.87	.84
LARGER	.80	.76	.85	.92
CUTDOWN	.76	.83	.75	.83
TIMESPENT	.84	.86	.93	.96
GIVEUP	.89	.87	.99	.95
CONTINUE	.80	.78	.84	.89
MAJOROLE	.76	.77	.86	.85
HAZARD	.68	.77	.79	.88
LEGAL	.61	.70	.64	.82
PERSONAL	.78	.72	.85	.93

Table 2.4: Sub-group thresholds for the one-factor model of abuse and dependence symptoms for alcohol use disorders

	Males 18-34 n=1205	Females 18-34 n=1359	Males 35+ n=2737	Females 35+ n=2445
TOLERANCE	0.775	1.150	1.480	1.683
WITHDRAWAL	1.497	1.827	1.871	2.045
LARGER	0.547	0.895	1.135	1.421
CUTDOWN	0.842	1.290	1.128	1.407
TIMESPENT	1.523	1.827	1.995	2.366
GIVEUP	1.883	2.315	2.318	2.612
CONTINUE	1.472	1.689	1.720	2.079
MAJOROLE	1.689	1.923	2.161	2.303
HAZARD	1.543	2.088	2.161	2.612
LEGAL	1.934	2.373	2.211	2.719
PERSONAL	1.991	2.122	2.233	2.612

Discussion

The CFA findings reveal that, in this Australian sample, a single factor best describes the eleven criteria which define alcohol abuse and dependence. They do not lend support to Edwards' bi-axial concept of alcohol use disorders (Edwards, 1986).

All the factor loadings are moderate to high, suggesting that they fit well with the underlying trait being measured. However, it is also clear that the criteria used to describe DSM-IV abuse discriminate best at the more severe end of this single latent variable which does not fit the notion that abuse is a less severe form of alcohol disorder. This is offset to some extent by the requirement that an individual must meet at least three dependence criteria to obtain a diagnosis and only one abuse criterion to be diagnosed with alcohol abuse. A further complicating factor to consider is that all individuals who meet an abuse criterion, but also meet criteria for dependence, will not be diagnosed with abuse. It is difficult to evaluate the current system in great depth because of these idiosyncrasies. The data in this chapter suggests that a simplified method of identifying disordered alcohol use may prove more practicable.

As proposed by Feingold and Rounsaville (1995a) a continuous measure, based on a sum of criteria met, may be the best measure of alcohol problems. The uniformly high factor loadings obtained suggest that all factors should be equally weighted to obtain this continuous measure. In line with widely used measures of other mental disorders such as the Beck Depression Inventory for depression (Beck, Steer, & Brown, 1996), a total score on the continuous measure of alcohol use disorder could then be used to classify individuals using such terms as 'normal', 'moderate' and 'severe'.

However, the fact that TOLERANCE, LARGER and CUTDOWN are the most prevalent criteria suggests that they inordinately affect diagnosis, yet they discriminate at the less severe end of the latent trait. Previous research has found that having a diagnosis of alcohol dependence has little effect on disability and help-seeking. Specifically, the possibility that young males are more likely to meet particular low severity criteria and be diagnosed with a disorder, does not necessarily

convert directly to perceived disability and treatment seeking. It is necessary to analyse further which particular criteria and combinations of criteria they are meeting. To this end Chapter 3 examines prevalences of criteria in age and gender sub-groups; but further research is warranted.

Thus, the results suggest that giving the more prevalent criteria a lesser weight compared with the other criteria may provide a more valid measure of the disorder. This would change the latent variable as such, but this may then become a more valid indicator of severity of disorder, disability and treatment-seeking.

The results also provide evidence that the factor structure of DSM-IV alcohol use disorders tend to vary according to age group. Overall the criteria load more strongly on the underlying factor in the older age groups compared with younger, with no clear trend in gender differences. In particular the dependence criteria TOLERANCE and LEGAL tend to be only modest for the younger age groups. Furthermore, there are large differences between threshold values reflecting severity levels across age and gender categories. These findings suggest that there may be a need to examine further the broad application of the diagnostic system across age and gender groups. Further research is necessary to ascertain whether weighting of criteria according to such sub-groups could improve the validity of the alcohol diagnoses.

The fact that a single factor solution was also found for cannabis use disorders (Teesson, Lynskey, Manor, & Baillie, 2002) suggests that this may be more generally applicable across the range of substance use disorders. Further research relating a continuous measure of alcohol use disorders to disability, comorbidity and health service usage is needed in order to assist in specifying categories of the disorder and to confirm the validity of the trait. Such research would examine the effects of differential weightings within the population as well as within sub-groups in the general population. The information obtained may be useful when compiling future definitions for DSM.

It should be noted that although a single factor solution was found to be more appropriate, this conclusion was based on the finding of equivalence between the one- and two-factor solutions. Research based on the current two-factor model remains valid until changes are made to future formulations of DSM alcohol use disorders. To this end, Chapter 3 examines prevalence statistics in the Australian community for alcohol use disorders under the current DSM-IV definitions. National prevalences of individual criteria as well as those within sub-groups will be analysed. Cross-national as well as intra-group comparisons shed further light on the broad relevance of current formulations of DSM-IV alcohol use disorders in this representative sample of the Australian population.

Appendix Chapter 2

App Ch 2 Table 1: CFA findings for all male drinkers aged 18-34 in NSMHWB (n=1205)

	1-factor solution		2-factor solution	
	Factor Loadings	Threshold	Factor 1 Loadings	Factor 2 Loadings
TOLERANCE	.634	0.775	.634	
WITHDRAWAL	.753	1.497	.754	
LARGER	.806	0.547	.807	
CUTDOWN	.739	0.842	.740	
TIMESPENT	.838	1.523	.839	
GIVEUP	.901	1.883	.902	
CONTINUE	.763	1.472	.764	
MAJOROLE	.748	1.689		.761
HAZARD	.729	1.543		.741
LEGAL	.635	1.934		.644
PERSONAL	.748	1.991		.759
Factor Correlation			.976	
CFI	.988		.987	
RMSEA	.023		.024	
WRMR	.828		.825	

	1-factor solution		2-factor solution	
	Factor Loadings	**Threshold**	**Factor 1 Loadings**	**Factor 2 Loadings**
TOLERANCE	.621	1.150	.621	
WITHDRAWAL	.702	1.827	.702	
LARGER	.779	0.895	.780	
CUTDOWN	.794	1.290	.794	
TIMESPENT	.904	1.827	.905	
GIVEUP	.800	2.315	.802	
CONTINUE	.789	1.689	.790	
MAJOROLE	.805	1.923		.816
HAZARD	.785	2.088		.794
LEGAL	.746	2.373		.754
PERSONAL	.646	2.122		.653
Factor Correlation			.982	
CFI	.995		.994	
RMSEA	.013		.013	
WRMR	.714		.712	

App Ch 2 Table 3: CFA findings for all male drinkers aged 35+ in NSMHWB (n=2737)

	1-factor solution		2-factor solution	
	Factor Loadings	**Threshold**	**Factor 1 Loadings**	**Factor 2 Loadings**
TOLERANCE	.721	1.480	.723	
WITHDRAWAL	.882	1.871	.884	
LARGER	.844	1.135	.846	
CUTDOWN	.764	1.128	.765	
TIMESPENT	.924	1.995	.926	
GIVEUP	1.001	2.318	1.005	
CONTINUE	.856	1.720	.859	
MAJOROLE	.856	2.161		.899
HAZARD	.753	2.161		.783
LEGAL	.541	2.211		.564
PERSONAL	.863	2.233		.904
Factor Correlation			.934	
CFI	.995		.996	
RMSEA	.015		.013	
WRMR	.782		.727	

	1-factor solution		2-factor solution	
	Factor Loadings	**Threshold**	**Factor 1 Loadings**	**Factor 2 Loadings**
TOLERANCE	.815	1.683	.817	
WITHDRAWAL	.843	2.045	.846	
LARGER	.913	1.421	.915	
CUTDOWN	.850	1.407	.855	
TIMESPENT	.959	2.366	.959	
GIVEUP	.944	2.612	.949	
CONTINUE	.878	2.079	.882	
MAJOROLE	.851	2.303		.890
HAZARD	.841	2.612		.862
LEGAL	.867	2.719		.892
PERSONAL	.933	2.612		.987
Factor Correlation			.930	
CFI	.996		.998	
RMSEA	0.014		.011	
WRMR	.763		.698	

CHAPTER 3: PREVALENCE AND PATTERNS OF DSM-IV ALCOHOL USE DISORDERS AND CRITERIA IN AGE AND GENDER SUB-GROUPS IN AUSTRALIA

Contents

Tables

Introduction

As outlined in Chapter 1, epidemiological research, largely from the US, provides important information on the prevalence and correlates of alcohol use disorders. The most recent data from the US on the prevalence of alcohol use disorders comes from the National Institute on Alcohol and Alcoholism's National Epidemiologic Survey on Alcohol and Related Conditions (NESARC). This survey was conducted in 2002 on a nationally representative sample of 43,093 respondents aged 18 years and older (Grant et al., 2004b). They found the 12-month prevalence of dependence to be 3.8% and abuse 4.6%. The Netherlands Mental Health Survey and Incidence Study (NEMESIS, Bijl, Ravelli, & van Zessen, 1998) found overall rates of alcohol abuse and dependence (4.6% and 3.7% respectively) to be similar to those found in the US. Similar rates have been reported in the UK where Farrell (2003) found the overall rate of dependence to be 5%.

Data on prevalences of alcohol use disorders from Australia has become available through the National Survey of Mental Health and Wellbeing (NSMHWB). As described earlier the NSMHWB was carried out in 1997 on a randomised stratified sample of Australians aged 18 years and older. The design and basic findings of this survey have been reported by Henderson et al. (2000). The method section of Chapter 2 above describes the design in some detail. This chapter reports for the first time DSM-IV alcohol use disorder rates in Australia, overall and within age and gender sub-groups.

Correlates of Abuse and Dependence

All epidemiological studies to date have found that age and gender are significant correlates of alcohol abuse and dependence. However, international studies have found that other sociodemographic variables relate to substance use disorders as well. Wu and Ringwalt (2004) analysed US 1999 National Household Survey data on socio-demographic correlates of past-year alcohol dependence. They found, when all variables in the equation were controlled, that for both males and females, currently married people were less likely to be alcohol dependent than single people and that those with another drug dependence (illicit or not) were more likely to be alcohol dependent. Males on the lowest incomes ($0-$19,999) were more likely to be alcohol

dependent than males on the highest income (≥$75,000); whilst females in the middle income brackets ($20,000-$74,999) were less likely to be dependent than females on the highest income. In males only, those with the lowest levels of education (0-11 years) were more likely to be dependent than those who had 16 or more years of education.

The NEMESIS study (Bijl, Ravelli, & van Zessen, 1998) reported the sociodemographic correlates of substance use disorders in general, and only controlled for age and gender when determining the significance of correlates. They found age and gender to be significant in the expected directions i.e. males and younger age groups were more likely to be dependent. Other 'unadjusted' correlates of substance use disorders were urban-dwelling (cf rural), not living in a couple relationship, disabled or unemployed (cf employed), having parents with a psychiatric history and having a personal history of neglect or abuse. It is not clear whether these would remain significant if a full logistic regression model was applied.

The UK National Psychiatric Morbidity Survey (Paykel, Abbott, Jenkins, Brugha, & Meltzer, 2003) found independent sociodemographic correlates of their measure of dependence were: age and gender in the expected directions (young and male); having any significant life event in the past year; low perceived social support; ethnicity; being accommodated in a flat; and living without a partner. Other variables included but not found to be significant were: employment status; size of primary support group; owning or renting a home; and urban-rural status.

While it is apparent that sociodemographic measures of the individual relate to alcohol use disorders, there is also considerable comorbidity between substance abuse disorders and other psychiatric conditions. The National Comorbidity Study in the US (Kessler, 1994) was carried out in 1990-1992 to assess the prevalence and correlates of all DSM-III-R psychiatric disorders in the general population of the US. More recently the NESARC study which was designed specifically to assess such comorbidities, found that the (adjusted) odds of alcohol dependence were high amongst those with mood (OR: 4.1; CI: 3.5-4.8) and anxiety (OR: 2.6; CI: 2.2-3.0) disorders. These odds were significantly lower for alcohol abuse and, although still significant for mood disorders (OR: 1.3; CI: 1.1-1.6), they were not so for anxiety

disorders (OR: 1.1; CI: 0.9-1.3) (Grant et al., 2004b). In the UK study (Farrell et al., 2003), the Clinical Interview Schedule Revised (CIS-R) was used to assess neurotic disorders which included depressive symptoms. This study found significant relationships between substance use disorders and neurotic disorders. Regular drinkers with a neurotic disorder were more likely to have an alcohol problem (22%) compared with those with no neurotic disorder (14%) and alcohol problems increased with the number of disorders.

To date no epidemiological data from Australia has been published on the correlates of alcohol use disorders. Such data is important to assist with decisions on policy affecting access to treatments for these disorders.

Relevance of Criteria Across Age and Gender Sub-Groups

The diagnoses for alcohol dependence and abuse have been developed based on research amongst older and often highly dependent clinical sub-samples. Researchers have suggested that these criteria may not apply as well to women or to younger age groups (Chung, Martin, Armstrong, & Labouvie, 2002; Dawson & Grant, 1993; Fulkerson, Harrison, & Beebe, 1999; Harrison, Fulkerson, & Beebe, 1998; Nelson & Wittchen, 1998; Wagner, Lloyd, & Gil, 2002; Winters, Latimer, & Stinchfield, 1999). This is an important issue because current definitions of dependence and abuse suggest that rates are much higher amongst young males in particular.

It is possible that the higher rates amongst males and young people may be accounted for by the patterns of criteria met in the sub-groups. Harrison and co-workers (1998) examined DSM-IV substance use criteria in general and their applicability to adolescents in a large population survey in the US. They excluded 'withdrawal' from the survey as it tends to be a symptom of long-term abuse and is rare amongst younger substance users. They measured the sensitivity and specificity of each of the other abuse and dependence criteria and their intercorrelations. They found the criterion CUT DOWN (a persistent desire to decrease use, however attempts may be unsuccessful) to function poorly and that the abuse/dependence dichotomy did not function meaningfully.

In their analysis of the results from the US National Household Survey on Drug Abuse in 2001, Harford and colleagues (2005) compared patterns of prevalences for

alcohol use disorder criteria between adolescents and the adult population. The Appendix to this chapter carries a summary table of the results from the Harford et al. study as it relates to individual criteria. The report does not give total sample outcomes, but provides prevalences of criteria within age/gender sub-groups. They found the most prevalent criteria in the total sample of 55,561 subjects to be the dependence criteria TOLERANCE (the need for larger amounts of alcohol in order to achieve the same effect) and TIME SPENT (a great deal of time spent obtaining, using or recovering from the effects of alcohol), and the abuse criterion HAZARD (recurrent use in physically dangerous situations eg driving, operating machinery). These results were consistent across age and gender sub-groups. For every criterion, males were significantly more likely to report symptoms than females and the 18-23 year age group was significantly more likely to report symptoms than adolescents (12-17years) and all older age groups.

Despite its intention to examine the differential prevalences of criteria in age and gender sub-groups, the study by Harford et al. (2005) did not further analyse the data to verify if prevalences of individual criteria within sub-groups could account for different levels of diagnosis within sub-groups. Data from Australia on this issue, and prevalences of criteria overall, has not yet been published. Such data can provide important information regarding the validity of individual criteria in current formulations of alcohol use disorders, both in the population as a whole and within population sub-groups.

Specifically, the aims of the present chapter are:
1. to examine the psychiatric as well as the sociodemographic correlates of alcohol dependence and abuse in Australia; and
2. to examine prevalences of alcohol use disorder criteria in the Australian adult population, and within age and gender sub-groups, in order to ascertain whether particular criteria have an undue impact on the rates of alcohol disorders.

Methods

Prevalence and correlate data were obtained from the Australian National Survey of Mental Health and Wellbeing (NSMHWB). Among the variables assessed by the modified CIDI were criteria for DSM-IV and ICD-10 diagnoses for alcohol and drug use and anxiety and mood disorders in the past 12 months. For this study DSM-IV criteria only have been used. Other measures of relevance to the present study include the presence of chronic physical illness, perceived physical and mental disability and days out of role due to illness in the past month, as well as relevant demographic variables.

An individual was considered to have a physical illness if they responded positively to the question in the survey asking if they had any of the following conditions: asthma, chronic bronchitis, anaemia, high blood pressure, heart trouble, arthritis, kidney disease, diabetes, cancer, stomach or duodenal ulcer, chronic gallbladder or liver trouble, or a hernia or rupture. Any physical or mental disability was positive if respondents fell in the moderate to severe range on the physical and mental sub-scales of the Short Form 12 (SF-12, Ware, Kosinski, & Keller, 1996). Respondents were also asked how many days they had out of role in the past 12 months due to any mental health problems. Responses were categorised into five or more days, compared with less than five for the purposes of these analyses.

Alcohol use disorders in the past 12 months were assessed by firstly identifying alcohol users as those who drank 12 or more standard drinks in that period. This group was further questioned regarding amount and frequency of use as well as specific questions leading to an assessment of conformity with the criteria for dependence and /or abuse. Descriptions of the criteria for DSM-IV abuse and dependence are listed in the table on page xiv.

Statistical Analyses

Prevalence estimates and logistic regressions were adjusted for sampling through the use of balanced repeated replications (BRR) weightings using SAS-callable SUDAAN (Shah, Barnwell, & Bieler, 1997). These weightings adjusted the data to conform to independent population estimates by state, part of state, age and sex.

Logistic regression was used to identify those variables correlating with diagnoses of alcohol dependence and abuse, both unadjusted and adjusted for other variables under consideration. Odds ratios and 95% confidence limits were used to indicate the strength of relationships amongst variables.

Chi squared tests were used to compare sub-groups and Bonferroni adjustments for multiple significance testing were made.

Results

Prevalence of Alcohol Use Disorders Australia-Wide and in Population Sub-Groups

There were 9,902,449 persons in the population aged 18 years and over who were current drinkers (73.54% of the population). The prevalence of DSM-IV abuse in the population was 1.90 (SE=0.17) and DSM-IV dependence was 4.14 (SE=0.32). These rates represented 255,735 and 557,902 persons aged 18 or more.

Abuse in Sub-Groups

Table 3.1 lists prevalence rates and unadjusted odds ratios for alcohol abuse in sociodemographic, comorbidity and disability sub-groups in the Australian sample. Males were nearly 3 times as likely to have an abuse diagnosis as females. People aged 18-24 were nearly 9 times as likely to have the diagnosis as those aged 45 and over and those aged 25-34 were 4 times as likely to receive an abuse diagnosis. Only those aged 35-44 were not significantly different from the over 44 year olds. Other sociodemographic variables that showed significant odds ratios were being single, separated, widowed or divorced (2.5 times more likely than married/de facto); being unemployed (2 times more likely than those employed); and not being in the work force (1/3 as likely as employed individuals). Having a higher degree, or living in an urban or rural environment had no significant relationship with alcohol dependence. None of the comorbidity nor disability measures was associated with having a diagnosis of alcohol abuse.

Dependence in Sub-Groups

The findings for dependence (Table 3.2) in relation to sociodemographic variables were similar to those for abuse. Males were around 3 times as likely to be dependent as females and people aged 18-24 were more than 5 times as likely to be dependent as those aged 45 and over. The odds of being dependent decreased with increasing age, and were significantly greater in all the age groups under 45 than in the over 44 year age group. Other sociodemographic variables that showed significant odds ratios were being single, separated, widowed or divorced (3 times more likely than married/de facto); being unemployed (over 2 times more likely than those employed); and not being in the work force (1/2 as likely as employed individuals). Having a

higher degree, or living in an urban or rural environment had no significant relationship with alcohol dependence.

In contrast to abuse, having comorbid mental health disorders markedly increased an individual's odds of also being alcohol dependent. Those with an affective disorder were 5 times more likely than those without to have alcohol dependence. Those with an anxiety disorder were 4.6 times more likely to be dependent and those with another drug disorder were nearly 11 times more likely. While physical disorders and physical disability did not relate to being alcohol dependent, those with moderate to severe self-rated mental disability were 3 times as likely to be alcohol dependent than those having mild or no disability.

Table 3.1: Prevalence and unadjusted odds of abuse in socio-demographic, comorbidity and disability sub-groups

	Variable	Sub-Group	Prevalence of abuse (SE)	Odds Ratios (CIs)
Socio-demographic variables	**Gender**	Male	2.92 (0.34)	3.27 (2.11-5.06)
		Female	0.91 (0.14)	1.00 (Comparison)
	Age	18-24	5.3 (0.77)	8.93 (3.92-20.34)
		25-34	2.43 (0.41)	4.02 (1.94-8.31)
		35-44	1.94 (0.59)	3.19 (0.84-12.11)
		45+	0.62 (0.23)	1.00 (Comparison)
	Highest Qualification	Bachelor's Degree or more	0.83 (0.35)	1.00
		Less than Bachelor's Degree	2.09 (0.19)	2.56 (0.91-7.18)
	Marital Status	Married, De Facto	1.24 (0.20)	1.00
		Single, Separated, Widowed, Divorced	3.13 (0.33)	2.57 (1.67-3.96)
	Employment Status	Employed	2.29 (0.26)	1.00
		Short- or Long-Term Unemployed	4.63 (1.02)	2.07 (1.18-3.62)
		Not in Workforce	0.78 (0.25)	0.33 (0.15-0.73)
	Urban-Rural Status	Urban	1.74 (0.26)	1.00
		Non-Urban	2.33 (0.51)	1.35 (0.70-2.61)
Comorbidities	**Any Affective Disorder**	No	1.91 (0.18)	1.00
		Yes	1.74 (0.54)	0.91 (0.45-1.83)
	Any Anxiety Disorder	No	1.91 (0.18)	1.00
		Yes	1.65 (0.63)	0.86 (0.35-2.11)
	Any Other Drug Disorder	No	1.73 (0.18)	1.00
		Yes	7.78 (2.12)	4.80 (2.48-9.31)
	Any Physical Disorder	No	2.21 (0.24)	1.00
		Yes	1.41 (0.25)	0.63 (0.40-1.00)
Disability	**SF-12 Mental (Mod-Sev Disability)**	No	1.82 (0.18)	1.00
		Yes	2.50 (0.50)	1.38 (0.87-2.20)
	SF-12 Physical (Mod-Sev Disability)	No	1.99 (0.19)	1.00
		Yes	1.48 (0.35)	0.74 (0.44-1.25)
	5 + Days Out of Role	No	1.95 (0.17)	1.00
		Yes	1.44 (0.48)	0.73 (0.34-1.56)

Table 3.2: Prevalence and unadjusted odds of dependence in socio-demographic, comorbidity and disability sub-groups

	Variable	Sub-Group	Prevalence of Dependence(SE)	Odds Ratios (CIs)
Socio-demographic variables	**Gender**	Male	6.09 (0.80)	2.81 (1.70-4.62)
		Female	2.26 (0.28)	1.00
	Age	18-24	9.34 (1.93)	5.35 (2.81-10.16)
		25-34	5.70 (0.61)	3.13 (1.95-5.04)
		35-44	4.01 (0.39)	2.17 (1.49-3.15)
		45+	1.89 (0.27)	1.00 Comparison)
	Highest Qualification	Bachelor's Degree or more	3.63 (0.53)	1.00
		Less than Bachelor's Degree	4.23 (0.42)	1.17 (0.73-1.88)
	Marital Status	Married, De Facto	2.53 (0.21)	1.00
		Single, Separated, Widowed, Divorced	7.15 (0.67)	2.96 (2.36-3.71)
	Employment Status	Employed	4.75 (0.44)	1.00
		Short- or Long-Term Unemployed	10.22 (2.70)	2.28 (1.33-3.91)
		Not in Workforce	2.17 (0.30)	0.45 (0.29-0.68)
	Urban-Rural Status	Urban	4.30 (0.45)	1.00
		Non-Urban	3.73 (0.37)	0.86 (0.61-1.22)
Comorbidities	**Any Affective Disorder**	No	3.38 (0.40)	1.00
		Yes	14.82 (1.38)	4.98 (3.30-7.52)
	Any Anxiety Disorder	No	3.53 (0.35)	1.00
		Yes	14.38 (1.92)	4.59 (2.93-7.17)
	Any Other Drug Disorder	No	3.45 (0.33)	1.00
		Yes	27.75 (3.31)	10.75 (7.01-16.47)
	Any Physical Disorder	No	4.02 (0.30)	1.00
		Yes	4.34 (0.51)	1.08 (0.85-1.37)
Disability	**SF-12 Mental (Mod-Sev Disability)**	No	3.35 (0.50)	1.00
		Yes	10.17 (1.50)	3.27 (1.77-6.06)
	SF-12 Physical (Mod-Sev Disability)	No	4.21 (0.52)	1.00
		Yes	3.85 (0.90)	0.91 (0.45-1.86)
	5 + Days Out of Role	No	3.94 (0.44)	1.00
		Yes	5.98 (1.28)	1.55 (0.81-2.97)

Adjusted Correlates of Alcohol Dependence and Abuse in the Population

Table 3.3 summarises the results of logistic regressions using the sociodemographic, comorbidity and disability variables described above as the independent variables; and alcohol abuse and dependence as the dependent variables. Controlling for all other variables in the equation, gender and age remained strong correlates of both dependence and abuse. Being in a married or a de facto relationship reduced the risk of alcohol dependence, but not of abuse. Being unemployed no longer correlated with abuse or dependence once other sociodemographic and mental health variables were controlled. Not being in the workforce was associated with a reduced risk of dependence, even when other variables such as age were included.

Prevalence of Criteria: Overall and in Gender and Age Sub-Groups

Table 3.4 lists prevalences of all eleven abuse and dependence criteria overall and for males and females separately. Using larger than intended amounts (LARGER, 11.04%), having trouble cutting down (CUT DOWN, 8.85%) and needing more alcohol to get the desired effect (TOLERANCE, 7.42%) were by far the most prevalent criteria. The abuse criteria: MAJOR ROLE (failure to fulfil obligations, important activities at work, school or home because of alcohol use, 1.5%), HAZARD (recurrent use in physically dangerous situations, 1.56%), LEGAL (recurrent alcohol-related legal problems, 0.85%) and SOCIAL (recurrent use despite awareness of alcohol use causing social or interpersonal problems, 0.85%) tended to be much less prevalent than the dependence criteria.

Reflecting the much higher prevalence of alcohol diagnoses amongst males, all but one of the criteria were more commonly endorsed by males than females. Only CONTINUE (continued use despite awareness of alcohol use causing physical or psychological problems) was not significant with Bonferroni adjustment. Similarly when age groups are compared, young people are significantly more likely than older people to meet each of the criteria (Table 3.5). When comparing age groups only the two abuse criteria, LEGAL and SOCIAL were not significant.

It is of interest to ascertain whether, given the higher rates of dependence and abuse amongst men and younger age groups, the prevalences within gender and age-groups

are similar across criteria. This may assist in explaining differential rates of diagnosis in these sub-groups. For example, it may be that one particularly prevalent criterion also occurs more frequently than average in males or young people. This would then increase the expected prevalence of diagnosis. To this end, chi-squared is recalculated (χ^2 adj) to test the differences between males and females and age sub-groups *given* the expected value of each criterion in the diagnosis category (right-hand columns in Tables 3.4 and 3.5). For example, the expected proportion for males in the dependence category is the total number of dependence criteria met by males (2324) divided by the total number of dependence criteria met in total (3675). Similarly the expected proportion of males with each abuse criterion is the total number of abuse criteria met by all males (345) divided by the total number of abuse criteria met (498). These proportions are listed for each sub-group and disorder in the last rows of the relevant tables.

As indicated in Table 3.4, there was little variation from the expected male to female prevalence ratios within criteria. Only the abuse criterion, MAJOR ROLE, had a significantly elevated prevalence for females compared with males. When this comparison was carried out for age groupings (Table 3.5), it was found that TOLERANCE was significantly higher for the youngest (18-34 year) age group and lower in those 35 and older. The opposite occurred for CUT DOWN where the prevalence was significantly lower in the 18-34 year groups and higher in the 35 years and older groups.

Table 3.3: Correlates of dependence and abuse (adjusted)

Variables in the equation		Adjusted Odds Ratios (CIs)	
		Dependence	**Abuse**
Socio-demographic variables			
Gender (male cf female)		3.01 (1.90-4.78)	2.82 (1.89-4.23)
	18-24 years	2.97 (1.32-6.69)	5.51 (2.95-10.30)
Age (cf 45+ group)	25-34 years	2.30 (1.33-3.98)	3.38 (1.79-6.35)
	35-44 years	1.86 (1.16-2.96)	2.96 (0.96-9.15)
Less than Bachelor's Degree (cf those with degree)		1.18 (0.71-1.97)	2.61 (0.90-7.57)
Unattached (cf married/de facto)		1.91 (1.44-2.52)	1.63 (0.99-2.68)
Unemployed (cf employed)		0.95 (0.47-1.93)	1.22 (0.64-2.33)
Not in Workforce (cf employed)		0.61 (0.43-0.86)	0.61 (0.31-1.23)
Non-Urban (cf urban)		0.97 (0.67-1.40)	1.46 (0.78-2.74)
Comorbidities			
Any Affective Disorder		2.88 (1.83-4.53)	0.78 (0.36-1.70)
Any Anxiety Disorder		2.09 (1.24-3.51)	0.69 (0.23-2.03)
Any Other Drug Disorder		3.89 (1.87-8.08)	1.91 (0.84-4.33)
Any Physical Disorder		1.56 (0.92-2.64)	1.02 (0.65-1.61)
Disability			
SF-12 Mental (Mod-Sev Disability)		1.66 (0.91-3.01)	1.52 (0.90-2.55)
SF-12 Physical (Mod-Sev Disability)		0.94 (0.49-1.82)	1.40 (0.79-2.48)
5 + Days Out of Role		1.12 (0.67-1.86)	0.75 (0.34-1.64)

Table 3.4: Prevalence of criteria in whole group and males and females with χ^2 and χ^2adj

Criteria		Males n=4705	Females n=5936	Total n=10641	χ^2_1 (p)*	χ^2_1 adj. (p)*
Tolerance	n	454	283	737	96.56	.78
	%	10.20	4.72	7.42	.0000	ns
	(SE)	(0.54)	(0.42)	(0.39)		
Withdrawal	n	165	96	261	31.59	.00
	%	3.64	1.26	2.43	.0000	ns
	(SE)	(0.37)	(0.19)	(0.20)		
Larger	n	703	442	1145	142.70	1.60
	%	15.16	7.04	11.04	.0000	ns
	(SE)	(0.66)	(0.28)	(0.37)		
Cut Down	n	596	329	925	91.14	0.52
	%	12.68	5.14	8.85	.0000	ns
	(SE)	(0.58)	(0.53)	(0.39)		
Time Spent	n	140	68	208	35.50	1.31
	%	2.64	0.98	1.80	.0001	ns
	(SE)	(0.26)	(0.12)	(0.14)		
Give Up	n	64	25	89	23.14	2.52
	%	1.27	0.28	0.77	.0000	ns
	(SE)	(0.17)	(0.09)	(0.09)		
Continue	n	202	108	310	8.62	0.41
	%	4.20	1.77	2.96	.0063	ns
	(SE)	(0.73)	(0.22)	(0.35)		
Total for Dependence	n	2324	1351	3675		
	prop.	.6324	.3676	1.0000		
Major Role	n	97	63	160	14.72	5.23
	%	2.11	0.90	1.50	.0006	.0222
	(SE)	(0.30)	(0.11)	(0.16)		
Hazard	n	116	36	152	42.39	3.22
	%	2.57	0.58	1.56	.0000	ns
	(SE)	(0.25)	(0.12)	(0.12)		
Legal	n	69	20	89	24.00	2.48
	%	1.52	0.21	0.85	.0000	ns
	(SE)	(0.28)	(0.05)	(0.15)		
Social	n	63	34	97	13.53	0.66
	%	1.25	0.47	0.85	.0009	ns
	(SE)	(0.21)	(0.09)	(0.12)		
Total for Abuse	n	345	153	498		
	prop.	.6928	.3072	1.0000		

(*bonferroni correction, p<.0045)

Table 3.5: Prevalence of criteria in whole group and age sub-groups with χ2 and χ2adj

Criteria		18-24 years	25-34 years	35-44 years	45+ years	Total	χ^2_3 (p)*	χ^2_3adj. (p)*
Tolerance	**n**	205	229	150	153	737	339.95	31.36
	%	20.60	10.30	5.54	2.93	7.42	.0000	.0000
	(SE)	(1.61)	(0.84)	(0.72)	(0.41)	(0.39)		
Withdrawal	**n**	51	76	71	63	261	41.76	0.57
	%	4.91	3.19	2.54	1.27	2.43	.0000	ns
	(SE)	(0.80)	(0.41)	(0.39)	(0.18)	(0.20)		
Larger	**n**	238	366	290	251	1145	211.51	3.36
	%	22.48	16.61	11.17	4.86	11.04	.0000	ns
	(SE)	(1.40)	(1.05)	(0.68)	(0.50)	(0.50)		
Cut Down	**n**	120	255	268	282	925	63.19	47.31
	%	11.85	11.75	10.59	5.75	8.85	.0000	.0000
	(SE)	(1.62)	(0.97)	(0.77)	(0.57)	(0.39)		
Time Spent	**n**	46	77	43	42	208	35.11	6.48
	%	3.93	3.01	1.59	0.68	1.80	.0000	ns
	(SE)	(0.73)	(0.36)	(0.31)	(0.18)	(0.14)		
Give Up	**n**	18	32	24	15	89	31.16	2.95
	%	1.41	1.49	0.80	0.22	0.77	.0001	ns
	(SE)	(0.38)	(0.36)	(0.15)	(0.06)	(0.09)		
Continue	**n**	67	80	84	79	310	16.72	3.02
	%	6.37	3.51	3.24	1.54	2.96	.0037	ns
	(SE)	(2.05)	(0.53)	(0.50)	(0.20)	(0.35)		
Total for Dependence	**n**	745	1115	930	885	3675		
	prop	0.2027	0.3034	0.2531	0.2408	1.0000		
Major Role	**n**	42	50	40	28	160	40.56	0.15
	%	4.15	1.99	1.40	0.51	1.50	.0000	ns
	(SE)	(0.73)	(0.34)	(0.36)	(0.11)	(0.16)		
Hazard	**n**	50	49	33	20	152	130.91	4.40
	%	5.06	2.39	1.06	0.34	1.56	.0000	ns
	(SE)	(0.63)	(0.38)	(0.36)	(0.10)	(0.12)		
Legal	**n**	21	23	29	16	89	15.91	3.23
	%	2.21	0.96	1.04	0.30	0.85	.0047	ns
	(SE)	(0.65)	(0.30)	(0.28)	(0.09)	(0.15)		
Social	**n**	23	28	21	25	97	5.88	4.27
	%	1.88	1.15	0.73	0.46	0.85	.1411	ns
	(SE)	(0.56)	(0.30)	(0.22)	(0.15)	(0.12)	ns	
Total for Abuse	**n**	136	150	123	89	498		
	prop	0.2731	0.3012	0.2470	0.1787	1.0000		

(*bonferroni correction, p<.0045)

Discussion

In line with results from the US, UK and The Netherlands, Australians have high levels of DSM-IV alcohol use disorders, especially amongst males and younger people. Apart from age and gender, other unadjusted correlates of dependence were socio-demographic variables (marital and employment status) and comorbid mental health disorders (affective, anxiety and drug use disorders) as well as self-reported mental disability. Measures of physical health, physical disability and days out of role did not relate to a diagnosis of dependence. The same socio-demographic variables were correlates of abuse but no other variable apart from having another drug use disorder related to a diagnosis of abuse. When odds ratios were adjusted for other variables in the equation, age and gender, marital status and affective, anxiety and other drug disorders all contributed independently to a diagnosis of dependence. For abuse, only the age and gender variables remained independently relevant.

Thus having comorbid mental health disorders and self-reported mental disability tend to distinguish those in our community who suffer from alcohol dependence from those with alcohol abuse. The sociodemographic variables that were found to relate to alcohol use disorders were similar to those found in the US, Netherlands and UK studies where similar variables were controlled for. In particular being in a dyadic relationship was found to be protective against alcohol dependence in all these surveys. This study found, as in the US (Wu & Ringwalt, 2004), that having another drug dependence is positively related to alcohol dependence. However, the US study found education related as well, which did not occur in the Australian sample. This could be due to differences in how comparisons were made on the basis of education in the two studies. Wu and Ringwalt (2004) used ≥ 16 years of education as the comparison which would be approximately equivalent to the Bachelor's degree used in this study, but they compared it with those who received 11 or less years of education separately from those receiving 12-15 years of education and the difference was found with the lower level of education. In this Australian study qualifications rather than years of education were obtained which yielded a list of skill levels reached, but not enabling easy extraction of equivalent categories to those used in the US study.

Unlike the Netherlands study (Bijl, Ravelli, & van Zessen, 1998), the current study did not find urban-rural status to relate to dependence. This may be due to the fact that the rural category included large regional centres as well as rural and remote areas which may have reduced observable differences. Australia is a very urbanised country and few people live in small villages as they do in Europe and the US. This would reduce the power of this present study to find a difference. The Netherlands study however, agreed with the Australian findings that having a disability is related to current alcohol dependence. The increased odds of having a mental or other drug disorder comorbid with alcohol dependence found in this study fits with findings from the UK (Paykel, Abbott, Jenkins, Brugha, & Meltzer, 2003) and US (Grant et al., 2004b).

When the prevalences of individual criteria were compared between males and females, the only criterion for which an unpredicted prevalence was found was for females with MAJOR ROLE. They were over-represented on this criterion. Given the expected ratio of male to female of approx 2:1, a ratio of approx 3:2 was found. Thus, females are more likely to endorse the notion that they have failed to fulfil their major role obligations. This may be due to the fact that women have greater child care responsibilities and their failure to fulfil this role is less socially acceptable than a male not turning up for work on occasion. It may also relate to gender differences in willingness to admit such a failure (Dawson & Grant, 1993). As it is in the wrong direction, this difference in prevalence would not account for any overall gender differences in prevalence of alcohol abuse.

When age groups are compared on prevalences of criteria, both TOLERANCE and CUT DOWN showed significant differences across age groups. When expected values are calculated it is clear that TOLERANCE is over represented in the 18-24 year group and under represented in the 35+ age groups. This makes intuitive sense as it would be expected that people are still building up their tolerances at younger ages. For CUT DOWN, virtually the opposite is the case where it is under represented in the under 35s and over represented in the older age groups. Again, this appears logical because older people are likely to be experiencing the physical and social

impacts of heavy drinking which may make them more inclined to attempt to give up drinking. Social pressure to drink heavily may not be as great in older people who would normally also have heavier family and work responsibilities. Overall, as the prevalences of the two variables work in opposite directions in the younger compared with the older age groups, the higher prevalence of alcohol dependence in the younger age group cannot be explained by differential prevalences of particular criteria.

Although overall rates for individual criteria are not given in the US study by Harford et al. (2005) it is clear, when comparing the male and female prevalences of criteria separately, that they are quite dissimilar between the two countries (see the Appendix to this chapter). Although TOLERANCE is similar for both countries, in Australia, LARGER and CUT DOWN are far greater than in the US, and TIME SPENT much less. It should be remembered that the US study included 12-17 year olds as well. As this age group tends to drink more than average this should inflate the US figures. When comparing the prevalences of dependence criteria in the two countries, the Australian prevalences (with no 12-17 year olds) tend to be on average much higher than the US; yet they have equivalent dependence rates. Two possible reasons for this are that there may be more people in Australia with one or two symptoms (so-called diagnostic orphans, Hasin & Paykin, 1998) which would not give them a diagnosis; and dependent individuals in Australia may have higher number of alcohol symptoms per capita. This would need further research to clarify.

No abuse criterion had more than 1.6% prevalence in the Australian sample, whereas in the US sample, HAZARD rated 5.4%. The Appendix to this chapter reveals that most of this criterion falls in the 18 to 29 year age group, so inclusion of the 12-17 year olds would have had little impact on these figures. Thus the considerably higher prevalence of abuse in the US (4.6%, Grant et al., 2004a) compared with Australia (1.9%) can be accounted for largely by the high prevalence of HAZARD in that country. Although this would require more thorough investigation, this difference may be due to different workplace constraints and drink driving rules in the two countries.

In summary alcohol use disorders are high in Australia and the prevalence of dependence is comparable to that in the US, UK and the Netherlands. This is much higher than in the southern European countries for which we have data (WHO World Mental Health Survey Consortium, 2004). The notion of 'drinking to get drunk' appears to be a long-standing tradition – especially in young males in these countries - and the research also suggests that young women are catching up (Maxwell, 2003; Zilberman, Tavares, & el-Guebaly, 2003). It is of interest that different criteria appear relevant in Australia compared with the US which raises questions about the cross-country comparability of these diagnoses (Maxwell, 2003; Teesson, Baillie, Lynskey, Manor, & Degenhardt, 2006).

The finding that abuse criteria are much less prevalent than dependence criteria suggests they may reflect a more severe form of disorder. This is offset to some extent by the fact that an individual has to meet only one abuse criterion to receive a diagnosis (as well as not being dependent), whereas a diagnosis of dependence requires a minimum of three criteria. Also, dependence is associated with high levels of psychiatric comorbidity which supports the notion that dependence itself may be the more severe disorder. Whether dependence precedes the other psychiatric disorders or is a consequence is still the subject of research (Degenhardt, Hall, & Lynskey, 2003; Teesson & Proudfoot, 2003).

It is of concern that alcohol use disorders do not relate independently to self-rated mental or physical disability. If an individual does not perceive him or herself as disabled then they are unlikely to seek help. This means that people with an acknowledged psychiatric illness will not see the need to moderate their behaviour or take the necessary steps to receive the treatments they need to lead healthy lives. However, as indicated in Chapter 2 the current definitions of alcohol disorders may not be optimal and implementation of a more valid indicator of disorder could bring about greater concordance with individual perceptions of disability. Furthermore, treatment seeking is only likely to occur with a perception of need for treatment through identifying the presence of a disability. In order to further clarify this issue, Chapters 4 and 5 are devoted to exploring treatment seeking behaviour of those with alcohol dependence.

Appendix Chapter 3

App Ch 3 Table 1: Prevalence of alcohol use disorder criteria in age and gender sub-groups in the US National Household Survey on Drug Abuse (Harford, Grant, Hsiao-ye, & Chiung, 2005). Comparison with total prevalences of criteria for Australia (NSMHWB)

Criterion	Gender	US Data (Harford, Grant, Hsiao-ye, & Chiung, 2005) Age Group						Australian data
		12-17	18-23	24-29	30-49	>=50	Total	Total
Tolerance	M	7.1	24.4	14.0	7.6	4.5	8.9	10.2
	F	7.2	14.5	7.0	4.7	1.7	5.1	4.7
Withdrawal	M	1.2	3.3	2.0	2.0	0.5	1.6	3.6
	F	1.2	1.7	0.9	0.8	0.4	0.8	1.3
Larger	M	0.8	3.6	3.5	2.7	1.3	2.2	15.2
	F	1.0	2.6	1.1	1.7	0.7	1.3	7.0
Cut Down	M	1.0	3.2	2.8	3.4	1.5	2.5	12.7
	F	1.1	2.1	1.3	1.9	1.0	1.5	5.1
Time Spent	M	5.4	23.7	16.1	9.0	3.9	9.2	2.6
	F	6.0	14.6	7.1	5.3	1.5	5.1	1.0
Give Up	M	1.5	6.7	3.8	3.0	0.9	2.6	1.3
	F	1.7	3.6	1.8	1.4	0.2	1.3	0.3
Continue	M	0.9	4.7	3.5	3.2	1.5	2.6	4.2
	F	1.2	3.2	1.5	2.1	0.7	1.6	1.8
Major Role	M	1.4	5.7	3.0	1.9	0.4	1.9	2.1
	F	1.9	2.9	0.9	0.8	0.1	0.9	0.9
Hazard	M	3.2	14.5	10.8	5.3	1.8	5.4	2.6
	F	3.0	7.2	3.9	2.0	0.5	2.2	0.6
Legal	M	0.9	3.8	1.4	1.0	0.3	1.1	1.5
	F	0.6	1.0	0.3	0.3	0.1	0.3	0.2
Social	M	0.9	3.9	2.7	2.5	0.9	2.0	1.3
	F	1.4	1.8	1.1	1.1	0.4	1.0	0.5

CHAPTER 4: THE IMPACT OF ALCOHOL DEPENDENCE ON SPECIALIST SERVICE USE IN AUSTRALIA

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Introduction

Chapter 3 revealed that, as in other western countries, alcohol dependence in Australia is most common among young males and that those with comorbid anxiety, depression or other drug disorders are also more likely to be alcohol dependent. The review in Chapter 1 has shown that effective treatments are available for alcohol problems. The use of brief interventions in primary care, through both regular check-ups by GPs and accident trauma units in hospitals can be effective and are likely to be cost-effective, especially for those less disabled by their alcohol misuse. The use of pharmacotherapies conjointly with effective psychotherapies has obtained positive outcomes and may prove more useful for those for whom brief interventions do not suffice and who are more treatment-resistant. Individual cognitive behavioural therapy (CBT) to assist with coping/resistance, social skills, relapse prevention and comorbid depression has also been found to be effective. One large study (Project MATCH Research Team, 1997) found that manualised treatments using CBT, motivational enhancement and twelve step facilitation were equally effective. Family therapy in the form of the community reinforcement approach has some support from the research and may prove helpful in actually getting problem drinkers to treatment (Proudfoot & Teesson, 2000).

However, research to date has found that few people with alcohol use disorders seek help for their problems. The national comorbidity survey in the US found that only 13.5% of those diagnosed with alcohol dependence in the past 12 months had sought help (Kessler et al., 1999), while the Netherlands-based NEMESIS study found that 17.5% of those with alcohol use disorders sought professional help (Bijl & Ravelli, 2000), and when comorbid conditions, sex and age were controlled, alcohol use disorders did not predict usage of care at all.

Considering the physical, psychological, interpersonal and public damage that alcohol dependence can cause, it is important to understand why people with such problems do not seek treatment. This chapter analyses data from the NSMHWB to answer the following questions:

1. What are the correlates of treatment seeking in the Australian population, and is alcohol dependence a correlate of service use?
2. If people with alcohol dependence seek help for their mental health problems, who do they go to and why? Were they satisfied with their treatment?
3. For people with alcohol dependence who wanted help but did not get it, what treatments did they want and what were the barriers to treatment?

The study flow chart in the Method section summarises these aims. The focus is on DSM-IV alcohol dependence because this has been found to be a reliable unitary construct whereas alcohol abuse has doubtful reliability and validity (see Discussion, Chapter 2).

Summary of Prior Research on Models of Treatment Seeking

Research on models of treatment seeking for alcohol use disorders has been carried out in clinical populations, small community samples and, more recently, in large epidemiological surveys. Chapter 1 provides an in depth review of the research that has been carried out to date in all areas. This review found that research in clinical samples has tended to be poorly specified and non-standard in methodology. Thus any conclusions from such research need to be viewed with caution. Community surveys provide better data using improved methodology, yet can only be applied to the local communities on which they are based. Finally, epidemiological surveys from other countries and based on population-wide research, provide good quality data about which factors propel people towards treatment for their alcohol problems in those countries. Such studies tend to be well-specified and use high standard methodology incorporating sophisticated statistical techniques.

Overall this research has found that personal predisposing variables such as age, gender, ethnicity, employment status, education level, marital status and attitudes can impact treatment seeking for alcohol problems. Enabling factors found to impact treatment seeking were income level, urban-rural status, social pressure, ease of accessing care and GP attitudes. Need factors such as perceived severity of illness and actual severity of illness were also found to affect whether a person seeks help.

The Present Study

Whilst overseas epidemiological studies have reported on prevalence and correlates of treatment seeking for alcohol use and other mental disorders, this present study is the first to report such data on DSM-IV alcohol dependence in Australia. It examines similar data from the Australian NSMHWB but also provides unique information on disability measures which Bijl and Ravelli (2000) suggested may have a greater bearing on treatment seeking than simply having a diagnosis of an alcohol use disorder.

Method

Sampling and Measures

The Australian NSMHWB is described in the Method section in Chapter 2. Apart from data on DSM-IV diagnoses for alcohol and drug use and anxiety and mood disorders, other measures of relevance to the present study include the presence of physical illness, perceived physical and mental disability, days out of role due to illness in the past month, service use for a mental health problem in the past 12 months, as well as relevant demographic variables.

Treatment seeking was assessed in terms of type of service accessed and type of treatment received (or wanted). Firstly individuals were asked if they had any hospital admissions for mental health problems in the past 12 months. This included admission to a drug and alcohol unit in a hospital. They were then asked if they had seen any of the following for a mental health problem in the past 12 months: general practitioner (GP), radiologist, pathologist, physician/specialist, surgeon, psychiatrist, psychologist, social/welfare worker, drug and alcohol counselor, other counselor, nurse, mental health team, chemist, ambulance officer, or another professional. Because numbers within many categories were low, for the purposes of this study these were collapsed into three categories:

- GP
- specialist alcohol/mental health (hospitalizations, psychiatrist, psychologist, social worker, drug counselor, mental health team)
- other

If individuals indicated that they received help, they were then asked which type of help they received from the following categories:

- Information about mental illness, its treatments, and available services
- Medicine or tablets
- Psychotherapy - discussion about causes that stem from your past
- Cognitive behaviour therapy - learning how to change your thoughts, behaviours and emotions

- Counseling - help to talk through your problems

- Help to sort out housing or money problems

- Help to improve your ability to work, or to use your time in other ways

- Help to improve your ability to look after yourself or your home

- Help to meet people for support and company

- Other (giving an example)

For the purposes of this report these were combined into five categories:

1. information;
2. medicines;
3. counseling including all psychotherapies;
4. practical issues (housing, money); and
5. self-improvement (work, self-care, meeting people)

Those who did not seek help were asked if they wanted help for a mental health problem and, if so, what type of help they wanted. Types of help were listed as above. They were also asked, if they wanted help, why they did not get help.

Data Analysis

Prevalence estimates and logistic regressions were adjusted for sampling through the use of balanced repeated replications (BRR) weightings using SAS-callable SUDAAN (see Method section in Chapter 3). It should be noted that where sample sizes became small the logistic regression output carried a warning about the instability of findings and was accompanied by large confidence intervals for the odds ratios. Where this has occurred a comment is made in the relevant section of the results.

Confidence limits of proportions and tests of differences of proportions were carried out using the methods recommended by Newcombe and Altman (2000).

Study Flowchart

Figure 4.1 provides a summary flowchart of the NSMHWB information that this study will present.

Figure 4.1: Flowchart of study design
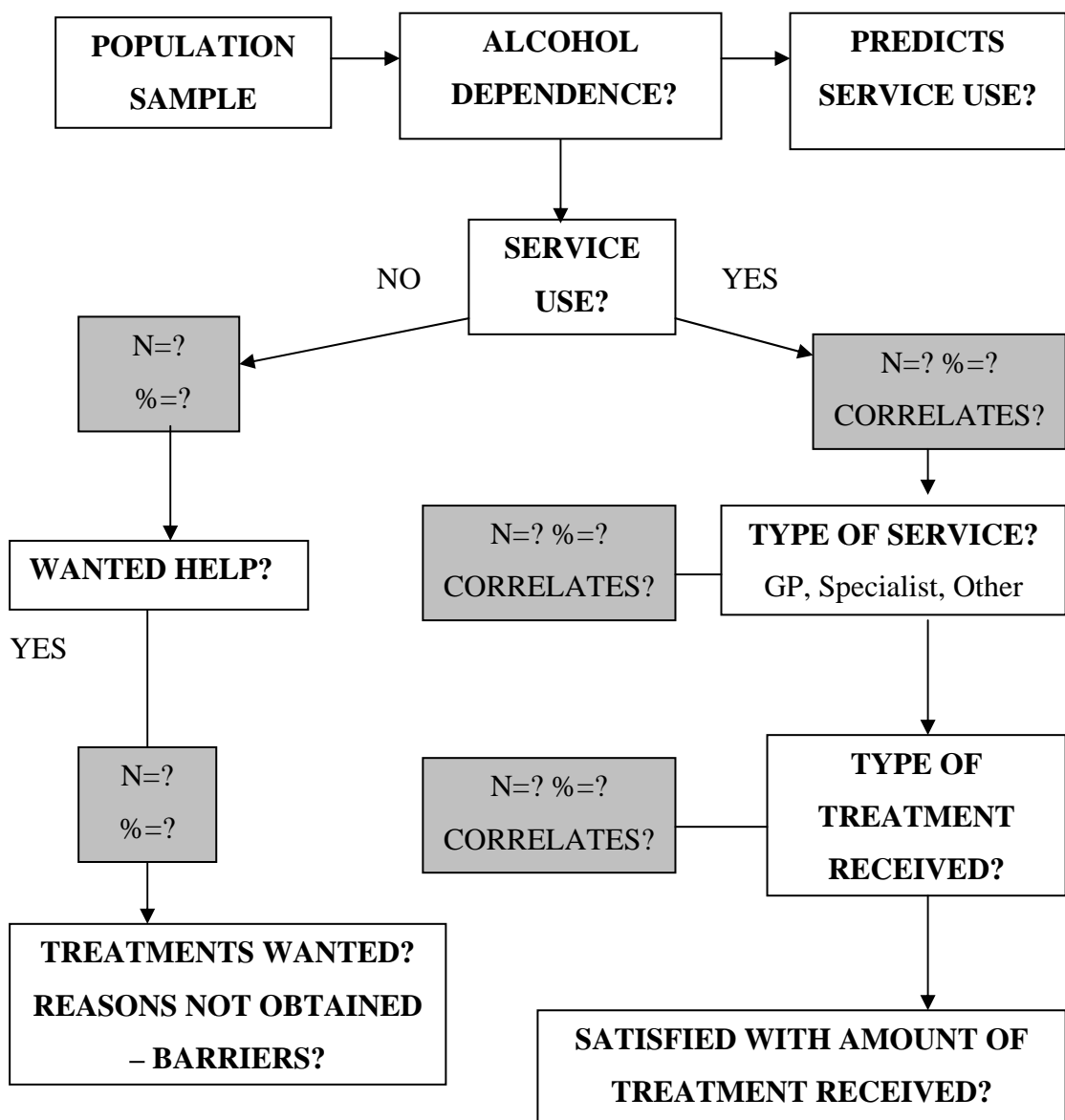
Results

Correlates of Treatment Seeking in the Whole Sample – Does Alcohol Dependence Predict Service Use?

Overall 1321 (11.05%) individuals sought professional help for their mental health problems in the past 12 months. Correlates of treatment seeking for any mental disorder were identified using logistic regression. The influence of type of alcohol diagnosis and level of dependence on treatment seeking were also explored. Level of dependence was defined as high if the individual met 4 or more criteria for dependence. A further variable examined was whether any social, physical or psychological variables were affected by drinking. This was measured by identifying all those who met either criterion 6 for dependence (important social, occupational or recreational activities given up due to drinking) or criterion 7 (continued drinking despite known physical and psychological problems associated with drinking). These analyses used the variables listed in Table 4.1 plus either of alcohol abuse, alcohol dependence, any alcohol use disorder (i.e. abuse or dependence), level of dependence (high vs. not) or significant social, psychological or physical harm due to drinking. Table 4.1 lists these results using alcohol dependence.

Males were about half as likely to seek any service for a mental disorder. Those aged between 18 and 54 were significantly more likely than the over 55 year group to use services for their mental health problems, with the 35 to 54 year age group being most likely to seek such help. Being a University graduate meant an individual was more likely to seek such help when compared with those with lesser education. Having an affective, anxiety or any drug disorder meant higher service use; while having a comorbid physical disorder did not. Amongst the disability measures, moderate to severe SF12 mental and physical disorders each correlated significantly with service use whilst days out of role did not.

Table 4.1: Correlates of treatment seeking for any mental disorder

Variables in the Equation	Odds Ratio	95.0% Confidence Interval for Odds Ratio	
		Lower	*Upper*
Sex (male cf female)**	0.55	0.41	0.73
Age (cf 55yr+ group) **			
18-34yr	1.47	1.09	1.99
35-54yr	2.18	1.66	2.87
Less than Bachelor Degree** (cf Bach degree)	0.58	0.42	0.79
Not married/de facto	1.19	0.91	1.56
Employment (cf employed)			
Part- or Full-time Unemployed	0.80	0.38	1.67
Not in Workforce	1.07	0.84	1.36
Urban Dwelling	0.82	0.56	1.19
Any Affective Disorder**	8.50	6.36	11.34
Any Anxiety Disorder**	5.83	3.28	10.35
Any Other drug disorder**	2.38	1.37	4.15
Any Physical Condition	1.20	0.95	1.52
SF-12 Mental Disability (moderate-severe)**	2.55	1.91	3.42
SF-12 Physical Disability (moderate-severe)*	1.38	1.04	1.84
5 or More Days Out of Role	1.27	0.97	1.66
Alcohol Dependence Diagnosis	1.73	0.78	3.80

* p<.05; ** p<.01

Having a diagnosis of alcohol dependence did not predict service use. Similarly, when alcohol abuse, any alcohol use disorder or level of dependence was substituted for dependence in the logistic regression, they did not predict treatment-seeking (Table 4.2). However, the measure of social, psychological and physical harms did significantly relate to treatment seeking.

Males and females were analysed separately to determine if different variables are more relevant to treatment seeking for mental health problems for either group. Very few differences were found and those that were had marginal significance levels. Similar to the total sample, none of the alcohol measures apart from social, psychological and physical harms predicted treatment seeking for each sex considered separately.

Table 4.2: Alcohol use disorders, level of dependence and treatment seeking in past 12 months

Alcohol Use Variable	Odds of Predicting Treatment Seeking	95%Confidence Limits for Odds Ratios	
		Lower	*Upper*
Alcohol Abuse	1.03	.48	2.22
Any Alcohol Use Disorder	1.38	.67	2.84
Alcohol Dependence	1.73	.78	3.80
Level of Dependence (>3 criteria)	1.84	0.53	6.40
Any Known Social, Physical or Psychological Harm	2.36	1.45	3.84

Prevalence and Correlates of Treatment Seeking Amongst Those with Alcohol Dependence

Prevalence of treatment seeking for those with alcohol dependence

Table 4.3 lists numbers and percentages (prevalences) of those with alcohol dependence who sought some form of treatment for their mental health problem/s in the past 12 months.

A total of 147 of the 437 with alcohol dependence sought help for their mental health problems in the past 12 months. Proportionately, about half the number of males with dependence sought help, compared with females. There were no clear trends in age although the 35-54 year group appeared to be more likely to seek help than the older and younger age groups. There was no trend for education and marital status while slightly less of the employed group tended to seek help. Having comorbid anxiety or affective disorder and, to a lesser extent a physical disorder were positively related to help seeking, while having a comorbid drug disorder was not. Moderate to severe mental or physical disabilities or spending 5 or more days out of role were associated with increased service use, as was, to a lesser extent, having 4 or more dependence symptoms.

Table 4.3: Number (prevalence) of those with alcohol dependence seeking any care for their mental health problems in the past 12 months

Variable	Sub-Group	Number in Sub-group with Dependence (weighted %)	Number Seeking Help in Sub-group (weighted %)	Weighted Percentage within Help-Seeking group (N=147)
Sex	Female	153 (2.3%)	71 (44.1%)	42.6%
	Male	284 (6.1%)	76 (23.6%)	57.4%
Age	18-34yr	232 (7.0%)	57 (22.6%)	44.8%
	35-54yr	166 (3.6%)	76 (40.8%)	47.5%
	55yr or more	39 (1.4%)	14 (30.5%)	7.7%
Highest Qualification	≥Bach Deg	56 (3.7%)	17 (29.1%)	13.3%
	<Bach Deg	381 (4.2%)	130 29.5%)	86.8%
Mar Status	Marr, De Facto	159 (2.5%)	54 (32.2%)	43.7%
	Single, Sep, Wid, Div	278 (7.1%)	93 (27.6%)	56.3%
Employment Status	Employed	293 (4.7%)	85 (26.4%)	65.2%
	Short- or Long-Term Unemployed	49 (9.8%)	19 (34.7%)	11.7
	Not in Workforce	95 (2.2%)	43 (39.0%)	23.2%
Urban-Rural Status	Urban	308 (4.2%)	106 (30.5%)	77.6%
	Non-Urban	129 (3.8%)	41 (26.4%)	22.5%
Comorbidities	Any Affective Disorder	824 (6.7%)	84 (63.7%)	53.1%
	Any Anxiety Disorder	676 (5.6%)	78 (71.8%)	48.0%
	Any Other Drug Disorder	83 (27.9%)	30 (30.4%)	20.0%
	Any Phys Dis	178 (4.3%)	76 (38.0%)	51.7%
Disability	SF-12 Mental (Mod-Sev Dis)	136 (10.4%)	81 (50.6%)	50.9%
	SF-12 Physical (Mod-Sev Dis)	79 (4.0%)	41 (49.6%)	28.2%
	≥5 Days Out of Role	78 (6.2%)	47 (52.0%)	26.5%
Level of Dependence	Met 4 or More Criteria	217 (100%)	96 (38.6%)	65.1%
	TOTAL GROUP	437	147 (29.5%)	100%

Correlates of treatment seeking for those with alcohol dependence

All the variables listed in Table 4.1 were placed into a logistic regression to determine, for those with alcohol dependence, which correlated with treatment seeking when the other variables were held constant. Overall males with alcohol dependence were less likely to seek help for their mental health problems than were females (OR=0.46; 95%CI=0.22-0.95). The only other variable to predict help seeking for those with alcohol dependence was the presence of a comorbid affective disorder (OR=3.31; 95%CI=1.43-7.66). Further analyses were done of the effects of grouping variables and it was found that sociodemographic variables as a group did not predict treatment seeking, but groupings of the three comorbidity variables and three disability variables did (p<.01 and p<.02 respectively). It should be noted that when sample sizes became smaller the logistic regression output from SUDAAN carried a warning about the instability of findings. For this sub-group – those with dependence who sought treatment (N=147) - such an error message appeared. It is at this point of breaking down the sample into smaller and smaller sub-groups that large confidence intervals for the odds ratio appear.

These logistic regressions were repeated for males and females separately to ascertain if different variables were important in help seeking for male and female alcohol dependent individuals. These found that having a comorbid anxiety disorder was predictive of service use for females but not males (OR=9.82; CI=1.02-94.06); having a comorbid affective disorder predicted service use for males but not females (OR=4.85; CI=1.23-19.15); unemployed females were less likely to seek help than employed females (OR=0.19; 95%CI=0.04-0.97); and having a comorbid physical disorder increased the chances of help-seeking for mental health problems amongst males (OR=5.38; 95%CI=1.40-20.68). Again the large confidence intervals serve as a warning to consider these results with some caution. This warning applies to all further findings in this Results section.

Further logistic regressions were carried out on the two comorbid groups: alcohol dependence with affective disorders and alcohol dependence with anxiety, to determine whether the comorbid groups were behaving differently from the whole alcohol dependent group. The only significant correlate of treatment seeking was

education (having a higher degree) within the comorbid affective and alcohol dependent group (OR=16.7; CI=3.03-100.0).

The following sections summarise findings regarding the sub-groups of those with dependence who received help, and those who did not obtain help.

Those with Alcohol Dependence Who Sought Help: Services Used, Treatments Received and Satisfaction

Type of services used

Participants were asked whether they had stayed at least overnight in a public or psychiatric hospital or a drug and alcohol ward for their mental health problems. Only 12 of those with alcohol dependence answered 'yes' to this, so that inpatient service use could not be used as a category of service use due to this low number. They were also asked if they had seen any of the following for a mental health problem in the past 12 months: GP, radiologist, pathologist, physician/specialist, surgeon, psychiatrist, psychologist, social/welfare worker, drug and alcohol counsellor, other counsellor, nurse, mental health team, chemist, ambulance officer, other professional. They were then asked about the type of treatments received if they had indicated that they had used services.

The data on types of services were collapsed into three categories: GP; specialist mental health (hospitalisations, psychiatrist, psychologist, social worker, drug counsellor, mental health team); and other, which included all other professions consulted.

Of the 147 with alcohol dependence who sought any help, 108 (21.8% (weighted %) of those with dependence) saw a GP, 68 (12.1%) saw a mental health specialist and 54 (10.3%) saw another professional. Correlates of service type were determined using logistic regression, and having a university degree and not being in the workforce (i.e. neither employed nor unemployed) were significantly correlated with seeking specialist services for mental health problems. No variable was found to significantly correlate with either of the other two types of service sub-categories.

Treatments received

For the purposes of analysis treatments received were collapsed into four categories: information, medicines, psychological (psychotherapy/CBT/counseling), and self-care/other. There were 48 (8.9% (weighted %) of those with dependence) who received some sort of information, 94 (17.6%) who received medicines, 90 (17.5%) who received psychological interventions and 41 (7.5%) in the 'other' category. There were very few in either the 'information' or the 'other' group who did not also seek either medical or psychological help (n=3 and 4 respectively). Logistic regressions were carried out within each treatment category to ascertain whether any variables predicted the different types of treatment received. No variable predicted any of the four types of interventions.

Satisfaction with treatment

Participants were then asked whether they felt they had got enough of each type of treatment received. Unfortunately this question was not asked of all in the 'other/self-care' category, so that results for the first three categories only are available for the satisfaction question. It was found that 32 who received information were satisfied with how much of this sort of help that they got (weighted proportion, p=0.66; 95% CI: 0.50-0.79); 82 got enough medicines (p=0.89; 95% CI: 0.80-0.94); and 63 got enough of their psychological intervention (p=0.76; 95% CI: 0.65-0.84). Proportions satisfied were compared amongst the three treatment categories, using Bonferroni adjustments for multiple testing. Table 4.4 summarises differences in proportions on this satisfaction measure along with confidence intervals for these differences (Newcombe & Altman, 2000). Significantly higher proportions reported satisfactions with medicines received than information received. There were no differences in satisfaction between information and psychological help received nor between psychological and medical help received.

Table 4.4: Differences in proportions satisfied with three types of treatment

Comparison	Difference in p-values	Lower Confidence Interval for Difference	Upper Confidence Interval for Difference	Significance of Difference*
Information vs Medicine	.235	.045	.436	p<.05
Information vs Psychological	.103	-.099	.318	ns
Medicine vs Psychological	.132	-.017	.278	ns

* Bonferroni-adjusted

Those With Alcohol Dependence Who Did Not Seek Help: Type of Treatment Wanted and Reasons for Not Seeking Needed Help

During the administration of the National Survey interview, participants were classified as to whether they had a likely mental health diagnosis and those that did were also asked why they did not get the different types of help. This meant that 260 of the 290 with dependence who did not get help were asked whether they wanted a particular type of help. Only 66 wanted any type of help. This represents 23.4% of those asked. The only variable to predict wanting but not getting treatment was being in the 35 to 54 year age group. More broadly, sociodemographic variables as a group and comorbidity variables as a group were predictive of this unmet need. Disability variables as a group were not.

Type of treatment wanted

Of the 66 respondents with alcohol dependence who wanted but did not receive some form of help for their mental health problems, 27 (38.1%) wanted information, 14 (21.4%) wanted medicines, 39 (62.4%) wanted psychological help, 27 (43.2%) wanted help with practical issues and 18 (23.2%) wanted help with self-improvement. Pairwise comparisons were made between proportions wanting each type of help with each other type of help using the technique described by Newcombe and Altman (2000) who have devised a widely-used approximation method for calculating CIs of proportions. The method also took into account sampling as well as Bonferroni adjustments for number of comparisons done. Table 4.5 summarises the results of these pairwise comparisons.

A significantly greater proportion wanted (but did not receive) psychological help compared with medical, information and self-improvement types of help. No other difference was significant.

Table 4.5: P-values for wanting but not receiving the treatment (diagonal) and differences in p-values for pairwise comparisons with confidence intervals for the differences.

	Information	Medicines	Psychological	Practical issues	Self-Improvement
Information	**.381**	.167 (-.084 to .392)	.244* (.000 to .450)	.051 (-.206 to .300)	.149 (-.090 to .367)
Medicines		**.214**	.410* (.140 to .612)	.218 (-.021 to .426)	.018 (-.189 to .223)
Psychological			**.624**	.193 (-.090 to .441)	.393* (.118 to .600)
Practical Issues				**.432**	.200 (-.029 to .403)
Self-Improvement					**.232**

* p<.05, Bonferroni-adjusted

Analysis of reasons for not seeking needed treatments

Where participants indicated that they did not seek help but felt they needed it, they were asked for their reasons. These are summarised in Table 4.6. Percentages are of all 66 who wanted but did not get help and are weighted for sampling bias.

The proportions of males and females who 'preferred to manage self' were .58 each, so that there was no difference between males and females who did not receive but wanted help and chose to manage themselves. Numbers in the other reason categories were too low to analyse further.

Table 4.6: Reasons for not seeking needed treatment

	TYPE OF HELP					
REASON	**INFORM -ATION**	**MEDI- CINES**	**COUNS/ PSYCH**	**PRACTI -CAL**	**SELF IMP**	**ANY HELP**
preferred to manage self	16 (25.7%)	11 (15.7%)	23 (39.6%)	11 (20.6%)	6 (8.0%)	36 (58.3%)
thought nothing would help	5 (5.9%)	0 (0.0%)	6 (6.8%)	4 (4.1%)	3 (2.3%)	8 (9.3%)
didn't know where to go	3 (3.1%)	0 (0.0%)	4 (4.5%)	5 (5.1%)	4 (4.1%)	8 (9.4%)
afraid to ask/or what others would think	8 (11.1%)	1 (2.4%)	9 (14.0%)	7 (10.6%)	5 (7.6%)	12 (17.1%)
couldn't afford it	3 (4.4%)	5 (9.8%)	7 (11.4%)	5 (8.5%)	4 (7.0%)	10 (16.9%)
asked but didn't get help	3 (4.0%)	1 (0.5%)	4 (5.8%)	2 (2.5%)	2 (1.4%)	5 (6.3%)
got help from another source	0 (0.0%)	1 (0.9%)	1 (3.5%)	4 (6.1%)	3 (3.5%)	6 (10.5%)
total wanting this type of help	27 (38.1%)	14 (21.4%)	39 (62.4%)	27 (43.2%)	18 (23.2%)	66 (100.0%)

The above results can be summarised as flow-charts which relate to the flow-chart of the study presented in the Method Section. Summary flow-charts are contained on the following pages. Figure 4.2 summarises results regarding prevalence and correlates of dependence and types of service used; Figure 4.3 summarises prevalence data on type of treatment received as well as relevant satisfaction details; and Figure 4.4 presents a summary of prevalence data regarding types of treatment wanted and not received amongst those who did not seek help.

Figure 4.2: Summary of results regarding prevalence and correlates of dependence and types of service used
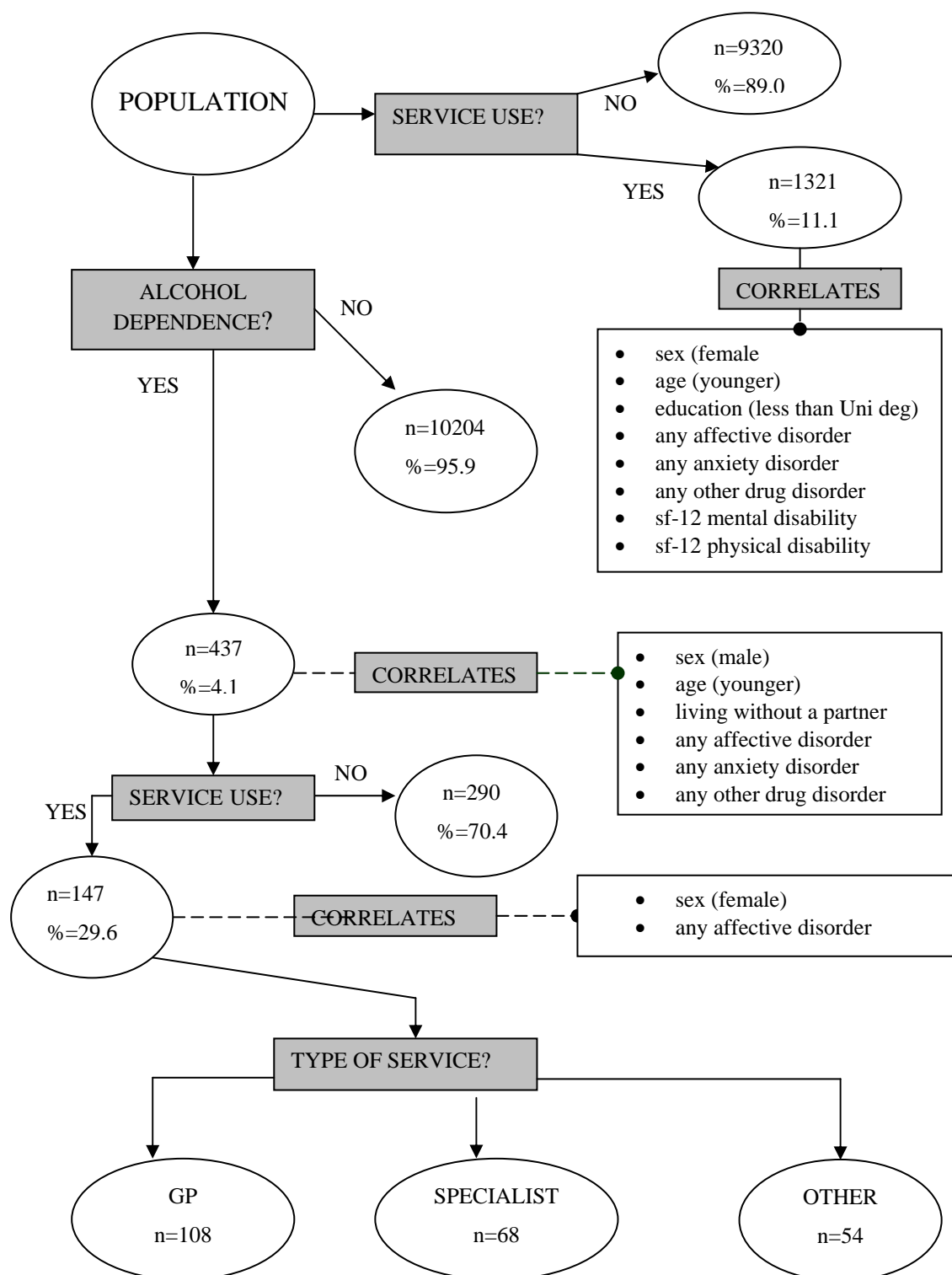
Figure 4.3: Prevalence of type of treatment received and satisfaction
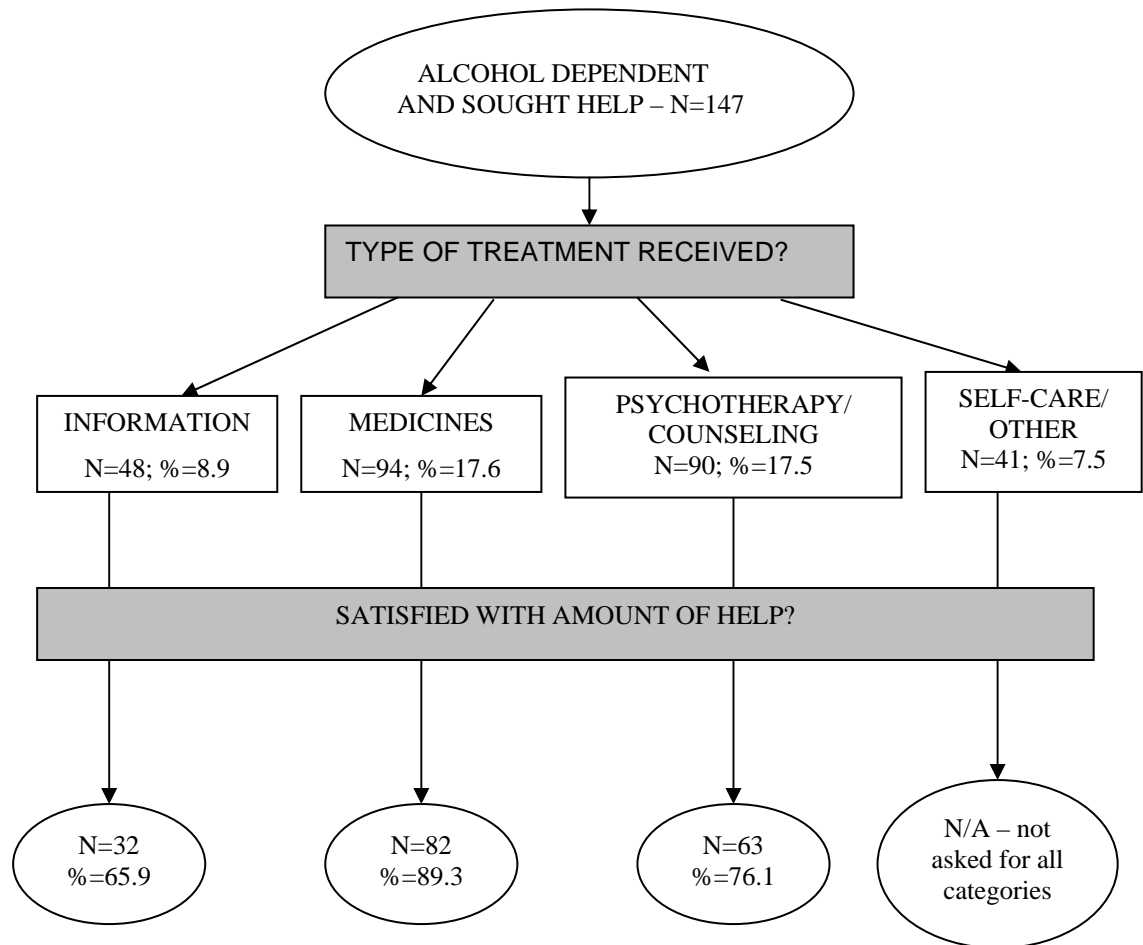
Figure 4.4: Treatment wanted and not received amongst those who did not seek help

ALCOHOL DEPENDENT & DID NOT SEEK HELP – ASKED IF THEY NEEDED EACH TYPE OF HELP – N=260

(*=% of those 260 asked but did not get help; **=% of those 66 who wanted help but did not get it

NEEDED ANY TYPE OF HELP
n=66; %=23.4*

SELF-IMPROVEMENT
n=18: %=23.2**

PRACTICAL ISSUES
n=27; %=43.2**

INFORMATION
n=27; %=38.1**

COUNSELING/
PSYCHOTHERAPY
n=39; %=62.4**

MEDICINES
n=14; %=21.4**
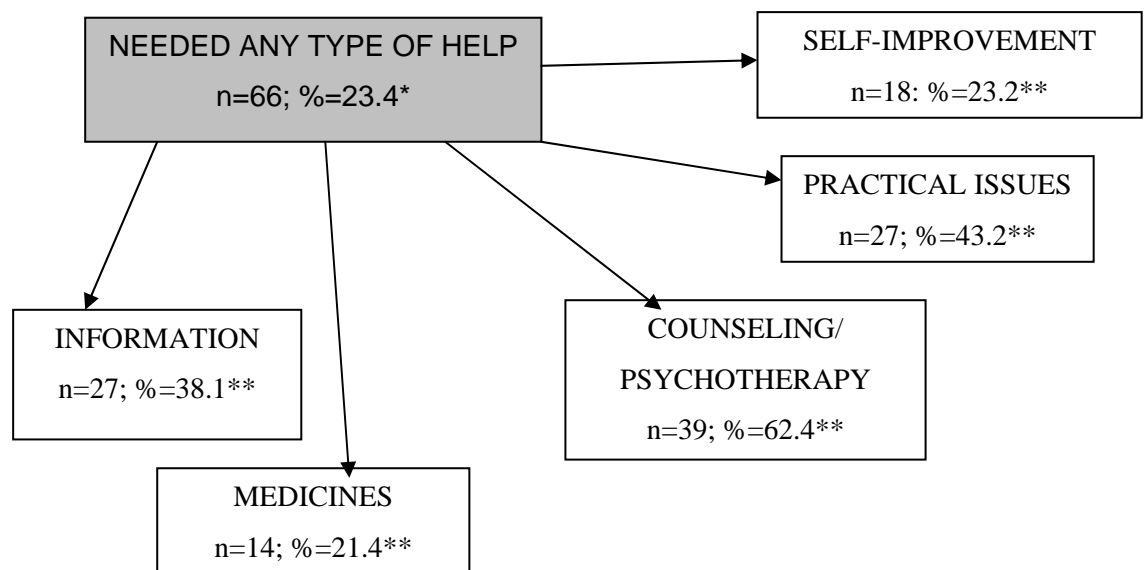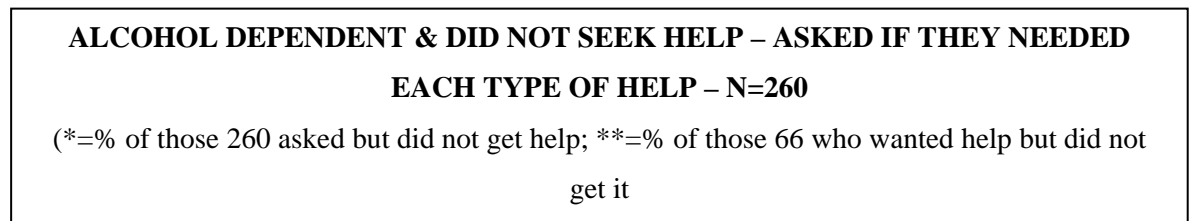
Discussion

Correlates of service use for any mental disorder

Consistent with the findings from the Netherlands-based NEMESIS study (Bijl & Ravelli, 2000), having an alcohol use disorder (dependence or abuse) did not predict treatment seeking in this Australian sample. Similarly level of dependence as measured by number of criteria met did not predict service use; but having social, psychological or physical problems associated with alcohol use did predict service use. This latter finding fits with results from smaller community-based surveys (Bannenberg, Raat, & Plomp, 1992; Hingson, Mangione, Meyers, & Scotch, 1982).

Age predicted treatment seeking, with the oldest group (55+ years) being least likely to seek help for a mental health problem. This result fits with predictions made from prior epidemiological research, but not with those made from clinical populations and small community surveys. These clinical studies tended to be methodologically weak and restricted in the applicability of their findings. The relationship between age and service seeking is not linear, as it appears that those who seek help most are in the middle age groups (35-54 years).

The findings that treatment seeking is positively related to being female, better educated and having comorbid psychiatric disorders, fits with prior research (Bijl & Ravelli, 2000; Bland, Newman, & Orn, 1997; Wu, Kouzis, & Leaf, 1999). Contrary to previous research, having a comorbid physical condition did not predict treatment seeking and neither did employment status nor living in an urban setting.

The fact that the SF-12 disability measures predicted treatment seeking for any mental health problem indicates that these measures provide independent and relevant information to models which attempt to predict treatment seeking in the general population.

Correlates of service use among the alcohol dependent group

The only single variables correlating with service use for those with dependence were being a female and having a comorbid psychiatric disorder. If disability measures were grouped in the regression analysis they predicted service use, but at a low level. It should be noted that confidence intervals were large in these analyses resulting from instability of findings due to low numbers. So, these findings plus those that males with affective disorders and females with anxiety disorders are most likely to seek help, provide an interesting direction for further research, but can only be considered as trends. Similarly, unemployed females with alcohol dependence show a trend to seek more help, as do males with a comorbid physical disorder.

Type of service wanted

Less than 30% of those with alcohol dependence sought any help for their problems. This corroborates prior research suggesting that most people do not seek such help. Research in the US had suggested that men were more likely to seek specialist services but this did not hold in this Australian sample. However, research in the US tends to consider treatment for alcohol use disorders as synonymous with 'specialist treatment' whilst primary care treatments have not been subjected to the same research scrutiny. In this Australian sample, and amongst those with alcohol dependence who sought help, most saw a GP, but there was no difference between males and females in this behaviour. Chapter 5 examines further the relationship between alcohol dependence and GP service use in Australia.

The only variables to show a significant relationship with type of service were having a higher education and not being in the workforce, both of which tended to be over-represented in specialist services. The former finding fits with prior data from both large and small-scale studies reported in the literature. Again these findings can only be described as trends. It is possible that the better educated seek help more because they understand the importance of receiving treatment as well as being able to afford services which may not be government funded (e.g. psychological services). The over-representation in specialist services of those not in the work force may be due to the disabling effects of heavy alcohol use which could preclude a person from

working, yet require them to receive some specialist treatments which may be government funded.

Type of treatment received and satisfaction with treatment

Around 18% of those with alcohol dependence received a medical intervention and a similar number received some sort of psychological intervention. Approximately 7.5% received information but virtually all those who received information also received either medical or psychological help. It is not clear whether this information was part of a single intervention package or whether it was a separate source of help.

No variable was found to correlate with receiving any of the types of help. However, there were significant differences in satisfaction with the different types of help in that those in receipt of information were significantly less satisfied with the amount of help received than those who received medicines. There was also a trend towards those receiving psychological help being less satisfied with the amount of help received than those who received medicines. However, the large confidence intervals for the odds ratios suggest that these results may be unreliable.

Findings regarding those who did not receive treatment

The prediction that the large proportion would not think they needed help was borne out by the finding that only 66 of the 260 (23%) who were asked, said they needed any type of help. Wanting but not getting help was associated with the 35 to 54 year age group which fits with the above finding that this group tends to seek help for mental health problems in general – they are more likely to see themselves as needing help but equally likely as other age groups to be unable to obtain help. The fact that disability measures as a whole did not predict unmet need for help also fits with the finding that disability is not associated with a diagnosis of dependence; while comorbidity variables as a whole predicted unmet need and had been found to be associated with both dependence and treatment seeking in this study.

The most salient expressed unmet need was for psychological/counseling types of help. This fits with the earlier finding that most satisfaction is expressed for medical

interventions compared with psychological and information types of help amongst those who do receive help.

Although numbers are small, the breakdown of reasons for not seeking treatment (although believing they needed help) does show some interesting trends. Bearing out a prediction from the research literature was that the largest proportion of those in this group said that they preferred to manage themselves. However there were no differences between males and females on this variable. Believing that nothing would help did not appear to be a significant reason for not seeking help.

Conclusion

A majority of those with alcohol dependence did not seek help for their problems in the past 12 months. However, it should be noted that the present study considered only professional treatment seeking and may have excluded attempts to ameliorate alcohol use problems through non-professional or alternative treatment agencies. Also, it cannot be assumed that all those with alcohol problems should be offered treatment as many (up to 50%) remit without any treatment (Hall & Teesson, 2000). Furthermore, evidence from this study and related research has found that most individuals with alcohol use problems do not report disability nor see a need to seek professional help, and thus may be very resistant to attempts to treat them. However these latter characteristics may be operated upon through public health policy, education about the risks associated with alcohol use disorders (Degenhardt, Hall, Teesson, & Lynskey, 2000), as well as improvements in understanding of and access to effective treatments.

Those who have an alcohol disorder comorbidly with an affective or anxiety disorder are much more likely to seek help and to see themselves as disabled. GPs need to be aware of these high levels of comorbidity, and treatment services should be integrated so that individuals with multiple problems are most effectively treated (Proudfoot & Teesson, 2003). Also specialist services need to be aware of and treat comorbid alcohol problems. Most people attend treatment for other disorders such as anxiety and depression. It has been argued elsewhere that at least some anxiety disorders dissipate or disappear when a comorbid individual is abstinent from alcohol for an

extended period (Allan, 1995), which highlights the importance of assessment and treatment of alcohol disorders in specialist mental health services.

On the other hand disability tends to not be associated with a diagnosis of alcohol dependence and thus is unrelated to treatment seeking in this group. However, those who suffer significant social, psychological or physical harms due to their alcohol use are more likely to seek help when all other variables are controlled for. This fits with the suggestion by Bijl and Ravelli (2000) that the definition of dependence may not be useful for pinpointing a population at significant risk - either the criteria for dependence or the manner in which they are combined may need to be re-evaluated. Although Chapter 3 analyses the overall validity of current DSM-IV definitions, further research is warranted to ascertain the relationships of individual symptoms with disability and service use in order to clarify just how debilitating the misuse of alcohol is.

It is telling that the level satisfaction with the amount of treatment received was highest for those who received medical interventions. This is likely due to the emphasis on medical treatments within the Government-funded medicare system where medical interventions are largely subsidized, but psychological ones are not. This reasoning is supported by the significant gap between medical and psychological treatments wanted by those who did not receive help, yet felt they needed it. Thus there is a need at the system level to recognize and encourage non-medical interventions that have been shown to be effective for alcohol use disorders. Evidence suggests that there are good psychological treatments available (Chapter 1). Yet the system may not support their use to the same extent as medical interventions. Furthermore, with increased understanding of the neurobiology of dependence, newer medical interventions directed specifically at the substance abuse are being trialled and show potential for improvements in treatments (see Chapter 1). Thus there may be considerable room to improve both individual and system variables leading to increased treatment seeking and improved overall outcomes.

Although few people with alcohol use disorders seek help for their problems, many will be in contact with their GPs in any 12 month period – largely for physical

disorders (Britt et al., 2005) – and this provides an opportunity for the GP to detect mental health disorders. Chapter 5 analyses further the data from the NSMHWB to ascertain the impact of alcohol misuse on level of GP service use in order to identify the opportunities it may provide to detect mental health disorders such as those related to alcohol misuse.

CHAPTER 5: ALCOHOL MISUSE AND UTILISATION OF GP SERVICES IN AUSTRALIA - OPPORTUNITIES FOR INTERVENTION

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Introduction

Within models of pathways to care (Aday & Andersen, 1974; Goldberg & Huxley, 1980; Weisner & Schmidt, 1995) general practitioners (GPs) are the primary gatekeepers for referral to specialist services. More recently there has also been an increased emphasis on a direct role of GPs in prevention and early intervention for psychiatric disorders including alcohol use disorders (e.g. Carr-Gregg, Enderby, & Grover, 2003; Millstein & Marcell, 2003; Roche, Hotham, & Richmond, 2002).

Although there is good evidence that interventions for alcohol disorders by GPs can have positive outcomes (Curry, Ludman, Grothaus, Donovan, & Kim, 2003; Fleming, Barry, Manwell, Johnson, & London, 1997; Senft, Polen, Freeborn, & Hollis, 1997) and are cost-effective (Fleming et al., 2000; Wutzke, Shiell, Gomel, & Conigrave, 2001), research to date in Australia and elsewhere has found that GPs in general do not screen for alcohol misuse. As a consequence they neither treat nor refer on those with disabling alcohol problems. Several reasons for this have been put forward including the increased burden on already overworked GPs; a lack of faith in treatments on the part of GPs; a lack of GP knowledge or skills to implement treatments; and general community beliefs and social attitudes about alcohol misuse (Aalto, Pekuri, & Seppa, 2003; Andrews, Henderson, & Hall, 2001; Beich, Gannik, & Malterud, 2002; Duaso & Cheung, 2002; McGlynn et al., 2003; Millstein & Marcell, 2003; Roche, Hotham, & Richmond, 2002; Roeloffs, Fink, Unutzer, Tang, & Wells, 2001). Yet research has shown that treating comorbid alcohol use disorders can ameliorate symptoms of depression and anxiety and may eliminate symptoms altogether (Brown, Irwin, & Schuckit, 1991; Lynskey, 1998). Thus, intervening for alcohol problems, although adding extra burden to GPs' work initially, may reduce it in the long run.

Not only are GPs reluctant to treat alcohol problems but, as the research outlined in Chapter 4 indicates, those with alcohol problems, especially the young, do not seek or see the need for treatment for such problems (see also Bijl & Ravelli, 2000; Hall, 2003; Kessler et al., 1999). Chapter 4 found that those with alcohol dependence are

no more likely to seek any professional help compared with those who are not dependent. This present chapter will explore in detail the epidemiology of GP service use in the Australian community in order to understand better the role that GPs could play in assisting those who are in need of treatment for their alcohol-related problems.

Chapter 2 has highlighted some of the deficiencies of current definitions of DSM-IV Alcohol Dependence. The NSMHWB provides individual data on alternative measures of alcohol misuse, and so a secondary aim of this chapter is to examine the relevance of some of these alternative measures which, in turn, may better assist GPs to identify those in need of treatment for their alcohol problems.

The Present Study

The Australian National Survey of Mental Health and Wellbeing (NSMHWB) provides data indicating how those with alcohol disorders in Australia use GP services. Specifically, this study examines the influence of alcohol use variables on any GP use, and high GP use (see below). Sociodemographic and other variables found elsewhere to relate to use of primary care services have also been included to establish their relevance in the Australian context. In particular prevalence of GP service use is examined within age and gender sub-groupings.

This study also examines the relative adequacy of current DSM-IV diagnoses of alcohol use disorders to pinpoint disability and treatment seeking. To this end, three other alternative measures of disorder are incorporated in this study, capitalising on the breadth of information that the NSMHWB provides.

Method

As described in previous chapters the NSMHWB was carried out in 1997 on a randomised stratified sample of 10,641 Australians aged 18 years and older. The survey provides measures of psychiatric disorders, including alcohol use disorders, as well as disability and chronic physical disorders, along with demographics and service use in the past 12 months.

Alcohol use variables

Alcohol use variables were assessed in the survey by firstly asking whether the person was a drinker at all (more than 12 drinks in the past 12 months). If they were drinkers then individuals were probed further to determine how much they drank and whether they met criteria for abuse and dependence.

In order to gain some insight into the validity of alternative measures of alcohol disorder to the DSM-IV diagnosis of dependence, alcohol use disorder (AUD) was defined in four different ways:

- DSM-IV alcohol dependence;
- WHO hazardous or harmful use;
- binge drinking; and
- problems associated with alcohol use.

Alcohol dependence was determined by meeting at least three of the seven DSM-IV criteria for dependence: (1) tolerance, (2) withdrawal, (3) use for longer time than intended, (4) persistent desire to decrease use, (5) social and personal interests given up or reduced, (6) time spent acquiring/using/recovering from alcohol use and (7) continued use despite alcohol-related problems. WHO hazardous or harmful use was defined by number of drinks per week, where hazardous drinking is between 21 and 49 drinks per week for males and 15 to 35 for females. Harmful drinking was greater than these weekly consumption values. Binge drinking was defined as drinking more than an average of seven drinks per occasion for males or five drinks per occasion for women. Any social, psychological or physical problems due to alcohol use were assessed by combining criteria 5 and 7 for dependence (see above).

The categories of alcohol disorder used in this present study were based on the notion of 'dose' of alcohol disorder (Olfson et al., 1997; Ormel, 1994). This variable combines alcohol use measures with the assessment of the presence of other mental disorders. Comorbid mental health disorders included any other drug dependence, neurasthenia, and any affective, anxiety or personality disorder. Four categories of the alcohol 'dose' variable were used for each type of AUD:

1. non-drinker (< 12 drinks per year)

2. drinker but no AUD

3. AUD with no other comorbid mental health problems

4. comorbid AUD and other mental health problems.

Other independent variables

Other variables, which have been suggested by prior research, and which are provided for each individual in the NSMHWB include: age, gender, qualifications, marital status, employment, urban-rural status, any affective disorder, any anxiety disorder, any other drug disorder, any chronic physical condition, any professional service use for a mental health problem, physical disability, mental disability and days out of role.

GP service usage

Two variables were used to assess GP service usage – any GP visits in the past 12 months and high GP visits in past 12 months. The 'high' group was the top 15% for age and sex in twelve age by sex categories – a method proposed by Bellon et al (1999). The twelve categories were males and females aged 18-29, 30-39, 40-49, 50-59, 60-69 and 70+ years.

Data analysis

The NSMHWB data was analysed using SAS-callable SUDAAN, a program specially designed to adjust for sampling used with such large-scale surveys (Shah, Barnwell, & Bieler, 1997). This allows outcomes to be generalisable to the population of Australia. The logistic regression program was used to determine the correlates of GP use; and the cross-tabulation program to ascertain prevalences, their confidence intervals and chi-squared values comparing dosage categories.

Results

Overall 83.4% of the population made any visit to the GP in the 12 months prior to the survey.

Defining high GP use

Table 5.1 lists the 15% cut-off points used to define high service users in the twelve age and gender categories (Bellon, Delgado, Luna, & Lardelli, 1999). For example 18 to 29 year old males were considered high service users if they attended more than 4 times in a year, while females and males aged over 70 were classified as high service users if they saw the GP more than 12 times in a year. For males there is a slow increase in the cut-off point with age, whilst females in the 40-49 year age group had the lowest cut-off amongst females. Males and females above 60 years tended to have similar cut-offs and were the highest within gender. The main difference between males and females occurs with the 18-39 year olds and 50-59 year olds, where males have much lower high GP use cut-offs.

Table 5.1: Cut-off points for number of visits defining high GP use (top 15%) for the twelve age by sex categories

	Male	Female
18-29yr	>4	>9
30-39yr	>5	>9
40-49yr	>5	>6
50-59yr	>6	>10
60-69yr	>10	>11
70+yr	>12	>12

Using these cut off points, a total of 14.6% of the population was included in this high usage category.

Correlates of GP use

Table 5.2: Correlates of any GP use in past 12 months

Variables in the equation	OR Any GP Visits	95% CI for OR	P
Sex (cf Male)	1.95**	1.69-2.25	.0000
Age (cf 18-35yo)			
• **35-54yo**	1.02	0.87-1.20	
• **55+**	1.58**	1.25-1.99	.0001
Qualifications (cf Uni Degree)	1.01	0.82-1.25	.9306
Married de facto (cf unattached)	1.25*	1.09-1.44	.0025
Employment (cf full/part time employment)			
• **unemployed**	0.62	0.38-1.00	
• **not in workforce**	0.98	0.84-1.13	.1433
Urban-Rural Status (cf non-urban)	1.22	1.06-1.40	.0069
Any Affective Disorder	1.52	1.12-2.07	.0090
Any Anxiety Disorder	1.39	0.75-2.57	.2804
Drug Dependence Other than Alcohol	0.84	0.57-1.24	.3702
Any Chronic Physical Condition	2.44**	2.09-2.86	.0000
SF-12 Mental (Moderate-Severe Disability)	1.09	0.90-1.31	.3656
SF-12 Physical (Moderate-Severe Disability)	2.52**	1.84-3.44	.0000
Five or More Days Out of Role	1.72*	1.28-2.31	.0008
Alcohol Dose based on Dependence (cf non-users):			
• **Use but not Dependent**	1.41	1.03-1.92	
• **Non-Comorbid Alcohol Dependent**	1.79	0.81-4.00	
• **Comorbid Alcohol Dependent**	1.57	0.62-3.98	.0684

*Significant at the 5% level, ** Significant at the 1% level (Bonferroni adjusted)

Table 5.2 lists the odds ratios derived from logistic regression using any GP attendance in the past 12 months as the dependent variable and using the alcohol 'dose' variable based on alcohol dependence. Table 5.3 lists the same information for high GP use. SUDAAN does not adjust confidence intervals for the number of tests carried out (Bonferroni), but it does provide probability values associated with Wald F values for each of the 14 variables. Using Bonferroni adjustment, a probability value of .05/14 (= .0036) is significant at the 5% level. Adjusted significance levels of odds ratios are indicated by asterisks in Tables 5.2 and 5.3.

Significant correlates of <u>any</u> GP attendance in the past 12 months are gender (female), being aged 55 and above (cf 18-35 years), being married or in a de facto relationship, having any chronic physical condition, having moderate to severe self-reported physical disability and having 5 or more days out of role in the past 12 months.

As shown in Table 5.3, correlates of <u>high</u> GP usage are: employment (not being in the workforce), having any anxiety disorder, having a chronic physical illness, having moderate to severe self-reported physical disability, and taking five or more days out of role. Non-dependent drinkers were significantly less likely to have high GP use than non-drinkers or dependent drinkers. Odds ratios are not presented for age and sex categories here as they were used to derive the high GP usage categories.

Measure of alcohol use disorder

Table 5.4 compares the odds ratios for the four alternative measures of alcohol use disorder: dependence, hazardous/harmful use, binge drinking and alcohol related problems, when each is substituted into the logistic regression equation. There is little difference amongst these variables – none is associated with any GP use in the past 12 months and for each, use without disorder results in less high GP usage.

Table 5.3: Correlates of high GP use (top 15% for age and sex) in past 12 months

Variables in the equation	OR High GP Use	95% Confidence Interval for OR	P
Sex (cf Male)	-	-	-
Age (cf 18-35yo)			
• **35-54yo**	-		-
• **55+**	-	-	-
		-	
Qualifications (cf Uni Degree)	1.35	1.04-1.76	.0274
Married de facto (cf unattached)	1.14	0.87-1.49	.3294
Employment (cf full/part time employment)			
• **unemployed**	0.86	0.35-2.09	
• **not in workforce**	1.58**	1.24-2.01	.0002
Urban-Rural Status (cf non-urban)	1.27	0.91-1.78	.1481
Any Affective Disorder	1.48	1.11-1.97	.0086
Any Anxiety Disorder	2.16*	1.42-3.29	.0008
Drug Dependence Other than Alcohol	1.12	0.68-1.86	.6385
Any Chronic Physical Condition	2.76**	2.36-3.22	.0000
SF-12 Mental (Moderate-Severe Disability)	1.44	1.13-1.84	.0049
SF-12 Physical (Moderate-Severe Disability)	2.95**	2.13-4.10	.0000
Five or More Days Out of Role	1.84**	1.42-2.38	.0000
Alcohol Dose based on Dependence (cf non-users):			
• **Use but not Dependent**	0.63**	0.48-0.81	
• **Non-Comorbid Alcohol Dependent**	0.71	0.39-1.30	
• **Comorbid Alcohol Dependent**	1.02	0.31-3.32	.0005

*Significant at the 5% level, ** at the 1% level (Bonferroni adjusted)

Table 5.4: Correlates of any GP use and high GP use in the past 12 months – comparing dependence and alternative alcohol use variables

Variables in the equation	OR Any GP Visits in Past Year	OR High GP Use (Top 15% for Age and Sex)
Alcohol Dose based on Dependence (cf non-users):	1.41	0.63**
• Use but not Dependent	1.79	0.71
• Non-Comorbid Alcohol Dependent	1.57	1.02
• Comorbid Alcohol Dependent		
Alcohol Dose based on Haz/Harm Use (cf non-users):	1.46	0.63*
• Use but not Haz/Harm Use	1.01	0.65
• Non-Comorbid Haz/Harm Use	1.63	0.95
• Comorbid Haz/Harm Use		
Alcohol Dose based on Binge Drinking (cf non-users):	1.41	0.61**
• Use but not Binge Drinking	1.37	0.90
• Non-Comorbid Binge Drinking	1.97	1.23
• Comorbid Binge Drinking		
Alcohol Dose based on Alcohol Problems – DSM-IV Criteria 5 and 7 (cf non-users):		
• Use but no Alcohol Problems	1.40	0.61**
• Non-Comorbid Alcohol Problems	1.78	1.06
• Comorbid Alcohol Problems	1.80	1.40

*Significant at the 5% level, ** at the 1% level (Bonferroni adjusted)

Prevalence of GP use – Age-gender sub groups and whole group

For this analysis a younger age group (18 to 34 years) was compared with older age categories combined (35+ years).

When considering any GP use in the past 12 months (Table 5.5), there were few significant differences between the alcohol 'dose' categories within age and sex categories. Exceptions were that for 18-34 year old females, those with dependence and comorbid dependence had significantly increased GP usage compared with abstainers and non-dependent drinkers; and for the total 35+ year group, those with alcohol dependence alone were least likely to go to the GP at least once a year. Overall, the younger group tended to follow a more predictable pattern of higher contact with GPs the greater the alcohol 'dose', whilst the older age groups tended to follow more of a 'U' shape across dose categories. Males and females followed a similar trend of a small increase with increasing dose, but males had lower prevalences in all dose categories. These findings are best illustrated graphically (see Figures 5.1 to 5.3).

Table 5.6 lists prevalences of high GP usage in age by gender categories. Overall, more differences were apparent when considering high GP usage, especially in the older age group and amongst females. For the younger age group the curves of prevalence by dose are J-shaped (Figure 5.5), whilst for the older group, the prevalence by dose curves were more U-shaped, where non-dependent and dependent only drinkers were least likely to be high GP service users. Young people with comorbid mental disorders tended to have the highest levels of high GP use, whilst non-dependent drinkers overall were least likely to be high GP users. Young females who were alcohol dependent and had comorbid mental disorders had the highest levels of high GP use, although the low numbers in some of these groups means findings should be treated with some caution.

Table 5.5: Prevalence of any GP use in gender, age and alcohol dose categories

Sub-Group	Measure	Non drinker	Drinker (not Dependent)	Alcohol Dependent Only	Comorbid Alcohol Dependent	Total for Sub-Group	χ^2 (3df) P
Male 18-34yr	*n/total	121/205	723/1063	61/77	48/62	953/1401	3.26
	adj. prev.	58.6	68.4	79.3	77.9	68.0	
	CI prev.	51.8-65.1	65.5-71.1	69.0-87.0	66.1-86.4	65.5-70.4	.37
Female 18-34yr	n/total	398/517	1089/1281	30/33	46/49	1563/1876	9.91
	adj. prev.	77.3	85.1	92.2	93.2	83.3	
	CI prev.	73.5-80.7	83.1-86.9	78.1-97.5	82.6-97.5	81.5-84.9	.04
Total 18-34yr	n/total	519/731	1812/2384	91/111	94/113	2516/3311	3.54
	adj. prev.	70.6	76.4	82.0	83.0	75.6	
	CI prev.	67.2-73.8	74.7-78.1	73.8-88.0	75.0-88.8	74.1-77.0	.33
Male 35+	n/total	467/570	2051/2596	51/69	56/66	2625/3281	3.60
	adj. prev.	82.4	79.1	74.3	85.1	79.7	
	CI prev.	79.1-85.3	77.5-80.6	62.9-83.1	74.6-91.7	78.3-81.0	.33
Female 35+	n/total	1412/1642	2067/2376	27/32	35/40	3541/4070	0.27
	adj. prev.	86.3	87.4	83.9	87.0	87.0	
	CI prev.	84.6-87.9	86.0-88.7	67.7-92.8	73.3-94.2	85.9-88.0	.96
Total 35+	n/total	1879/2211	4118/4961	78/101	91/106	6166/7429	9.63
	adj. prev.	85.2	82.7	76.5	85.8	83.4	
	CI prev.	83.7-86.6	81.6-83.7	67.4-83.7	77.9-91.2	82.5-84.2	.04
Total for Males	n/total	588/767	2774/3654	112/156	104/128	3578/4705	1.86
	adj. prev.	74.9	75.5	77.3	80.8	75.57	
	CI prev.	69.5-79.5	71.9-78.7	61.0-88.1	66.8-89.7	72.0-78.8	.61
Total for Females	n/total	1810/2133	3156/3650	57/64	81/89	5104/5936	3.28
	adj. prev.	84.0	86.5	88.5	90.6	85.7	
	CI prev.	81.9-86.0	83.7-88.9	75.2-95.2	75.0-96.9	84.2-87.1	.37
Total All Sub-Groups	n/total	2398/2900	5930/7304	169/220	185/217	8682/10641	4.45
	adj. prev.	81.2	80. 5	79.7	84.1	80.7	
	CI prev.	79.4-82.9	77.4-83.2	68.4-87.7	72.8-91.3	78.4-82.8	.24

* n/total – number in the dose category/total number in the category

adj. prev. – prevalence (%) adjusted for sampling by SUDAAN

CI prev. – 95% CIs for prevalence

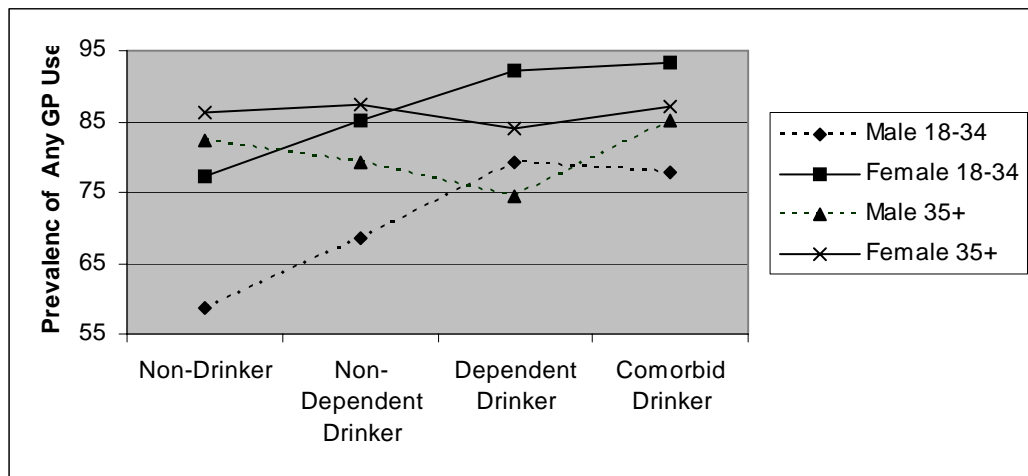*Figure 5.1: Prevalence of any GP use summarised by age, gender and alcohol 'dose'*

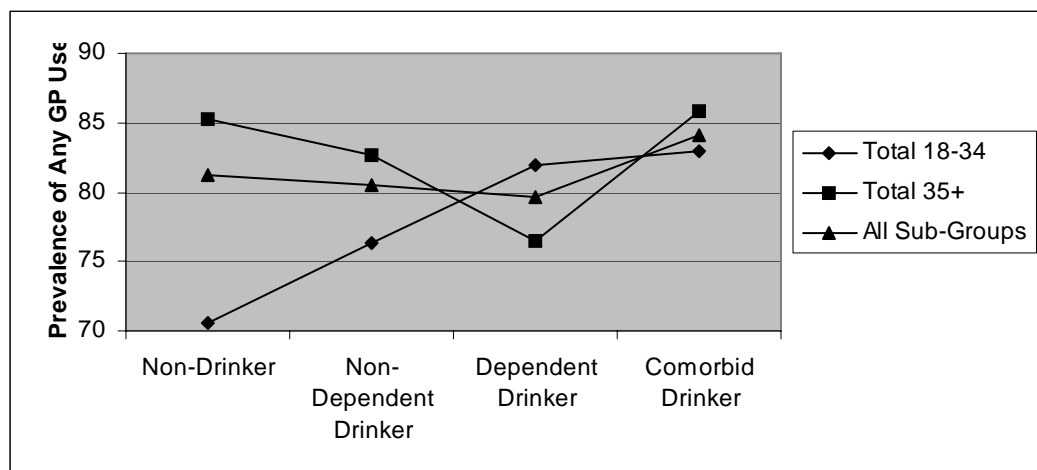*Figure 5.2: Prevalence of any GP use summarised for age and alcohol 'dose'*

Figure 5.3: Prevalence of any GP use summarised for gender and alcohol 'dose'
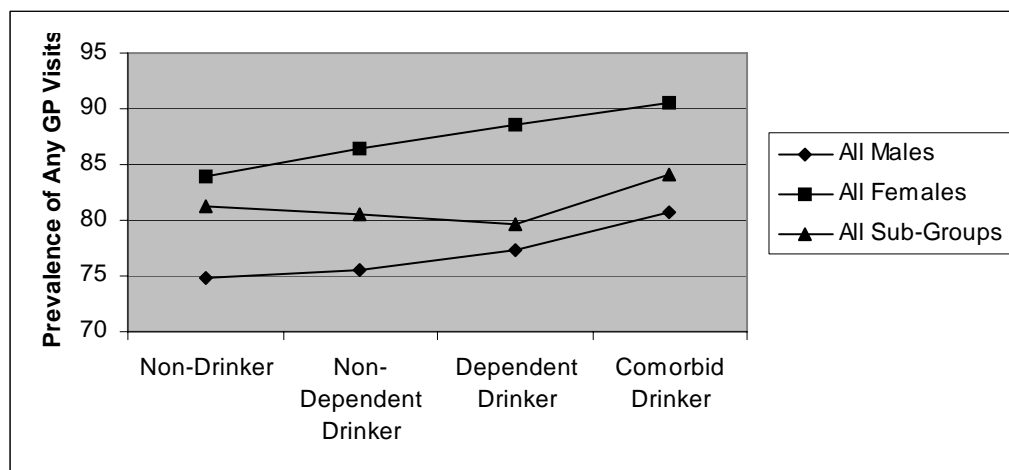
Table 5.6: Prevalence of high GP use in gender, age and alcohol 'dose' categories

Sub-Group	Measure	Alcohol 'Dose'				Total for Sub-Group	χ^2 (3df) P
		Non drinker	Drinker (not Dependent)	Alcohol Dependent Only	Comorbid Alcohol Dependent		
Male 18-34yr	n/total	35/175	143/1100	11/73	24/62	213/1331	1.63
	adj. prev.	19.9	13.4	15.2	39.2	15.7	
	CI prev.	14.7-26.4	11.5-15.5	8.7-25.2	28.0-51.6	13.8-17.8	.66
Female 18-34yr	n/total	100/526	193/1379	8/36	19/41	320/2000	13.38
	adj. prev.	19.0	13.6	21.5	45.9	15.9	
	CI prev.	15.9-22.6	11.9-15.5	11.2-37.3	31.7-60.8	14.4-17.6	.01
All 18-34yr	n/total	135/711	336/2400	19/112	43/105	533/3331	5.61
	adj. prev.	19.3	13.5	16.5	41.4	15.8	
	CI prev.	16.6-22.4	12.2-14.9	10.8-24.5	32.5-51.0	14.6-17.1	.16
Male 35+	n/total	130/565	337/2592	9/75	22/76	498/3320	17.32
	adj. prev.	23.4	13.1	12.3	28.9	15.2	
	CI prev.	20.1-27.1	11.9-14.5	6.7-21.6	19.9-39.9	14.0-16.5	.00
Female 35+	n/total	300/1500	241/2410	5/42	13/48	559/3993	63.86
	adj. prev.	19.9	9.7	12.4	26.8	14.0	
	CI prev.	18.0-22.0	8.6-11.0	5.5-25.6	16.3-40.7	13.0-15.1	.00
All 35+yr	n/total	430/2048	578/4816	14/117	35/125	1057/7047	74.18
	adj. prev.	20.9	11.6	12.3	28.2	14.6	
	CI prev.	19.2-22.7	10.7-12.5	7.5-19.5	21.1-36.7	13.8-15.4	.00
All Males	n/total	165/767	480/3654	20/156	46/28	711/4705	6.85
	adj. prev.	22.3	13.2	14.1	35.1	15.3	
	CI prev.	14.5-32.5	11.4-15.3	7.5-24.9	13.0-66.1	12.1-19.2	.10
All Females	n/total	400/2133	434/3650	13/64	32/89	879/5936	95.43
	adj. prev.	19.7	11.2	17.5	37.9	14.7	
	CI prev.	17.4-27.2	10.1-12.4	7.6-35.4	20.4-59.3	13.4-16.1	.00
Total All Sub-Groups	n/total	565/2900	914/7304	33/220	78/217	1590/10641	30.24
	adj. prev.	20.5	12.3	14.8	36.1	15.0	
	CI prev.	16.9-24.6	11.1-13.6	9.2-23.0	16.1-62.3	13.0-17.3	.00

* n/total – number in the dose category/total number in the category

adj. prev. – prevalence (%) adjusted for sampling by SUDAAN

CI prev. – 95% CIs for prevalence

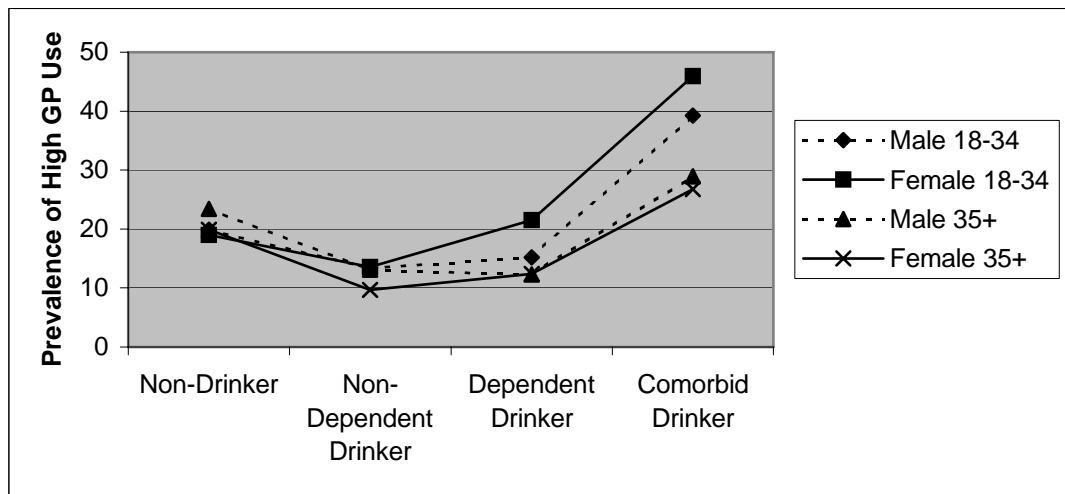*Figure 5.4: High GP use by age, gender and alcohol 'dose'*

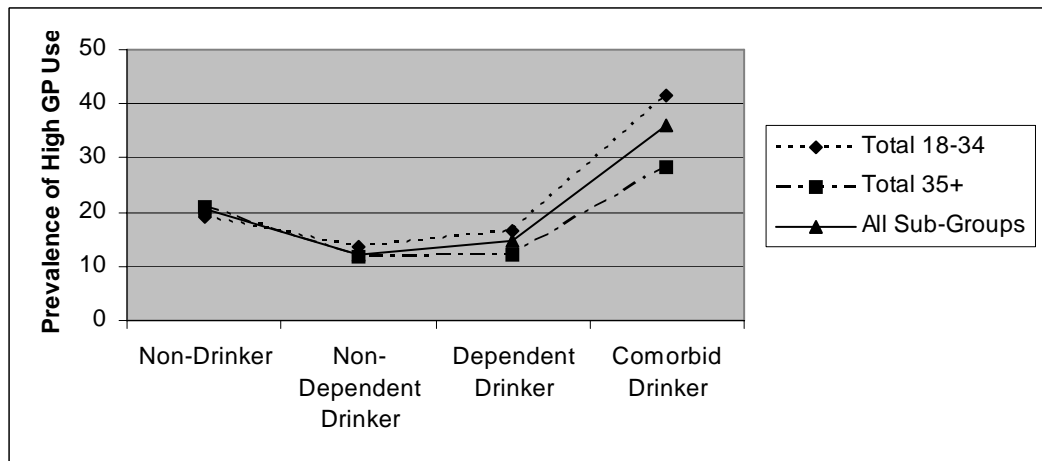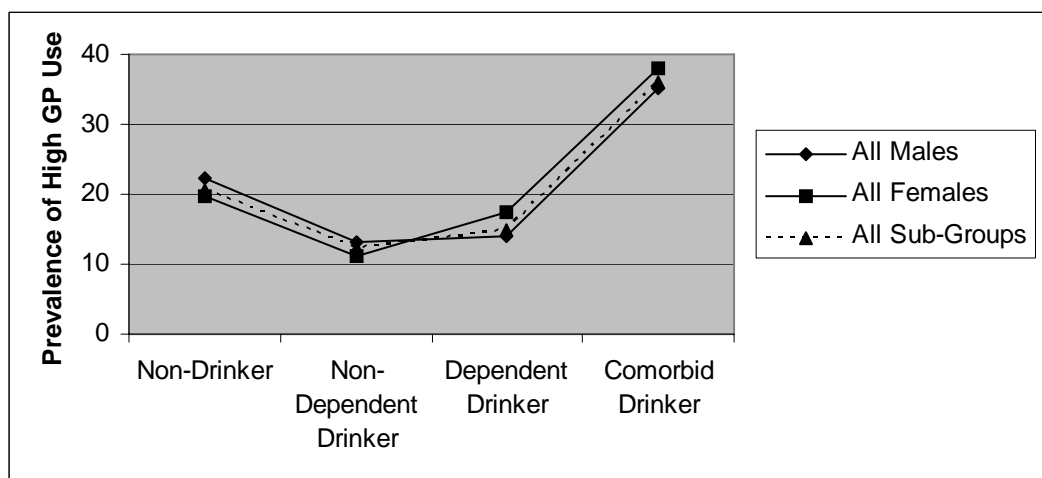*Figure 5.5: High GP use by age and alcohol 'dose'*

Figure 5.6: High GP use by gender and alcohol 'dose'

Discussion

The study presented in Chapter 2 was designed to assess whether current measures of DSM-IV alcohol use disorders were valid in pinpointing true mental disability. This present study substituted several alternative measures of alcohol use disorder for alcohol dependence, in order to determine whether such alternative measures would show differential association with GP service usage. The three alternative measures (WHO hazardous or harmful use, binge drinking, and alcohol-related problems) were found to be no better predictors of GP use than alcohol dependence. This applied to excessive GP use as well. Thus this study cannot suggest that the alternative measures to alcohol dependence assessed here are better indicators of disability in the community. The rest of this discussion refers only to results using alcohol dependence as the indicator of level of alcohol problem.

Because most people access a GP in any year, mere attendance cannot be considered a measure of disability. However, it is reasonable to assume that 'high' or excessive GP use is more indicative of higher disability. This study found that the use of any GP services is significantly higher amongst females and those in the over 55 year age group. Although prior research supports the finding that females use primary care services at higher rates than do males (Kapur et al., 2004; Little et al., 2001; Parslow, Jorm, Christensen, Jacomb, & Rodgers, 2004; Tudiver & Talbot, 1999), the results with regard to age have been more equivocal (Carr-Hill, Rice, & Roland, 1996; Kapur et al., 2004; Knox & Britt, 2004; Little et al., 2001). While these prior studies focused on correlates (including age and gender) of excessive use, the present study could not include age and gender in logistic regressions predicting high GP use because of its particular design (i.e. excessive use was defined relative to age and gender sub-groups).

Amongst those variables which did correlate with excessive use of GP services was having a university degree. This finding may be due to the fact that socio-economic factors are associated with having a higher education. In fact Dunlop et al. (2000) found that lower income and fewer years of schooling correlated with lower access to (universally funded) health care in Canada. Economic factors are likely to provide the greater flexibility that would permit increased service access such as presentation for

check-ups and other preventive procedures. On the other hand those not in the workforce (excluding the unemployed) have more opportunity to visit GPs which is reflected in their higher levels of use, although this is not reflected in the unemployed group. Again, socio-economic factors may distinguish between these two groups. Further research in the Australian context would throw more light on this issue.

It is of interest that the urban-rural variable approached significance for 'any' GP use in the past 12 months - urban dwellers tend to be more likely to use any GP services in the year. However, they do not necessarily have higher rates of illness needing GP care, as this should be reflected in the 'high' GP service use figures as well. It is of interest to note that in another Australian study (Knox & Britt, 2004) where number of problems was included in the regression model, remoteness of location was a significant (negative) predictor of level of service use. This implies that accessibility may be a cause of differences in GP usage and that increasing the number and availability of GPs in rural areas may remove this inequity (Ferguson, Ries, & Russo, 2003).

Being married or de facto was positively associated with any, but not 'high', GP use. It is difficult to speculate why this would be so, when this variable did not predict specialist service use in the study reported in Chapter 4. It generally costs a lot less to see a GP than a specialist in Australia, and therefore it may be that spousal/family influences can have more of an impact where socio-economic factors are not salient.

The high GP usage of those with anxiety disorders (and to a lesser extent, affective disorders) reflects prior findings (Bellon, Delgado, Luna, & Lardelli, 1999; Knox & Britt, 2004) and confirms that the presence of mental disorders increases GP service use. The increased odds of those with any physical condition and with high physical disability (SF-12 as well as days out of role) are predictable both logically and from results from prior research (Knox & Britt, 2004; Little et al., 2001; Parslow, Jorm, Christensen, Jacomb, & Rodgers, 2004).

Compared with abstainers, those who use alcohol but are not dependent are less likely to be high GP service users, whereas those who are dependent or comorbidly

dependent do not differ from non-drinkers in high GP service usage. Thus, if high GP usage is accepted as an indicator of higher disability, moderate alcohol use appears to be protective in this Australian sample. These findings fit well with accepted medical opinion. For example the Harvard School of Public Health has an on-line nutrition source summarising the benefits of moderate alcohol consumption (Harvard School of Public Health, 2006). They list the probable health benefits as improvements to the heart and circulatory system, type 2 diabetes and gallstones. The article concludes that the effects of alcohol are likely to be causal as the benefits remain, even when associated variables such as weight, amount of sleep and level of exercise are taken into account. However, some dissenting research is emerging from Australia which suggests that apparent benefits may be artifactual. If this is the case then elevated levels of service use by abstainers may best be explained by the fact that many are compelled to abstain by their ill-health (Fillmore, Stockwell, Kerr, Chikritzhs, & Bostrom, 2006).

Prevalence data is of particular interest as it relates to the opportunity to screen and intervene for alcohol misuse. Although young people, and particularly males, are less likely to present to a GP service in a given year, over three-quarters of all young people do, and much higher proportions who drink or misuse alcohol do. Although rates of any GP contact are higher in the older age groups, overall, drinkers and non-drinkers do not behave differently in this age group. This contrasts with the younger group where non-drinkers are less likely than drinkers to visit a GP over the year. This latter finding may be because young drinkers are also heavy drinkers and heavy drinking (not necessarily dependence) has significant risks associated with it, such as traffic and other accidents which may require increased GP usage.

With regard to 'high' or excessive use of GP services, those with comorbid alcohol and mental disorders are most likely to be over-represented across all ages, but abstainers are also excessive service users – especially in the older age group. It is likely that some people need to become abstainers when they are older because of alcohol and other-related health problems incurred throughout their lives. Such problems would then increase their level of contact with their GPs.

Having alcohol dependence alone appears to influence high service use more in the young than the older age groups, but numbers are generally low. Again this may be due to the risks associated with binge drinking which is a common practice amongst young drinkers.

The large majority of high service users with alcohol dependence also have other mental health problems, and this group has particularly high usage. It is in this group of comorbid individuals that interventions for alcohol may provide the most rewarding outcomes for GPs. If alcohol screening is directed to those with common psychiatric disorders such as anxiety and depression, the burden of excess consultations by a few individuals is likely to be reduced. This would involve screening a significantly lower proportion of patients than mass screenings would require, but is likely to have a much higher yield of positive outcomes overall. Even if GPs choose not to intervene for these problems, screening alone is an important function, as GPs have contact with the large proportion of individuals with alcohol dependence comorbid with other psychiatric disorders. Their role as gatekeeper and primary referral source to specialist care remains crucial.

CHAPTER 6: CONCLUSION

Contents

Background

Despite the high burden of disease imposed by alcohol disorders in western societies, much of the research indicates that few individuals seek help for these problems (Bijl & Ravelli, 2000; Kessler et al., 1999). This brings into question the validity of current formulations of alcohol disorders; and the availability and accessibility of effective treatments. This thesis examines these issues in detail.

In order to provide a sound basis for assessing treatment seeking behaviour, the validity of current DSM-IV formulations of alcohol use disorders was examined (Chapter 2) as were the prevalence and correlates of these disorders (Chapter 3). Treatment seeking behaviour for those Australians with alcohol dependence was then analysed from two perspectives: firstly an overall epidemiological assessment of treatment seeking from any specialist for a mental health problem (Chapter 4); then, focussing on GPs, an in-depth analysis of how dependence relates to 'any' and 'high' service use (Chapter 5).

Chapter Descriptions and Findings

Chapter 1 provided an historical perspective to the current definitions of alcohol disorders. International expert commentators have suggested that, while current definitions of alcohol use disorders provide useful standards as a basis for research, some deficiencies need to be addressed. In particular there is a need for more information on the validity of the current definitions of dependence and abuse as distinctive diagnoses. Chapter 1 also highlights the lack of Australian data on prevalence and correlates of alcohol use disorders, and suggests that this data is needed to pinpoint the level of need for services in the community.

To give further background to the research in the chapters that followed, Chapter 1 furnished an overview of the research on effective treatments for alcohol disorders. The main conclusions from this review were that effective treatments do exist for alcohol disorders, yet there is a need for greater dissemination of information on

effective treatments to the community as a whole, and to GPs in particular. There is also a need for more research on the availability and access to effective treatments in the Australian context in order to assist GPs to adopt the most effective practices in regard to treating alcohol use disorders.

To facilitate our understanding of the research on service use, Chapter 1 also provided a description of the models of treatment seeking behaviour that have been proposed to date. Much of the research on these models has been carried out in the US where the health care system is different from that of Australia. In particular, in Australia GPs act as gatekeepers for referral to specialist services, while in the US individuals can access specialist services directly. This may have implications for how models of treatment seeking developed in the US fit with Australian data. Thus it is important to gather Australian data to ascertain which variables impact service use and this thesis provides relevant information in relation to individuals needing help for their alcohol dependence.

The thesis used data from the Australian National Survey of Mental Health and Wellbeing (NSMHWB, Teesson, Hall, Lynskey, & Degenhardt, 2000), analysing responses from 10,641 individuals over the age of 18. This is the only survey carried out to date which assesses the mental health of Australians on a nationally representative basis. Of particular relevance to this thesis, the survey provides DSM-IV measures of mental health disorders including alcohol use disorders; as well as measuring physical disorders and disability, mental disability and service usage. Using this data from the NSMHWB, Chapters 2 to 5 examine the following questions:

- How well are DSM-IV alcohol use disorders specified?
- What are the prevalence and correlates of alcohol use disorders in Australia? and
- What are the prevalence and correlates of treatment-seeking for alcohol dependence in Australia?

Chapter 2 used confirmatory factor analysis (CFA, Muthén & Muthén, 1998) to examine the eleven criteria that comprise DSM-IV alcohol use disorders. It

considered these criteria in the whole population as well as within age and gender sub-groups. This analysis found that a single factor described alcohol use disorders equally as well as two factors. Thus it is more parsimonious to describe DSM-IV alcohol use disorders as a single factor. This runs counter to traditional definitions of alcohol use disorders. The additional finding that the criteria behave differently in different age groups suggests that there is a need to examine further the broad application of the diagnostic system across all age groups. Further research may examine whether weighting of criteria according to such sub-groups could improve the validity of the alcohol diagnoses.

Although Chapter 2 found that a single factor was most appropriate, this conclusion was based on the finding of equivalence between the one- and two-factor solutions, (whilst arguing that parsimony should ultimately prevail). It does not suggest that it would not be valid to use the current two-factor model used by DSM-IV to conduct further research. Thus, **Chapter 3** examined the prevalence of DSM-IV defined alcohol use disorders in Australia in order that comparisons could be made cross-nationally as well as to provide background to the issue of service use. Data was analysed using SUDAAN which is a program designed specifically for use with cross-sectional survey data such as the NSMHWB, where over-sampling has been used to increase numbers in the smaller socio-demographic groups. This allows conclusions to be drawn about characteristics of the Australian population overall. In particular the SUDAAN cross-tabulation and logistic regression programs enable Australia-wide prevalence data to be ascertained, as well as to generalise about correlates of the particular variables under consideration.

At around 4%, Australians have similar dependence rates to the US, UK and the Netherlands. This figure accounts for well over 500,000 individuals aged 18 and over in the community. The findings of this study are also similar to these countries in that males and young people are significantly more likely to be dependent than other groups, and individuals not in a couple relationship and those with other drug dependencies were more likely to have alcohol use disorders. Also in concordance with international research, alcohol dependence in Australia tends to co-occur with

other psychiatric disorders as well as mental disability. This distinguishes alcohol dependence from alcohol abuse where no such relationship exists.

An in-depth analysis of the prevalence of criteria for abuse and dependence also suggests that international comparisons of the prevalence of disorder may be flawed, due to large variations in the prevalences of particular criteria cross-nationally. Although Australians have comparable dependence rates, they tend to endorse more criteria than seen in US surveys, but because of the way dependence is defined this does not necessarily translate to an increase in diagnosis overall. Further research would assist to understand whether in fact there are more individuals who meet one or two criteria ('diagnostic orphans') in Australia or whether those with dependence have more symptoms; and what the implications of this may be for services. It is also possible that the different rates of abuse between the US and Australia (4.6% cf 1.9% respectively), due largely to differences in prevalence of the HAZARD criterion, may be ascribed to different policies around the use of alcohol in the workplace and in relation to vehicle use.

A further issue, not canvassed in the present research is how the modified CIDI is administered across studies. Various reviewers have suggested that comparison can be made more difficult where the wording has been varied slightly, or where there are local variations in understanding of particular operationalisations of criteria. The issue of problems with operationalisation of criteria for dependence has been addressed by Caetano (1999; Caetano & Cunradi, 2002) and he concludes that a high level of careful probing is needed to ensure that misidentification of criteria is avoided.

An analysis of the individual criteria in this Australian sample did not suggest that any sub-set of criteria could explain the higher rates of dependence and abuse in males and young people. This question was raised in Chapter 2 where it was suggested that a system of weighting for different criteria in population sub-groups may improve diagnosis. As no consistent findings with regard to particular criteria were found, no simple system of weighting can be suggested from this data. Use of a less complicated unidimensional formulation of alcohol use disorders may prove

more practicable in the search for a measure of alcohol disorder that indicates true disability in the community.

Chapter 4 was the first of two chapters to examine past year treatment seeking behaviour of those with alcohol dependence in the Australian NSMHWB. Those individuals identified as being alcohol dependent were asked whether they sought help of any professional agent for their mental health problems over the past year. Professions were collapsed into three groups: GP; specialist alcohol/mental health (hospitalizations, psychiatrist, psychologist, social worker, drug counsellor, mental health team); and other. Type of help received was categorised into four categories: information; medicines; psychotherapy; and self-care/other. Correlates and prevalences were again adjusted for sampling using logistic regression and cross-tabulation programs in SUDAAN.

As found in international studies, DSM-IV alcohol dependence did not correlate with treatment seeking for a mental health problem in the past 12 months. Although number of criteria met (severity) did not predict service use, having social, psychological or physical problems associated with alcohol use did. This makes intuitive good sense in that respondents are acknowledging they have problems – not just describing alcohol related issues (e.g. drinking more than intended), which to an individual may not imply disability. Amongst those with dependence the only correlates of treatment seeking were being female and having a comorbid psychiatric disorder.

In agreement with prior research, this study found that less than 30% of those with alcohol dependence sought any help for their mental health problems in the past year. The only variables to show a significant relationship with type of service were having a higher education and not being in the workforce, both of which tended to be over-represented in specialist services. It is possible that these two sub-groups seek different types of specialist services, with the better-educated being able to pay for private treatments while those out of the work force due to their drinking problems (e.g. invalid pensioners) will be required to find specialist help within the government funded public health system.

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Amongst those who received treatment, there tended to be most satisfaction with the level of medicines used and less with the amount of psychological intervention and information received. For people with dependence who wanted but did not receive help, the largest unmet need was for psychological help. Because medical interventions are heavily Government subsidised in Australia, and psychological services are not, this indicates the importance of system variables to treatment seeking behaviour in the general population. As the review of the literature in Chapter 1 indicated, psychological services are the mainstay of alcohol treatment, yet despite individuals seeing the need for such help, such interventions are poorly accessed, if not supported in our community.

Chapter 5 examined in greater depth the impact of alcohol dependence on GP service use. It also assessed the validity of alternative measures of alcohol use disorder (apart from dependence) in predicting treatment seeking. Two types of GP service use were considered – any GP visits in the past 12 months and high (top 15% for age and gender) GP visits in the past 12 months. Most people (83.4%) visit a GP each year, so that the findings of age, gender, physical illness and disability as the only correlates of such treatment seeking are unsurprising. The one other variable of borderline significance was being married or in a dyadic relationship where it is likely that spouse pressure may lead to service use.

Results for high GP use are more interesting however, where not being in the workforce (but not 'unemployed') and having an anxiety disorder also increased the odds of high GP use, while drinking alcohol but not being dependent decreased these odds. These sorts of findings add to the debate around how beneficial any alcohol use can be.

Perhaps of greatest interest is the fact that even though young people see the GP least, three quarters of them do so each year and those with comorbid mental disorders are the highest GP users. Thus there is ample opportunity for GPs to assess and intervene for alcohol use disorders, and the suggestion has been made from this research that they may find it more efficient to assess only those with psychiatric disorders in the

first place, as they are more likely to have an alcohol use disorder. Prior research has suggested that intervention for the alcohol disorder may ameliorate the comorbid psychiatric disorder, which in turn would reduce excessive GP service use.

Results in Terms of the Aims of the Research

Chapter 1 set out the overall aims of the research in the form of three questions. Each chapter addressed one or more of these questions and the following section summarises findings in terms of each of the questions.

How well are DSM-IV alcohol use disorders specified?

- An examination of the latent structure of DSM-IV alcohol use disorders was presented in Chapter 2. In effect it suggested that the current bi-axial assumption underlying the definition of alcohol use disorders, and of substance use disorders in general, should be revised. All the criteria that are used to define alcohol dependence and abuse contribute at a moderate to high level to an underlying alcohol disorder trait.

- Chapter 5 also considered several alternative formulations of alcohol use disorders, constrained around current definitions, and found that none improved on the DSM-IV dependence diagnosis as an indicator of high GP service use and thus, indirectly, of disability. Future research on a unidimensional formulation of alcohol disorder would need to provide a means of incorporating level of severity, which could be validated directly against disability measures. Also alternative formulations such as requiring the presence of withdrawal and/or craving symptoms on cessation of use before any positive diagnosis is made, should be examined further (de Bruijn, Korzec, Koerselman, & van Den Brink, 2004; Langenbucher et al., 2000).

What are the prevalence and correlates of alcohol use disorders in Australia?

- Research described in Chapter 3 revealed that alcohol dependence has a prevalence of 4.1% and abuse 1.9% in Australia. The prevalence of dependence was similar to that found in international studies while level of abuse is much lower than that found in the US, where most of the prior

research has been carried out. Australian data on prevalence of individual
criteria did not match prevalences from the US. In particular although
TOLERANCE is similar for both countries, in Australia, LARGER and CUT
DOWN are far greater than in the US, and TIME SPENT much less.
Furthermore, no abuse criterion had more than 1.6% prevalence in the
Australian sample, whereas in the US sample, HAZARD rated 5.4%. This
latter figure is likely the main source of difference in prevalence of abuse
between Australia and the US.

- In terms of correlates of dependence younger people, males, those not in a
  couple relationship and those with other psychiatric and substance use
  disorders were most likely to have a diagnosis. For abuse, only age and gender
  (in the same direction) were independent correlates. These findings were
  similar to those found in research from other countries.

**What are the prevalence and correlates of treatment seeking for alcohol
dependence in Australia?**

- Less than 30% of those with alcohol dependence sought any help for their
  mental health problems. This fits with prior research suggesting that few
  people with alcohol dependence seek or see the need for help with their
  alcohol problems.
- Alcohol dependence did not correlate with specialist service use. However,
  having social, psychological or physical problems associated with alcohol use
  did predict service use.
- Other correlates of specialist service use for those with alcohol dependence
  were being female and having a comorbid affective disorder. When the male
  and female alcohol dependent groups were analysed separately, females with
  anxiety disorders and males with affective disorders were more likely to seek
  specialist help.
- In terms of use of GP services, although being alcohol dependent did not
  significantly correlate with any or high service use, young dependent drinkers
  are more likely than their age cohort to be high users of GP services, although
  this is largely due to the presence of comorbid psychiatric conditions. Young

people with comorbid alcohol and psychiatric disorders were the highest GP service users overall.

Summary: Contribution to Theory, Research and Practice

The aims of this thesis were to analyse Australian epidemiological data in order to determine whether and why individuals with alcohol use disorders seek treatment. As a first step, the validity of DSM-IV formulations of alcohol use disorders and prevalence of such disorders in Australia were examined. These first two studies provided new and important data on how well alcohol disorders are specified and how current definitions can affect cross-national comparisons.

A major finding of the thesis was that a unidimensional approach to definitions of DSM-IV alcohol use disorders is as valid as the bi-axial formulation that underpins current definitions of substance use disorders. The research suggests that all eleven criteria for abuse and dependence load at moderate to high levels on a single factor. This has important ramifications for the revision of DSM-IV currently underway. With the availability of large sets of population data on DSM-IV alcohol use disorders, particularly from the US, there is ample opportunity to replicate these findings. Further research is needed to consider the fate of the individual criteria for alcohol disorder if they are to be incorporated into a future unidimensional measure of such a disorder.

The evidence regarding treatment seeking for those with alcohol dependence suggests that the system or individual variables discourage help seeking for such problems. Just as it is important to ensure diagnosis is accurate, so too individuals suffering significant problems through their alcohol use must be afforded the information and the opportunity to receive necessary treatments. Thus the role for public health policy is clear. Individuals need to be educated about the risks associated with alcohol use disorders and accessible and effective treatments need to be made available.

As highlighted by Christensen and Griffiths (2000), the advent of the internet provides a unique opportunity to improve public literacy of mental health disorders. In particular, the web may be used to provide access to treatments to those who would

otherwise receive no treatment at all. However the authors emphasise that there is a need for research in this area to provide more information on the quality of the information given by particular web-sites. Another means of accessing those with mental disorders who may be reluctant to visit a specialist is bibliotherapy and efforts to combine both the internet and written self-help materials are showing promise (Cunningham, Humphreys, Koski-Jannes, & Cordingley, 2005). Thus it is important to encourage research and implementation of such innovative measures designed to increase treatment seeking for alcohol use disorders.

In summary, the findings from this research support the contention that many of those with alcohol use disorders identify no functional impairment and do not see themselves as disabled. However, there is a sub-group that does need intervention and this research suggests that current definitions are not optimal for indicating those truly at risk for their alcohol misuse. Furthermore, at the system level, there is a need to recognize and encourage the use of effective innovative non-medical as well as medical interventions in order to provide a range of treatments acceptable to those for whom alcohol misuse has become a significant problem.

REFERENCES

Aalto, M., Pekuri, P., & Seppa, K. (2003). Primary health care professionals' activity in intervening in patients' alcohol drinking during a 3-year brief intervention implementation project. *Drug & Alcohol Dependence., 69*(1), 9-14.

Aday, L. A., & Andersen, R. (1974). A framework for study of access to medical care. *Health Services Research*, 208-220.

Aertgeerts, B., Buntinx, F., Ansoms, S., & Fevery, J. (2002). Questionnaires are better than laboratory tests to screen for current alcohol abuse or dependence in a male inpatient population. *Acta Clinica Belgica, 57*(5), 241-249.

Allan, C. A. (1995). Alcohol problems and anxiety disorders - A critical review. *Alcohol & Alcoholism, 30*(2), 145-151.

Alte, D., Luedemann, J., Rose, H. J., & John, U. (2004). Laboratory markers carbohydrate-deficient transferrin, gamma-glutamyltransferase, and mean corpuscular volume are not useful as screening tools for high-risk drinking in the general population: results from the Study of Health in Pomerania (SHIP). *Alcoholism: Clinical & Experimental Research, 28*(6), 931-940.

Andrews, G., Henderson, S., & Hall, W. (2001). Prevalence, comorbidity, disability and service utilisation. Overview of the Australian National Mental Health Survey. *British Journal of Psychiatry, 178*, 145-153.

Andrews, G., Issakidis, C., & Carter, G. (2001). Shortfall in mental health service utilisation. *British Journal of Psychiatry, 179*, 417-425.

APA. (1994). *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*. Washington DC: American Psychiatric Association.

Arndt, T., & Keller, T. (2004). Forensic analysis of carbohydrate-deficient transferrin (CDT): implementation of a screening and confirmatory analysis concept is hampered by the lack of CDT isoform standards. *Forensic Science International, 146*(1), 9-16.

Azrin, N. H., Acierno, R., Kogan, E. S., Donohue, B., Besalel, V. A., & McMahon, P. T. (1996). Follow-up results of supportive versus behavioral therapy for illicit drug use. *Behaviour Research & Therapy, 34*(1), 41-46.

Babor, T. F. (1994). Avoiding the horrid and beastly sin of drunkenness: Does dissuasion make a diference? *Journal of Consulting and Clinical Psychology, 62*(6), 1127-1140.

Bannenberg, A. F. I., Raat, H., & Plomp, H. N. (1992). Demand for alcohol treatment by problem drinkers. *Journal of Substance Abuse Treatment, 9*, 59-62.

Bardsley, P. E., & Beckman, L. J. (1988). The Health Belief Model and entry into alcoholism treatment. *The International Journal of the Addictions, 23*(1), 19-28.

Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *Manual for the Beck Depression Inventory-II*. San Antonio, TX: Psychological Corporation.

Becker, M. H., Haefner, D. P., Kasl, S. V., Kirscht, J. P., Maiman, L. A., & Rosenstock, I. M. (1977). Selected psychosocial models and correlates of individual health-related behaviors. *Medical Care, 15*(5 SUPPL), 27-46.

Beckman, L. J., & Kocel, K. M. (1982). The treatment-delivery system and system and alcohol abuse in women: Social policy implications. *Journal of Social Issues, 38*(2), 139-151.

Beich, A., Gannik, D., & Malterud, K. (2002). Screening and brief intervention for excessive alcohol use: qualitative interview study of the experiences of general practitioners. *BMJ., 325*(7369), 870.

Bellon, J. A., Delgado, A., Luna, J. D., & Lardelli, P. (1999). Psychosocial and health belief variables associated with frequent attendance in primary care. *Psychological Medicine., 29*(6), 1347-1357.

Bernadt, M. W., Mumford, J., & Murray, R. M. (1984). A discriminant-function analysis of screening tests for excessive drinking and alcoholism. *Journal of Studies on Alcohol, 45*(1), 81-86.

Bijl, R. V., & Ravelli, A. (2000). Psychiatric morbidity, service use, and need for care in the general population: Results of the Netherlands Mental Health Survey and Incidence Study. *American Journal of Public Health, 90*(4), 602-607.

Bijl, R. V., Ravelli, A., & van Zessen, G. (1998). Prevalence of psychiatric disorder in the general population: Results of the Netherlands Mental Health Survey and Incidence Study (NEMESIS). *Social Psychiatry and Psychiatric Epidemiology, 33*(12), 587-595.

Bland, R. C., Newman, S. C., & Orn, H. (1997). Help-seeking for psychiatric disorders. *Canadian Journal of Psychiatry, 42*(9), 935-942.

Blendon, R. J., Schoen, C., DesRoches, C., Osborn, R., & Zapert, K. (2003). Common concerns amid diverse systems: health care experiences in five countries. *Health Affairs, 22*(3), 106-121.

Blondell, R. D. (2005). Ambulatory detoxification of patients with alcohol dependence. *American Family Physician, 71*(3), 495-502.

Bradizza, C. M., Stasiewicz, P. R., & Maisto, S. A. (1994). A conditioning reinterpretation of cognitive events in alcohol and drug cue exposure. *Journal of Behavior Therapy and Experimental Psychiatry, 25*(1), 15-22.

Britt, H., Miller, G., Knox, S., Charles, J., Valenti, L., Pan, Y., et al. (2005). *General Practice Activity in Australia 2003-04*. Canberra: AIHW.

Brown, S. A., Irwin, M., & Schuckit, M. A. (1991). Changes in anxiety among abstinent male alcoholics. *Journal of Studies on Alcohol, 52*(1), 55-61.

Browne, M. W., MacCallum, R. C., Kim, C.-T., Andersen, B. L., & Glaser, R. (2002). When Fit Indices and Residuals Are Incompatible. *Psychological Methods, 7*(4), 403-421.

Bucholz, K. K., Hesselbrock, V. M., Shayka, J. J., Nurnberger, J. I., Jr., Schuckit, M. A., Schmidt, I., et al. (1995). Reliability of individual diagnostic criterion items for psychoactive substance dependence and the impact on diagnosis. *Journal of Studies on Alcohol, 56*(5), 500-505.

Caetano, R. (1996). Recent thinking about the concept of alcohol dependence. *Annals of Epidemiology, 6*(5), 458-462.

Caetano, R. (1999). The identification of alcohol dependence criteria in the general population. *Addiction., 94*(2), 255-267.

Caetano, R., & Cunradi, C. (2002). Alcohol dependence: a public health perspective. *Addiction, 97*(6), 633-645.

Carr-Gregg, M. R., Enderby, K. C., & Grover, S. R. (2003). Risk-taking behaviour of young women in Australia: screening for health-risk behaviours. *Medical Journal of Australia., 178*(12), 601-604.

Carr-Hill, R. A., Rice, N., & Roland, M. (1996). Socioeconomic determinants of rates of consultation in general practice based on fourth national morbidity survey of general practices.[comment]. *BMJ, 312*(7037), 1008-1012.

Chaney, E. F. (1989). Social Skills Training. In R. Hester & W. R. Miller (Eds.), *Handbook of Alcohol Treatment Approaches* (pp. 206-221). New York: Pergamon Press.

Christensen, H., & Griffiths, K. (2000). The Internet and mental literacy. *Australian ans New Zealand Journal of Psychiatry, 34*, 975-979.

Chung, T., Martin, C. S., Armstrong, T. D., & Labouvie, E. W. (2002). Prevalence of DSM-IV alcohol diagnoses and symptoms in adolescent community and clinical samples. *Journal of the American Academy of Child & Adolescent Psychiatry, 41*(5), 546-554.

Commander, M. J., Odell, S. O., Williams, K. J., Sashidharan, S. P., & Surtees, P. G. (1999). Pathways to care for alcohol use disorders. *Journal of Public Health Medicine, 21*(1), 65-69.

Commander, M. J., Sashidharan, S. P., Odell, S. M., & Surtees, P. G. (1997). Access to mental health care in an inner-city health district. I: Pathways into and within specialist psychiatric services. *British Journal of Psychiatry, 170*(4), 312-316.

Cunningham, J. A., Humphreys, K., Koski-Jannes, A., & Cordingley, J. (2005). Internet and paper self-help materials for problem drinking: is there an additive effect? *Addictive Behaviors, 30*(8), 1517-1523.

Cunningham, J. A., Sobell, L. A., Sobell, M. B., Agrawal, S., & Toneatto, T. (1993). Barriers to treatment: Why alcohol and drug abusers delay or never seek treatment. *Addictive Behaviors, 18*, 347-353.

Cunningham, J. A., Sobell, L. C., Sobell, M. B., & Gaskin, J. (1994). Alcohol and drug abusers' reasons for seeking treatment. *Addictive Behaviors, 19*(6), 691-696.

Curry, S., Ludman, E., Grothaus, L., Donovan, D., & Kim, E. (2003). A randomized trial of a brief primary-care-based intervention for reducing at-risk drinking practices. *Health Psychology, 22*(2), 156-165.

Dawe, S., Loxton, N. J., Hides, L., Kavanagh, D. J., & Mattick, R. P. (2002). *Review of diagnostic and screening for alcohol and other drug use and other psychiatric disorders*. Canberra: Commonwealth Department of Health and Aged Care.

Dawson, D. (1996). Gender differences in the risk of alcohol dependence: United States, 1992. *Addiction., 91*(12), 1831-1842.

Dawson, D. A., & Grant, B. F. (1993). Gender effects in diagnosing alcohol abuse and dependence. *Journal of Clinical Psychology, 49*(2), 298-307.

Dawson, D. A., Grant, B. F., Stinson, F. S., Chou, P. S., Huang, B., & Ruan, W. J. (2005). Recovery from DSM-IV alcohol dependence: United States, 2001-2002.[see comment]. *Addiction, 100*(3), 281-292.

de Bruijn, C., Korzec, A., Koerselman, F., & van Den Brink, W. (2004). Craving and withdrawal as core symptoms of alcohol dependence. *Journal of Nervous & Mental Disease, 192*(7), 494-502.

Degenhardt, L., Hall, W., & Lynskey, M. (2003). What is comorbidity and why does it occur. In M. Teesson & H. Proudfoot (Eds.), *Comorbid Mental Disorders and Substance Use Disorders*. Canberra: Australian Government Department of Health and Ageing.

Degenhardt, L., Hall, W., Teesson, M., & Lynskey, M. (2000). *Alcohol use disorders in Australia: Findings from the National Survey of Mental Health and Well-*

Being. NDARC Technical report No. 97. Sydney: National Drug and Alcohol Research Centre.

Duaso, M. J., & Cheung, P. (2002). Health promotion and lifestyle advice in a general practice: what do patients think?[comment]. *Journal of Advanced Nursing., 39*(5), 472-479.

Dunlop, S., Coyte, P. C., & McIsaac, W. (2000). Socio-economic status and the utilisation of physicians' services: results from the Canadian National Population Health Survey. *Social Science & Medicine, 51*(1), 123-133.

Edwards, G. (1986). The alcohol dependence syndrome: a concept as stimulus to enquiry. *British Journal of Addiction, 81*, 171-183.

Edwards, G., Arif, A., & Hodgson, R. (1981). Nomenclature and classification of drug and alcohol related problems: a WHO memorandum. *Bulletin of the World Health Organisation, 50*, 225-242.

Edwards, G., & Gross, M. (1976). Alcohol dependence: provisional description of a clinical syndrome. *British Medical Journal, 1*, 1058-1061.

Edwards, G., Hawker, A., Hensman, C., Petro, J., & Williamson, V. (1973). Alcoholics known/unknown to agencies: epidemiological studies in a London suburb. *British Journal of Psychiatry, 123*, 169-183.

Elliot, A. (2002). The Decline in Bulk Billing: Explanations and Implications [Electronic Version]. *Current Issues Brief, Parliamentary Library, Parliament of Australia*, 3 2002-2003. Retrieved 24/1/2006.

Farrell, M., Howes, S., Taylor, C., Lewis, G., Jenkins, R., Bebbington, P., et al. (2003). Substance misuse and psychiatric comorbidity: an overview of the OPCS National Psychiatric Morbidity Survey. *International Review of Psychiatry, 15*(1-2), 43-49.

Feingold, A., & Rounsaville, B. (1995a). Construct validity of the abuse-dependence distinction as measured by DSM-IV criteria for different psychoactive substances. *Drug and Alcohol Dependence, 39*, 99-109.

Feingold, A., & Rounsaville, B. (1995b). Construct validity of the dependence syndrome as measure by DSM-IV for different psychoactive substances. *Addiction., 90*(12), 1661-1669.

Ferguson, L., Ries, R., & Russo, J. (2003). Barriers to identification and treatment of hazardous drinkers as assessed by urban/rural primary care doctors. *Journal of Addictive Diseases., 22*(2), 79-90.

Fillmore, K., Stockwell, T. R., Kerr, T. W., Chikritzhs, T., & Bostrom, A. (2006). *Systematic error in prospective studies of alcohol use and mortality risk: A meta-analysis of prospective mortality studies and re-estimation of the impact of alcohol on premature mortality in Australia. [T171]*. Perth: National Drug Research Institute.

Finney, J. W., Hahn, A. C., & Moos, R. H. (1996). The effectiveness of inpatient and outpatient treatment for alcohol abuse: the need to focus on mediators and moderators of setting effects. *Addiction., 91*(12), 1773-1796; discussion 1803-1720.

Finney, J. W., & Monahan, S. C. (1996). The cost-effectiveness of treatment for alcoholism: A second approximation. *Journal of Studies on Alcohol, 57*(3), 229-243.

Flaherty, B., Homel, P., & Hall, W. (1991). Public attitudes towards alcohol control policies. *Australian Journal of Public Health, 15*(4), 301-306.

Fleming, M. F., Barry, K. L., Manwell, L. B., Johnson, K., & London, R. (1997). Brief physician advice for problem alcohol drinkers: A randomized controlled trial in community-based primary care practices. *JAMA, 277*(13), 1039-1045.

Fleming, M. F., Mundt, M. P., French, M. T., Manwell, L. B., Stauffacher, E. A., & Barry, K. L. (2000). Benefit-cost analysis of brief physician advice with problem drinkers in primary care settings [see comments]. *Medical Care, 38*(1), 7-18.

Forrest, C. B. (2003). Primary care in the United States: primary care gatekeeping and referrals: effective filter or failed experiment? *BMJ, 326*(7391), 692-695.

Foxcroft, D. R., Ireland, D., Lister-Sharp, D. J., Lowe, G., & Breen, R. (2002). Primary prevention for alcohol misuse in young people. *Cochrane Database of Systematic Reviews, 3.*

Fulkerson, J. A., Harrison, P. A., & Beebe, T. J. (1999). DSM-IV substance abuse and dependence: are there really two dimensions of substance use disorders in adolescents? *Addiction., 94*(4), 495-506.

Goldberg, D. P., & Huxley, P. (1980). *Mental illness in the community: The pathway to psychiatric care.* London: Tavistock.

Gomel, M. K., Saunders, J. B., Burns, L., Hardcastle, D. M., & Sumich, M. (1994). Dissemination of early intervention for harmful alcohol consumption in general practice. *Health Promotion Journal of Australia, 4*(2), 65-69.

Grant, B. F. (1997a). Barriers to alcoholism treatment: Reasons for not seeking treatment in a general population sample. *Journal of Studies on Alcohol, 58*(4), 365-371.

Grant, B. F. (1997b). Prevalence and correlates of alcohol use and DSM-IV alcohol dependence in the United States: results of the National Longitudinal Alcohol Epidemiologic Survey. *Journal of Studies on Alcohol, 58*(5), 464-473.

Grant, B. F., Dawson, D. A., Stinson, F. S., Chou, S. P., Dufour, M. C., & Pickering, R. P. (2004a). The 12-month prevalence and trends in DSM-IV alcohol abuse and dependence: United States, 1991-1992 and 2001-2002. *Drug & Alcohol Dependence, 74*(3), 223-234.

Grant, B. F., Stinson, F. S., Dawson, D. A., Chou, S. P., Dufour, M. C., Compton, W., et al. (2004b). Prevalence and co-occurrence of substance use disorders and independent mood and anxiety disorders: results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Archives of General Psychiatry, 61*(8), 807-816.

Hall, R. H. (2003). Promoting men's health. *Australian Family Physician, 32*(6), 401-407.

Hall, W., & Teesson, M. (2000). Alcohol-use disorders: Who should be treated and how? In G. Andrews & S. Henderson (Eds.), *Unmet Need in Psychiatry: Problems, Resources, Responses* (pp. 290-301). Cambridge, UK: Cambridge University Press.

Harford, T. C., Grant, B. F., Hsiao-ye, Y., & Chiung, M. C. (2005). Patterns of DSM-IV alcohol abuse and dependence criteria among adolescents and adults: results from the 2001 National Household Survey on drug abuse. *Alcoholism: Clinical and Experimental Research, 29*(5), 810-828.

Harford, T. C., & Muthén, B. O. (2001). The dimensionality of alcohol abuse and dependence: a multivariate analysis of DSM-IV symptom items in the National Longitudinal Survey of Youth. *Journal of Studies on Alcohol., 62*(2), 150-157.

Harrison, P. A., Fulkerson, J. A., & Beebe, T. J. (1998). DSM-IV substance use disorder criteria for adolescents: A critical examination based on a statewide school survey. *American Journal of Psychiatry, 155*(4), 486-492.

Harvard School of Public Health. (2006). Alcohol [Electronic Version]. Retrieved 6 June, 2006 from http://www.hsph.harvard.edu/nutritionsource/alcohol.html.

Hasin, D. (2003). Classification of alcohol use disorders. *Alcohol Research & Health: the Journal of the National Institute on Alcohol Abuse & Alcoholism, 27*(1), 5-17.

Hasin, D., Li, Q., McCloud, S., & Endicott, J. (1996). Agreement between DSM-III, DSM-III-R, DSM-IV and ICD-10 alcohol diagnoses in US community-sample heavy drinkers. *Addiction, 91*(10), 1517-1527.

Hasin, D., Muthuen, B., Wisnicki, K. S., & Grant, B. (1994). Validity of the bi-axial dependence concept: a test in the US general population. *Addiction., 89*(5), 573-579.

Hasin, D., & Paykin, A. (1998). Dependence symptoms but no diagnosis: Diagnostic "orphans" in a community sample. *Drug & Alcohol Dependence, 50*(1), 19-26.

Hasin, D., & Paykin, A. (1999). Alcohol dependence and abuse diagnoses: Concurrent validity in a nationally representative sample. *Alcoholism: Clinical & Experimental Research, 23*(1), 144-150.

Hasin, D., Schuckit, M. A., Martin, C. S., Grant, B. F., Bucholz, K. K., & Helzer, J. E. (2003). The validity of DSM-IV alcohol dependence: what do we know and what do we need to know? *Alcoholism: Clinical & Experimental Research, 27*(2), 244-252.

Hays, R. (1985). An integrated value-expectancy theory of alcohol and other drug use. *British Journal of Addiction, 80*, 379-384.

Helzer, J. E., Burnam, A., & McEvoy, L. T. (1991). Alcohol abuse and dependence. In L. N. Robins & D. A. Regier (Eds.), *Psychiatric Disorders in America: The Epidemiologic Catchment Area Study*. New York: The free Press.

Henderson, S., Andrews, G., & Hall, W. (2000). Australia's mental health: An overview of the general population survey. *Australian and New Zealand Journal of Psychiatry, 34*, 197-205.

Hingson, R., Mangione, T., Meyers, A., & Scotch, N. (1982). Seeking help for drinking problems: A study in the Boston metropolitan area. *Journal of Studies on Alcohol, 43*(3), 273-288.

Homel, R. (1989). Crime on the roads: drinking and driving. In J. Vernon (Ed.), *Alcohol and crime*. Canberra: Australian Institute of Criminology.

Homel, R. (1993). Random breath testing in Australia: getting it to work according to specifications. *Addiction, 88*(Supplement), 27S-33S.

Hughes, J. R. (2002). Three classics that promoted the scientific study of drug dependence. *Addiction, 97*, 111-112.

Kapur, N., Hunt, I., Lunt, M., McBeth, J., Creed, F., & Macfarlane, G. (2004). Psychosocial and illness related predictors of consultation rates in primary care--a cohort study. *Psychological Medicine, 34*(4), 719-728.

Kessler, R. (1994). The National Comorbidity Survey of the United States. *International Review of Psychiatry, 6*, 365-376.

Kessler, R. C., Aguilar-Gaxiola, S., Berglund, P. A., Caraveo-Anduaga, J. J., DeWit, D. J., Greenfield, S. F., et al. (2001). Patterns and predictors of treatment

seeking after onset of a substance use disorder. *Archives of General Psychiatry, 58*(11), 1065-1071.

Kessler, R. C., Zhao, S., Katz, S. J., Kouzis, A. C., Frank, R. G., Edlund, M., et al. (1999). Past-year use of outpatient services for psychiatric problems in the National Comorbidity Study. *American Journal of Psychiatry, 156*(1), 115-123.

Klein, C., di Menza, S., Arfken, C., & Schuster, C. R. (2002). Interaction effects of treatment setting and client characteristics on retention and completion. *Journal of Psychoactive Drugs, 34*(1), 39-50.

Knox, S. A., & Britt, H. (2004). The contribution of demographic and morbidity factors to self-reported visit frequency of patients: a cross-sectional study of general practice patients in Australia. *BMC Family Practice, 5*, 17.

Korten, A., & Henderson, S. (2000). The Australian National Survey of Mental Health and Well-Being. Common psychological symptoms and disablement. *British Journal of Psychiatry, 177*, 325-330.

Langenbucher, J., Martin, C. S., Labouvie, E., Sanjuan, P. M., Bavly, L., & Pollock, N. K. (2000). Toward the DSM-V: the Withdrawal-Gate Model versus the DSM-IV in the diagnosis of alcohol abuse and dependence. *Journal of Consulting & Clinical Psychology., 68*(5), 799-809.

Langenbucher, J. W., Labouvie, E., Martin, C. S., Sanjuan, P. M., Bavly, L., Kirisci, L., et al. (2004). An application of item response theory analysis to alcohol, cannabis, and cocaine criteria in DSM-IV. *Journal of Abnormal Psychology, 113*(1), 72-80.

Langenbucher, J. W., Morgenstern, J. M., Labouvie, E., Miller, K. J., & Nathan, P. E. (1996). On criterion weighting in the DSM-IV. *Journal of Consulting & Clinical Psychology., 64*(2), 343-356.

Little, P., Somerville, J., Williamson, I., Warner, G., Moore, M., Wiles, R., et al. (2001). Psychosocial, lifestyle, and health status variables in predicting high attendance among adults. *British Journal of General Practice., 51*(473), 987-994.

Lynskey, M. T. (1998). The comorbidity of alcohol dependence and affective disorders: treatment implications. *Drug & Alcohol Dependence, 52*(3), 201-209.

Maisto, S. A., & Saitz, R. (2003). Alcohol use disorders: screening and diagnosis. *American Journal on Addictions, 12*(1).

Mann, K. (2004). Pharmacotherapy of alcohol dependence: a review of the clinical data. *CNS Drugs*.

Mariani, J. J., & Levin, F. R. (2004). Pharmacotherapy for alcohol-related disorders: what clinicians should know. *Harvard Review of Psychiatry, 12*(6), 351-366.

Mathers, C., & Vos, T. (1999). *The Burden of Disease and Injury in Australia* (No. AIHW cat no PHE17). Canberra: Australian Institute of Health and Welfare.

Mattick, R. P., & Jarvis, T. (Eds.). (1993). *An outline for the management of alcohol problems: Quality assurance project*. Canberra: Australian Government Publishing Service.

Maxwell, J. C. (2003). Update: comparison of drug use in Australia and the United States as seen in the 2001 National Household Surveys. *Drug and Alcohol Review, 22*, 347-357.

Mayfield, D., McLeod, G., & Hall, P. (1974). The CAGE questionnaire: Validation of a new alcohol screening instrument. *American Journal of Psychiatry, 131*, 1121-1123.

Mayo-Smith, M. F. (1997). Pharmacological management of alcohol withdrawal. A meta-analysis and evidence-based practice guideline. American Society of Addiction Medicine Working Group on Pharmacological Management of Alcohol Withdrawal [see comments]. *Jama, 278*(2), 144-151.

McGlynn, E. A., Asch, S. M., Adams, J., Keesey, J., Hicks, J., DeCristofaro, A., et al. (2003). The quality of health care delivered to adults in the United States. *The New England Journal of Medicine, 348*(26), 2635-2645.

McGovern, M. P., & Carroll, K. M. (2003). Evidence-based practices for substance use disorders. *Psychiatric Clinics of North America, 26*(4), 991-1010.

McPherson, M., Casswell, S., & Pledger, M. (2004). Gender convergence in alcohol consumption and related problems: issues and outcomes from comparisons of New Zealand survey data. *Addiction, 99*(6), 738-748.

Meadows, G., Burgess, P., Fossey, E., & Harvey, C. (2000). Perceived need for mental health care, findings from the Australian National Survey of Mental Health and Wellbeing. *Psychological Medicine, 30*, 645-656.

Meyer, R. E. (2001). Finding paradigms for the future of alcoholism research: an interdisciplinary perspective.[see comment]. *Alcoholism: Clinical & Experimental Research, 25*(9), 1393-1406.

Midford, R. (2005). Australia and alcohol: living down the legend. *Addiction, 100*(7), 891-896.

Miller, W. R., & Wilbourne, P. L. (2002). Mesa Grande: A methodological analysis of clinical trials of treatment for alcohol use disorders. *Addiction, 97*(3), 265-277.

Millstein, S. G., & Marcell, A. V. (2003). Screening and counseling for adolescent alcohol use among primary care physicians in the United States. *Pediatrics., 111*(1), 114-122.

Moore, R. D. (1994). Screening and assessment of alcohol and other drug use. *Maryland Medical Journal, 43*(1), 35-39.

Morgenstern, J., Langenbucher, J., & Labouvie, E. W. (1994). The generalizability of the dependence syndrome across substances: an examination of some properties of the proposed DSM-IV dependence criteria. *Addiction, 89*(9), 1105-1113.

Muthén, B., & Lehman, J. (1985). Multiple group IRT modeling: Applications to item bias analysis. *Journal of Educational Statistics, 10*(2), 143-160.

Muthén, B. O. (1996). Psychometric evaluation of diagnostic criteria: Application to a two-dimensional model of alcohol abuse and dependence. *Drug & Alcohol Dependence, 41*(2), 101-112.

Muthén, B. O., Grant, B., & Hasin, D. (1993). The dimensionality of alcohol abuse and dependence: factor analysis of DSM-III-R and proposed DSM-IV criteria in the 1988 National Health Interview Survey. *Addiction, 88*(8), 1079-1090.

Muthén, B. O., & Muthén, L. K. (2001). *Mplus. Statistical Analysis With Latent Variables. User's Guide (v2.01)*. Los Angeles, CA: Muthén & Muthén.

Muthén, L. K., & Muthén, B. O. (1998). *Mplus Users' Guide*. Los Angeles, CA: Muthén & Muthén.

Nelson, C. B., Rehm, J., Ustun, T. B., Grant, B., & Chatterji, S. (1999). Factor structures for DSM-IV substance disorder criteria endorsed by alcohol,

cannabis, cocaine and opiate users: results from the WHO reliability and validity study. *Addiction, 94*(6), 843-855.

Nelson, C. B., & Wittchen, H. U. (1998). DSM-IV alcohol disorders in a general population sample of adolescents and young adults. *Addiction, 93*(7), 1065-1077.

Newcombe, R. G., & Altman, D. G. (2000). Proportions and their differences. In D. G. Altman, D. Machin, T. N. Bryant & M. J. Gardner (Eds.), *Statistics with confidence: Second Edition* (pp. 45-56). London: BMJ.

Olfson, M., Fireman, B., Weissman, M. M., Leon, A. C., Sheehan, D. V., Kathol, R. G., et al. (1997). Mental disorders and disability among patients in a primary care group practice.[comment]. *American Journal of Psychiatry., 154*(12), 1734-1740.

Ormel, J. (1994). Common mental disorders and disability acrosss cultures: Results from the WHO Collaborative Study on Psychological Problems in Mental Health Care. *JAMA, 272*(22), 1741-1748.

Parslow, R., Jorm, A., Christensen, H., Jacomb, P., & Rodgers, B. (2004). Gender differences in factors affecting use of health services: an analysis of a community study of middle-aged and older Australians. *Social Science & Medicine, 59*(10), 2121-2129.

Paykel, E., Abbott, R., Jenkins, R., Brugha, T., & Meltzer, H. (2003). Urban-rural mental health differences in Great Britain: findings from the National Morbidity Survey. *International Review of Psychiatry, 15*(1-2), 97-107.

Peele, S. (1996). Recovering from an all-or-nothing approach to alcohol. *Psychology Today, September/October*, 68-70.

Peters, L., & Andrews, G. (1995). Procedural validity of the computerized version of the Composite International Diagnostic Interview (CIDI-Auto) in the anxiety disorders. *Psychological Medicine, 25*(6), 1269-1280.

Phillips, R. L. (2005). Primary care in the United States: problems and possibilities. *BMJ, 331*(7529), 1400-1402.

Prochaska, J. O., & DiClemente, C. C. (1986). Toward a comprehensive model of change. In W. R. Miller & N. Heather (Eds.), *Treating Addictive Behaviors* (2 ed., pp. 3-27). New York & London: Plenum Press.

Prochaska, J. O., DiClemente, C. C., & Norcross, J. C. (1992). In search of how people change. Applications to addictive behaviors. *American Psychologist., 47*(9), 1102-1114.

Project MATCH Research Team. (1997). Matching alcoholism treatments to client heterogeneity: Project MATCH Posttreatment drinking outcomes. *Journal of Studies on Alcohol, 58*(1), 7-29.

Proudfoot, H., & Teesson, M. (2000). *Investing in drug and alcohol treatment. NDARC Technical Report No. 91*. Sydney: National Drug and Alcohol Research Centre, UNSW.

Proudfoot, H., & Teesson, M. (2003). Comorbidity and the delivery of services. In M. Teesson & H. Proudfoot (Eds.), *Comorbid Mental Disorders and Substance Use Disorders*. Canberra: Australian Government Department of Health and Ageing.

Rees, D. W., & Farmer, R. (1985). Health beliefs and attendance for specialist alcoholism treatment. *British Journal of Psychiatry, 147*, 317-319.

Robins, L., Helzer, J. E., Croughan, J., Williams, J. B. W., & Spitzer, R. L. (1981). *The NIMH diagnostic interview schedule, version III*. Washington (DC): US Public Health.

Robins, L. N., & Regier, D. A. (Eds.). (1991). *Psychiatric disorders in America: The Epidemiological Catchment Area study*. New York: The Free Press.

Roche, A. M., Hotham, E. D., & Richmond, R. L. (2002). The general practitioner's role in AOD issues: overcoming individual, professional and systemic barriers. *Drug & Alcohol Review., 21*(3), 223-230.

Roeloffs, C. A., Fink, A., Unutzer, J., Tang, L., & Wells, K. B. (2001). Problematic substance use, depressive symptoms, and gender in primary care. *Psychiatric Services., 52*(9), 1251-1253.

Rounsaville, B. J., Spitzer, R. L., & Williams, J. B. (1986). Proposed changes in DSM-III substance use disorders: description and rationale. *American Journal of Psychiatry, 143*(4), 463-468.

Rydon, P., Redman, S., & Sanson-Fisher, R. W. (1988). The assessment of alcohol-related problems: A need for a new perspective. *Australian Drug and Alcohol Review, 7*, 127-130.

Saunders, J. B., Aasland, O. G., Babor, T. F., Fuente, J. R. d. l., & 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.

Schorling, J. B., & Buchsbaum, D. (1997). Screening for alcohol and drug abuse. *Medical Clinics of North America, 81*(4), 845-865.

Schuckit, M. A. (1996). Recent developments in the pharmacotherapy of alcohol dependence. *Journal of Consulting & Clinical Psychology, 64*(4), 669-676.

Senft, R. A., Polen, M. R., Freeborn, D. K., & Hollis, J. F. (1997). Brief intervention in a primary care setting for hazardous drinkers. *American Journal of Preventive Medicine, 13*(6), 464-470.

Shah, B. V., Barnwell, B. G., & Bieler, G. S. (1997). *SUDAAN User's Manual, Release 7.5*. Research Triangle Park: Research Triangle Institute.

Shand, F., Gates, J., Fawcett, J., & Mattick, R. (2003). *The Treatment of Alcohol Problems*. Canberra: National Alcohol Strategy.

Sobell, L. C., Agrawal, S., & Sobell, M. B. (1999). Utility of liver function tests for screening "alcohol abusers" who are not severely dependent on alcohol. *Substance Use & Misuse, 34*(12), 1723-1732.

Spitzer, R. L., Williams, J. B., Gibbon, M., & First, M. B. (1990). *Structured Clinical Interview for DSM-R-III*. Washington, D.C.: The American Psychiatric Press.

Spurling, M. C., & Vinson, D. C. (2005). Alcohol-related injuries: Evidence for the Prevention Paradox. *Annals of Family Medicine, 3*(1), 47-52.

Teesson, M., Baillie, A., Lynskey, M., Manor, B., & Degenhardt, L. (2006). Substance use, dependence and treatment seeking in the United States and Australia: a cross-national comparison. *Drug & Alcohol Dependence, 81*(2), 149-155.

Teesson, M., Hall, W., Lynskey, M., & Degenhardt, L. (2000). Alcohol- and drug-use disorders in Australia: Implications of the National Survey of Mental Health and Wellbeing. *Australian and New Zealand Journal of Psychiatry, 34*, 206-213.

Teesson, M., Lynskey, M., Manor, B., & Baillie, A. (2002). The structure of cannabis dependence in the community. *Drug and Alcohol Dependence, 68*, 255-262.

Teesson, M., & Proudfoot, H. (Eds.). (2003). *Comorbid Mental Disorders and Substance Use Disorders: Epidemiology, Prevention and Treatment*. Canberra: Australian Government Department of Health and Ageing.

Thom, B. (1986). Sex differences in help-seeking for alcohol problems - 1. Barriers to help-seeking. *British Journal of Addiction, 81*, 777-788.

Thom, B. (1987). Sex differences in help-seeking for alcohol problems - 2. Entry into treatment. *British Journal of Addiction., 82*, 989-997.

Tudiver, F., & Talbot, Y. (1999). Why don't men seek help? Family physicians' perspectives on help-seeking behavior of men. *The Journal of Family Practice, 48*(1), 47-52.

Volpicelli, J. R., Rhines, K. C., Rhines, J. S., Volpicelli, L. A., Alterman, A. I., & O' Brien, C. P. (1997). Naltrexone and alcohol dependence. Role of subject compliance [see comments]. *Archives of General Psychiatry, 54*(8), 737-742.

Wagner, E. F., Lloyd, D. A., & Gil, A. G. (2002). Racial/ethnic and gender differences in the incidence and onset age of DSM-IV alcohol use disorder symptoms among adolescents. *Journal of Studies on Alcohol., 63*(5), 609-619.

Ware, J., Jr., Kosinski, M., & Keller, S. D. (1996). A 12-Item Short-Form Health Survey: construction of scales and preliminary tests of reliability and validity. *Medical Care, 34*(3), 220-233.

Weisner, C. (1993). Toward an alcohol treatment entry model: A comparison of problem drinkers in the general population and in treatment. *Alcoholism: Clinical and Experimental Research, 17*(4), 746-752.

Weisner, C., & Schmidt, L. (1995). *Access and Need for Alcohol Treatment*. Berkeley, CA: Alcohol Research Group.

WHO Brief Intervention Study Group. (1996). A cross-national trial of brief interventions with heavy drinkers. WHO Brief Intervention Study Group. *American Journal of Public Health, 86*(7), 948-955.

WHO World Mental Health Survey Consortium. (2004). Prevalence, severity, and unmet need for treatment of mental disorders in the World Health Organization World Mental Health Surveys.[see comment]. *JAMA, 291*(21), 2581-2590.

Williams, D., & McBride, A. J. (1998). The drug treatment of alcohol withdrawal symptoms: a systematic review. *Alcohol & Alcoholism, 33*(2), 103-115.

Winters, K. C., Latimer, W., & Stinchfield, R. D. (1999). The DSM-IV criteria for adolescent alcohol and cannabis use disorders. *Journal of Studies on Alcohol, 60*(3 May), 337-344.

Wittchen, H.-U. (1994). Reliability and validity studies of the WHO-Composite International Diagnostic Interview (CIDI): A critical review. *Journal of Psychiatric Research, 28*, 57-84.

World Health Organization. (1996). *Composite International Diagnostic Interview*. Geneva: World Health Organization.

Wu, L. T., Kouzis, A. C., & Leaf, P. J. (1999). Influence of comorbid alcohol and psychiatric disorders on utilization of mental health services in the National Comorbidity Survey. *American Journal of Psychiatry, 156*(8), 1230-1236.

Wu, L. T., & Ringwalt, C. L. (2004). Alcohol dependence and use of treatment services among women in the community. *American Journal of Psychiatry, 161*(10), 1790-1797.

Wutzke, S. E., Shiell, A., Gomel, M. K., & Conigrave, K. M. (2001). Cost effectiveness of brief interventions for reducing alcohol consumption. *Social Science & Medicine., 52*(6), 863-870.

Yu, C.-Y. (2002). Evaluating cutoff criteria of model fit indices for latent variable models with binary and continuous outcomes.   Retrieved 1 April, 2004

Zernig, G., Fabisch, K., & Fabisch, H. (1997). Pharmacotherapy of alcohol dependence. *Trends in Pharmacological Sciences, 18*, 229-231.

Zilberman, M., Tavares, H., & el-Guebaly, N. (2003). Gender similarities and differences: the prevalence and course of alcohol- and other substance-related disorders. *Journal of Addictive Diseases, 22*(4), 61-74.

APPENDICES

1. Who Seeks Treatment for Alcohol Dependence?

2. The Structure of Alcohol Dependence in the Community

1. Who Seeks Treatment for Alcohol Dependence?

ORIGINAL PAPER

Heather Proudfoot · Maree Teesson

Who seeks treatment for alcohol dependence?
Findings from the Australian National Survey of Mental Health and Wellbeing

■ **Abstract** *Background* This paper presents findings from the Australian National Survey of Mental Health and Wellbeing (NSMHWB) regarding prevalence and treatment seeking for Australians with DSM-IV alcohol dependence and examines the influence of alcohol use variables on treatment seeking. *Method* A standardised interview (including CIDI 2.1) was administered to a stratified random sample of 10,641 Australians aged 18 years and over. Demographic variables, common DSM-IV mental disorders, physical health status, perceived disability and treatment-seeking behaviour were assessed. Multiple logistic regression was used to ascertain the independent effects of all variables considered. *Results* The prevalence of DSM-IV alcohol dependence was 4.1 % in this population, with 75 % being male and nearly 60 % in the 18–34 year age group. Variables that correlated independently with alcohol dependence were sex (male), age (young), not being in a married or de facto relationship and having any affective, anxiety or other substance use disorder. Functional disability did not correlate with a dependence diagnosis. Correlates of treatment seeking for those with dependence were sex (female) and having a comorbid affective disorder. Having a diagnosis of dependence and/or abuse and having more dependence symptoms did not predict treatment seeking. However, meeting either of two criteria assessing psychological, physical or social problems due to alcohol use tended to increase service use. *Conclusions* People with alcohol dependence do not perceive themselves as disabled and do not seek treatment. However, having a comorbid affective disorder or other problems directly attributable to alcohol use increases the likelihood that such individuals will seek treatment. Efforts should be made at the primary care level to encourage those engaged in harmful drinking practices to recognise the risks of such drinking and reduce it or seek treatment. Similarly, it is recommended that integrated services are enhanced at both primary and specialist levels in order that those with multiple problems are appropriately treated. Further research is required to refine measurement of disability and diagnoses of alcohol use disorders and to examine the relationship between disability and alcohol use.

■ **Key words** alcohol dependence – treatment seeking – prevalence – functional disability – comorbidity – Australia

Introduction

Alcohol is one of the most commonly used substances and contributes more than 10 % to the total health burden in established market economies (Murray and Lopez 1996). It is widely documented that alcohol abuse in its various forms costs society dearly and large-scale surveys provide evidence that alcohol is the source of many significant social and health problems for the individual.

In 1997, for the first time in Australia, general population data on alcohol use disorders were collected as part of the National Survey of Mental Health and Wellbeing (NSMHWB). In addition to providing diagnoses of mental disorders including substance use, the survey also enquired about service use for mental health problems in the past 12 months (Meadows et al. 2000). This paper examines service use for those with alcohol dependence.

Despite the availability of effective treatments for alcohol use disorders (Proudfoot and Teesson 2000), research to date has found that few people with such problems seek help. The National Comorbidity Survey in the US found that only 13.5 % of those diagnosed with alcohol dependence in the past 12 months had sought help (Kessler et al. 1999) while the Netherlands-based

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NEMESIS study found that 17.5 % of those with alcohol use disorders sought any professional help (Bijl and Ravelli 2000), and when comorbid conditions and sex and age were controlled, alcohol use disorders did not predict usage of care at all.

Various models have been proposed to describe treatment-seeking behaviour in general and have been applied variously to alcohol problems (Aday and Andersen 1974; Becker et al. 1977; Goldberg and Huxley 1980; Hays 1985; Weisner and Schmidt 1995). These models tend to identify and categorise variables which are structurally based or individually based, as well as whether those factors are amenable to manipulation through a broad-based health policy.

Studies on clinical populations and small community survey samples have examined factors related to treatment seeking including structural variables such as cost and length of wait until treatment (Rees and Farmer 1985; Cunningham et al. 1993), demographic variables such as age, gender and marital status (Bannenberg et al. 1992; Weisner 1990; Hingson et al. 1982; Commander et al. 1999), individual beliefs about illness and treatment (Cunningham et al. 1993; Thom 1986; Thom 1987; Hingson et al. 1982; Rees and Farmer 1985; Weisner 1993), and symptom severity and time with the problem (Thapar et al. 1998; Thom 1986; Thom 1987; Cunningham et al. 1993; Cunningham et al. 1994; Hingson et al. 1982; Bannenberg et al. 1992; Bardsley and Beckman 1988). However, a review of these studies has found that they tend to suffer from serious methodological problems such as non-random subject selection, not using standard measures of alcohol problems or diagnosis, frequently not presenting a full account of all variables under consideration and poor use of statistical techniques (Proudfoot and Teesson 2001).

General population surveys which assess mental illness prevalence and service usage in national samples are an important alternative source of relevant information. Several large studies have been carried out recently in the United States (Kessler et al. 1994; Wu et al. 1999), Canada (Bland et al. 1997), The Netherlands (Bijl and Ravelli 2000) and now Australia (Henderson et al. 2000; Teesson et al. 2000). These studies used sophisticated sampling procedures and statistical analyses which allow greater confidence in conclusions drawn about whole-population attitudes and behaviour.

Important findings from the overseas studies consistently show that most people do not want or seek help for their mental health problems including alcohol use disorders (Bijl and Ravelli 2000; Wu et al. 1999); there is no relationship between age and treatment seeking for mental health problems (Bijl and Ravelli 2000; Wu et al. 1999; Bland et al. 1997); women are more likely to seek help but more so in primary care settings than specialist settings (Bijl and Ravelli 2000; Bland et al. 1997); those in stable dyadic relationships are less likely to seek help (Bijl and Ravelli 2000; Wu et al. 1999; Bland et al. 1997); women and younger people are less likely to be referred to a specialist by a General Practitioner (GP) (Wu et al. 1999); and people in urban settings are more likely to seek help in primary care (Bijl and Ravelli 2000). An increase in the number of dependence symptoms and the presence of comorbid psychiatric disorders are also more likely to lead to professional help seeking (Bijl and Ravelli 2000; Wu et al. 1999; Bland et al. 1997).

Whilst overseas epidemiological studies have reported on treatment seeking for alcohol use disorders, and Parslow and Jorm (2000) have addressed the issue of service use in Australia for those with any affective anxiety or substance use disorder, this present study is the first to report on Australian data specifically targeting service use for those with alcohol dependence. ICD-10 prevalence rates for alcohol and other drug dependence from the NSMHWB have been reported by Hall et al. (1999) but this paper presents for the first time DSM-IV prevalence rates for alcohol dependence in Australia. It draws together data from the Australian NSMHWB regarding the prevalence and correlates of DSM-IV alcohol dependence and treatment seeking for dependence. It provides unique information on the effects of disability measures on treatment seeking for alcohol problems. As Bijl and Ravelli (2000) suggest, it is possible that severity of functional limitations may not be great especially for non-chronic conditions with good social support and this may be reflected in low levels of treatment seeking for those with uncomplicated alcohol disorders.

In this study, variables relating to the diagnosis of alcohol dependence are first examined, and then factors influencing treatment seeking.

Subjects and methods

■ Sampling and measures

The Australian NSMHWB surveyed a national stratified, multi-stage probability sample of persons aged 18 years and older in 1997. Methods and basic findings for this survey have been summarised by Henderson et al. (2000). In total 10,641 respondents (78%) were interviewed using a modified version of the Composite International Diagnostic Interview (CIDI) (World Health Organization 1996). Among the variables assessed by the modified CIDI were criteria for DSM-IV diagnoses for alcohol and drug use and anxiety and mood disorders in the past 12 months. Other measures of relevance to the present study include the presence of physical illness, perceived physical and mental disability (SF-12, Ware et al. 1996), days out of role due to illness in the past month, service use for a mental health problem in the past 12 months, as well as relevant demographic variables.

Alcohol dependence in the past 12 months was assessed by first identifying alcohol users as those who drank 12 or more standard drinks in that period. This group was further questioned regarding amount and frequency of use as well as specific questions leading to an assessment of conformity with the DSM-IV criteria for dependence. According to DSM-IV, individuals are dependent if they meet any three of the following:
(1) Tolerance – the need for larger amounts of the drug in order to achieve the same effect.
(2) Withdrawal – characteristic syndrome present upon cessation of the drug or the drug is taken to relieve withdrawal symptoms.
(3) The substance is taken over a longer period of time than initially intended.
(4) A persistent desire to decrease use; however attempts may be unsuccessful.

(5) Social and personal interests are given up or decreased due to the substance use.

(6) Considerable time spent acquiring the substance/using or recovering from use.

(7) Continuation of substance use despite awareness of recurrent problems associated with use.

In order to assess treatment seeking, individuals were asked if they had seen a GP or any other professional for a mental health problem in the past 12 months.

■ Data analysis

Initial analyses of the data involved using population estimates obtained from the full sample surveyed to determine the prevalence and correlates of alcohol dependence, correlates of treatment seeking Australia-wide and to investigate the effects of alcohol diagnosis on treatment seeking. Finally, the alcohol dependent group was analysed separately to determine correlates of treatment seeking within this sub-sample. Prevalence estimates and logistic regressions were adjusted for sampling through the use of balanced repeated replications (BRR) weightings using SAS-callable SUDAAN (Shah et al. 1997). These weightings adjusted the data to conform to independent population estimates by state, part of state, age and sex.

Logistic regression was used to identify those variables correlating with a diagnosis of alcohol dependence and with treatment seeking, when other variables were held constant. The independent variables were introduced in a block as we were interested in how each variable correlated with the criterion, rather than in overall model-building. One breakdown of independent variables which is afforded by SUDAAN is to group variables under logical headings and ascertain the relevance of the grouping to the dependent variable. This procedure was used in the section examining prevalence and correlates of treatment seeking amongst those with alcohol dependence. Odds ratios and 95% confidence limits were used to indicate the strength of relationships amongst variables. Despite the fact that multiple significance tests were carried out and Bonferroni corrections would be preferable, SUDAAN does not allow for fine adjustments of these confidence intervals. However, such adjustments could be made to probability values and these adjusted p-values have been provided.

Confidence limits of proportions and tests of differences of proportions were carried out using the methods recommended by Newcombe and Altman (2000).

Results

■ Prevalence of alcohol dependence in the Australian population, aged 18 years and over

The overall prevalence of alcohol dependence was 4.1% (n = 437) with a much higher proportion of males (6.1%) than females (2.3%) receiving the diagnosis. Males represented nearly 75% of the total alcohol dependent group. The prevalence decreased linearly with age both in terms of the proportion in the age group with alcohol dependence and the proportion represented in the alcohol dependence group. Nearly 60% of the dependent group came from the 18–34 year age group, representing some 7% of this age group.

■ Correlates of alcohol dependence in the Australian population, aged 18 years and over

Overall males were three times more likely to be dependent than females and dependence decreased signifi-

cantly with increased age (Table 1). Those in the youngest age group (18–34 years) were four times more likely to be dependent than those over 55 years, whilst those aged 35–54 years were over two and a half times more likely to be dependent. Having an affective or drug use disorder was significantly associated with alcohol dependence with those with comorbid drug disorders being at highest risk (OR = 3.9). Those adults not living in a marital or de facto relationship also were significantly more likely to be dependent.

Further regression analyses were carried out on males and females separately. Results indicated that for males alone, age, marital status and having a comorbid drug disorder remained significant correlates of dependence, whilst for females alone, having an affective disorder was the only correlate of alcohol dependence.

■ Correlates of treatment seeking for any mental disorder in the Australian population, aged 18 years and over

Overall 1,321 (11.05%) individuals sought professional help for their mental health problems in the past 12 months. Correlates of treatment seeking for any mental disorder, and the influence of type of alcohol diagnosis and level of dependence on treatment seeking were examined. Level of dependence was defined as high if the individual met four or more criteria for dependence. A further variable examined was whether any social, physical or psychological variables were affected by drink-

Table 1 Correlates of alcohol dependence

Variables in the equation	Odds Ratio (OR)	95% Confidence Interval for OR	
		lower	upper
*Sex (cf female)	3.02	2.05	4.47
*Age (cf 55 + group)			
18–34	4.09	2.60	6.44
35–54	2.65	1.60	4.40
Less than Bachelor degree (cf those with a degree)	1.21	0.72	2.05
*Not married/de facto	2.06	1.55	2.74
Employment (cf employed)			
Part- or full-time unemployed	0.98	0.47	2.01
Not in workforce	0.72	0.49	1.04
Urban dwelling	1.03	0.66	1.61
*Any affective disorder	2.79	1.78	4.37
Any anxiety disorder	1.97	1.16	3.35
*Any other drug disorder	3.94	1.99	7.81
Any physical condition	1.59	0.97	2.60
SF-12 mental disability (moderate-severe)	1.62	0.89	2.97
SF-12 physical disability (moderate-severe)	0.94	0.48	1.85
5 or more days out of role	1.08	0.65	1.80

* p < 0.05 equivalent with Bonferroni adjustment

ing. This was ascertained by identifying all those who met either DSM-IV criterion 6 for dependence (important social, occupational or recreational activities given up due to drinking) or criterion 7 (continued drinking despite known physical and psychological problems associated with drinking).

Logistic regression found that males were about half as likely as females to seek any service for a mental disorder (Table 2). Those aged between 18 and 54 were significantly more likely than the over 55 year group to use services for their mental health problems, while the 35–54 year age group was most likely to seek such help. Being a graduate meant an individual was more likely to seek such help when compared with those with lesser education. Having an affective, anxiety or any drug disorder meant higher service use; while having a comorbid physical disorder did not. Amongst the disability measures, moderate to severe SF-12 mental disorder correlated significantly with service use whilst SF-12 physical disorder and days out of role did not.

Influence of alcohol use variables on treatment seeking

Having a diagnosis of alcohol dependence did not predict service use, and when alcohol abuse, any alcohol use disorder or level of dependence was substituted for dependence in the logistic regression, their odds of predicting treatment seeking did not differ significantly

Table 2 Correlates of treatment seeking for any mental disorder

Variables in the equation	Odds Ratio (OR)	95 % Confidence Interval for OR	
		lower	upper
*Sex (male cf female)	0.55	0.41	0.73
*Age (cf 55 + group)			
18–34	1.47	1.09	1.99
35–54	2.18	1.66	2.87
*Less than Bachelor degree (cf Bachelor degree)	0.58	0.42	0.79
Not married/de facto	1.19	0.91	1.56
Employment (cf employed)			
Part- or full-time unemployed	0.80	0.38	1.67
Not in workforce	1.07	0.84	1.36
Urban dwelling	0.82	0.56	1.19
*Any affective disorder	8.50	6.36	11.34
*Any anxiety disorder	5.83	3.28	10.35
*Any other drug disorder	2.38	1.37	4.15
Any physical condition	1.20	0.95	1.52
*SF-12 mental disability (moderate-severe)	2.55	1.91	3.42
SF-12 physical disability (moderate-severe)	1.38	1.04	1.84
5 or more days out of role	1.27	0.97	1.66
Alcohol dependence diagnosis	1.73	0.78	3.80

* $p < 0.05$ equivalent with Bonferroni adjustment

from 1. Although the measure of social, psychological and physical harms came close to significance (OR = 2.36, 95 % CI = 1.45–3.84), this association was not significant once the Bonferroni correction was made.

Males and females were analysed separately in order to determine whether different factors were influencing treatment seeking for these sub-groups. No differences were found and none of the alcohol measures predicted treatment seeking for each sex considered separately.

Prevalence and correlates of treatment seeking amongst those with alcohol dependence

A total of 147 of the 437 (29.5 %) with alcohol dependence sought help for their mental health problems in the past 12 months. Overall males with alcohol dependence were less likely to seek help for their mental health problems than were females (OR = 0.46, 95 % CI = 0.22–0.95). The only other variable to predict help seeking for those with alcohol dependence was the presence of a comorbid affective disorder (OR = 3.31, 95 % CI = 1.43–7.66). Further analyses were conducted on the effects of grouping variables and it was found that sociodemographic variables as a group and disability variables as a group did not predict treatment seeking, but grouping of the three comorbidity variables did ($p < 0.05$ equivalent with Bonferroni adjustment).

Further logistic regressions which considered gender and comorbidity groups separately yielded unstable and, thus, unreliable standard errors due to low numbers within group.

Discussion

Alcohol dependence in this Australian sample was found to be nearly three times as prevalent amongst males as females and was particularly over-represented in the 18–34 year age group.

When other variables were controlled for, the only variables which correlated with dependence were sex (male), age (younger), not living with a partner and having any other affective or drug disorder. These data agree well with predictions made from the U. S. data (Grant 1997), although education level did not correlate significantly with an alcohol dependence diagnosis in the Australian data. However, when males and females were considered separately, different correlates were found for each sex. For males alone, having an affective disorder did not correlate significantly with dependence, but being young, unattached and having a comorbid drug disorder remained significant correlates. For the female-only group, having any affective disorder remained the only significant correlate.

Self-rated level of physical and mental functioning as measured by SF–12 did not correlate with having alcohol dependence. Similarly, the other measure of disability – days out of role – did not relate to dependence. This

study is the first large epidemiological study of mental disorders to take account of measures of perceived disability when assessing treatment-seeking behaviour. Bijl and Ravelli (2000) suggested that alcohol use disorders do not predict treatment seeking because those classified as having such disorders have few associated 'functional' limitations. This notion has been supported here by the fact that measures of disability (SF-12 mental and physical and days out of role) did not correlate with a diagnosis of alcohol dependence.

Like the findings from the Netherlands-based NEMESIS study (Bijl and Ravelli 2000), having an alcohol use disorder (dependence or abuse) did not predict treatment seeking in this Australian sample. Similarly, level of dependence as measured by number of criteria met did not predict service use; but a trend was evident that having social, psychological or physical problems associated with alcohol use did relate to service use. This latter finding fits with results from smaller community-based surveys (Bannenberg et al. 1992; Hingson et al. 1982).

Age predicted treatment seeking, with the oldest group (55 + years) being least likely to seek help for a mental health problem. This result fits with predictions made from prior epidemiological research, but not with those made from clinical populations and small community surveys. However, as noted earlier, these studies tended to be poor methodologically and restricted in the applicability of their findings. The relationship between age and service seeking is not linear, as it appears that those who seek help most are in the middle age groups (35–54 years).

The finding that women are more likely to seek help fits with prior research, as do being better educated and having comorbid psychiatric disorders. Contrary to previous research, having a comorbid physical condition did not predict treatment seeking for the whole sample. Again, contrary to previous findings, neither employment status nor living in an urban setting predicted service use for a mental health disorder.

The fact that the SF–12 disability measures predicted treatment seeking for any mental health problem indicates that these measures provide independent and relevant information to models which attempt to predict treatment seeking in the general population, but not for alcohol.

Conclusion

A majority of those with alcohol dependence did not seek help for their problems in the past 12 months. However, it should be noted that the present study considered only professional treatment seeking and may have excluded attempts to ameliorate alcohol use problems through non-professional or alternative treatment agencies. Also, it cannot be assumed that all those with alcohol problems should be offered treatment as many (up to 50 %) remit without any treatment (Hall and Teesson

2000). Furthermore, evidence from this study and related research has found that most individuals with alcohol use problems do not suffer serious disability nor do they see a need to seek professional help. Thus, they may be very resistant to attempts to treat them.

However, these latter characteristics may be operated upon through public health policy, education about the risks associated with alcohol use disorders (Degenhardt et al. 2000), as well as improvements in the understanding of and access to effective treatments. In particular, research suggests that there may be considerable social and personal benefit from use of screening and brief intervention by GPs where individuals are not attending specifically for their alcohol problems (WHO Brief Intervention Study Group 1996). Thus, even though people do not seek or see the need for help, it is possible to deliver such help effectively.

Those who have an alcohol disorder comorbidly with an affective disorder are much more likely to seek help and to see themselves as disabled. GPs need to be aware of these high levels of comorbidity, and treatment services should be integrated so that individuals with multiple problems are most effectively treated. Also specialist services need to be aware of and treat comorbid alcohol problems. Most people attend treatment for other disorders such as anxiety and depression (Parslow and Jorm 2000). It has been argued elsewhere that at least some anxiety disorders dissipate or disappear when a comorbid individual is abstinent from alcohol for an extended period (Allan 1995). Similarly, effective treatments for depression have been found to ameliorate alcohol use disorders (Brown et al. 1997). Such findings highlight the importance of assessment and treatment of alcohol disorders in specialist mental health services.

On the other hand, mental disability tends not to be associated with a diagnosis of alcohol dependence and, thus, is unrelated to treatment seeking in this group. However, those who suffer significant social, psychological or physical harms due to their alcohol use are more likely to seek help when all other variables are controlled for. This fits with the suggestion by Bijl and Ravelli (2000) that the definition of dependence may not be useful for pinpointing a population at significant risk – either the criteria for dependence or the manner in which they are combined may need to be re-evaluated. Further research is warranted to ascertain the relationships of individual symptoms with disability and service use in order to clarify just how debilitating the misuse of alcohol is.

The only single variables correlating with service use for those with alcohol dependence were being a female and having a comorbid affective disorder. If disability measures were grouped in the regression analysis, they predicted service use, yet perceived mental disability alone did not. This suggests further research into and refinement of disability assessment.

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References

1. Aday LA, Andersen R (1974) A framework for study of access to medical care. Health Serv Res: 208–220
2. Allan CA (1995) Alcohol problems and anxiety disorders – a critical review. Alcohol & Alcoholism 30: 145–151
3. Bannenberg AFI, Raat H, Plomp HN (1992) Demand for alcohol treatment by problem drinkers. J Subst Abuse Treat 9: 59–62
4. Bardsley PE, Beckman LJ (1988) The Health Belief Model and entry into alcoholism treatment. The International Journal of the Addictions 23: 19–28
5. Becker MH, Haefner DP, Kasl SV, Kirscht JP, Maiman LA, Rosenstock IM (1977) Selected psychosocial models and correlates of individual health-related behaviors. Med Care 15: 27–46
6. Bijl RV, Ravelli A (2000) Psychiatric morbidity, service use, and need for care in the general population: results of the Netherlands Mental Health Survey and Incidence Study. Am J Public Health 90: 602–607
7. Bland RC, Newman SC, Orn H (1997) Help-seeking for psychiatric disorders. Canadian Journal of Psychiatry 42: 935–942
8. Brown RA, Evans DM, Miller IW, Burgess ES, Mueller TI (1997) Cognitive-behavioral treatment for depression in alcoholism. Journal of Consulting & Clinical Psychology 65: 715–726
9. Commander MJ, Odell SO, Williams KJ, Sashidharan SP, Surtees PG (1999) Pathways to care for alcohol use disorders. J Public Health Med 21: 65–69
10. Cunningham JA, Sobell LA, Sobell MB, Agrawal S, Toneatto T (1993) Barriers to treatment: why alcohol and drug abusers delay or never seek treatment. Addict Behav 18: 347–353
11. Cunningham JA, Sobell LC, Sobell MB, Gaskin J (1994) Alcohol and drug abusers' reasons for seeking treatment. Addict Behav 19: 691–696
12. Degenhardt L, Hall W, Teesson M, Lynskey M (2000) Alcohol use disorders in Australia: findings from the National Survey of Mental Health and Wellbeing. NDARC Technical report No. 97, National Drug and Alcohol Research Centre, Sydney
13. Goldberg DP, Huxley P (1980) Mental illness in the community: the pathway to psychiatric care. Tavistock, London
14. Grant BF (1997) Prevalence and correlates of alcohol use and DSM-IV alcohol dependence in the United States: results of the National Longitudinal Alcohol Epidemiologic Survey. J Stud Alcohol 58: 464–473
15. Hall W, Teesson M (2000) Alcohol-use disorders: who should be treated and how? In: Andrews G Henderson S (eds) Unmet need in psychiatry, problems, resources, responses. Cambridge University Press, Cambridge, UK, pp. 290–301
16. Hall W, Teesson M, Lynskey M, Degenhardt L (1999) The 12-month prevalence of substance use and ICD-10 substance use disorders in Australian adults: findings from the National Survey of Mental Health and Wellbeing. Addiction 94: 1541–1550
17. Hays R (1985) An integrated value-expectancy theory of alcohol and other drug use. Br J Addict 80: 379–384
18. Henderson S, Andrews G, Hall W (2000) Australia's mental health: an overview of the general population survey. Aust N Z J Psychiatry 34: 197–205
19. Hingson R, Mangione T, Meyers A, Scotch N (1982) Seeking help for drinking problems: a study in the Boston metropolitan area. J Stud Alcohol 43: 273–288
20. Kessler RC, McGonagle KA, Zhao S, Nelson CB, Hughes M, Eshleman S, Wittchen HU, Kendler KS (1994) Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States. Results from the National Comorbidity Survey. Arch Gen Psychiatry 51: 8–19
21. Kessler RC, Zhao S, Katz SJ, Kouzis AC, Frank RG, Edlund M, Leaf P (1999) Past-year use of outpatient services for psychiatric problems in the National Comorbidity Study. Am J Psychiatry 156: 115–123
22. Meadows G, Burgess P, Fossey E, Harvey C (2000) Perceived need for mental health care, findings from the Australian National Survey of Mental Health and Wellbeing. Psychol Med 30: 645–656
23. Murray CJL, Lopez AD (eds) (1996) The global burden of disease. World Health Organization, Washington
24. Newcombe RG, Altman DG (2000) Proportions and their differences. In: Altman DG, Machin D, Bryant TN, Gardner MJ (eds) Statistics with Confidence: 2nd Ed. BMJ, London, pp. 45–56
25. Parslow RA, Jorm AF (2000) Who uses mental health services in Australia? An analysis of data from the National Survey of Mental Health and Wellbeing. Aust N Z J Psychiatry 34: 997–1008
26. Proudfoot H, Teesson M (2000) Investing in drug and alcohol treatment. NDARC Technical Report No. 91, National Drug and Alcohol Research Centre, UNSW, Sydney
27. Proudfoot H, Teesson M (2001) Who seeks treatment for alcohol dependence? Findings from the Australian National Survey of Mental Health and Wellbeing. NDARC Technical Report No. 122, National Drug and Alcohol Research Centre, Sydney
28. Rees DW, Farmer R (1985) Health beliefs and attendance for specialist alcoholism treatment. Br J Psychiatry 147: 317–319
29. Shah BV, Barnwell BG, Bieler GS (1997) SUDAAN User's Manual, Release 7.5, Research Triangle Institute, Research Triangle Park
30. Teesson M, Hall W, Lynskey M, Degenhardt L (2000) Alcohol- and drug-use disorders in Australia: implications of the National Survey of Mental Health and Wellbeing. Aust N Z J Psychiatry 34: 206–213
31. Thapar AK, Stott NC, Richens A, Kerr M (1998) Attitudes of GPs to the care of people with epilepsy. Fam Pract 15: 437–442
32. Thom B (1986) Sex differences in help-seeking for alcohol problems: 1. Barriers to help-seeking. Br J Addict 81: 777–788
33. Thom B (1987) Sex differences in help-seeking for alcohol problems: 2. Entry into treatment. British Journal of Addiction 82: 989–997
34. Ware J Jr, Kosinski M, Keller SD (1996) A 12-item short-form health survey: construction of scales and preliminary tests of reliability and validity. Med Care 34: 220–233
35. Weisner C (1990) The alcohol treatment-seeking process from a problems perspective: responses to events. Br J Addict 85: 561–569
36. Weisner C (1993) Toward an alcohol treatment entry model: a comparison of problem drinkers in the general population and in treatment. Alcoholism: Clinical and Experimental Research 17: 746–752
37. Weisner C, Schmidt L (1995) Access and need for alcohol treatment. Alcohol Research Group, Berkeley, CA
38. WHO Brief Intervention Study Group (1996) A cross-national trial of brief interventions with heavy drinkers. WHO Brief Intervention Study Group. Am J Public Health 86: 948–955
39. World Health Organization (1996) Composite International Diagnostic Interview. World Health Organization, Geneva
40. Wu LT, Kouzis AC, Leaf PJ (1999) Influence of comorbid alcohol and psychiatric disorders on utilization of mental health services in the National Comorbidity Survey. Am J Psychiatry 156: 1230–1236

2. The Structure of Alcohol Dependence in the Community

The structure of alcohol dependence in the community

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Abstract

Background:: Although dependence on alcohol appears to be a reliable unitary construct, abuse has not found a similar level of support as a separate construct. This paper describes a confirmatory factor analysis of the DSM-IV alcohol abuse and dependence criteria in a general population sample.
Methods:: Data from alcohol drinkers ($n = 7746$) were obtained from a cross-sectional study of a large, representative sample of the Australian general population. One- and two-factor solutions for the DSM-IV criteria for abuse and dependence (assessed by CIDI-Auto) were compared using confirmatory factor analysis.
Results:: Approximately 74% of Australians had used alcohol 12 or more times in the past year and 19% met at least one DSM-IV alcohol abuse or dependence criterion. Overall 6% met criteria for an alcohol use disorder (1.9% abuse, 4.1% dependence). More men than women met criteria for an alcohol use disorder and the prevalence of alcohol use disorders decreased with increasing age. Both one- and two-factor solutions from the confirmatory factor analyses provided an adequate fit to the data for the overall sample. The correlation between the abuse and dependence factors in the two-factor model was extremely high (0.95).
Conclusion:: Alcohol abuse and dependence criteria were most parsimoniously described by a single continuous construct incorporating all eleven abuse and dependence criteria.
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Keywords: Alcohol dependence; Alcohol abuse; DSM-IV; Confirmatory factor analysis; Item response theory

Alcohol dependence was first formulated by Edwards and Gross (1976) and Edwards et al. (1981), as a number of psychological and physiological factors associated with diminished control over alcohol use. In a later publication, Edwards (1986) referred to the 'bi-axial concept' where dependence as described above constitutes one axis of the syndrome and alcohol-related problems formed the other. Although dependence on alcohol has support as a reliable unitary construct (Morgenstern et al., 1994; Bucholz et al., 1995; Feingold and Rounsaville, 1995; Langenbucher et al., 2000), abuse has not found a similar level of support (e.g. Feingold and Rounsaville, 1995; Hasin et al., 1996; Hasin and Paykin, 1999; Langenbucher et al., 2000; Hasin, 2003). Thus, compared with the literature on alcohol dependence,

less is known about the validity of alcohol abuse and its implementation in widely used diagnostic schemes.

This paper aims to explore the structure of the DSM-IV criteria for alcohol use disorders by examining the relationship between the abuse and dependence criteria, in order to ascertain the appropriateness of the criteria to alcohol use disorders. The DSM-IV specifies 11 criteria for alcohol use disorders (see Table 2). Dependence is measured by seven criteria, at least three of which must be endorsed for a diagnosis. Abuse is measured by four criteria, and a diagnosis is made if at least one criterion is endorsed (and a diagnosis of dependence is absent).

A limited number of studies have been carried out to clarify the dependence–abuse categorization for alcohol use disorders, although most have focused on clinical populations and employed a range of factor analytic techniques with inconsistent results. Some studies have found evidence for two separate, although related factors (Muthén et al., 1993a;

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Harford and Muthén, 2001), while others have identified single dimensions. In an analysis of the DSM-III-R and DSM-IV criteria for alcohol use disorders, Muthén et al. (1993a) concluded that the observed pattern of symptoms was best accounted for by a two-factor model. Based on factor loadings, the dimensions corresponded approximately to the DSM constructs of abuse and dependence. However, some dependence criteria loaded primarily on the "abuse" factor, and the criterion concerning time spent using or recovering from the effects of alcohol failed to load on either factor. In contrast, Hasin et al. (1994) found that a two-factor model fitted the criteria best but the two factors correlated 0.98, leading the authors to conclude that the one-factor solution was most appropriate. To date no studies have specifically assessed the current DSM-IV criteria in a broad-based population sample.

The WHO cross-national study by Nelson et al. (1999) tested the seven DSM-IV dependence and four abuse criteria for alcohol using confirmatory factor analysis (CFA) with community and treatment center samples. With this sample, they found a two-factor solution no better than the one-factor solution; but when they 'trimmed' the data of extreme respondents (those who responded NO to all criteria or YES to 10 or 11 criteria) they found the two-factor solution superior. Feingold and Rounsaville (1995) also performed a CFA on 10 of the 11 criteria using a mixed, non-random sample, and found that a one-factor solution was as good a fit as a two-factor solution, suggesting that the abuse criteria are assessing the same construct as the dependence criteria.

The DSM-III substance abuse committee (Rounsaville et al., 1986) viewed abuse as a diagnosis that should be reserved for individuals referred to treatment because of episodic drug use who had not yet developed a pattern of behaviors indicative of dependence. In contrast, the DSM-IV conceptualizes abuse as the negative social consequences and role impairment associated with substance use. According to a recent review by Hasin (2003) many of the psychometric problems found with the abuse diagnosis are because it is a residual factor and only occurs where dependence has been excluded.

A recent US population-based study (Hasin and Grant, 2004) found that a third of those diagnosed as dependent did not meet criteria for abuse. In particular, 46% of women and 29% of men who met dependence criteria did not meet any abuse criterion. Thus, the abuse criteria may reflect a different underlying construct than dependence.

A further aim of this paper is to examine where each criterion discriminates best on the dimensions which underlie the criteria. If a single factor fits all eleven criteria it is hypothesized that the abuse criteria should discriminate at a lower (or less severe) level, while the dependence criteria should discriminate at a higher level. A priority of the DSM-IV criteria is to assist clinicians to differentiate between people who have a disorder and those who do not. The relative discriminatory power of each of the criteria for alcohol use disorders at the diagnostic threshold is therefore examined.

The present paper applies the methods of Muthén (1996) to examine the factor structure of DSM-IV alcohol use disorders in the Australian National Survey of Mental Health and Wellbeing (NSMHWB, Teesson et al., 2000).

1. Methods

The NSMHWB was carried out in 1997 on a random stratified multistage sample of approximately 13,600 private dwellings in Australia where one resident over the age of 18 was asked to participate in an interview (Henderson et al., 2000). A modified version of the Composite International Diagnostic Interview (CIDI, World Health Organization, 1996; Teesson et al., 2000) was developed for the survey and administered by trained staff. The CIDI has been used in a range of epidemiological studies, and has been shown to be a reliable and valid survey instrument (Wittchen, 1994; Peters and Andrews, 1995). A total of 10,641 respondents were interviewed giving a 78% response rate.

Questioning was restricted to symptoms in the last 12 months. Alcohol abuse and dependence were assessed in all persons who had consumed at least 12 alcoholic drinks in the past 12 months (the 11 criteria are listed in Table 2). Population and sub-group prevalence estimates were adjusted for sampling through the use of balanced repeated replications (BRR) weightings using SUDAAN (Shah et al., 1997). These weightings adjusted the data to conform to independent population estimates by state, part of state, age and sex.

Two confirmatory factor analyses of the 11 DSM-IV diagnostic criteria were carried out using M*plus* version 3.12 (Muthén and Muthén, 1998). The fit of both models was then examined using WLSMV (weighted least-squares means and variance adjusted) estimation. WLSMV uses weighted least-square parameter estimates from the diagonal of the weight matrix. These methods are recommended for categorical variables by Muthén and Muthén (2001) on the basis of simulation studies (Muthén et al., in press) and follow a long line of research on the structure of alcohol symptoms (Muthén et al., 1993a,b; Muthén, 1995, 1996; Harford and Muthén, 2001).

Although NSMHWB data have been obtained by complex sampling procedures, the factor analysis methods used in this paper assumed simple random sampling. Muthén et al. (1993a) argue that M*plus* is applicable for use with complex samples because it uses multivariate analyses, which are less sensitive to complex sampling than univariate methods.

A further issue to consider is selection of appropriate tests of model fit. The chi-squared statistic is a common measure of goodness of fit but has been found to be over-sensitive to trivial differences in large samples, where unique variances tend to be small (Browne et al., 2002). For binary data such as that used in this study, Yu (2002) recommends use of the comparative fit index (CFI), the root mean square error of approximation (RMSEA) and the weighted root-mean-square residual (WRMR). Recommended cutoff points for these measures are: CFI > 0.96, RMSEA < 0.05

and WRMR > 0.9. The CFI, RMSEA and the WRMR are therefore also reported in this paper. As in the study by Harford and Muthén (2001), the chi-squared statistic (χ^2) and χ^2/d.f. are presented, not to measure goodness of fit but for the purpose of comparing the one- and two-factor solutions.

Following Muthén (1996) thresholds and factor loadings from the confirmatory factor analysis were reparameterised into difficulty and discrimination indices used in item response theory (see Muthén and Lehman, 1985, Eqs. (7) and (8)). Item characteristic curves and item information functions were then plotted from the values using methods described by Hambleton and Swaminathan (1984).

2. Results

In all, 7746 or 73.5% of Australians aged 18 and over had at least 12 drinks in the past 12 months (termed "drinkers") whilst 19.1% met at least one criterion for alcohol abuse or dependence. Overall 6% met criteria for an alcohol use disorder (1.9% abuse, 4.1% dependence). Amongst drinkers the prevalence of abuse was 2.6% and dependence 5.6% giving 8.2% with an alcohol use disorder.

Table 1 lists the prevalence of DSM-IV alcohol abuse and dependence amongst drinkers in population age and gender sub-groups. Odds ratios shown in Table 1 indicate that males are more than twice as likely as females to have a diagnosis of alcohol dependence or abuse. Young people aged 18–24 are nearly 17 times as likely to have a diagnosis of abuse than people over 55 and more than 7 times more likely to have a diagnosis of dependence. Young drinkers aged 18–24 are significantly more likely to meet criteria for abuse than all other age groups.

Overall 39.51% (S.E. 3.90) of individuals who had a diagnosis of dependence also met at least one criterion for abuse. There was no significant difference between males and females (males 41.5%, females 34.3%, OR = 1.33, 95% CI: 0.75–2.36).

Table 2 lists the prevalence of the 11 dependence and abuse criteria in this population sample. The most prevalent criteria are found amongst those for dependence, with drinking more (15.01%) and needing more (10.08%) along with a persistent desire to cut down (12.04%) dominating.

Table 3 lists the standardized factor loadings linking the observed symptom criteria to latent factors; the CFI, RMSEA, WRMR and χ^2 goodness of fit tests, and for the two-factor model, the estimated correlation between the two latent factors. Both the one- and two-factor models showed an adequate fit to the data, with no evidence of significant departures from the model assumptions. For both models the CFI was well

Table 1
Alcohol abuse and dependence (all drinkers, *n* = 7746): sub-group prevalence, related confidence intervals and odds ratios

	Abuse		Dependence	
	Prevalence (95% CI)	OR (95% CI)	Prevalence (95% CI)	OR (95% CI)
Males	3.50 (2.76–4.42)	2.68 (1.75–4.11)	7.30 (5.53–9.57)	2.28 (1.33–3.91)
Females	1.43 (1.03–1.97)	1.00 (comparison)	3.53 (2.75–4.53)	1.00 (comparison)
18–24 years	6.58 (4.91–8.76)	16.84 (5.12–55.41)	11.73 (7.76–17.36)	7.53 (4.53–12.52)
25–34 years	3.08 (2.18–4.34)	7.45 (2.90–19.18)	7.23 (5.83–8.93)	4.34 (2.89–6.51)
35–44 years	2.83 (1.36–4.66)	6.05 (1.90–19.21)	5.24 (4.30–6.36)	3.05 (2.04–4.57)
45–54 years	1.50 (0.51–4.30)	3.46 (0.83–14.38)	4.01 (2.59–6.18)	2.26 (1.04–4.91)
55+ years	0.44 (0.15–1.25)	1.00 (comparison)	1.83 (1.32–2.54)	1.00 (comparison)

Table 2
Twelve months prevalence of alcohol dependence and abuse criteria amongst all drinkers (*n* = 7746)

DSM-IV diagnosis	Criteria	Description	Weighted prevalence (S.E.)
	TOLERANCE	Tolerance to the effects of alcohol; need more to get desired effect	10.08 (0.51)
	WITHDRAWAL	Withdrawal syndrome, or alcohol or similar substance taken to avoid or relieve withdrawal symptoms	3.31 (0.27)
Alcohol dependence	LARGER	Alcohol is taken in larger amounts or for longer periods than required	15.01 (0.50)
	CUT DOWN	Persistent desire, or unsuccessful efforts to cut down	12.04 (0.50)
	TIME SPENT	A great deal of time spent obtaining, using or recovering from the effects of alcohol	2.45 (0.19)
	GIVE UP	Reduction in important social, occupational or recreational activities because of alcohol use	1.05 (0.12)
	CONTINUE	Continued use despite awareness of alcohol use causing physical or psychological problems	4.03 (0.47)
	MAJOR ROLE	Failure to fulfill obligations, important activities at work, school or home because of alcohol use	2.04 (0.22)
Alcohol abuse	HAZARD	Recurrent use in physically dangerous situations e.g. driving, operating machinery	2.12 (0.17)
	LEGAL	Recurrent alcohol-related legal problems	1.16 (0.21)
	SOCIAL	Recurrent use despite awareness of alcohol use causing social or interpersonal problems	1.16 (0.16)

Table 3
Standardized factor loadings, thresholds and tests of model fit for one- and two-factor models of abuse and dependence symptoms for alcohol (n = 7746)

	One-factor model		Two-factor model	
	Factor loadings	Threshold	Factor 1 loadings	Factor 2 loadings
TOLERANCE	0.72	1.31	0.72	
WITHDRAWAL	0.82	1.83	0.82	
LARGER	0.85	1.05	0.85	
CUT DOWN	0.78	1.18	0.78	
TIME SPENT	0.90	1.93	0.90	
GIVE UP	0.93	2.27	0.94	
CONTINUE	0.83	1.75	0.83	
MAJOR ROLE	0.82	2.04		0.85
HAZARD	0.77	2.06		0.79
LEGAL	0.66	2.27		0.67
SOCIAL	0.80	2.24		0.83
Factor correlation		n/a		0.95
CFI		0.993		0.994
RMSEA		0.014		0.014
WRMR		1.005		0.956
χ^2 (d.f.)		90.533 (37)		99.383 (38)
χ^2/d.f.		2.45		2.62

above the recommended cutoff of 0.95, RMSEA values well below the recommended 0.06 cutoff and WRMR greater than 0.9. The χ^2 statistics are significant as expected but are of a similar order of magnitude for the two models. Thus, it is not possible to distinguish between the two models based on measures of goodness of fit.

Although both models provide an adequate fit to the data, the two-factor model produced an extremely high correlation between the factors of abuse and dependence (0.95). Given this high correlation between the factors, the most parsimonious model for the DSM-IV criteria is a one-factor model, which assumes the four abuse and seven dependence criteria are indicators of a single underlying dimension representing level of alcohol use disorder. Factor loadings linking the 11 abuse and dependence criteria to the latent factor were moderate to high, ranging from 0.66 for LEGAL to 0.93 for GIVE UP. TIME SPENT and GIVE UP were the two criteria most closely related to the latent alcohol use disorder while LEGAL and TOLERANCE were relatively poorer indicators.

Factor loadings and thresholds from the single factor model were reparameterized into Item Response Theory difficulty and discrimination parameters (see Muthén and Lehman, 1985, Eqs. (7) and (8)) and Fig. 1 shows Item Characteristic Curves using these parameters. The item (criterion) characteristic curves show the relationship between the latent trait in standard deviation units (x-axis) and the probability that a particular criterion is endorsed (y-axis). The curve for each criterion is defined by its discrimination (slope or gradient) and difficulty (horizontal placement). Thus the steeper curves such as LARGER, GIVE UP and TIME SPENT are those criteria with higher discrimination parameters (and factor loadings); whilst curves displaced further to the right (GIVE UP, LEGAL, SOCIAL, HAZARD and
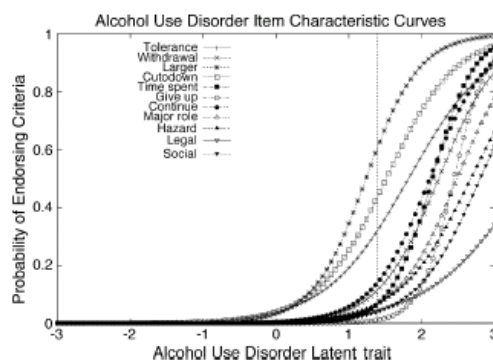

Fig. 1. Item characteristic curves for DSM-IV alcohol dependence and abuse criteria.

MAJOR ROLE) are criteria which discriminate at the more severe end of the latent trait. Because the threshold between diagnosis and no disorder is arbitrary (and no natural cut points were found in this analysis), the prevalence of alcohol use disorders in drinkers (8.2%) was assumed to be the best estimate of the diagnostic threshold implied in DSM-IV. A vertical dotted line shows this estimated diagnostic threshold in Figs. 1 and 2.

Item information functions for each of the 11 criteria are shown in Fig. 2. The vertical axis shows Fisher information and the horizontal the estimated latent trait underlying the abuse and dependence criteria. A criterion provides the most information where its information curve reaches its highest point, which is also the steepest point of the item characteristic curve. Thus, GIVE UP and TIME SPENT provide the most information although above the diagnostic threshold. It is readily seen that most criteria provide their maximum information above the point of the current diagnostic threshold. Only LARGER provides its maximum information below our estimated diagnostic threshold. Other than LARGER alone
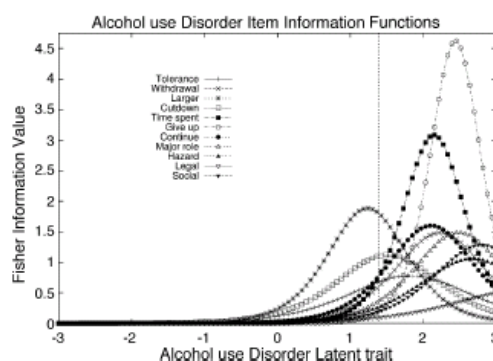

Fig. 2. Item information functions for DSM-IV alcohol dependence and abuse criteria.

no subset of the 11 criteria can be found to maximize information at the estimated diagnostic threshold. Thus, in its current form the DSM-IV criteria are better suited as a measure of the severity of the underlying alcohol use disorder rather than optimal for making decisions about the presence or absence of a disorder.

3. Discussion

In this paper we have examined the prevalence and psychometric properties of symptoms of alcohol abuse and dependence within a large and representative sample of the general population. Alcohol use disorders and their symptoms are relatively common within the general population: 1.9% met criteria for abuse and a further 4.1% met criteria for dependence. Alcohol use disorders are most prevalent among young males. By far the most common criteria in the general population are three of the dependence criteria: tolerance to the effects of alcohol (10.08%), drinking more than intended (15.01%) and persistent desire or efforts to cut down (12.04%). Forty percent of those with a diagnosis of alcohol dependence also reported the presence of abuse criteria. This is consistent although somewhat lower then that found in a US population sample (66%; Hasin and Grant, 2004)

The results of two confirmatory factor analyses indicated that both a one-factor model, which assumed that the seven dependence and four abuse criteria loaded on a single dimension, and a two-factor model, which assumed that abuse and dependence were separate but related dimensions, provided an adequate fit to the data. The two-factor model indicated an extremely high correlation (0.95) between the dimensions of abuse and dependence. Given this high correlation, it is difficult to argue that the two categories represent distinct dimensions. Thus, it appears more reasonable to accept the one-factor model.

These results support the findings of previous studies that have concluded that the symptoms of alcohol dependence reflect a single underlying dimension (Hasin et al., 1994; Morgenstern et al., 1994; Bucholz et al., 1995; Feingold and Rounsaville, 1995; Nelson et al., 1999; Langenbucher et al., 2000). The results of these studies do not support Edwards' bi-axial concept (Edwards, 1986).

Interestingly, two previous analyses of the factor structure underlying the abuse and dependence criteria for alcohol use disorders did not support the utility of a one-factor model and instead conclude that these criteria were most adequately represented by a two-factor model in which abuse and dependence represented two distinct yet correlated factors (Muthén et al., 1993a; Harford and Muthén, 2001). The apparent discrepancy between our findings for alcohol use disorders and in a separate paper on cannabis use disorders (Teesson et al., 2002) may be due to methodological differences. Indeed the present paper is the first to examine this issue using the DSM-IV criteria in a representative sample of the general population. The differing results indicate a need for further research on the psychometric properties of these disorders and their criteria.

The contributions of individual criteria varied considerably in this present study. Ten of the eleven criteria had strong relationships with the underlying dimension of alcohol use disorder (all with factor loadings greater than 0.72). One criterion (LEGAL) had a relatively weaker relationship. Although recurrent alcohol-related legal problems could have considerable consequences for the individual, it is a relatively infrequently endorsed criterion (only 1.2% of drinkers). It may be that factors other than having an alcohol use disorder are related to an individual having legal problems. LEGAL also had the highest threshold (2.27) indicating that it discriminates between individuals at the more severe end of alcohol use disorders. The criteria most likely to determine the presence or absence of a diagnosis are LARGER, CUT DOWN, TOLERANCE, and WITHDRAWAL (see Figs. 1 and 2). However, these criteria are not the strongest indicators of the underlying dimension. In contrast, GIVE UP and TIME SPENT are the best indicators of the underlying dimension (high factor loadings and information values) but they provide most information above the diagnostic threshold (having high thresholds). These results suggest some modifications to DSM-IV if the primary purpose is to discriminate cases that reach diagnosis from those that do not. If GIVE UP and TIME SPENT were reworded to reduce their thresholds they could provide more information about the presence or absence of diagnosis.

Further research relating a continuous measure of alcohol use disorders to disability, comorbidity and health service usage is needed in order to confirm the construct validity of the current findings. The information obtained may be useful when compiling future definitions for DSM alcohol use disorders.

References

Browne, M.W., MacCallum, R.C., Kim, C.-T., Andersen, B.L., Glaser, R., 2002. When fit indices and residuals are incompatible. Psychol. Methods 7 (4), 403–421.

Bucholz, K.K., Hesselbrock, V.M., Shayka, J.J., Nurnberger Jr., J.I., Schuckit, M.A., Schmidt, I., Reich, T., 1995. Reliability of individual diagnostic criterion items for psychoactive substance dependence and the impact on diagnosis. J. Stud. Alcohol 56 (5), 500–505.

Edwards, G., 1986. The alcohol dependence syndrome: a concept as stimulus to enquiry. Br. J. Addict. 81, 171–183.

Edwards, G., Arif, A., Hodgson, R., 1981. Nomenclature and classification of drug and alcohol related problems: a WHO memorandum. B. World Health Organ. 50, 225–242.

Edwards, G., Gross, M., 1976. Alcohol dependence: provisional description of a clinical syndrome. Br. Med. J. 1, 1058–1061.

Feingold, A., Rounsaville, B., 1995. Construct validity of the dependence syndrome as measure by DSM-IV for different psychoactive substances. Addiction 90 (12), 1661–1669.

Hambleton, R.K., Swaminathan, H., 1984. Item Response Theory: Principles and Applications. Kluwer Nijhoff, Hingham, MA.

Harford, T.C., Muthén, B.O., 2001. The dimensionality of alcohol abuse and dependence: a multivariate analysis of DSM-IV symptom items in the National Longitudinal Survey of Youth. J. Stud. Alcohol 62 (2), 150–157.

Hasin, D., 2003. Classification of alcohol use disorders. Alcohol Res. Health: J. Nat. Inst. Alcohol Abuse Alcohol. 27 (1), 5–17.

Hasin, D., Li, Q., McCloud, S., Endicott, J., 1996. Agreement between DSM-III, DSM-III-R, DSM-IV and ICD-10 alcohol diagnoses in US community-sample heavy drinkers. Addiction 91 (10), 1517–1527.

Hasin, D., Paykin, A., 1999. Alcohol dependence and abuse diagnoses: concurrent validity in a nationally representative sample. Alcohol.: Clin. Exp. Res. 23 (1), 144–150.

Hasin, D.S., Grant, B.F., 2004. The co-occurence of DSM-IV alcohol abuse in DSM-IV alcohol dependence: results of the National Epidemiologic Survey on alcohol and related conditions on heterogeneity that differ by population subgroup. Arch. Gen. Psychiat. 61 (9), 891–896.

Hasin, D.S., Muthuen, B., Wisnicki, K.S., Grant, B., 1994. Validity of the bi-axial dependence concept: a test in the US general population. Addiction 89 (5), 573–579.

Henderson, S., Andrews, G., Hall, W., 2000. Australia's mental health: an overview of the general population survey. Aust. N.Z. J. Psychiat. 34, 197–205.

Langenbucher, J., Martin, C.S., Labouvie, E., Sanjuan, P.M., Bavly, L., Pollock, N.K., 2000. Toward the DSM-V: the Withdrawal-Gate Model versus the DSM-IV in the diagnosis of alcohol abuse and dependence. J. Consult. Clin. Psych. 68 (5), 799–809.

Morgenstern, J., Langenbucher, J., Labouvie, E.W., 1994. The generalizability of the dependence syndrome across substances: an examination of some properties of the proposed DSM-IV dependence criteria. Addiction 89 (9), 1105–1113.

Muthén, B., Lehman, J., 1985. Multiple group IRT modeling: applications to item bias analysis. J. Educ. Stat. 10 (2), 143–160.

Muthén, B.O., 1995. Factor-analysis of alcohol-abuse and dependence symptom items in the 1988 National-Health Interview Survey. Addiction 90 (5), 637–645.

Muthén, B.O., 1996. Psychometric evaluation of diagnostic criteria: application to a two-dimensional model of alcohol abuse and dependence. Drug Alcohol Depen. 41 (2), 101–112.

Muthén, B.O., duToit, S.H.C., Spisic, D., in press. Robust inference using weighted least squares and quadratic estimating equations in latent variable modeling with categorical and continuous outcomes. Psychometrika.

Muthén, B.O., Grant, B., Hasin, D., 1993a. The dimensionality of alcohol abuse and dependence: factor analysis of DSM-III-R and proposed DSM-IV criteria in the 1988 National Health Interview Survey. Addiction 88 (8), 1079–1090.

Muthén, B.O., Hasin, D., Wisnicki, K.S., 1993b. Factor analysis of ICD-10 symptom items in the 1988 National Health Interview Survey on alcohol dependence. Addiction 88 (8), 1071–1077.

Muthén, B.O., Muthén, L.K., 2001. Mplus. Statistical Analysis With Latent Variables. User's Guide (v2. 01). Muthén & Muthén, Los Angeles, CA.

Muthén, L.K., Muthén, B.O., 1998. Mplus Users' Guide. Muthén & Muthén, Los Angeles, CA.

Nelson, C.B., Rehm, J., Ustun, T.B., Grant, B., Chatterji, S., 1999. Factor structures for DSM-IV substance disorder criteria endorsed by alcohol, cannabis, cocaine and opiate users: results from the WHO reliability and validity study. Addiction 94 (6), 843–855.

Peters, L., Andrews, G., 1995. Procedural validity of the computerized version of the composite international diagnostic interview (CIDI-Auto) in the anxiety disorders. Psychol. Med. 25 (6), 1269–1280.

Rounsaville, B.J., Spitzer, R.L., Williams, J.B., 1986. Proposed changes in DSM-III substance use disorders: description and rationale. Am. J. Psychiat. 143 (4), 463–468.

Shah, B.V., Barnwell, B.G., Bieler, G.S., 1997. SUDAAN User's Manual, Release 7. 5. Research Triangle Institute, Research Triangle Park.

Teesson, M., Hall, W., Lynskey, M., Degenhardt, L., 2000. Alcohol- and drug-use disorders in Australia: implications of the National Survey of mental health and wellbeing. Aust. N.Z. J. Psychiat. 34, 206–213.

Teesson, M., Lynskey, M., Manor, B., Baillie, A., 2002. The structure of cannabis dependence in the community. Drug Alcohol Depen. 68, 255–262.

Wittchen, H.U., 1994. Reliability and validity studies of the WHO—composite international diagnostic interview (CIDI): a critical review. J. Psychiat. Res. 28 (1), 57–84.

World Health Organization, 1996. Composite international diagnostic interview. World Health Organization, Geneva.

Yu, C.-Y., 2002. Vol. 2004, http://www.statmodel.com/download/Yudissertation.pdf.