

Physical health problems among patients seeking treatment for alcohol use disorders: a study in six European cities

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ABSTRACT

The present study investigates physical health problems among patients with alcohol use disorders at alcohol treatment agencies in six European cities. The sample comprised 315 patients with a primary alcohol use disorder. Data were collected at admission to treatment using a structured research protocol, and ratings were made by a medically qualified physician subsequent to a physical examination of the patient. Physical health problems were extremely common: 79% of the sample had at least one problem, and 59% had two or more problems. Health problems were often serious, and 60% had at least one health problem that required treatment. The most common problems were gastrointestinal and liver disorders, but about a quarter of the sample had cardiovascular or neurological problems. Frequency of drinking, duration of alcohol use disorder, and severity of alcohol dependence were associated with increased physical morbidity. Current smoking status and age were also associated with poorer physical health. Older drinkers had more physical health problems although they were less severely alcohol dependent than their younger counterparts. The high prevalence of physical health problems among problem drinkers provides opportunities of screening for alcohol use disorders not only in specialist alcohol treatment services but also in other health-care settings. It is recommended that alcohol treatment agencies should provide a full routine health screen of patients at admission to treatment with provision or referral to appropriate treatment.

Keywords age, alcohol, comorbidity, dependence, physical health, smoking.

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INTRODUCTION

The concurrent presentation of different types of health problems among individuals with alcohol use disorders is a topic of increasing interest for both clinicians and researchers. This issue is often referred to as 'comorbidity' or 'dual diagnosis', and it has been widely studied in relationship to the co-occurrence of psychiatric problems among problem drinkers. There is now an extensive literature on problem drinking and mental health co-morbidities (Regier *et al.* 1990; Hasin, Nunes & Meydan 2004). There is also a substantial literature on the co-occurrence of physical health problems among psychiatric patients (Koranyi 1979; Koran *et al.* 1989;

Madsen, Aakerlund & Pedersen 1997; Lambert, Velakoulis & Pantelis 2003).

It is surprising therefore that less is known about physical co-morbidities among patients with alcohol use disorders. The capacity of alcohol, and especially of heavy drinking, to adversely affect the physical health of the drinker has been well known for many years. Increases in consumption of alcohol are associated with increased likelihood of admission to a general hospital (Chick 1994) with between 20% and 40% of admissions to general hospital wards estimated to be due to problems related to alcohol (Royal College of Physicians 1987; Lieber 1995). Health problems have been demonstrated, e.g. in relation to diseases of the liver, the pancreas, the heart, different

forms of cancers, and the nervous system, and it is generally acknowledged that alcohol can cause damage to nearly every tissue and body system with the possibility of consequent disability or disease (Royal College of Physicians 1987), and excess morbidity for alcohol use disorder tends to affect more bodily systems than drug use disorders (Adrian & Barry 2003). Alcohol abuse has been identified as one of the leading preventable causes of death (Thun *et al.* 1997).

The physical health of problem drinkers may be adversely affected both by the direct effects of alcohol (e.g. as a hepatotoxic agent), and also indirectly by environmental and lifestyle factors that are often associated with alcohol misuse. The prevalence of cigarette smoking among problem drinkers is extremely high (Friedman *et al.* 1991; Hughes 1995), and alcohol abuse is commonly associated with malnutrition (World, Ryle & Thomson 1985). Alcohol problems may also adversely affect health through the increased risks of unemployment or homelessness (Catalano *et al.* 1993; Sosin & Bruni 1997). Physical complications are often the main reason why problem drinkers seek help (Edwards, Marshall & Cook 2003). However, where patients present for treatment with co-morbid health disorders, this may complicate the assessment, planning and provision of treatment.

Relatively few research studies have presented data on the nature and extent of physical health problems among clinical samples of patients with alcohol use disorders. The present study investigates physical health problems among alcohol misusers seeking treatment at alcohol treatment agencies in six European cities. In particular, the study investigates the presence and severity of health problems in nine physical health domains and any associated need for treatment of physical health problems.

METHOD

Agency and subject samples

The study sample ($n = 315$) was recruited from patients presenting to alcohol treatment services and seeking treatment for a primary alcohol use disorder. Patients were recruited from specialist alcohol treatment services in six European cities. These were Lisbon/Portugal ($n = 52$), Ljubljana/Slovenia ($n = 50$), Tübingen/Germany ($n = 48$), Sofia/Bulgaria ($n = 51$), Vienna/Austria ($n = 65$) and Bergen/Norway ($n = 49$).

There were no formal selection or inclusion criteria other than seeking treatment for a primary alcohol use disorder, and no exclusion criteria. Participants were recruited from both inpatient and outpatient clinical treatment services. The agencies and patients constituted

opportunistic samples, and were not intended to be representative of national alcohol treatment services, nor of alcohol misuse patients within their respective countries. For this reason, inter-agency comparisons are reported only for basic sample descriptive purposes, and inferences regarding cross-sample comparisons will not be drawn from the analyses of the data.

Measures

Data were collected at admission to treatment by means of a structured clinical research protocol. The instrument contained items and scales developed specifically for this project as well as measures adapted from published instruments. The main assessment tool was the Health Morbidity Scale (HMS). This was constructed to assess severity of physical health disorders for nine health domains (cardiovascular; neurological; gastrointestinal and liver; respiratory; endocrine, nutritional and metabolic; musculoskeletal; dermatological; dental; genitourinary). Assessment ratings were made by medically qualified physicians subsequent to a physical examination of the patient, supported by a self-reported clinical history, and with associated clinical investigations if required. All raters were trained and qualified medical practitioners though they were not specifically trained for the purposes of this study. Specific medical diagnoses were recorded. Ratings were made for each health domain on a 4-point scale (0 = no disorder; 1 = mild disorder; 2 = moderate disorder; 3 = severe disorder).

As a further indicator of severity of health problems within each domain, need for physical health treatment was assessed subsequent to the physical examination and was rated by the examining physician for the nine health domains on a 3-point scale (0 = no treatment required; 1 = non-urgent treatment; 2 = urgent treatment required).

Information was collected regarding basic personal and social demographics, and of prior contact with physical health and alcohol treatment services. Current (previous 30 days) medication for a medical or psychiatric (not substance use) disorder was recorded. Measures were taken of frequency of alcohol use (assessed in days), and quantity of alcohol consumption (assessed in standard UK units of alcohol, with 1 unit = 8 g ethanol) during the previous 30 days. Measures were also taken of tobacco smoking, and of use of illicit drugs. Severity of alcohol dependence was assessed by means of the Severity of Dependence Scale (SDS-A). The SDS-A is a five-item scale which can be used to assess dependence, is easily administered in a clinical setting, and has known psychometric properties (Gossop *et al.* 1995). The SDS-A produces a total dependence score with a range 0–15, and is highly correlated with DSM-IV diagnosis of alcohol dependence (Ferri *et al.* 2000).

Statistical analyses

Factors associated with HMS scores were investigated using multiple regression analysis, with the analysis conducted in two stages. Bivariate correlations were calculated between HMS scores and a range of social demographic and alcohol problem variables. Where statistically significant correlations were found between these variables and HMS scores, these variables were entered in the multiple regression analysis as covariates. Logistic regression analysis was used to investigate differences in the nine physical health domains among drinkers aged 54 years or less and those aged 55 years or more.

RESULTS

Sample characteristics

The mean age of the study sample was 45.8 years ($SD = 10.1$, range 17–70 years). There was a statistically significant difference between the national samples in mean age ($F = 2.86$, $P < 0.05$) due mainly to the lower mean age of the Bulgarian sample (mean = 42.5 years) and the higher mean age of the Norwegian sample (mean = 49.2 years). Seventy-five per cent of the sample were men. There was no difference between the national samples in the ratio of men to women ($\chi^2 = 4.84$, d.f. = 5, $P = 0.44$). Two-thirds of the sample (67%) were recruited from inpatient services and one-third (33%) from outpatient services. About two-thirds of the sample (68%) were not in full-time employment, and 18% were without stable accommodation or homeless.

The mean daily quantity of alcohol consumed prior to treatment was 23.1 units ($SD = 16.6$). The mean frequency of alcohol use (last 30 days) was 23.0 ($SD = 8.9$), and 53% of the sample reported having used alcohol every day during the previous 30 days. The mean severity of alcohol dependence (SDS-A) score was 8.04 ($SD = 3.29$). The mean age of onset of alcohol use disorder was 30.3 years ($SD = 11.4$), and the mean duration of the alcohol use disorder was 15.5 years ($SD = 10.6$).

Relatively low rates of illegal drug use were reported. During the previous 30 days, use of heroin was reported by 1% ($n = 4$), and use of cocaine and amphetamines was reported by less than 1% ($n = 3$ and $n = 2$, respectively). The most commonly used illegal drug was cannabis (8%, $n = 24$), and the mean frequency of cannabis use (during the previous 30 days) was 7 days ($SD = 8.7$). Fifty-seven per cent of the sample were cigarette (or other tobacco) smokers. The low prevalence of polydrug use may be due to the specific recruitment of patients with a primary alcohol use disorder rather than a more general substance misuse sample.

Health problems

The majority of the sample (79%) were assessed as having at least one physical health problem at admission to treatment. Gastrointestinal and liver disorders were the health problems most commonly identified during physical examination (see Table 1). These problems were identified for almost half of the sample (48%). Health problems were also commonly found for the cardiovascular (28%), neurological (26%) and dental (29%) health domains. Multiple health problems were common. More than half (59%) of the sample were assessed as having two or more health problems, and 39% were assessed as having three or more health problems.

Many of the health problems were serious, and 41% of the sample were assessed as having at least one health problem rated as 'moderate' or 'severe'. The types of health problems that were most likely to be rated as 'moderate' or 'severe' were gastrointestinal and liver disorders (17%), cardiovascular (11%), neurological (11%) and dental (12%). Examples of commonly diagnosed gastrointestinal and liver disorders were gastritis, gastroduodenitis, alcoholic liver disease, alcoholic hepatitis and liver cirrhosis. The most commonly identified cardiovascular disorder was hypertension (50 cases). Neurological disorders included central nervous system impairment and polyneuropathy.

For more than half of the sample (60%), the health problems were sufficiently serious to require treatment. About a quarter of the sample (26%) were assessed as requiring treatment for one health problem. One-third (34%) were assessed as requiring treatment for conditions in two or more health domains, and 17% were assessed as requiring treatment for conditions in three or more domains. As indicated by the previous findings, the disorders most likely to require treatment were gastrointestinal and liver disorders (28%) with 4%

Table 1 Prevalence of health problems among problem drinkers.

Health domain	Moderate/ Disorder present	severe disorder	Requires treatment
Cardiovascular	28%	11%	24%
Neurological	26%	11%	18%
Gastrointestinal and liver	48%	17%	28%
Respiratory	14%	6%	9%
Endocrine and metabolic	10%	5%	8%
Musculoskeletal	20%	8%	14%
Dermatological	10%	3%	9%
Dental	29%	12%	25%
Genitourinary	10%	2%	7%
Any health problem	79%	40%	60%

assessed as requiring 'urgent' treatment, cardiovascular (24%) with 3% requiring urgent treatment, neurological (18%) with 1.5% urgent, and dental (25%) with 2% urgent.

Factors associated with health problems

Bivariate correlations were calculated between HMS scores and a range of social demographic and alcohol problem variables (age, sex, age of onset of alcohol use disorder, duration of alcohol use disorder, age of first alcohol treatment episode, quantity of alcohol consumed on a typical drinking day, frequency of alcohol consumption, severity of alcohol dependence, and smoking status). Statistically significant correlations were found between HMS scores and the following variables: frequency of alcohol use, duration of alcohol use disorder, severity of alcohol dependence (SDS-A), and smoking status. These five variables were entered as covariates in the multiple regression analysis with HMS scores as the dependent variable (Table 2).

The results of the multiple regression analysis showed statistically significant associations between HMS scores and all five of the covariates that were entered in the model. More frequent use of alcohol, longer duration of alcohol use disorder, more severe alcohol dependence

scores, greater age, and smoking status were all found to be predictive of higher HMS scores.

Physical health co-morbidity among older problem drinkers

Differences in health problems between patients aged 54 years or less ($n=246$) and those aged 55 years or older ($n=68$) were investigated using logistic regression analysis. The dependent variables in the analysis were the nine physical health domains (problems assessed as moderate/severe). To control for the effect of alcohol problems and smoking status which were found to be significantly associated with HMS scores, severity of alcohol dependence, frequency of alcohol consumption, duration of alcohol use disorder, and smoking status were also included as covariates in the regression analysis. This model was statistically significant ($\chi^2_{[13]}=57.78$; $P<0.001$).

Statistically significant differences were found between the older and younger age groups on three health problem domains. Older patients were significantly more likely [odds ratio (OR) = 5.22] to have cardiovascular and neurological (OR = 2.72) health problems. Older patients were also more likely to have musculoskeletal health problems (see Table 3).

Statistically significant differences between the older and younger age groups were also found on the alcohol problem and smoking variables that were entered as covariates in the regression model. Older patients scored lower than the younger patients on the measures of severity of alcohol dependence (7.0 versus 8.3; Wald_[1] = 16.72; $P<0.001$). Older patients had a longer mean duration of alcohol use disorder (20.6 years versus 14.1 years; Wald_[1] = 8.95; $P<0.01$). There were no statistically significant differences between the older and younger patients in terms of smoking status or frequency of alcohol use.

Table 2 Factors associated with physical health problems.

Variable	Beta	t	P
Alcohol dependence (SDS-A)	0.125	2.21	0.03
Frequency of alcohol use	0.133	2.30	0.02
Duration of alcohol use disorder	0.139	2.20	0.03
Age	0.230	3.67	<0.001
Smoker	0.231	4.01	<0.001

For the multiple regression analysis: $R=0.404$; adjusted $R^2=0.146$; $F=9.47$, $P<0.001$. SDS, Severity of Dependence Scale.

Table 3 Differences in physical health problems among older^a and younger patients.

Health domain	Beta	Wald test	P	Odds ratio	95% confidence interval
Cardiovascular	1.65	11.46	<0.001	5.22	2.01, 13.61
Neurological	1.00	4.34	0.04	2.72	1.06, 6.99
Gastrointestinal and liver	-0.10	0.04	0.84	0.91	0.34, 2.39
Respiratory	0.24	0.11	0.74	1.27	0.31, 5.19
Endocrine, nutritional	1.14	2.29	0.13	3.14	0.71, 13.79
Musculoskeletal	1.18	3.83	0.05	3.27	1.00, 10.68
Dermatological	-1.19	0.78	0.38	0.31	0.02, 4.23
Dental	-0.68	1.25	0.26	0.51	0.15, 1.67
Genitourinary	1.47	1.17	0.28	4.36	0.30, 62.94

^aOlder patients, aged 55 or more.

Severity of alcohol dependence (SDS-A), frequency of alcohol consumption, duration of alcohol use disorder, and smoking status were also included as covariates in the analysis (see text).

For the logistic regression analysis: $\chi^2=57.78$; d.f. = 13, $P<0.001$.

SDS, Severity of Dependence Scale.

DISCUSSION

Physical health disorders were extremely common among the patients seeking treatment for alcohol problems. More than three-quarters of the sample had at least one physical health problem at admission to treatment, and many had multiple health problems. These health problems were clinically important. Sixty per cent of the sample had at least one physical health problem that required treatment, and half had more than one condition requiring treatment. The most common health problems were gastrointestinal and liver disorders, but about a quarter of the sample had cardiovascular or neurological problems.

Before discussing these findings, a number of study limitations should be taken into account. Other studies have shown marked variability in the prevalence of alcohol-related problems across European countries (Rehm *et al.* 2005). In the present study, the agencies and patients were not intended to be representative of national alcohol treatment services, nor of alcohol misuse patients within their respective countries, and the study design does not permit inferences to be made regarding possible cross-national differences. Also, the assessment and analysis of health problems in terms of health domains do not correspond to diagnostic disorders, and the classification of health problems in such terms may group together disparate health problems that differ in terms of consequences and prognosis. For this reason, further investigation is required where specific alcohol-related physical disorders are a focus of interest. Finally, the sample was drawn from clinical settings, and comprised patients with relatively severe alcohol use disorders. For this reason, the findings may not be indicative of the physical health problems of heavy drinkers from different health-care systems or of other, non-clinical samples.

We also note that the design does not permit direct inferences about the precise nature of the reported relationships, and because of the cross-sectional design, it is not known to what extent some of the observed disorders may be reversible with abstinence. Alcohol dependence may cause certain illnesses or increase their severity; comorbid disorders may lead to or aggravate alcohol dependence; and both disorders may be due to some third condition. Inferences about the expected nature of the alcohol–disease relationship may, however, be supported by evidence from other sources. The relationship of alcohol to some diseases (e.g. coronary heart disease) is complex. With regard to other diseases (e.g. liver disease, pancreatitis, hypertension, central nervous system impairment) the effects of alcohol are well-established (Korsten 1989; Sherman, Koskinas & Williams 1996; Kaplan 2004; Huntgeburth, Ten Freyhaus & Rosenkranz 2005).

Previous studies have reported that frequency of alcohol use (Nishiyori *et al.* 2005) and quantity of alcohol consumption (Becker *et al.* 1996; Rehm *et al.* 2003a; Okosun *et al.* 2005) are associated with physical morbidity. In the present study, three alcohol-related factors were associated with physical ill health. In addition to frequency of drinking, duration of the alcohol use disorder and severity of alcohol dependence were also associated with increased physical morbidity.

Alcohol dependence may act as a powerful mechanism which sustains alcohol consumption behaviours (e.g. quantity and frequency of drinking) and which may also mediate the impact of drinking upon the acute and chronic consequences of drinking. Other studies have shown that the relationship between dependence and problems may exist independently of the quantity of alcohol consumed, and that alcohol dependence may serve as a stronger predictor of physical health problems than the quantity of alcohol consumed (Drummond 1992).

Current smoking status was also found to be predictive of physical morbidity in heavy drinkers. The interrelationship between alcoholism and tobacco smoking has been previously reported, as have their separate and combined effects on physical morbidity. Because of its importance, this finding deserves repeated emphasis. Alcohol problems and tobacco smoking tend to be positively associated (Friedman *et al.* 1991; Hughes 1995; Crum *et al.* 2005), with higher alcohol intake related to heavier smoking (Jensen & Bellecci 1987). Between 80% and 95% of alcoholics smoke cigarettes, a rate that is three times higher than for the general population, and about 70% of alcoholics are heavy smokers (Collins & Marks 1995). It has been estimated that more alcoholics will die from smoking-related causes than from alcohol-related causes (Hurt *et al.* 1996).

Excessive alcohol use and smoking have both been identified as risk factors for cardiovascular and respiratory diseases, and for some forms of cancer. The co-occurrence of smoking and excessive drinking leads to a multiplicative risk for cardiovascular disease and for cancers in the upper aerodigestive tract and in the liver (Tuyns *et al.* 1988; Tuyns 2001). Compared with the risk for non-smoking non-drinkers, the risk for developing mouth and throat cancer are seven times greater for those who use tobacco, six times greater for those who use alcohol, and 38 times greater for those who use both substances (Blot 1992). Interactions between alcohol and other types of substance use have also been found to lead to increased physical morbidity. Patients with co-dependence upon both alcohol and cocaine have been found to have higher rates of multiple physical disorders than patients who were dependent upon alcohol-only or cocaine-only (Salloum *et al.* 2004).

Increased age was also associated with poorer physical health. The finding that older problem drinkers had more physical health problems than their younger counterparts is important. Demographic trends show the elderly to be the fastest growing segment of the population, and physicians can expect to see such patients in increasing numbers. Relatively little is known about the aetiology and consequences of alcohol use disorders in the elderly (Gomberg 2003). Studies have shown that relatively high rates of hospital inpatients aged 65 and older have substance abuse disorders (Moos, Mertens & Brennan 1993; Brennan *et al.* 2000). However, despite the prevalence of alcohol use in older people, the risks and problems of alcohol for the elderly are often unrecognized (Fink *et al.* 1996).

In a previous study of psychiatric patients, the highest prevalence of somatic disorders was found among older patients and patients with alcohol disorders (Madsen *et al.* 1997). The present study also found that older drinkers had more physical health problems although they were less severely alcohol dependent than their younger counterparts. Other studies have also reported greater health problems among the elderly despite lower levels of alcohol consumption (Schuckit 1982; Fink *et al.* 1996; Moos *et al.* 2005). The physiological changes associated with ageing permit the harmful effects of alcohol to take effect at lower levels of consumption than for younger drinkers, and excessive drinking among the elderly may aggravate the medical problems that occur with ageing.

The high prevalence of physical health problems among persons with alcohol dependence provides opportunities for screening and treatment of alcohol use disorders. It has long been acknowledged that screening for alcohol problems should take place not only in specialist alcohol treatment services but also in other health-care settings (Chick 1991). Heavy drinkers are more likely than light drinkers or non-drinkers to see their general practitioner for chronic health problems (Proude *et al.* 2006). Clinical impression alone is unlikely to provide a sound basis for detection of this group. The use of biochemical markers can be useful for monitoring current alcohol consumption (Miller & Anton 2004). However, this may not detect other harmful drinking patterns, such as occasional excessive drinking episodes, which may adversely affect physical health (Rehm *et al.* 2003b). Brief screening instruments such as the CAGE (Ewing 1984), the short Alcohol Use Disorders Identification Test (Piccinelli *et al.* 1997), or the SDS-A (Gossop *et al.* 1995), may be of use in this context.

Previous studies have shown that many medical illnesses remain undiagnosed among patients with psychiatric disorders (Korany 1979; Koran *et al.* 1989), and among alcohol-misusing patients (Mansell *et al.* 2006).

The high prevalence of clinically important health problems among alcohol dependent patients in the present study gives emphasis to the need for a full routine health screen of such patients at admission to alcohol treatment services, and for provision or access to appropriate treatment. The capacity of existing services to provide an adequate medical response to physical health problems is often extremely limited in terms of staff and facilities. The present findings suggest the need for alcohol programmes to be able to provide basic-level medical services within their own programmes. Where severe or complex disorders are identified, this will often require referral to specialist medical services. This should be facilitated by the alcohol treatment agencies. Where reliance is placed upon separate alcohol and medical treatment services, this frequently leads to a lack of liaison between the separate clinical systems. Where professionals are unclear about how best to provide joint alcohol and medical treatments, the burden of accessing the different services tends to fall upon the patients, who are often poorly equipped for such a demanding task.

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