Alcohol and prescribed psychotropic drug use among patients admitted to a department of old-age psychiatry in Norway

Aud Johannesen
Norwegian National Advisory Unit on Ageing and Health, Vestfold Hospital Trust, Norway

Knut Engedal
Norwegian National Advisory Unit on Ageing and Health, Vestfold Hospital Trust, Norway

Marianne Larsen
Diakonhjemmet Hospital, Norway

Elin Lillehovde
Innlandet Hospital Trust, Norway

Line Tegner Stelander
University Hospital of North Norway, Norway

Anne-Sofie Helvik
Norwegian National Advisory Unit on Ageing and Health, Vestfold Hospital Trust, Norway
Faculty of Medicine, Department for Public Health and General Practice, Norwegian University of Science and Technology (NTNU), Norway
St. Olav's University Hospital, Norway

Corresponding author:
Aud Johannesen, Norwegian National Advisory Unit on Ageing and Health, Aldring og helse, Postboks 2136, 3103 Tønsberg, Norway.
Email: aud.johannessen@aldringoghelse.no

Abstract

Background: Although alcohol and prescribed psychotropic drug use has increased among older people, the usefulness of information provided about these substances in patients' referrals to departments of old-age psychiatry (OAPsy) is unknown. **Aims:** To examine whether patients' self-reported elevated use of alcohol and prescribed psychotropic drugs corresponds with information provided in the referrals to OAPsy departments and to explore the factors associated with elevated self-reported use of these substances. **Methods:** We recorded the information provided in referrals about the elevated use of alcohol and psychotropic drugs in a sample of 206 patients (69 men) from 12 OAPsy departments. The Alcohol Use Disorders Identification Test (AUDIT) and Drug Use Disorders Identification Test (DUDIT) helped to assess self-reported use. We also collected demographic data, as well as information about cognitive functioning and symptoms of anxiety and depression. **Results:** Seventy-three patients (35%) scored above the cut-off for alcohol use for women/men (AUDIT $\geq$ 3/4) or psychotropic drugs (DUDIT $\geq$ 6/8), if not both. Twenty patients (10%) reported an elevated use of both alcohol and psychotropic drugs, and the referrals for eight (40%) and ten (50%) of them, respectively, included information about this use. There was a significant association between self-reported use of alcohol above the cut-off and information about elevated use in the referrals. However, no such association was found between information in the referrals and self-reported use of prescribed psychotropic drugs. Elevated alcohol use was associated with more years of education, while elevated use of psychotropic drugs was associated with younger age and severe symptoms of anxiety and depression. **Conclusion:** The information reported in referrals about the elevated use of alcohol and psychotropic drugs demonstrated a trend in associations with self-reported use. However, the risk factors for elevated use of alcohol and psychotropic drugs in the elderly need to be examined further.

Keywords

addiction, elderly, older people, senior citizens, substance abuse

Elevated use of alcohol and of prescribed psychotropic drugs may be a problem for older people above 65 years of age. Throughout the present study, we will use the term psychotropic drugs to refer to prescribed psychotropic drugs. Both the ageing process (altered metabolism and volume of distribution) and general health (physical and mental) can interact with alcohol consumption and intake of psychotropic drugs, leading to poorer health and impaired function in activities of daily life (Blow & Barry, 2012; Rao, Crome, Crome, Ramakrishnan, & Iliffe, 2015).

Various terms describe the use and misuse of alcohol and psychotropic drugs, including dependency, harmful use, risky use and elevated use (Hallberg, Högberg, & Andreasson, 2009). Our chosen term in this study is elevated use. The definition of elevated use in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) (2013), is broad, and no standard definition of elevated use has emerged from the literature (Simoni-Wastila & Huiwen, 2006). Nonetheless, one alcohol unit per day for people aged 65 years and above, both men and women, is often a recommended limit for the consumption of alcohol in this age group (The American Geriatric Society, 2003). However, alcohol consumption below this limit may also harm health (Fillmore, Stockwell, Chikritzhs, Bostrom, & Kerr, 2007; Moos, Brennan, Schutte, & Moos, 2004).

Previously published studies have reported that elevated drug and alcohol use and mental illness often occur simultaneously (Schonfeld et al., 2010). One study by Caputo et al.

(2012) reported that depression was prevalent among those with elevated use of alcohol or psychotropic drugs. Additionally, a report by Rao and colleagues (2015) highlighted that older people's psychosocial risk factors such as retirement, boredom, loneliness and homelessness were associated with higher rates of alcohol use. Other studies show a possible connection between alcohol consumption and cognitive function across a lifetime (Kuzma, Llewellyn, Langa, Wallace, & Lang, 2014; Langballe et al., 2015). Alcohol use has also been associated with a higher level of education (Blow, 2004; Støver, Bratberg, Nordfjærn, & Krokstad, 2012). Several studies show that elevated use of alcohol and psychotropic drugs, alone or in combination, negatively influences many diseases (Støver et al., 2012). Alcohol alone is argued to have a negative impact on at least 60 diseases (World Health Organization, 2004).

Physical health problems and the long-term prescription of psychotropic drugs are also important factors in the development of substance dependence in older people. The use can be non-specific, and the role of substance use in the treatment of physical conditions is frequently overlooked (Rao et al., 2015). In addition, Hobden, Bryant, Sanson-Fisher, Oldmeadow, and Carey (2016) note that identification by general practitioners (GPs) of the shared context between depression and alcohol is low. This is unfortunate because late-onset elevated substance use is more likely to have a better treatment prognosis than early-onset misuse (Moy, Crome, Crome, & Fisher, 2011; O'Connell, Chin, Cunningham, & Lawlor, 2003; Rao et al., 2015).

Among US citizens, about one-fourth of older adults were likely to use psychotropic drugs with a potential for dependency, and this use is likely to increase as the population ages (Simoni-Wastila & Huiwen, 2006). An Australian study comparable to ours showed that 20% of patients in geriatric hospital units and community healthcare centres screened positive for elevated use of alcohol and long-term use of psychotropic drugs (Draper et al., 2015). Furthermore, a Norwegian study showed that benzodiazepine use was common in old-age psychiatry departments but that the information provided in referrals to these departments regarding the use of these drugs often did not match actual use (Høiseth et al., 2013).

In Norway, there is little knowledge about older people's alcohol and psychotropic drug use (Frydenlund, 2011; Lunde, 2015), but we do know that alcohol consumption has increased among older people in recent decades and that the level of consumption among older people is higher today than it was for this age group 15 years ago (Bye & Østhus, 2012; Støver et al., 2012). In the past decade, consumption of psychotropic drugs has also increased among older people, and today, the elderly account for approximately half of the consumption of psychotropic drugs in Norway (Midtflå, 2007). In addition, a study of older home-dwelling people showed that the proportion of the population using psychotropic drugs increases with age (Støver et al., 2012). Given this background knowledge, we believe that increased efforts and attention among health professionals can be effective in reducing unhealthy consumption of alcohol and the use of psychotropic drugs in the elderly.

However, elevated substance use among older people has not been prioritised in Norway, and guidelines for the diagnosis, treatment and follow-up of older people with a substance use disorder (misuse) and co-morbid mental illness are lacking (ROP-Guidelines, 2012). Studies also show that there is lack of focus on the elevated use of alcohol and psychotropic drugs when healthcare personnel and GPs apply for or facilitate services for older people (Duckert, Lossius, Ravndal, & Sandvik, 2008; Johannessen, Engedal, & Helvik, 2014; Johannessen, Helvik, Engedal, Ulstein, & Sørlie, 2015; Sandvik, 2014). A review study indicates that there has been little research addressing substance abuse in older adults (Rosen, Engel, Hunsaker, Engel, & Reynolds, 2013). What is more, studies examining the differences and

similarities between referral sources and self-reported use of alcohol and psychotropic drugs, as well as the reasons for these differences, are not well documented (Helseth, Lykke-Enger, Aamot, & Johnsen, 2005; Høiseth et al., 2013). To our knowledge, there is a lack of research focusing on the elevated use of alcohol and psychotropic drugs among old-age psychiatry hospital patients and the factors associated with this use.

Therefore, this study had two objectives. The first was to examine whether patients' self-reported elevated use of alcohol and prescribed psychotropic drugs corresponded with the information provided on their referral to the department of old-age psychiatry. The second was to explore the factors associated with elevated self-reported use of alcohol and/or psychotropic drugs.

Methods

Setting and participants

The data were acquired from 219 patients referred to 12 Norwegian departments of old-age psychiatry located in both the south and north of the country. The inclusion criteria for the patients were being >65 years of age and having the capacity to provide informed written consent to participate in the study. No specific exclusion criteria were defined. One participant declined to participate after the assessment, one was <65 years old and 11 provided insufficient information on the assessment scales. Thus, 206 patients were included in the analyses.

Data collection

The participants were enrolled from June 2013 to July 2015, but not systematically or in a randomised manner. Trained doctors, psychologists, nurses, social workers and occupational therapists collected the data after being trained on how to conduct the interviews, perform the testing and use the assessment scales. The healthcare personnel were familiar with most

of the scales, and the training therefore focused mainly on the Alcohol Use Disorders Identification Test (AUDIT), which was used to assess alcohol consumption, and the Drug Use Disorders Identification Test (DUDIT). To ensure the quality of data collection, we held telephone meetings with each hospital unit throughout the data collection period.

Referrals

The information that the hospitals received from the GPs (referrals) was assessed, and information on the evaluated use of alcohol and/or psychotropic drugs was recorded.

Assessment of the patients

Socio-demographic characteristics included the variables of age, gender, marital status and years of education. Alcohol consumption was assessed by the Alcohol Use Disorders Identification Test (AUDIT) and by the short version with three items, AUDIT-C, which both assess elevated drinking (Babor, De La Fuente, Saunders, & Grant, 1989). AUDIT is a ten-item questionnaire. Each item can be rated from 0 to 4. The recommended cut-off has been set to 4 for both genders (Blow & Barry, 2012). However, other studies recommend using a cut-off score for elevated drinking of 3 for women (Crome, Dar, Janikiewicz, Rao, & Tarbuck, 2011). The cut-off score for the AUDIT in the present study was set at 3 for women and 4 for men. The Drug Use Disorders Identification Test (DUDIT) assessed psychotropic drug use. This questionnaire is an 11-item assessment instrument developed to identify non-alcohol drug use patterns and various drug-related problems (Berman, Bergman, Palmstierna, & Schlyter, 2005). The first nine items are scored on five-point scales ranging from 0 to 4, and the last two are scored on three-point scales (values of 0, 2, and 4). Scores of 2 for women and 6 for men are used as the cut-off values in other population groups with illicit drug use (Berman et al., 2005). Total scores range from 0 to 44,

with higher scores suggesting a more severe drug problem. In our study, which assessed psychotropic drugs in older people, we used the DUDIT to initially identify any use of prescribed psychotropic drugs and then determine the number of participants meeting a cut-off score of 6 for women and 8 for men (Voluse et al., 2012). Cognitive function was assessed by the Norwegian revised version of the Mini Mental State Examination (MMSE) (Engedal, Laake, Haugen, & Gilje, 1988; Folstein, Folstein, & McHugh, 1975; Strobel & Engedal, 2008). The scale consists of 20 items, with a possible score between 0 and 30. A lower score denotes more impairment. The Montgomery–Aasberg Depression Rating Scale (MADRS) was used to rate the severity of depression. This scale has ten items; each can be rated from 0 to 6, resulting in a total range from 0 to 60. A higher score denotes more severe depression (Montgomery & Aasberg, 1979; see also Engedal et al., 2012). To assess anxiety, we applied the Geriatric Anxiety Inventory (GAI). This is a 20-item questionnaire in which each item is scored as yes or no and then coded as 0 (symptom not present) or 1 (symptom present). The scores can vary between 0 and 20; a higher score denotes more severe anxiety symptoms (Bendixen & Engedal, 2015; Pachana et al., 2007). Furthermore, the psychotropic drugs taken (or prescribed) were grouped according to the Anatomical Therapeutic Chemical (ATC) code into the following categories: antipsychotics (N05A except lithium), antidepressants (N06A), anxiolytics (N03A & N05B), hypnotics/sedatives (N05C) and opioids (N02A) (yes versus no) (WCCfDSM, 2015). The information was collected from each patient's medical records in the old-age psychiatry unit.

Statistics

The statistical analysis was performed using IBM SPSS version 22 (Chicago, IL, USA). Descriptive analysis of categorical variables was performed with Pearson's chi-squared test or Fisher's exact test (depending on the sample size), and for continuous variables, the non-parametric Mann–Whitney U test was used since the data were not normally distributed. Cohen's kappa statistics were used to report agreement between two sources of information.

Logistic regression analysis (the "enter" method) was performed to study the associations between the three dependent variables: elevated self-reported use of alcohol (AUDIT $\geq 3/4$), elevated self-reported use of psychotropic drugs (DUDIT $\geq 6/8$) and elevated self-reported use of both alcohol and psychotropic drugs (versus non-elevated self-reported use of either alcohol or drugs). The independent variables included in the unadjusted analysis were demographic variables (gender, age, living alone and level of education), cognitive functioning (MMSE score), symptoms of depression and anxiety (MADRS and GAI) and information in the referrals regarding elevated use of alcohol and/or psychotropic drugs. Level of education (<ten years versus $\geq$ten years) was categorised because of a non-linear association with the dependent variables. Independent variables in the unadjusted logistic regression analyses of the first two dependent variables (elevated self-reported use of alcohol and elevated self-reported use of psychotropic drugs) that showed associations at $p \leq 0.1$ were included in the adjusted logistical regression models. Independent functional health and drug variables in the unadjusted logistic regression analyses of the third dependent variable (elevated self-reported use of both alcohol and drugs) that were associated with the dependent variable at $p \leq 0.1$ were included in the adjusted analyses, which controlled for the information provided on the referrals and the demographic information.

Statistical tests were carried out to assess for interactions and possible collinearity. Probability values below 0.05 were considered statistically significant.

Ethics

This study followed the ethical principles outlined in the Helsinki declaration (World

Table 1. Characteristics of patients by self-reported elevated use of alcohol and/or psychotropic drugs (assessed using the AUDIT[a]/DUDIT[b])

		All		No reported elevated use of alcohol or psychotropic drugs		Reported elevated use of alcohol and/or psychotropic drugs		
Number	N (%)	206	(100.0)	133	(65.0)	73	(36.0)	p < 0.05[g]
Socio-demographic information								
Men	N (%)	69	(3.5)	45	(33.8)	24	(3.9)	0.889
Age	Mean (SD)	74.81	(7.3)	75.69	(7.5)	73.81	(6.7)	**0.018**
Education ≥ 10 years[i]	N (%)	141	(68.5)	84	(63.2)	57	(78.1)	**0.014**
Living alone	N (%)	128	(62.1)	84	(63.2)	44	(60.3)	0.586
Functional								
MMSE score[c]	Mean (SD)	26.29	(3.8)	26.04	(3.7)	26.74	(3.3)	0.174
MADRS score[d]	Mean (SD)	14.25	(9.9)	13.54	(9.9)	15.52	(9.9)	0.169
GAI score[e]	Mean (SD)	8.03	(6.8)	7.83	(6.8)	8.03	(6.8)	0.580
Main diagnoses[h]								
MCI and dementia[f]	N (%)	51	(24.6)	35	(26.3)	16	(21.9)	
Disorder due to abuse	N (%)	8	(3.9)	0	(0.0)	8	(11.0)	
Psychosis	N (%)	15	(7.3)	9	(6.8)	6	(8.2)	
Affective disorders	N (%)	88	(42.8)	57	(42.9)	31	(42.5)	
Anxiety	N (%)	31	(15.1)	21	(15.8)	10	(13.7)	
Other	N (%)	13	(6.3)	11	(8.3)	2	(2.7)	

Note. Bold numbers indicate significant associations.
[a]Alcohol Use Disorders Identification Test (AUDIT), cut-off sore of 3/4 for women/men. [b]Drug Use Disorders Identification Test (DUDIT), cut-off score of 6/8 for women/men. [c]Cognitive function was assessed by Mini Mental State Examination (MMSE). [d]Depression was assessed by the Montgomery–Aasberg Depression Rating Scale (MADRS). [e]Anxiety was assessed using the Geriatric Anxiety Inventory (GAI). [f]Mild cognitive impairment (MCI). [g]The non-parametric Mann–Whitney U test was used for continuous data, and chi-square test was used for categorical data. [h]Missing information from four patients. [i]No tests were conducted due to the small numbers and 6 x 2 table.

Medical Association, 2013). Additionally, the study procedures were presented to the Regional Committee for Ethics in Medical Research, Southern Norway, and were subsequently approved. Consent was obtained from the patients after they had received verbal and written information about the study and before the assessment took place.

Results

In total, 206 patients ($n = 69$, 34% men) with a mean age (SD) of 75 (7) years were included. The mean educational level of the participants was 12 (4) years, and 128 (62%) lived alone.

The distribution of the patients who were excluded ($n = 13$) from the analysis due to missing information did not differ significantly from those included in terms of age (mean 74 years, SD 6 years), gender ($n = 4$, 31% men), education (mean 11 years, SD 3 years) or living alone ($n = 8$, 62%).

Of all 206 participants, 73 (35%) scored above the cut-off for elevated use of alcohol (AUDIT ≥ 3/4) and/or psychotropic drugs (DUDIT ≥ 6/8). Those with an elevated use were younger and were more likely to have had an education of ten or more years than those without elevated use (see Table 1). The groups did not differ with regard to the other demographic variables or functional state.

The three most frequent main diagnoses of the participants were: affective disorder ($n = 88$, 43%), mild cognitive impairment (MCI) or dementia ($n = 51$, 25%), and anxiety ($n = 31$, 15%). In total, eight (4%) of the participants had disorders due to abuse, and all of those patients scored above the cut-off for elevated use of alcohol or psychotropic drugs (see Table 1).

Information in the referrals regarding elevated use of alcohol and psychotropic drugs

Patients who reported an elevated use of alcohol (AUDIT $\geq$ 3/4, in total 48/206, 23% of the patients) or of psychotropic drugs (DUDIT $\geq$ 6/8, in total 45/206, 22% of the patients) had information on the referrals indicating this elevated use significantly more often than those not reporting any elevated use (see Table 2). Cohen's kappa between relevant information on the referrals and self-reported elevated use was 0.46 for elevated alcohol use and 0.28 for elevated psychotropic drug use. In total, 20 (10%) of the patients reported an elevated use of both alcohol and psychotropic drugs. With these patients, information about the elevated use of alcohol and psychotropic drugs was included in the referrals for eight (40%) and ten (50%) of the patients, respectively.

Factors associated with elevated self-reported use of alcohol

In the unadjusted logistic regression analyses, a high level of education, use of antipsychotics and information in the referral indicating elevated use of alcohol were associated with elevated self-reported use of alcohol (see Table 3). In the adjusted logistic regression analysis, only information in the referrals about elevated alcohol consumption increased the risk of reporting elevated use of alcohol. The explained adjusted variance assessed using Nagelkerke R-squared was 38%.

Factors associated with elevated self-reported use of psychotropic drugs

In the unadjusted logistic regression analyses, the factors associated with the outcome measure of elevated self-reported use of psychotropic drugs were younger age, information in the referrals noting an elevated use of psychotropic drugs, all categories of psychotropic drugs taken and increased anxiety and depressive symptom scores (Table 3). In the adjusted logistic regression analysis, younger age and use of any of the psychotropic drugs – anxiolytics, hypnotics, antidepressants, antipsychotics and opioids – were associated with a DUDIT score indicating elevated use of psychotropic drugs. The explained adjusted variance assessed using Nagelkerke R-squared was 42%.

Factors associated with elevated self-reported use of alcohol and psychotropic drugs

In the unadjusted logistic regression analyses, the factors associated with a score on the AUDIT and DUDIT indicating an elevated use of both alcohol and psychotropic drugs were a high level of education, all categories of psychotropic drugs taken and information in the referrals noting an elevated use of alcohol and psychotropic drugs (Table 4). In the logistic regression analyses adjusting for education level and information in the referrals regarding elevated consumption of alcohol and psychotropic drugs, the use of anxiolytics, antidepressant antipsychotics and opioids increased the risk of elevated self-reported use of both alcohol and psychotropic drugs. The explained adjusted variance in these models was 41–45%. The explained adjusted variance in a model including only level of education and information in the referrals regarding elevated consumption of alcohol and psychotropic drugs was 34%.

Table 2. Information in the referrals and use of psychotropic drugs by self-reported elevated use of alcohol and/or psychotropic drugs (assessed with AUDIT[a]/DUDIT[b])

	No reported elevated use of alcohol or drugs		Reported elevated use of alcohol			Reported elevated use of drugs			Reported elevated use of alcohol and drugs		
	N	(%)	N	(%)	p-value[c]	N	(%)	p-value[c]	N	(%)	p-value[c]
Number	133	(100.0)	48	(100.0)		45	(100.0)		20	(100.0)	
Information in the referrals											
Elevated use of alcohol	8	(6.0)	22	(45.8)	<0.001				8	(40.0)	<0.001
Elevated use of psychotropic drugs	14	(10.5)				15	(33.3)	0.001	10	(50.0)	<0.001
Psychotropic drugs[c]											
Anxiolytics (N03A & N05B)	48	(36.1)	22	(45.8)	0.217	35	(77.8)	<0.001	16	(80.0)	<0.001
Hypnotics and sedatives (N05C)	41	(30.8)	18	(37.5)	0.363	26	(57.8)	0.001	11	(55.0)	0.039
Antidepressants (N06A)	25	(18.8)	14	(29.2)	0.146	16	(35.6)	0.024	8	(40.0)	0.039
Antipsychotics (N05A)	24	(18.1)	17	(35.4)	0.014	20	(44.4)	0.001	10	(50.0)	0.003
Opioids (N02A)	9	(6.8)	7	(14.6)	0.131	11	(24.4)	0.002	6	(30.0)	0.005

[a]Alcohol Use Disorders Identification Test (AUDIT), cut-off sore of 3/4 for women/men. [b]Drug Use Disorders Identification Test (DUDIT), cut-off score of 6/8 for women/men. [c]Compared to those not reporting elevated use of alcohol or drugs with Fisher's exact test due to small numbers.

Table 3. Participants' report of elevated use of alcohol or psychotropic drugs assessed with AUDIT[a] and DUDIT[b]. Unadjusted and adjusted estimates[f]

| | Report of elevated use of alcohol | | | | Report of elevated use of psychotropic drugs | | | |
| | Unadjusted[g] | | Model[h] | | Unadjusted[g] | | Model[h] | |
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Demographics								
Men	0.978	0.486–1.968			0.711	0.335–1.508		
Age (years)	0.964	0.919–1.010			**0.946**	**0. 009–0.994**	**0.919**	**0.857–0.985**
Education ≥ 10 years	**3.905**	**1.545–9.869**	3.107	0.944–10.229	2.222	0.985–5.015	1.585	0.526–4.779
Not living alone	1.277	0.649–2.509			0.894	0.437–1.827		
Functional								
MMSE score[c]	1.107	0.995–1.231			1.055	0.952–1.170		
GAI score[e]	0.979	0.931–1.030			**1.051**	**1.000–1.109**	1.028	0.949–1.113
MADRS score[d]	1.017	0.980–1.048			**1.041**	**1.004–1.078**	0.992	0.932–1.055
Psychotropic drugs								
Anxiolytics, N03A+N05B	1.594	0.803–3.164			**7.292**	**3.125–17.015**	**4.555**	**1.668–12.441**
Hypnotics and sedatives, N05C	1.415	0.701–2.856			**3.245**	**1.587–6.636**	**2.645**	**1.047–6.685**
Antidepressants, N06A	1.861	0.864–4.009			**2.441**	**1.145–5.206**	2.118	0.756–5.933
Antipsychotics, N05A	**2.786**	**2.631–5.561**	2.021	0.800–5.107	**3.768**	**1.788–7.943**	**3.116**	**1.195–8.127**
Opioids, N02A	2.436	0.850–6.982	2.873	0.820–10.068	**4.545**	**1.734–11.912**	**3.782**	**1.002–14.267**
Information in the referrals								
Elevated use of alcohol	**13.750**	**5.501–34.367**	19.837	6.737–57.292				
Elevated use of drugs					**4.214**	**1.835–9.677**	3.017	0.974–9.350
Adjusted R² in %[i]			38.4				42.4	

Note. OR = odds ratio; CI = confidence interval. Bold numbers indicate significant associations.
[a]Alcohol Use Disorders Identification Test (AUDIT), cut-off score of 3/4 for women/men. [b]Drug Use Disorders Identification test (DUDIT), cut-off score of 6/8 for women/men. [c]Cognitive function was assessed by Mini Mental State Examination (MMSE). [d]Depression was assessed by the Montgomery–Aasberg Depression Rating Scale (MADRS). [e]Anxiety was assessed using the Geriatric Anxiety Inventory (GAI). [f]Compared to those without an elevated use of alcohol or psychotropic drugs (assessed using AUDIT and DUDIT). [g]Independent variables associated ($p \leq 0.100$) with the outcome in the unadjusted analyses were included in the adjusted model. [h]The variables presented in the models were adjusted for each other. [i]Nagelkerke R-squared.

Table 4. Comparison of participants reporting an elevated use of alcohol and psychotropic drugs with AUDIT[a] and DUDIT[b]. Unadjusted and adjusted estimates[f]

	Unadjusted		Models[g]		Adjusted R^2 in %[h]
	OR	95% CI	OR	95% CI	
Demographic					
Men	0.489	0.154–1.549			
Age (by years)	0.966	0.905–1.033			
Education ≥ 10 years	**10.857**	**1.409–83.658**			
Not living alone	0.766	0.276–2.126			
Functional					
MMSE[c]	1.188	0.990–1.427	1.079	0.869–1.340	35.4
GAI score[e]	1.024	0.955–1.099			
MADRS score[d]	1.047	0.996–1.101	1.048	0.985–1.116	38.0
Drugs					
Anxiolytics, N03A+N05B	**8.889**	**2.462–32.098**	**5.869**	**1.386–24.856**	43.6
Hypnotics and sedatives, N05C	**2.918**	**1.091–7.801**	1.365	0.417–4.463	36.7
Antidepressants, N06A	**2.996**	**1.091–8.228**	**7.530**	**1.759–32.241**	44.8
Antipsychotics, N05A	**4.815**	**1.764–13.140**	**3.564**	**1.063–11.952**	40.8
Opioids, N02A	**6.103**	**1.873–9.881**	**7.588**	**11.679–34.292**	43.1
Information in the referrals					
Elevated use of alcohol	**10.417**	**3.315–32.737**			
Elevated use of drugs	**8.429**	**2.988–23.773**			

Note. OR = odds ratio; CI = confidence interval. Bold numbers indicate significant associations. [a]Alcohol Use Disorders Identification Test (AUDIT), cut-off sore of 3/4 for women/men. [b]Drug Use Disorders Identification Test (DUDIT), cut-off score of 6/8 for women/men. [c]Cognitive function was assessed by Mini Mental State Examination (MMSE). [d]Depression was assessed by the Montgomery–Aasberg Depression Rating Scale (MADRS). [e]Anxiety was assessed using the Geriatric Anxiety Inventory (GAI). [f]Compared to those without an elevated use of alcohol or psychotropic drugs (assessed using AUDIT and DUDIT). [g]Models were adjusted for demographic variables associated at $p \leq 0.100$ with the outcome in the unadjusted (i.e., educational level) model and information in the referrals. [h]Nagelkerke R-squared in %.

Discussion

This is the first study on alcohol and psychotropic drug use among patients referred to a department of old-age psychiatry in Norway. We found that about a third of the patients reported either elevated use of alcohol, psychotropic drugs or both. A comparably high proportion of patients referred to a geriatric hospital unit reported an elevated use of alcohol and substances in an Australian study by Draper and colleagues (2015). In a Norwegian study, Høiseth and colleagues (2013) indicated that benzodiazepine use was common in old-age psychiatry departments but that the information on the referrals about the use of these drugs was often not consistent with the actual use. In an earlier Norwegian study of older home-

dwelling people, the proportion of persons who had a problematic relation to alcohol and a long-term use of psychotropic drugs increased with age (Støver et al., 2012). Older people are more vulnerable to alcohol and psychotropic drug use (Ramchandani et al., 2015; Rao et al., 2015), and this elevated use can be a risk to their mental and physical health, potentially causing hospitalisation. To prevent or reduce elevated use of alcohol and psychotropic drugs in older people, this type of use needs to be detected, and the awareness of elevated and risky use should be enhanced among all health-care personnel. Thus, it can be beneficial to screen older people who seek help from their GP and who are referred to a department of geriatric medicine or old-age psychiatry. We

also suggest that these sensitive topics should be handled with great consideration in order to maintain a patient-centred framework (Lid & Malterud, 2012).

Moreover, we found that an elevated self-reported use of alcohol as measured by the AUDIT was significantly associated with the information included in the referrals regarding alcohol consumption. This finding suggests that GPs have a good relationship with the patients they refer to old-age psychiatry departments. It also may indicate that the patients in old-age psychiatry tell the health personnel the same story about their alcohol use that they have told their GPs and that their actual consumption may be completely different. This calls for other strategies to determine true use. However, studies have reported that a good therapeutic relationship or alliance has a strong impact on treatment (Helseth et al., 2005; Horvath, 2006). In addition, those who had an elevated use of alcohol were more likely than those without any reported elevated use to have had an education of ten or more years (see Table 3). The association between alcohol use and higher education level has also been reported in other studies (Blow, 2014; Støver et al., 2012).

The factors associated with elevated self-reported use of psychotropic drugs were lower age, increasing symptoms of anxiety and depression, all categories of psychotropic drugs and information on the referrals noting an elevated use of psychotropic drugs. The findings in our study related to increased symptoms of depression are in line with those of another study that showed depression to be the most prevalent symptom among those with an elevated use of alcohol or psychotropic drugs (Caputo et al., 2012). Information in the referrals about elevated psychotropic drug use was no longer associated with self-reported elevated use of psychotropic drugs in the adjusted analysis. The reason for this lack of significance could be that GPs are not aware of the point at which the use of psychotropic drugs may be a challenge for the patient (Høiseth et al., 2013). However, it is the GPs who prescribe a large proportion of addictive medications to older patients and thus have a key role in the prescriptions provided to this group (Kann, Lundquist, & Lurås, 2014; Støver et al., 2012). They could therefore be expected to be aware of patient challenges with psychotropic drug use.

A review of the literature conducted six years ago shows that an elevated use of drugs and alcohol often occurs simultaneously with mental illness (Schonfeld et al., 2010). In our study, eight of the participants were diagnosed with disorders due to abuse, all scoring above the cut-off for elevated use of alcohol or psychotropic drugs. Moreover, elevated use of both alcohol and psychotropic drugs was associated with a high level of education, the use of any category of psychotropic drugs and information in the referrals noting an elevated use of alcohol and psychotropic drugs.

Alcohol and drug use among older adults is an area of increasing public health concern (Satre, 2015). Furthermore, identification by GPs of the common context between depression and alcohol is low (Hobden et al., 2016). Based on our results, and from a public health perspective, we suggest further guidelines – tailored to older populations – for the diagnosis, treatment and follow-up of individuals with elevated substance use and co-morbid mental illness. This would help to promote and empower older people with an elevated use of alcohol and prescribed psychotropic drugs. To develop these services and treatments, it is important to involve different healthcare personnel as well as the patients themselves to ensure shared responsibility. The hospital treatment in these cases is quite brief, and it is the relationship with the primary healthcare personnel, especially the patients' GPs, that lasts longer, possibly throughout a lifetime (Lid, Oppedal, Pedersen, & Malterud, 2012). Moreover, we suggest that more effort should be devoted to increasing the knowledge of healthcare personnel and GPs about older people's vulnerability to alcohol and psychotropic drug use. In addition, increased awareness of the

elevated use of alcohol and psychotropic drugs is required when healthcare personnel and GPs apply for or facilitate services for older people (Duckert et al., 2008; Johannessen et al., 2014, 2015; Sandvik, 2014). A study by Lid, Nesvåg, and Meland (2015) emphasised that improvement of practice can be strengthened by using clinical cases in healthcare staff discussions.

Limitations

Despite the importance of this study, it still has some limitations that should be considered. First, the study had weak statistical power given the low number of patients included in the analyses. Second, the inclusion of patients was not performed systematically, e.g., including all patients or using a randomisation procedure. Thus, even if the proportion of elevated use found in the present study is comparable with international studies of older adults, the estimates are uncertain. Therefore, in further studies it is important to perform a systematic assessment of all patients referred to departments of old-age psychiatry as well as to conduct a larger-scale study to increase statistical power. A further limitation is the choice of cut-off score for the AUDIT and DUDIT. The AUDIT cut-off score was not based on sensitivity or specificity research, as it is for adults in the general population (Berman et al., 2005). Although a cut-off score for the DUDIT has been recommended in studies assessing problematic use of prescribed drugs (Voluse et al., 2012), whether we appropriately captured users who had a problematic use remains unknown. Another argument is that our participants used psychotropic drugs which are socially acceptable (Johannessen et al., 2015), even if older people have a slower metabolism of medication.

Conclusion

Information on GPs' referrals regarding the elevated use of alcohol corresponded with self-reported use of alcohol, but this was not the case for the use of psychotropic drugs. Those with an elevated use of alcohol had more years of education than those without reported elevated use. The factors associated with elevated self-reported use of psychotropic drugs were lower age and increasing symptoms of anxiety and depression. Healthcare staff at all levels should be aware of the factors associated with elevated use of alcohol and psychotropic drugs. Furthermore, primary healthcare personnel and GPs should remember to include this important information in their referrals in order to promote health in older populations.

References

Babor, T., De La Fuente, J. R., Saunders, J., & Grant, M. (1989). *AUDIT: The alcohol use disorders identification test. Guidelines for use in primary healthcare.* Geneva, Switzerland: WHO.

Bendixen, A. B., & Engedal, K. (2015). Anxiety among older psychiatric patients: A hidden comorbidity? *Aging & Mental Health.* Advance online publication. doi:10.1080/13607863.2015.1063106

Berman, A. H., Bergman, H., Palmstierna, T., & Schlyter, F. (2005). Evaluation of the Drug Use Disorders Identification Test (DUDIT) in criminal justice and detoxification settings and in a

Swedish population sample. *European Addiction Research*, *11*(1), 22–31.

Blow, F. C. (2014). New findings in alcohol and comorbid mental health disorders in older adults. *American Journal of Geriatric Psychiatry*, *22*(9), 851–853.

Blow, F. C., & Barry, K. L. (2012). Alcohol and substance misuse in older adults. *Journal of Current Psychiatry Reports*, *14*(4), 310–319.

Bye, E. K., & Østhus, K. (2012). *Alkoholkonsum blant eldre [Alcohol consumption among the elderly]*. Oslo, Norway: Statens institutt for rusmiddelforskning SIRUS.

Caputo, F., Vignoli, T., Leggio, L., Addolorato, G., Zoli, G., & Bernardi, M. (2012). Alcohol use disorders in the elderly: A brief overview from epidemiology to treatment options. *Experimental Gerontology*, *47*(6), 411–416.

Crome, I., Dar, K., Janikiewicz, S., Rao, T., & Tarbuck, A. (2011). *Our invisible addicts*. London, UK: Working Group of the Royal College of Psychiatrists, College Report CR165.

Diagnostic and Statistical Manual of Mental Disorders, DSM-5 (2013). In *Wikipedia*. Retrieved from http://en.wikipedia.org/wiki/Diagnostic_and_Statistical_Manual_of_Mental_Disorders

Draper, B., Ridley, N., Johnco, C., Withall, A., Sim, W., Freeman, M., . . . Lintzeris, N. (2015). Screening for alcohol and substance use for older people in geriatric hospital and community health settings. *International Psychogeriatrics*, *27*(1), 157–166.

Duckert, F., Lossius, K., Ravndal, E., & Sandvik, B. (2008). *Kvinner og alkohol [Women and alcohol]*. Oslo, Norway: Universitetsforlaget.

Engedal, K., Kvaal, K., Korsnes, M., Barca, M. L., Borza, T., Selbaek, G., & Aakhus, E. (2012). The validity of the Montgomery–Aasberg depression rating scale as a screening tool for depression in later life. *Journal of Affective Disorders*, *141*(2–3), 227–232.

Engedal, K., Laake, P., Haugen, P., & Gilje, K. (1988). Efficacy of short mental tests in the detection of mental impairment in old age. *Comprehensive Gerontology*, *2*(2), 87–93.

Fillmore, K. M., Stockwell, T., Chikritzhs, T., Bostrom, A., & Kerr, W. (2007). Moderate alcohol use and reduced mortality risk: Systematic error in prospective studies and new hypotheses. *Annals of Epidemiology, 17*(5), 16–23.

Folstein, M. F., Folstein, S. E., & McHugh, P. R. (1975). "Mini-mental state": A practical method for grading the cognitive state of patients for the clinician. *Journal of Psychiatric Research*, *12*(3), 189–198.

Frydenlund, R. (2011). *Eldre, alkohol og legemiddelbruk [The elderly, alcohol and prescribed drugs]*. Oslo, Norway: Kompetansesenter rus.

Hallberg, M., Högberg, P. I., & Andreasson, S. (2009). *Alcohol consumption among elderly European Union citizens*. Stockholm, Sweden: Swedish National Institute of Public Health.

Helseth, V., Lykke-Enger, T., Aamot, T. O., & Johnsen, J. (2005). Rusmiddelscreening av pasienter i alderen 17–40 år innlagt med psykose. *Tidsskrift Nor leageforeningen*, *125*(9), 1178–1180.

Hobden, B., Bryant, J., Sanson-Fisher, R., Oldmeadow, C., & Carey, M. (2016). Co-occurring depression and alcohol misuse is under-identified in general practice: A cross-sectional study. *Journal of Health Psychology*. Advance online publication. doi:1359105316643855

Høiseth, G., Kristiansen, K. M., Kvande, K., Tanum, L., Lorentzen, B., & Refsum, H. (2013). Benzodiazepines in geriatric psychiatry: What doctors report and what patients actually use. *Drugs and Ageing*, *30*(2), 113–118.

Horvath, A. O. (2006). The alliance in context: Accomplishments, challenges, and future directions. *Psychotherapy: Theory, Research and Practice*, *43*(3), 258–265.

Johannessen, A., Engedal, K., & Helvik, A.-S. (2014). Use and misuse of alcohol and psychotropic drugs among older people: Is that an issue when services are planned for and implemented? *Scandinavian Journal of Caring Sciences*, *29*(2), 325–32.

Johannessen, A., Helvik, A.-S., Engedal, K., Ulstein, I., & Sørlie, V. (2015). Prescribers' of psychotropic drugs experiences and reflections on use and misuse of alcohol and psychotropic drugs among older people: A qualitative study. *Quality in Primary Care*, *23*(3), 134–140.

Kann, I. C., Lundquist, C., & Lurås, H. (2014). Prescription of addictive and non-addictive drugs to home-dwelling elderly. *Drugs and Aging*, 31(6), 453–459.

Kuzma, E., Llewellyn, D. J., Langa, K. M., Wallace, R. B., & Lang, I. A. (2014). History of alcohol use disorders and risk of severe cognitive impairment: A 19-year prospective cohort study. *American Journal of Geriatric Psychiatry*, 22(10), 1047–1054.

Langballe, E. M., Ask, H., Holmen, J., Stordal, E., Saltvedt, I., Selbæk, G., . . . Tambs, K. (2015). Alcohol consumption and risk of dementia up to 27 years later in a large, population-based sample: The HUNT study, Norway. *European Journal of Epidemiology*, 30(9), 1049–1056.

Lid, T. G., & Malterud, K. (2012). General practitioners' strategies to identify alcohol problems: A focus group study. *Scandinavian Journal of Primary Health Care*, 30, 64–69.

Lid, T. G., Nesvåg, S., & Meland, E. (2015). When general practitioners talk about alcohol: Exploring facilitating and hampering factors for pragmatic finding. *Scandinavian Journal of Public Health*, 43(2), 153–158.

Lid, T. G., Oppedal, K., Pedersen, B., & Malterud, K. (2012). Alcohol-related hospitals admissions: Missed opportunities for follow up? A focus group study about general practitioners' experiences. *Scandinavian Journal of Public Health*, 40, 531–536.

Lunde, L. H. (2015). Alkoholvaner og problematisk alkoholbruk blant eldre – Kunnskapsstatus [Alcohol habits and problematic alcohol use among older people]. In S. Nesvåg (Ed.), *Eldres rusmiddelbruk [Older people's substance misuse]* (pp. 10–31). Stavanger, Norway: KORFOR, University Hospital.

Midtflå, J. M. (2007). *Bruk av anxiolytika og hypnotika til eldre [Use of anxiolytics and hypnotics among the elderly]*. Tromsø, Norway: University of Tromsø.

Montgomery, S. A., & Aasberg, M. (1979). A new depression scale designed to be sensitive to change. *The British Journal of Psychiatry: The Journal of Mental Science*, 134(4), 382–389.

Moos, R. H., Brennan, P. L., Schutte, K. K., & Moos, B. S. (2004). High-risk alcohol consumption and late-life alcohol use problems. *American Journal of Public Health*, 94(11), 1985–1991.

Moy, I., Crome, P., Crome, I., & Fisher, M. (2011). Systematic and narrative review of treatment for older people with substance problems. *European Geriatric Medicine*, 2(4), 199–262.

O'Connell, H., Chin, A.-V., Cunningham, C., & Lawlor, B. (2003). Alcohol use disorders in elderly people: Redefining an age old problem in old age. *British Medical Journal*, 327(7416), 664–667.

Pachana, N. A., Byrne, G. J., Siddle, H., Koloski, N., Harley, E., & Arnold, E. (2007). Development and validation of the Geriatric Anxiety Inventory. *International Psychogeriatrics*, 19(1), 103–114.

Ramchandani, V. A., Slattum, P. W., Patkar, A. A., Wu, L.-T., Lee, J. C., . . . Li, T. K. (2015). Psychopharmacology and the consequences of alcohol and drug interaction. In I. Crome, P. Crome, A. Ramakrishnan, & S. Iliffe (Eds.), *Substance use and older people* (pp. 149–170). Oxford, UK: Wiley & Sons.

Rao, T., Crome, I., Crome, P., Ramakrishnan, A., & Iliffe, S. (2015). *Substance use and older people*. Oxford, UK: Wiley & Sons.

ROP-Guidelines. (2012). *Nasjonale faglige retningslinjer for utredning og oppfølging av personer med samtidig ruslidelser og psykiske lidelser [National guidelines for treatment of substance misuse and psychiatric disorders]*. Oslo, Norway: Helsedirektoratet, IS-1948.

Rosen, D., Engel, R. J., Hunsaker, A. E., Engel, Y., & Reynolds, C. F. (2013). Just say know: An examination of substance use disorders among older adults in gerontological and substance abuse journals. *Social Work in Public Health*, 28(3–4), 377–387.

Sandvik, T. (2014). *Pragmatic case finding som metode for identifisering av alkoholmisbruk hos sykehuspasienter: "Jeg følte det var noe som ikke stemte" [Pragmatic case finding as a method to identify alcohol misuse among hospital patients: "I felt that it was something that was not right"]*. University of Stavanger, Norway.

Satre, D. D. (2015). Alcohol and drug use problems among older adults. *Clinical Psychology: Science and Practice*, *22*(3), 238–254.

Schonfeld, L., Bellinda, L., King-Kallimanis, M. S., Darran, M., Duchene, M. S. W., Etheridge, R. L., ... Lynn, N. (2010). Assessment and brief intervention for substance misuse among older adults: The Florida project. *American Journal of Public Health*, *100*(1), 108–114.

Simoni-Wastila, L., & Huiwen, K. Y. (2006). Psychoactive drug abuse in older adults. *American Journal of Geriatric Pharmacotherapy*, *4*(4), 380–394.

SPSS (version 22.0) [computer software]. (2013). IBM SPSS Statistics for Windows, Version 22.0. Chicago, IL: IBM Corp.

Støver, M., Bratberg, G., Nordfjærn, T., & Krokstad, S. (2012). *Bruk av alkohol og medikamenter blant eldre (60+) i Norge: Helseundersøkelsen i Nord-Trøndelag [Use of alcohol and medication among elderly (60+) in Norway: Faculty of Medicine, Department of Public Health and General Practice]*. Trondheim, Norway: Institutt for samfunnsmedisin, Det medisinske fakultet.

Strobel, C., & Engedal, K. (2008). *MMSE-NR: The standardized Norwegian MMSE*. Oslo, Norway:

Norwegian National Advisory Unit on Ageing and Health.

The American Geriatric Society. (2003). *Clinical guidelines for alcohol use disorders in older adults*. Retrieved from http://www.americangeriatrics.org/products/positionpapers/alcohol.shtml

Voluse, A. C., Gioia, C. J., Sobell, L. C., Dum, M., Sobell, M. B., & Simco, E. R. (2012). Psychometric properties of the Drug Use Disorders Identification Test (DUDIT) with substance abusers in outpatient and residential treatment. *Addictive Behaviors*, *37*(1), 36–41.

World Health Organization. (2004). *The global burden of disease*. Retrieved from http://www.who.int/healthinfo/global_burden_disease/GBD_report_2004update_full.pdf

WCCfDSM. (2015). *ATC/DDD index*. Oslo, Norway: WHO Collaborating Centre for Drug Statistics Methodology.

World Medical Association. (2013). *WMA Declaration of Helsinki: Ethical principles for medical research involving human subjects*. Ferney-Voltaire, France: World Medical Association. Retrieved from http://www.wma.net/en/30publications/10policies/b3/index.html