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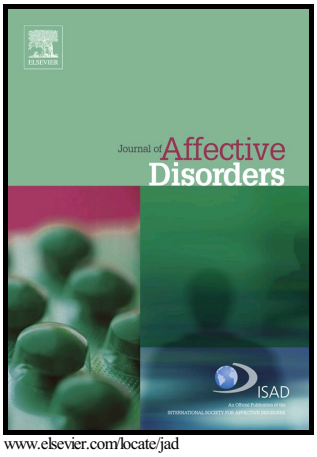

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Monitoring of alcohol consumption in primary care among adults with bipolar disorder: a cross-sectional and retrospective cohort study

Sarah L Hardoon[1], Zarnie Khadjesari[1,2], Irwin Nazareth[1], Fiona L Hamilton[1], Irene Petersen[1]

1. Research Department of Primary Care & Population Health, UCL, London, UK
2. Institute of Psychiatry, Psychology and Neuroscience, King's College London, London, UK

Corresponding author contact information:

Dr Sarah L Hardoon

Research Department of Primary Care & Population Health

UCL Medical School

Royal Free Hospital

Rowland Hill St

London NW3 2PF

Tel: 020 7794 0500 ext. 36768

Fax: 020 7794 1224

Email: s.hardoon@ucl.ac.uk

Abstract (250 words max; count: 250)

Background

Screening for alcohol use disorders is an important priority in the healthcare of people with bipolar disorder, incentivised in UK primary care since 2011, through the Quality and Outcomes Framework (QOF). The extent of alcohol monitoring in primary care, and impact of QOF, is unknown. The aim was to examine recording of alcohol consumption in primary care.

Methods

Poisson regression of biennial alcohol recording rates between 2000 and 2013 among 14,051 adults with bipolar disorder and 90,023 adults without severe mental illness (SMI), from 484 general practices contributing to The Health Improvement Network UK-wide primary care database.

Results

Alcohol recording rates among people with bipolar disorder increased from 88.6 records per 1000 person-years (95% confidence interval 81.2 to 96.6) in 2000/2002 to 837.4 records per 1000 person-years (817.4 to 858.0) in 2011/2013; a more than nine-fold increase, mainly occurring after the introduction of the QOF incentive in 2011. In 2000/2002 alcohol recording levels among people with bipolar disorder were not statistically significantly different from those without SMI (adjusted rate ratio 0.96, 0.88 to 1.05). By 2011/2013, people with bipolar disorder were over four times as likely to have an alcohol record: adjusted rate ratio 4.45 (4.15 to 4.77).

Limitations

The routinely collected data may be incomplete. Alcohol data entered as free-text was not captured.

Conclusions

The marked rise in alcohol consumption recording highlights what can be achieved. It is most likely attributable to QOF, suggesting that QOF, or similar schemes, can be powerful tools in promoting aspects of healthcare.

Keywords

Bipolar disorder; Alcohol; Screening; Primary care; QOF

Short communication (limit 2000 words; word count 2000)

1. Introduction

Individuals with bipolar disorder have a lifetime risk of more than one in three of developing an alcohol use disorder (AUD)(Di Florio et al., 2014). Among people with bipolar disorder, comorbid AUD is associated with poorer prognosis including increased suicide risk(Cardoso et al., 2008;Carra et al., 2014), increased severity and frequency of manic and depressive episodes(Cardoso et al., 2008;Salloum et al., 2001;Salloum et al., 2002), and poorer adherence and response to treatments(Leclerc et al., 2013). Screening for, and management of, AUDs is therefore an important priority in the healthcare of people with bipolar disorder. In April 2011, financial incentives were introduced in the UK primary care setting to encourage general practitioners (GPs) to screen for alcohol consumption in people with severe mental illness (SMI), including bipolar disorder, within the Quality and Outcomes Framework (QOF) scheme(British Medical Association, 2014). QOF, introduced in April 2004, is the principal Payment for Performance scheme in the UK, designed to incentivise good practice in primary care by providing financial reward for achieving targets in monitoring and care of patients for different medical conditions.

There are no national studies examining alcohol screening in primary care among people with bipolar disorder and the impact of the national QOF on alcohol screening rates is unknown. The aims of this study were therefore to i) examine demographic patterns in alcohol consumption recording since the introduction of the QOF incentive for alcohol screening in SMI in April 2011 in a large, national sample of people with bipolar disorder in primary care, and ii) to compare alcohol recording levels in this sample with the levels of recording in people without SMI over time.

2. Methods

2.1 Study design

Cross-sectional and retrospective cohort study

2.2 Data source

Data came from The Health Improvement Network (THIN) primary care database(Blak et al., 2011) which comprises longitudinal electronic patient records retrieved from over 500 general practices

across the UK (approximately 6% of the UK population). Diagnoses, symptoms and other relevant health information are principally entered into the THIN database in coded form, using the Read Code clinical classification system, described in Supplemental Table s1 (Chisholm, 1990). THIN includes the Townsend deprivation index, which is a composite measure of social deprivation(Townsend et al., 1988). Two established data quality control measures ensure data quality and completeness (Horsfall et al., 2013;Maguire et al., 2009).

2.3 Study population

The study population comprised men and women aged 18-99 years with a prior Read code in their primary care records indicative of a bipolar disorder diagnosis (Supplemental Table s1). A separate comparison cohort of people without SMI was formed, matched to the bipolar disorder study population on practice, gender, and age at baseline. Each individual with bipolar disorder was matched with up to six people without SMI.

2.4 Setting and Quality and Outcomes Framework context

The setting was UK general practice, over the period 1 April 2000 to 31 March 2013, which includes time periods before and after the introduction of, and subsequent amendments to, the QOF scheme for SMI(British Medical Association, 2014). SMI has been included in QOF since 2004. Initially, the QOF for SMI rules comprised keeping a register of people with SMI and offering them an annual review. In April 2006, general lifestyle screening was incorporated. In April 2011 alcohol screening was added, whereby general practices are offered up to 4 QOF points (£133.76 per point in 2012/2013) for recording of alcohol consumption for people with SMI during the preceding 15 months.

2.5 Principal outcome: Alcohol consumption recording

Three different means of recording of alcohol consumption in THIN were considered:

1. Read Codes indicative of level of alcohol consumption (Supplemental Table s2)
2. Read Codes indicative of use of a validated alcohol screening test (Supplemental Table s3)
3. Continuous measure of drinking (e.g. units per week)

2.6 Socio-demographic characteristics

Patterns in alcohol recording by the following characteristics were investigated: gender, age, registration status (newly registered with the GP in the last year versus registered for over one year), Townsend deprivation quintile, and UK region (former Strategic Health Authority for England, and country for Wales, Scotland and Northern Ireland).

2.7 Statistical Analysis

To address the first aim, (cross-sectional study to examine socio-demographic variations in recording since the addition of alcohol screening to the QOF for SMI in 2011) the study population was restricted to those individuals with bipolar disorder with complete follow up during the period 1 April 2011 to 31 March 2013. The relative risk of having an alcohol record, by 10-year age group, deprivation quintile, UK region, and registration status was estimated from multivariable Poisson regression, stratifying by gender, and adjusting for the other demographic characteristics, with robust standard errors to account for clustering of individuals within general practices.

To address the second aim (cohort study to compare time-trends in alcohol recording among people with and without bipolar disorder), the full study sample of people both with and without bipolar disorder was used. Rates of recording of alcohol consumption (any record type) per 1000 person-years were computed among those with and without bipolar disorder during two-year periods between April 2000 and March 2013 (reflecting QOF reporting periods). Rate ratios of alcohol recording comparing individuals with bipolar disorder against individuals without SMI were estimated using Poisson regression, adjusting for age, gender, deprivation, and UK region, with robust standard errors to take into account clustering within practices. An interaction between bipolar disorder status (yes or no) and time period was included to assess whether differences in recording among individuals with and without SMI have changed over time.

3. Results

3.1 Alcohol recording levels among adults with bipolar disorder in 2011-2013

Among 6,768 individuals from 409 general practices, 5,663 (84%) individuals had a relevant alcohol consumption record during the two-year period. 80 practices (19.6%) had 100% recording levels.

Supplemental Figure s1 illustrates the types of alcohol data recorded among these 5,663 individuals. 243 (4.3%) had a Read code for an alcohol screen (with or without additional alcohol data). 2,893 (51.4%) individuals had a record of the units of alcohol consumed. Of the 3,787 records comprising Read codes for alcohol consumption, 3,750 (99%) were codes listed as eligible for recompense in the QOF for SMI (Supplemental Table s2). Alcohol recording levels were higher in women (85.1%), compared with men (81.6%) and were lowest in the youngest and oldest age groups (Table 1 and Supplemental Table s4). There were no statistically significant differences in recording levels by deprivation, registration status, or UK region.

3.2 Time trend in alcohol recording, comparing adults with and without bipolar disorder

In total, 14,051 individuals with bipolar disorder and 90,023 individuals without SMI from 484 practices were included in this time-trend analysis. Demographic characteristics are presented in Supplemental Table s5. Rates of alcohol recording increased rapidly over time among individuals with bipolar disorder with an average annual increase in recording rate of 20% (95% CI 19% to 21%), and a more than 9-fold increase over the 13 year period April 2000-March 2013 (Table 2 and Supplemental Table s6). Recording rates rose particularly rapidly between the periods April 2009-March 2011 and April 2011-March 2013, that is, following the addition of alcohol screening to the QOF for SMI in April 2011 (Supplemental Figure s2). There was a comparatively modest average annual increase in recording rates of 4% (95% CI 3% to 4%) among those without SMI, corresponding to a total increase of 57%. As such, rates of alcohol recording among individuals with and without bipolar disorder were similar in the earliest period April 2000-March 2002, (adjusted rate ratio of 0.96 (95% CI 0.88 to 1.05), p=0.4), but by April 2011-March 2013, people with bipolar disorder were more than four times as likely to have an alcohol record than those without SMI; adjusted rate ratio 4.45 (95% CI 4.15 to 4.77), p<0.001.

4. Discussion

There has been a nine-fold increase in recording of alcohol consumption in primary care among people with bipolar disorder between 2000 and 2013, compared with a modest 57% increase among people without SMI. Correspondingly, in 2011-2013, over 80% of individuals with bipolar disorder had

their current alcohol levels recorded in primary care, with one fifth of general practices attaining 100% recording levels.

The alcohol recording rate among people with bipolar disorder began to diverge from that among people without SMI after the introduction of the QOF for SMI in 2004. The rise in recording of alcohol consumption among people with bipolar disorder was particularly marked following the addition of alcohol screening to the QOF for SMI in 2011, offering general practices remuneration for recording of alcohol consumption in people with SMI(British Medical Association, 2014). While the concurrence of this rise in recording with the modification of QOF to include alcohol screening does not prove that the rise is a result of QOF, the absence of alternative likely influences, along with the observed relative stability of alcohol recording rates in people without SMI, supports that the QOF for SMI has played an important role.

4.1 Comparison with other studies

A previous study examined the impact of a local version of the QOF in a single London borough(Hamilton et al., 2014). This local QOF rewarded general practices for alcohol screening and brief intervention in people with cardiovascular disease (CVD) or SMI, between 2008 and 2011 (that is, prior to the introduction of alcohol screening to the national QOF for SMI in 2011). In line with the present study findings, a marked increase in screening rates was observed in the 30 participating practices following the introduction of this local QOF (from 4.8% to 65.7% in the combined population of people with CVD or SMI). However, even while the local QOF was in effect, alcohol screening rates among people with SMI remained considerably lower (49%) than in the present study population. The lower recording rate could reflect that the national QOF is a greater incentiviser than the local scheme.

4.2 Strengths and limitations

Diagnoses of SMI in primary care records have been previously validated(Nazareth et al., 1993), and the THIN SMI population has been shown to be representative of the UK SMI population(Hardoon et al., 2013). A limitation of the study is the use of routine data, not collected specifically for research purposes, which may therefore be subject to errors and omissions. However, established data quality

control measures (Horsfall et al., 2013;Maguire et al., 2009) were used to ensure good data quality. Three different means of recording of alcohol in the patient records were considered (Read codes for screening tests, Read codes for alcohol level, and inputted units of alcohol consumed). Alcohol data may also be entered into a patient's records as free text, which is not captured in this study, and which therefore could have led to underestimation of alcohol recording rates, particularly among those without bipolar disorder, among whom use of Read codes is not incentivised. However, given the relative ease of recording of units of alcohol or Read codes in a patient's records, compared with free text, the sole use of free text is likely to be limited.

4.3 Implications

The current high alcohol recording rates in people with bipolar disorder is very encouraging, especially given evidence that assessment of alcohol use alone (without subsequent intervention) can lead to reductions in hazardous drinking(Kypri et al., 2007;McCambridge and Day, 2008;McCambridge and Kypri, 2011). Nevertheless screening is just a first step in the management of AUDs in people with bipolar disorder. To fully address the high prevalence of AUDs in this population, appropriate effective interventions need to be delivered, where indicated by the screening. Further research is needed to determine the extent to which alcohol interventions are implemented in people with bipolar disorder.

The results suggest that QOF can be a powerful tool in boosting monitoring of alcohol use among people with bipolar disorder in the primary care setting. Such schemes may further provide an opportunity to encourage other relevant screening, treatment or interventions for people with bipolar disorder, and present an exciting prospect for promoting the healthcare of people with bipolar disorder, which merits further investigation.

Ethical approval

The scheme for THIN to obtain and provide anonymous patient data to researchers was approved by the National Health Service South-East Multicentre Research Ethics Committee in 2002, and scientific approval for this study was obtained from CSD Medical Research's Scientific Review Committee in January 2015.

Contributors

IP, IN and ZK conceived the study. ZK prepared the protocol and all authors contributed to the study design and edited the protocol. SLH extracted and cleaned the data, undertook the statistical analysis and wrote the first draft of the manuscript. All authors contributed to, and have approved, the final manuscript

Role of the funding source

This research was carried out independently of the funders. The views expressed are those of the authors and not necessarily those of the funders.

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Conflict of interest

None

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Tables and Figures

Table 1: Proportions of men and women with bipolar disorder who have an alcohol record during the period April 2011- March 2013 and relative risk of recording of alcohol by demographic group

	Men			Women		
	Records/N (%)	RR (95% CI)*	p	Records/N (%)	RR (95% CI)*	p
All	2185/2679 (81.6)			3478/4089 (85.1)		
Age, years						
18-29	150/203 (73.9)	0.91 (0.82 to 1.00)		217/275 (78.9)	0.94 (0.87 to 1.00)	
30-39	294/399 (73.7)	0.90 (0.84 to 0.97)		515/618 (83.3)	0.99 (0.95 to 1.04)	
40-49	566/693 (81.7)	1		818/974 (84.0)	1	
50-59	484/588 (82.3)	1.01 (0.96 to 1.06)		772/877 (88.0)	1.05 (1.01 to 1.09)	
60-69	416/485 (85.8)	1.06 (1.01 to 1.11)		647/733 (88.3)	1.05 (1.01 to 1.09)	
70-79	216/243 (88.9)	1.09 (1.03 to 1.16)		372/435 (85.5)	1.02 (0.97 to 1.07)	
80-89	55/63 (87.3)	1.08 (0.98 to 1.18)		130/161 (80.7)	0.97 (0.89 to 1.05)	
90-99	4/5 (80.0)	0.99 (0.63 to 1.55)		7/16 (43.8)	0.52 (0.30 to 0.92)	
			<0.001			<0.001
Deprivation quintile						
1 (Least deprived)	399/493 (80.9)	0.98 (0.92 to 1.03)		642/780 (82.3)	0.95 (0.91 to 1.00)	
2	406/510 (79.6)	0.96 (0.91 to 1.03)		665/780 (85.3)	0.99 (0.95 to 1.04)	
3	465/568 (81.9)	1.00 (0.94 to 1.06)		740/868 (85.3)	1.00 (0.96 to 1.04)	
4	492/590 (83.4)	1.02 (0.97 to 1.08)		805/929 (86.7)	1.01 (0.97 to 1.05)	
5 (Most deprived)	423/518 (81.7)	1		626/732 (85.5)	1	
			0.4			0.1
UK Region						
London	249/301 (82.7)	1		334/391 (85.4)	1	
East Midlands	33/41 (80.5)	0.96 (0.78 to 1.18)		37/48 (77.1)	0.92 (0.72 to 1.18)	
East of England	143/173 (82.7)	1.01 (0.92 to 1.10)		220/256 (85.9)	1.01 (0.94 to 1.08)	
West Midlands	189/227 (83.3)	1.01 (0.92 to 1.11)		296/333 (88.9)	1.05 (0.98 to 1.12)	
North East	62/69 (89.9)	1.08 (0.95 to 1.23)		91/107 (85.0)	0.99 (0.90 to 1.10)	
North West	251/309 (81.2)	0.98 (0.91 to 1.06)		395/463 (85.3)	1.00 (0.94 to 1.07)	
Yorks & Humber	28/41 (68.3)	0.82 (0.65 to 1.03)		38/44 (86.4)	1.01 (0.87 to 1.18)	
N Ireland	92/108 (85.2)	1.03 (0.93 to 1.14)		151/172 (87.8)	1.03 (0.96 to 1.11)	
Scotland	335/407 (82.3)	0.99 (0.92 to 1.07)		557/656 (84.9)	0.99 (0.93 to 1.06)	
South Central	289/352 (82.1)	1.00 (0.92 to 1.08)		494/572 (86.4)	1.02 (0.96 to 1.09)	
South East Coast	211/262 (80.5)	0.97 (0.88 to 1.07)		352/424 (83.0)	0.98 (0.91 to 1.05)	
South West	176/220 (80.0)	0.97 (0.89 to 1.06)		297/360 (82.5)	0.97 (0.90 to 1.05)	
Wales	127/169 (75.1)	0.92 (0.82 to 1.02)		216/263 (82.1)	0.96 (0.88 to 1.05)	
			0.6			0.6
Registration status						
Not newly registered	2048/2502 (81.9)	1		3276/3843 (85.2)	1	

Newly registered	137/177 (77.4)	0.97 (0.90 to 1.05)	0.5	202/246 (82.1)	0.98 (0.92 to 1.04)	0.4

*RR = Relative risk, estimated from Poisson regression, adjusting for the other factors considered and accounting for clustering of people within general practices. Unadjusted relative risks are presented in the Supplemental Table s4 for comparison.

Table 2: Rates of recording of alcohol consumption among people with and without bipolar disorder, and corresponding rate ratios, according to time period

	People with bipolar disorder				People without severe mental illness					
Time period *	N	Total person years	No. with alcohol record	Rate of alcohol recording per 1000 person-years (95% CI)	N	Total person years	No. with alcohol record	Rate of alcohol recording per 1000 person-years (95% CI)	Adjusted rate ratio# (95% CI)	p
Apr 00 - Mar 02 (before SMI QOF)	3,377	5,759	510	88.6 (81.2 to 96.6)	20,262	34,891	3,186	91.3 (88.2 to 94.5)	0.96 (0.88 to 1.05)	0.4
Apr 02 - Mar 04 (before SMI QOF)	4,713	7,604	1,280	168.3 (159.4 to 177.8)	29,185	47,990	7,290	151.9 (148.5 to 155.4)	1.09 (1.04 to 1.16)	0.001
Apr 04 - Mar 06 (SMI QOF in effect)	6,172	8,890	2,175	244.7 (234.6 to 255.2)	39,182	61,735	10,720	173.6 (170.4 to 177.0)	1.39 (1.31 to 1.47)	<0.001
Apr 07 - Mar 09 (lifestyle screening added in SMI QOF)	7,589	10,578	3,253	307.5 (297.2 to 318.3)	51,623	82,931	13,292	160.3 (157.6 to 163.0)	1.89 (1.77 to 2.01)	<0.001
Apr 09 - Mar 11 (lifestyle screening added in SMI QOF)	8,356	10,567	4,100	388.0 (376.3 to 400.1)	59,205	91,434	15,806	172.9 (170.2 to 175.6)	2.22 (2.09 to 2.36)	<0.001
Apr 11 - Mar 13 (alcohol screening added in SMI QOF)	8,754	7,800	6,532	837.4 (817.4 to 858.0)	63,930	97,599	18,204	186.5 (183.8 to 189.2)	4.45 (4.15 to 4.77)	<0.001

*Time periods chosen to reflect the reporting periods for, and updates to, the Quality and Outcomes Framework (QOF) Pay for Performance scheme for severe mental illness (SMI)
#Adjusted rate ratio comparing people with bipolar disorder to people without severe mental illness, from Poisson regression adjusting for age, gender, deprivation, and UK region and accounting for clustering of people in general practices. Unadjusted rate ratios are presented in the Supplemental Table s6 for comparison.

Highlights

3 to 5 bullet points (maximum 85 characters, including spaces, per bullet point).

- Alcohol monitoring in people with bipolar disorder in UK primary care was examined
- Alcohol recording rates rose more than nine-fold between 2000 and 2013

- In 2011-13 over 80% of people with bipolar disorder had their alcohol level checked
- By 2011-13 recording was four times higher than in people without bipolar disorder
- The favourable trend coincides with the launch of incentives for alcohol screening