Patient self-report versus medical records for smoking status and alcohol consumption at Aboriginal Community Controlled Health Services

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Aboriginal and Torres Strait Islander Australians experience significantly poorer health outcomes and lower life expectancy than non-Indigenous Australians. Much of the disease burden for Aboriginal and Torres Strait Islander people is due to non-communicable or chronic disease. Health behaviours such as smoking and alcohol use are among the leading preventable risk factors that contribute to this health gap.[1] For example, despite substantial declines over the past five years, smoking rates and rates of risky alcohol consumption (consuming 11 or more standard drinks on one occasion, at least once per month) in 2018–2019 remain significantly higher among Aboriginal and Torres Strait Islander people, compared to the non-Indigenous Australian population.[2] The history of colonisation and dispossession of Aboriginal and Torres Strait Islander Australians, and ongoing experiences of trauma and racism, continue to influence health behaviours such as smoking and high alcohol consumption.[2]

Primary care can play a key role in the prevention or modification of health risk factors,[3] and many Aboriginal and Torres Strait Islander people receive their primary care through Aboriginal Community Controlled

Abstract

Objective: This study assessed the level of agreement, and predictors of agreement, between patient self-report and medical records for smoking status and alcohol consumption among patients attending one of four Aboriginal Community Controlled Health Service (ACCHSs).

Methods: A convenience sample of 110 ACCHS patients self-reported whether they were current smokers or currently consumed alcohol. ACCHS staff completed a medical record audit for corresponding items for each patient. The level of agreement was evaluated using the kappa statistic. Factors associated with levels of agreement were explored using logistic regression.

Results: The level of agreement between self-report and medical records was strong for smoking status (kappa=0.85; 95%CI: 0.75-0.96) and moderate for alcohol consumption (kappa=0.74; 95%CI: 0.60-0.88). None of the variables explored were significantly associated with levels of agreement for smoking status or alcohol consumption.

Conclusions: Medical records showed good agreement with patient self-report for smoking and alcohol status and are a reliable means of identifying potentially at-risk ACCHS patients.

Implications for public health: ACCHS medical records are accurate for identifying smoking and alcohol risk factors for their patients. However, strategies to increase documentation and reduce missing data in the medical records are needed.

Key words: Aboriginal, Indigenous, smoking status, alcohol consumption, agreement, self-report, medical record, preventive care

Health Services (ACCHSs).[4] The World Health Organization's Framework Convention on Tobacco Control notes concern about high levels of smoking among Indigenous peoples worldwide and recommends the promotion of smoking cessation based on best practice evidence.[5] There is good evidence that General Practitioner (GP) provision of brief simple advice about quitting is effective in increasing cessation rates.[6] Similarly, there is moderate-quality evidence supporting brief intervention for reducing alcohol

consumption, particularly among hazardous and harmful drinkers.[7] The '5As' (Ask, Assess, Advise, Assist, Arrange) is a framework used in brief intervention and is recommended for use by Australian GPs in the provision of preventive care for risk factors including smoking and alcohol.[8] The first step in the 5As framework, 'Ask', aims to identify patients with these risk factors.[8] Current guidelines recommend that Aboriginal and Torres Strait Islander people are screened at least annually for smoking and alcohol use, and that Aboriginal health services establish a system for documenting and routinely updating the smoking status of all patients.[9]

The documentation of risk factors in a patient's medical record is important for patient care, as such documentation can alert healthcare providers to a patient's risk status and prompt the delivery of brief intervention or other preventive care,[10,11] and can also support comprehensive patient care over time.[12] However, several studies in the ACCHS setting suggest that the recording of risk factors in medical records may be poor or inconsistent.[13-15] For example, across three studies conducted in ACCHSs, fewer than half of patients had their Body Mass Index documented in the medical record, between 47% and 82% had their smoking status recorded, and just over half of patients (57%) had documentation of alcohol use.[13-15] In addition, Bailie et al. 2011 reported that only 28% of patients were documented as current smokers – a rate substantially lower than known smoking rates in the communities served by participating health services.[13] If medical records are to be of value in identifying at-risk patients, they need to provide accurate and up-to-date information about a patient's risk status. This study aimed to examine the level of agreement between patient self-report and medical records for smoking status (current or non-smoker) and alcohol consumption (yes/no), and any predictors of agreement, among a sample of patients attending one of four ACCHSs.

Methods

Study design and setting

Data were collected as part of a larger 'Chronic Care Service Enhancement Project', involving a collaboration between seven ACCHSs from across NSW, the Centre for Aboriginal Health (NSW Ministry of Health), and the University of Newcastle. The ACCHSs played a key role in developing the larger

project, including deciding on relevant aims and developing appropriate strategies to achieve their aims. Details regarding the study design and setting have been published previously.[16]

Briefly, one component of the project examined the quality of the medical record data being collected by ACCHSs. This component was designed to inform and improve data collection for assessing the outcomes of the larger project. Four ACCHSs agreed to take part in the data quality assessment, which involved comparing data on matching clinical items collected from different sources, including patient self-report and clinic medical records. Data were collected on patients' current smoking and alcohol consumption status. Only the results of the data quality assessment component of the larger study are reported here.

The four ACCHSs used either Medical Director or Communicare clinical software packages and were located in: major cities, inner regional areas and remote areas of NSW.[17] Data were collected in 2013–2014. Ethics approval for this study was obtained from the Aboriginal Health & Medical Research Council (AH&MRC) Ethics Committee (approval number 863/12) and the University of Newcastle (UoN) Human Research Ethics Committee (H-2012-0100).

Participants and procedure

Participating ACCHSs were asked to collect data about matching clinical items from consenting patients and the patient's medical record, including the patient's smoking status (current, ex, or never) and alcohol consumption (yes/no). At the time that this study was conducted, ACCHSs were required to record patients' 'drinking status' (as part of national key performance indicators), but criteria to classify safe vs. harmful alcohol consumption were not defined.[18] Staff at participating ACCHSs (including reception and Health Workers) invited a convenience sample of approximately 30 adult patients per site to complete a touchscreen computer survey after their appointment with a GP. The survey was completed after the appointment to ensure that any changes in smoking status or alcohol consumption detected since the previous appointment could be updated in the medical record. Written informed consent for survey completion, and to conduct an audit of the patient's medical record, was sought from all participants. The survey asked patients to self-report their current

smoking status and alcohol consumption. A staff member undertook a manual search of consenting patients' medical records (starting from when the patient first attended the service) and noted the patient's smoking and alcohol status as recorded in their medical record, as part of a larger dataset. De-identified data were provided by each site to the research team.

Derived variables

Self-reported smoking status response options were recoded to classify respondents as either current smokers (response options: "I smoke daily" or "I smoke occasionally") or non-smokers (response options: "I don't smoke now but I used to", "I have tried it, but have never smoked regularly", and "I have never smoked"). Medical record audit responses were also categorised as either current smokers, non-smokers (including 'ex-smoker' and 'never smoker'), or not recorded (including missing data). Self-reported alcohol responses were reclassified to indicate whether the patient currently consumed any alcohol (response option: "Yes, I drink alcohol") or not (response options: "No, I don't drink alcohol" or "I don't drink now, but I used to"). Medical record audit responses were categorised as either current or no alcohol consumption, or not recorded (including missing data).

Analysis

The level of agreement between self-report and medical records was evaluated as concordance, defined as the percentage of cases in which self-reported status matched the response from the medical record,[19] and using the kappa statistic after removal of missing values. A sample size of 100 allowed the outcomes to be assessed with ~10% level of precision, assuming a prevalence rate of 45% for current smoking and 69% for current alcohol consumption,[2] and a 95% level of confidence. Two separate logistic regressions were used to examine predictors of agreement between patient self-report and medical record for smoking status, and for alcohol consumption. Predictors included sex (male or female), age (categorised as <30yrs, 30–59yrs, and 60yrs+), Aboriginal and Torres Strait Islander status (Aboriginal and/or Torres Strait Islander, or non-Indigenous), and study site (1, 2, 3 or 4). All statistical analyses were performed using STATA (StataCorp, 2009, Stata Statistical Software: Release 11, College Station, TX: StataCorp LP).

Results

Sample

A total of 110 participants from across the four sites had self-report survey and medical record audit data on smoking and alcohol available for analysis. As this was a convenience sample, the consent rate was not recorded. The socio-demographic characteristics of the sample are included in Table 1. As shown, just over half of the sample were female (51%) and 95% of the sample identified as Aboriginal, Torres Strait or both Aboriginal and Torres Strait Islander people. The majority of the sample were aged 30–59 years (59%). Based on patient self-report, the prevalence of current smoking was 37%, and the prevalence of current alcohol consumption was 49%. Data were available for two sites (n=52) on the number of times the patient had visited the service for an appointment in the past 12 months. More than 90% of these patients reported having been to the service four or more times in the last year (data not shown).

The level of agreement between patient self-report and medical records

Table 2 presents the raw agreement data for self-reported and medical records on current smoking and current alcohol consumption. As shown, the raw agreement was 82% for smoking and 73% for alcohol. Mismatches between self-reported and medical record status were evident for 6% (n=7) of patients for smoking and 11% (n=12) of patients for alcohol. A substantial proportion of data were missing in the medical record: 12% (n=13) and 16% (n=18) of patients did not have their smoking or alcohol status recorded, respectively. Following the exclusion of missing records, there was strong agreement between self-report and medical records for smoking status (kappa=0.85 [95%CI: 0.75–0.96], p<0.01, n=97) and moderate agreement for alcohol status (kappa=0.74 [95%CI: 0.60-0.88], p<0.01, n=92).

Predictors of agreement between patient self-report and medical records

The results of the logistic regression are presented in Table 3. Aboriginal and Torres Strait Islander status was not able to be included as a variable in the regression analyses because self-reported and medical

Table 1: Demographic characteristics of the sample (n=110).	
Characteristics	**N (%)**
Age	
18−24 years	5 (5%)
25−29 years	7 (6%)
30−34 years	2 (2%)
35−39 years	10 (9%)
40−44 years	15 (14%)
45−49 years	11 (10%)
50−54 years	8 (7%)
55−59 years	19 (17%)
60−64 years	14 (13%)
65−69 years	7 (6%)
More than 70 years	12 (11%)
Sex	
Male	54 (49%)
Female	56 (51%)
Aboriginal and Torres Strait Islander status	
Aboriginal	101 (92%)
Torres Strait Islander	3 (3%)
Both Aboriginal and Torres Strait Islander	1 (1%)
Neither	5 (5%)
Site	
Site 1	31 (28%)
Site 2	30 (27%)
Site 3	21 (19%)
Site 4	28 (26%)
Self-reported current smoker	
Yes	41 (37%)
No	69 (63%)
Self-reported alcohol consumption	
Yes	54 (49%)
No	56 (51%)

record smoking and alcohol status were in agreement for all non-Indigenous participants (n=5). The logistic regression indicated that none of the other variables (sex, age or site) were significant predictors of agreement between self-reported and medical record status for either smoking or alcohol (all p-values >0.05).

Discussion

In this sample of patients attending an ACCHS, the level of agreement between self-reported and medical records was strong for smoking status and moderate for alcohol consumption. There were only a few cases

in which there was disagreement in risk status according to the two data sources. For example, relying on documentation in the medical record would potentially miss four of 41 self-reported current smokers and three of 54 patients reporting current alcohol consumption, and would incorrectly identify three of 69 self-reported non-smokers as current smokers and nine of 56 self-reported non-drinkers as currently consuming alcohol. Results suggest that medical records are accurate and up-to-date and are a reliable way for healthcare providers to identify current smokers and those consuming alcohol – providing a starting point from where additional questions about the level of consumption can be asked.

To our knowledge, no previous studies have explored the level of agreement between self-report and medical records for smoking and alcohol risk factors in the Indigenous healthcare setting. Studies from outside the Aboriginal healthcare setting report similar results, with strong levels of agreement between self-report and medical records for smoking status,[20-22] and moderate levels of agreement for alcohol consumption.[22] One previous study compared patient- and GP-reported risk status among Aboriginal patients attending an ACCHS. Agreement was moderate for smoking (kappa=0.62) and poor for harmful alcohol use (kappa<0).[23] However, these results are not directly comparable, as this study examined harmful consumption rather than any alcohol consumption, and compared self-report to GP awareness of risk status, rather than medical record documentation of the risk factors.

There was a substantial amount of missing data in the medical records on smoking status and alcohol consumption in the current study, highlighting the need for more consistent documentation in the medical record. Gaps in the recording of risk factor status in Indigenous health settings have previously been identified. For example, across four Aboriginal and Torres Strait Islander medical services in Queensland, smoking and alcohol

Table 2: Agreement for current smoking status and alcohol consumption according to self-reported and medical record audit data among ACCHS patients (n=110).							
	Medical record:	**Yes**	**Yes**	**No**	**No**	**NR***	**NR***	
Item	**Self-report:**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Raw agreement**
		N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	
Current smoker		37 (34%)	3 (3%)	4 (4%)	53 (48%)	–	13 (12%)	90 (82%)
Current alcohol consumption		45 (41%)	9 (8%)	3 (3%)	35 (32%)	6 (6%)	12 (11%)	80 (73%)

Note:
* Not recorded/missing from the medical record

risk status was not documented in the medical record for 18% and 43% of patients, respectively,[14] while 29% of patients from eight Aboriginal health services had not had their smoking status recorded in the previous two years.[15] The proportion of missing data in this current study was substantially lower than in these previous studies, with only 12% of patients missing smoking status, and 17% missing alcohol consumption data in the medical record. This may be explained by the convenience nature of our sample, whereby regular patients, with more opportunities for healthcare providers to assess and document their risk status, were possibly more likely to be approached to participate.

Primary care services, including ACCHSs, experience significant challenges in medical record keeping. The quality of medical record documentation is affected by factors such as time pressures on staff, misfiling and illegibility.[20] ACCHSs may face additional challenges to comprehensive risk factor documentation, such as the highly multidisciplinary nature of the staff (including GPs, Aboriginal Health Workers, nurses, etc) required to access and enter patient

data. Conigrave et al. 2021 also noted that engaging in accurate record-keeping places additional pressure on staff who are already providing care to vulnerable people,[24] with many ACCHS clients presenting to primary care with comorbidities and competing health priorities.

In the current study, neither age, sex nor site were significant predictors of agreement between self-report and medical record status. Again, this may be due to the convenience nature of the sample. Non-Indigenous status was associated with 100% agreement for both smoking and alcohol status (although was based on a small sample). Some differences in the delivery of preventive services have previously been reported in the ACCHS setting for Aboriginal and Torres Strait Islander patients compared to non-Indigenous patients, and by age and sex.[13] However, findings related to the delivery of preventive care, and this study did not examine whether documentation of risk factors varied by client age, gender or Indigenous status. Previous studies outside the Aboriginal healthcare setting have reported differences in agreement between self-report and medical records according to age[25,26] and sex[26] for the reporting of disease or comorbidities, while others have found that race, sex and age did not affect agreement rates for reporting of risk factors including smoking.

Strengths and limitations

A key strength of this study was the central engagement of ACCHSs in the study design and involvement of ACCHSs and Aboriginal and Torres Strait Islander staff in recruitment and data collection. This study also has a number of important limitations. Firstly, the sample size was relatively small and based on a convenience sample of participants. These patients may have been more likely to be regular patients who were well known to the service, and therefore possibly had better risk factor documentation in their medical records. Data available from two of the sites (n=54 patients) support this idea, with more than 90% of these patients reporting having been to the service four or more times in the past 12 months. Previous studies have identified that gaps in risk factor recording were more prevalent among younger and less frequent attendees.[15] Secondly, the manual audits of medical records were not subject to any cross-checking or inter-rater reliability measures, and there may have been some

human error in this process. Patient self-report is also subject to sources of error such as social desirability bias and recall error.[20] However, self-report is likely to be reasonably accurate in this case, given patients were asked to identify whether they were current smokers and currently consumed alcohol or not, rather than more complex questions about the number of cigarettes smoked or the frequency and number of drinks they usually consume. Finally, alcohol was recorded as any vs. no current consumption and did not indicate a level of risk associated with alcohol intake. However, as noted above, no standardised criteria to define harmful alcohol consumption were in use across ACCHSs at the time of the survey.[18] In 2017, the Federal Government asked ACCHSs to standardise their alcohol screening using the three-question Alcohol Use Disorders Identification Test- Consumption (AUDIT-C). The AUDIT-C allows for the identification of unhealthy drinking using specified cut-off scores. This change in screening will allow healthcare providers to more readily identify those at risk due to alcohol consumption. Finally, while the prevalence of smoking among our sample was similar to national estimates, the prevalence of those consuming any alcohol was substantially lower than national estimates of approximately 70% of Aboriginal and Torres Strait Islander Australians consuming alcohol in the past 12 months,[2] which may reflect some bias in our sample.

Implications for public health practice

Our data indicate that for patients attending an ACCHS, medical records appear to be reliable for the identification of current smokers and those consuming alcohol. However, our findings suggest that mechanisms are needed to help prompt and support healthcare providers to record such information in the patient's medical record, in order to overcome issues associated with missing data. Such mechanisms might include staff training or automated prompts for practitioners to complete or update fields. There is some evidence that educational and training programs and feedback are effective in improving medical record documentation by healthcare providers.[27] Updating or redesigning record forms can also help to improve documentation.[27,28] Medical records are important for both identifying at-risk

Table 3: Logistic regression results for the level of agreement between self-reported and medical record audit data for ACCHS patient smoking status and alcohol consumption.		
Predictor	**OR (95% CI)**	***p*-value**
Smoking status (n=97)		
Age		
18−34 years	Reference	
35−64 years	0.95 (0.09-10.58)	0.96
65 years and over	0.33 (0.16-6.79)	0.47
Sex		
Male	Reference	
Female	2.70 (0.43-16.57)	0.28
Site		
1	Reference	
2	0.22 (0.02-2.42)	0.22
3	0.58 (0.08-4.21)	0.59
4	0.17 (0.01-1.90)	0.15
Alcohol consumption (n=92)		
Age		
18−34 years	Reference	
35−64 years	0.35 (0007-1.87)	0.22
65 years and over	0.62 (0.10-3.72)	0.60
Sex		
Male	Reference	
Female	0.84 (0.22-3.12)	0.79
Site		
1	Reference	
2	0.51 (0.09-2.94)	0.45
3	0.24 (0.21-2.61)	0.24
4	1.03 (0.19-5.59)	0.97

patients and for service-level reporting and analysis, and it is therefore important for healthcare services to maintain accurate and up-to-date records. The failure to document risk status is also a potential barrier to continuity and coordination of care, especially in services with high staff turnover.[13] However, implementing training or record redesign strategies in ACCHSs would require adequate resourcing and funding support.

Furthermore, although we found moderate to strong levels of agreement between self-reported and medical record smoking status and alcohol consumption, accurate documentation does not necessarily indicate that subsequent steps from the 5As framework will be undertaken by a healthcare provider. Indeed, a recent RCT explored whether providing training and support to ACCHSs could increase rates of alcohol screening using the new AUDIT-C tool. While the RCT improved screening rates, it did not increase the odds of clients receiving brief intervention.[24] Such findings highlight the fact that while screening and documentation of risk factors can act as a prompt for healthcare providers, it does not ensure that preventive care is delivered. Thus, additional strategies will also be needed to help healthcare providers to 'Assess, Advise, Assist, and Arrange support' for those patients identified as at-risk. Electronic medical record systems can be designed to provide an automatic 'red flag' to alert the GP or other healthcare provider to a patient's risk status and provide a range of information, resources or strategies for the healthcare provider and patient. For example, a point-of-care electronic decision support system trialled in Australian primary care (including in ACCHSs) displayed traffic light prompts to alert practitioners to gaps in screening and appropriate management of cardiovascular (CVD) risk factors, as well as training, audit and feedback.[29] The system led to improvements in identification and recording of CVD risk, and an increase in the prescription of new or increased numbers of medications for patients at high risk of CVD.

Conclusions

Medical records showed strong to moderate agreement with patient self-report for smoking status and alcohol consumption, suggesting the medical record is a reasonably reliable means of identifying potentially at-risk patients in the ACCHS setting. ACCHSs

are key to closing the gap for Aboriginal and Torres Strait Islander health, and this study highlights the comprehensive work being done by these organisations in screening and documenting risk factors for their patients. However, strategies such as additional staff training and improved design of record forms are needed to improve recording and updating of smoking status and alcohol consumption in medical records and reduce missing data. In addition, mechanisms to prompt and support ACCHS healthcare providers to act on documented risk status should be explored.

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Availability of data and material

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

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