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Research

Feasibility and outcomes of a general practice and specialist alcohol and other drug collaborative care program in Sydney, Australia

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Abstract. Alcohol and other drug (AoD) use is an important health and community issue and may be positively affected by collaborative care programs between specialist AoD services and general practice. This paper describes the feasibility, model of care and patient outcomes of a pilot general practice and specialist AoD (GP-AoD) collaborative care program, in Sydney, Australia, based on usual care data, the minimum data set, service utilisation information and the Australian Treatment Outcome Profile (ATOP), a patient-reported outcome measure. There were 367 referrals to the collaborative care program. GPs referred 210 patients, whereas the AoD service referred 157 patients. Most GP referrals (91.9%) were for AoD problems, whereas nearly half the AoD service referrals were for other issues. The primary drugs of concern in the GP group were either opioids or non-opioids (mostly alcohol). The AoD service-referred patients were primarily using opioids. An ATOP was completed for 152 patients. At the time of referral, those in the GP-referred non-opioid group were significantly less likely to be abstinent, used their primary drug of concern more days and were more likely to be employed (all $P < 0.001$). A second ATOP was completed for 93 patients. These data showed a significant improvement in the number of days the primary drug of concern was used ($P = 0.026$) and trends towards abstinence, improved quality of life and physical and psychological well-being for patients in the program. There are few studies of GP-AoD collaborative care programs and nothing in the Australian context. This study suggests that GP-AoD collaborative care programs in Australia are feasible and improve drug use.

Keywords: continuity of patient care, delivery of health care: integrated, patient-centred care, primary health care, substance abuse treatment centres.

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Introduction

Almost four in 10 people in Australia use alcohol and other drugs (AoD) in harmful and/or dependent ways (Australian Institute of Health and Welfare (AIHW) 2017); this is associated with significant morbidity and mortality (AIHW 2016). Early interventions with evidence-based AoD treatments improve health outcomes (U.S. Department of Health and Human Services (HHS) 2016).

GPs in Australia see nearly 89% of the community each year (Britt *et al.* 2016) and are well placed to intervene with screening, brief interventions, treatment and/or referral for people experiencing issues with AoD use. AoD use may not be addressed by GPs (Mules *et al.* 2012) due to poor skills, knowledge or lack of specialist AoD support (McKeown *et al.* 2003; McAvoy 2008; Ampt *et al.* 2009). The structure of primary care in Australia makes it difficult for GPs to provide care for patients with AoD issues, particularly those with complex AoD presentations (Berends and Lubman 2013).

Specialist AoD services in Australia employ highly skilled, multidisciplinary staff who are ideally placed to assist patients with complex AoD presentations, but their ability to provide care for comorbid medical issues is limited (Digiusto *et al.* 2013). Collaborative care can support the management of comorbidities in primary care while complex AoD issues are managed in the specialist AoD setting. This may lead to greater engagement in care and improved health outcomes (Setodji *et al.* 2018).

Collaborative care has been successfully used for depression, anxiety, diabetes, asthma and heart failure (Bodenheimer *et al.* 2002; Archer *et al.* 2012). It has been suggested that specialist AoD and general practice collaborative care would support AoD

treatment (Samet *et al.* 2001; Weisner *et al.* 2001), but studies are limited. US studies have shown increased utilisation of treatment services (Setodji *et al.* 2018) and improved abstinence (Samet *et al.* 2003; Watkins *et al.* 2017) following collaborative care. The use of patient-reported health and well-being outcomes is limited in these studies and it is unclear what aspect of the interventions in the heterogeneous studies led to this effectiveness (Pace and Uebelacker 2018).

This study sought to address the paucity of research into collaborative care programs between GPs and AoD services in Australia. Specifically, the aim of this study was to explore the feasibility and outcomes of an AoD specialist service and GP collaborative care program (GP-AoD) in Sydney, Australia.

Methods

This study used a clinical audit to explore patient characteristics, demographics and outcomes using routinely collected data, which included demographic data (minimum data set) at baseline, service utilisation information, referral reason and the Australian Treatment Outcome Profile (ATOP) (Ryan *et al.* 2014), a patient-reported outcome measure, at initial assessment and again at program completion.

The ATOP is a psychometrically validated clinician-administered 21-item instrument that assesses a range of patient-reported outcomes in the preceding 4 weeks. ATOP assesses both continuous items (i.e. days each category of substance was used, days of paid employment and study and patient-reported ratings of physical well-being, psychological well-being and quality of life; each rated on a scale of 0–10, with higher scores denoting better health) and categorical (yes/no) items covering housing, recent violence, arrests and child protection issues (Ryan *et al.* 2014).

Patients were categorised by referral source (GP or AoD service), because these two groups are at different points in their AoD treatment journey and by substance (opioid and non-opioid), because treatment effectiveness for these substances differs (Pace and Uebelacker 2018).

Model of care

The South Eastern Sydney Local Health District Drug and Alcohol Service (SESLHD D&A) provides comprehensive care for people with AoD issues in south-east Sydney. The SESLHD D&A provides inpatient detoxification, in-hospital consultation and liaison, outpatient clinics, medication-assisted treatment of opioid dependence, magistrate early referral into treatment, drug court and chemical use in pregnancy services. The New South Wales Ministry of Health funded the SESLHD D&A to enhance links between the specialist AoD services and local GPs.

The service commenced a pilot GP-AoD collaborative care program in 2012. The program employed experienced AoD nurses; GPs from the local area and staff from the specialist AoD service were encouraged to refer patients to the program. The nurses saw patients both at the AoD service and in local GP practices. The program provided comprehensive AoD assessments, case management, participation in coordinated care planning, brief interventions and assistance with the initiation of and stabilisation on medication for opioid dependence and alcohol and other related pharmacotherapies prescribed by GPs. The program supported priority access for GP referrals into the specialist service. Nurses liaised with GPs to support the transfer of treatment for patients stabilised in treatment and ready to transfer their care to general practice or who needed to access a GP for general care. General information was provided on request for GP or AoD staff. The nurses were supported by other specialist staff from the AoD service, including addiction medicine specialists, GPs, psychiatrists, psychologists and social workers.

Inclusion and exclusion criteria

All patients referred to the SESLHD D&A collaborative care program from January 2012 to September 2015 were included in the study. There were no specific inclusion or exclusion criteria.

Data analysis

Data were analysed using R version 4.0.0 (R: The R Project for Statistical Computing; r-project.org, accessed 23 August 2021). One-way analysis of variance (ANOVA) was used to examine between-group differences in continuous variables. Post hoc analyses of differences between groups used the Tukey test or the Games–Howell where the homogeneous variance assumptions were not met (e.g. days of work, days primary drug used). Group differences in categorical variables were examined using Pearson Chi-squared tests, with between-group post hoc analyses using adjusted standardised residual comparisons.

To assess within-group changes between the initial and most recent ATOP assessment, paired-samples *t*-tests were used for continuous variables that were normally distributed (well-being indicators), whereas Wilcoxon signed-rank tests were used for variables that were not normally distributed (days of work/school, days primary drug of concern used). McNemar's χ^2 was used to assess changes in categorical outcomes.

The significance of differences in several baseline variables (e.g. age, sex, substance use, days of work or study) between participants who had only one ATOP at assessment and those who had an assessment and follow-up ATOP was tested using one-way ANOVA (for continuous variables) and Chi-squared tests of independence (for categorical variables). *P*-values were corrected for multiple comparisons using the Benjamini–Hochberg procedure.

Ethics approval for the study was obtained from the Human Research Ethics Committee of the South Eastern Sydney Local Health District (Approval no. 12/089/LNR/12/POWH/198).

Results

Collaborative care program utilisation

GPs and AoD staff contacted the GP-AoD collaborative care program on 478 occasions. There were 367 patient referrals and 111 GP and AoD staff contacts for general information from January 2012 to September 2015. Of the 367 patient referrals, 210 (57%) were from GPs: 180 from high-AoD-caseload GPs (86%) and 30 from GPs who reported infrequently seeing patients with AoD issues. The program managed 89% of the GP-referred patients entirely in general practice, with only 11% transferred to the AoD setting. The specialist AoD service referred 157 patients to the program, with 98% referred from the opioid treatment program within the specialist AoD service. The program assisted 52% of AoD-referred patients to completely

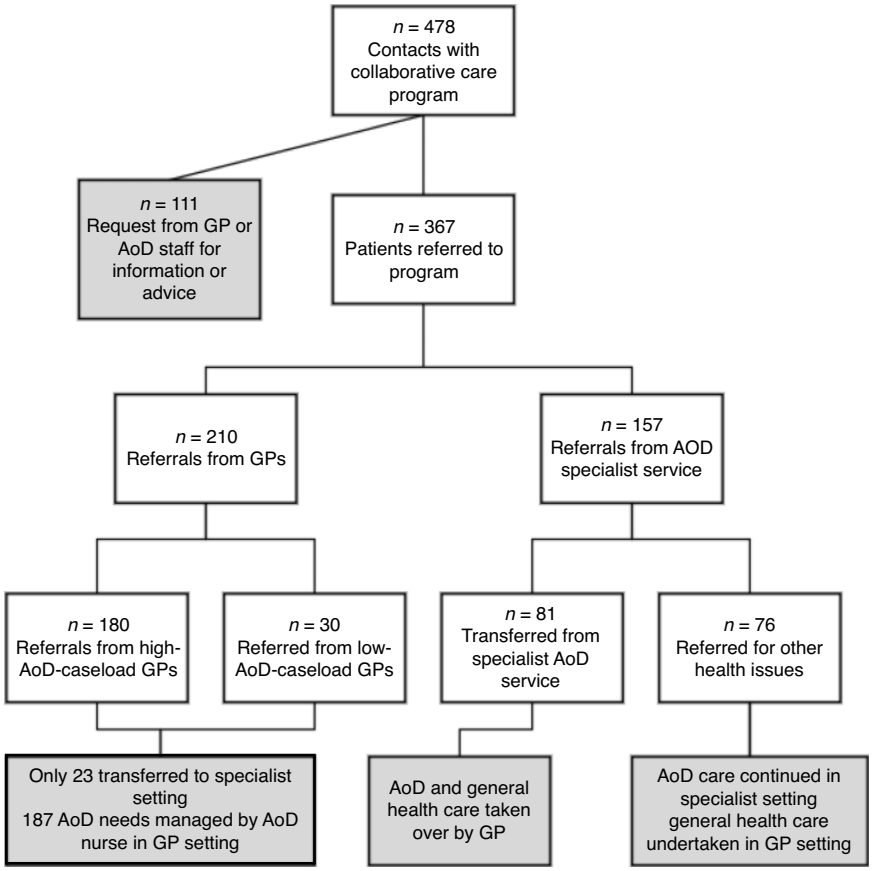

Fig. 1. Details of requests and referrals to the GP-AoD collaborative care program.

transfer care to GPs, whereas all other participants continued AoD specialist care while accessing GPs for general health care (Fig. 1).

Patient characteristics

Of the 367 patients referred to the program, one ATOP was completed for 152 patients at first assessment. These patients were more likely to be middle-aged and male. Across groups, housing was unstable for 12.3–23.9% of patients and the mean (±s.d.) psychological and physical well-being scores were 5.22 ± 2.33 and 6.15 ± 2.33 respectively (scale 0–10). Days in paid work (or education) in the past 28 days was generally low, but GP-referred non-opioid patients reported working significantly more days than GP-referred opioid patients (mean (±s.d.) 8.15 ± 9.7 vs 1.21 ± 4.43 days respectively; $P < 0.001$). Patients in the AoD-referred group reported significantly better quality of life than the GP-referred non-opioid group at the time of referral (mean (±s.d.) 6.45 ± 2.34 vs 5.14 ± 2.40 respectively; $P = 0.017$; Table 1).

All patients referred to the program for opioid use reported significantly fewer days using opioids and higher rates of abstinence in the past 28 days ($P = 0.001$). There were significantly lower rates of recent injecting at program entry for the non-opioid GP-referred group ($P = 0.003$). All participants had high rates of smoking (59.6–91.7%) and the proportion of smokers was significantly higher in the AoD service-referred group than the GP-referred non-opioid group ($P = 0.001$).

Specialist AoD service-referred patients had significantly fewer contacts with the program than the GP-referred non-opioid and opioid groups (1.71 ± 1.47 vs 5.71 ± 5.30 and 6.13 ± 5.59 respectively; $P < 0.001$).

Reasons for referral and services provided

Most GP patients were referred to the program for AoD issues (91.9%). The primary drug of concern was alcohol (63.2%), opioids (14.8%) or amphetamines, benzodiazepines or cannabis (22%). Almost all patients referred from the specialist AoD service to the program had opioid use disorder and were stable on treatment; they were either ready to transfer all their care to general practice or needed non-drug-related care (i.e. assistance with pharmacy and medication dosing or physical or mental health issues) while continuing AoD management in the specialist setting.

Patients stable on treatment for opioid dependence were transferred to both high- and low-caseload GPs. Some GPs were new to prescribing for opioid dependence and the program supported them to commence prescribing; this increased AoD service capacity to offer treatment to new patients and increased the number of local GPs providing treatment for opioid dependence. Transfer to GP care may have led to access to general and preventative health care with the possibility of better general health outcomes.

Most GP-referred patients continued their care in the general practice setting with collaborative care nurse support (89%).

Table 1. Comparison of GP-referred non-opioid patients, GP-referred opioid patients and public specialist AoD service-referred patients at entry into the program using the minimum data set (MDS), service utilisation data and ATOP

Unless indicated otherwise, data are given as the mean ± s.d. or *n* (%). Within rows, different lowercase letters indicate significant differences between groups on post hoc analyses (Tukey's test (quality of life, psychological health) or Games–Howell test (primary drug days, days worked/school)). PDoC, primary drug of concern

Variable	GP non-opioid ($n = 57$)	GP opioid ($n = 46$)	Specialist AoD service ($n = 49$)	Statistic	*P*-value
Age (years)	45.09 ± 11.45	43.71 ± 10.18	44.12 ± 11.35	$F_{2,141} = 0.21$	0.810
Male sex	37 (64.9)	34 (73.9)	29 (59.2)	$\chi^2_2 = 2.32$	0.314
Primary referral reason is AoD problem	52/56[A] (92.9)a	39/43[A] (90.7)a	25/47[A] (53.2)b	$\chi^2_2 = 29.35$	<0.001
No. days PDoC used (past 28 days)	15.21 ± 11.31a	4.26 ± 8.30b	3.65 ± 8.25b	$F_{2,149} = 24.62$	<0.001
Abstinent from PDoC (past 28 days)	10 (17.5)a	32 (69.6)b	36/48[A] (75)b	$\chi^2_2 = 42.94$	<0.001
Days injected (past 28 days)	3 (5.3)a	11 (23.9)b	15 (30.6)b	$\chi^2_2 = 11.97$	0.003
Daily tobacco use	34 (59.6)a	34/45[A] (75.5)ab	44 (89.8)b	$\chi^2_2 = 14.45$	0.001
Psychological well-being	5.25 ± 2.40a	5.22 ± 2.33a	6.15 ± 2.34a	$F_{2,146} = 2.46$	0.089
Physical well-being	5.33 ± 2.06a	5.49 ± 2.07a	5.98 ± 2.56a	$F_{2,146} = 1.14$	0.324
Quality of life	5.14 ± 2.40a	5.33 ± 2.49ab	6.45 ± 2.34b	$F_{2,146} = 4.22$	0.017
Days at work/school (past 28 days)	8.15 ± 9.65a	1.21 ± 4.43b	4.12 ± 7.78ab	$F_{2,147} = 10.2$	<0.001
Acute housing/at risk of eviction	7 (12.3)	11 (23.9)	10 (20.4)	$\chi^2_2 = 3.09$	0.214

[A]The reason for referral and ATOP measures were incomplete for a small number of patients.

Table 2. Changes in the ATOP over time for all patients referred to the collaborative care program who completed two or more ATOPs ($n = 93$)

Unless indicated otherwise, data are given as the mean±SD or *n* (%). Variables with unadjusted $P < 0.05$ are in bold. PDoC, primary drug of concern

Variable	ATOP		Statistic[A]	*P*-value	
	First	Last		Unadjusted[B]	Adjusted[C]
No. days PDoC was used (past 28 days)	8.1 ± 10.6	4.0 ± 8.2	$\mathbf{t_{92} = 3.06}$	**0.003**	**0.026**
Abstinent past 28 days	51/92 (55.4)	64/93 (68.8)	$\chi^2_1 = 4.17$	**0.041**	0.103
Injected past 28 days	20/93 (21.5)	10/92 (10.9)	$\chi^2_1 = 3.05$	0.081	0.104
Daily tobacco use	73/91 (80.2)	65 /91 (73.9)	$\chi^2_1 = 1.78$	0.182	0.205
Days at work/school (past 28 days)	4.13 ± 7.8	3.9 ± 7.3	$t_{89} = 0.52$	0.606	0.606
Acute housing problem	19/90 (21.1)	10/93 (10.8)	$\chi^2_1 = 4.92$	**0.027**	0.103
Psychological well-being	5.6 ± 2.4	6.1 ± 2.2	$t_{90} = 1.93$	0.057	0.103
Physical well-being	5.7 ± 2.3	6.1 ± 1.9	$t_{90} = 1.84$	0.068	0.103
Quality of life	5.7 ± 2.5	6.2 ± 2.2	$t_{90} = 1.85$	0.067	0.103

[A]McNemar test for repeated categorical variables and paired *t*-test for continuous variables.
[B]*P*-values not adjusted for multiple comparisons.
[C]*P*-values adjusted for multiple comparisons using the Benjamini–Hochberg procedure.

Twenty-three GP-referred patients were seen in the AoD service for counselling, outpatient medicated alcohol withdrawal or for short-term opioid treatment stabilisation or respite from pharmacy-based administration of opioid treatment.

Reasons for ATOP non-completion

An ATOP was not completed if the patient refused the referral, did not attend, was lost to follow up if it was clinically inappropriate or if clinicians did not have time during the session; unfortunately, this was common ($n = 215$). Breakdown figures for the above reasons were not available for analysis. In addition, a second ATOP could not be completed for patients only seen once or who started in the collaborative care program near the end of the study period.

Patient outcomes

A follow-up ATOP was administered towards the end of treatment and was completed for 93 patients: 30 GP-referred non-opioid patients, 31 GP-referred opioid patients and 32 AoD service-referred patients. The number of months between the initial and most recent follow-up ATOP ranged from 1 to 28 months (mean (±s.d.) 10.55 ± 10.05 months) and was not significantly correlated with changes in primary drug use or well-being indicators.

Table 2 presents changes in outcome data derived from ATOP scores over time. After controlling for multiple comparisons, there was significant improvement in the days the drug of concern was used ($P = 0.026$). Other measures, such as housing problems, injecting drug use, psychological well-being, physical well-being and quality of life trended towards improvement but did not meet criteria for statistical significance. The high prevalence of tobacco smoking remained unchanged. Between-group comparisons of the amount of change in ATOP scores between the first visit and follow-up were performed, but, likely due to low numbers in each group, none of the differences was significant. There were no baseline differences between patients

who completed only one ATOP and those who completed additional ATOPs (corrected *P*-value range 0.459–0.678; see Supplementary Table S1).

Discussion

This is the first study to explore collaborative care between a specialist AoD service and GPs in the Australian context and the first to use ATOP as an outcome measure for an AoD-GP collaborative care program.

The GP-AoD collaborative care program was associated with significant reductions in substance use. There was a clear trend towards improvement in all other outcomes (except employment and tobacco use). This suggests collaborative care supports positive change. The specialist AoD service provided specialist care to stabilise patients, whereas general practice supported patients' ongoing care and reintegration into the 'mainstream', where care could be accessed for other health issues, including preventative screening, with broader health and well-being implications and lower cost (Ritter *et al.* 2014).

Most patients with opioid dependency at entrance to the program were already stable on opioid dependence treatment and had lower days used, higher abstinence and lower collaborative care utilisation. This reflects the efficacy of opioid dependency treatment, which was maintained after transfer to GPs.

The GP-referred non-opioid group used more days, had fewer days abstinent and a lower quality of life, with alcohol the most common drug used, and higher rates of employment. This suggests a group with unstable AoD use that may have, through the program, accessed treatment earlier in their illness, potentially resulting in maintained function and better outcomes.

The extraordinarily high smoking prevalence in all groups in the program is significantly worse than general smoking rates in the Australian community (11%; AIHW 2017). Failure to assist these patients to stop smoking puts them at risk of substantial morbidity and mortality and needs to be addressed.

Complex patients can be difficult to manage in general practice due to limitations in the Australian GP fee-for-service model (Berends and Lubman 2013). The similarities in age, sex, housing issues and psychological and physical well-being for all patients at entry into the collaborative care program suggest that GPs were seeing patients with high complexity and, before the introduction of the program, were managing this without support. The program eased referral and transition to and from the specialist setting. Responding to calls for advice and information from GPs and AoD staff ($n = 111$) may have led to a referral to the program or maintenance of GP management after this contact. Unfortunately, patient identity and outcomes are unknown for these calls.

Most GP-referred patients were managed entirely in the GP setting. This maintained the GP locus of care, improving early access to treatment and is preferred by patients (Hutchings *et al.* 2006). Conversely, more than half the AoD service-referred patients made the, usually exceedingly difficult, transition to GP management of opioid dependency.

This study was strengthened by use of a validated patient-reported outcome measure, measuring outcomes important to patients (employment, housing, quality of life, physical and psychological well-being), as well as those important to providers (i.e. AoD use).

Unfortunately, it is not possible to benchmark these results against other models or broader AoD service outcomes because there are no other comparable published data. Although these improvements are encouraging and offer preliminary evidence for the promise of collaborative care, the absence of a non-collaborative care control group, incomplete data and small numbers make it difficult to say with certainty that the program offers an advantage over usual care. Less than half the patients referred to the program completed one ATOP and only 25% completed more than one ATOP. The lack of difference at baseline between patients who only had one ATOP and those who had a repeat ATOP suggests that the change observed is robust, but the outcomes of patients who did not have an ATOP is unknown. This confounds and constrains the generalisability of the results and limits the power of the study to show significant outcomes. However, this is real-world, imperfect data and reflects data collection within the constraints of usual care. These results build on our understanding of the role of GP-AoD collaborative care: this care is feasible and supported patients to transition smoothly in and out of GP care.

AoD use naturally changes over time. The results of this study may have been affected by individuals' natural history of use within the time frame of this research project. Participants stable on treatment for opioid dependence at referral would be expected to maintain stability, and this resulted in less significant ATOP changes. This lack of change is important because it demonstrates that patients who are stable remain so on transfer of care from specialist services.

Future research of GP-AoD collaborative care with a larger sample size and a usual care control group could show more robust positive outcomes. Further research could focus on understanding the principles of collaborative AoD-GP care and the role of communication, referral pathways, the provision of education for GPs and improved professional relationships. Workplace cultural change to support collaborative interaction between GPs and specialist AoD services is also important. Understanding patients' experiences of care and factors that help and hinder patient engagement, care and recovery may assist both GPs and specialist AoD services to respond more effectively.

Collaborative care programs between GPs and specialist AoD services, driven by experienced AoD nurses and supported by experienced AoD medical care, are feasible and can benefit GPs, patients and AoD services. The program infrastructure needed to support this will require innovative solutions and funding models that harness and link existing services with delineated roles. Specialist clinical staff with AoD skills and an understanding of the GP setting will assist in the building of collaborative care models leading to a better clinician and patient experience and better health and welfare outcomes for patients.

Conflicts of interest

None of the authors have any connections with the tobacco, alcohol or gaming industry. HHKW has received funding for consultancies and/or expert advisory panels with Indivior,

Lundbeck, Seqirus, Mundipharma and Pfizer. NL has been received funding for research studies, consultancies and/or expert advisory panels with Indivior, Braeburn, and Mundipharma. The other authors have nothing to declare.

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