

Does attending *Work It Out* – a chronic disease self-management program – affect the use of other health services by urban Aboriginal and Torres Strait Islander people with or at risk of chronic disease? A comparison between program participants and non-participants

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Abstract. *Work It Out* is a holistic chronic disease self-management program for urban Aboriginal and Torres Strait Islander people in Queensland, which is part of an integrated and comprehensive system of care for chronic disease management. This study examines differences in primary healthcare services use between *Work It Out* participants and non-participants. This retrospective observational study of services use, analysed data extracted from the clinical medical records system and *Work It Out* program assessments. General practitioner and allied health services use were compared among the participants and non-participants using logistic regression models and zero-truncated Poisson and negative binomial regression models. Compared with non-participants, *Work It Out* participants were more likely to use GP management plans, GP team care arrangements, GP mental health consultation and subsequent allied health services. Among those who used the services more than once, *Work It Out* participants had higher service use rates than non-participants for Aboriginal and Torres Strait Islander health assessments, GP management plans, team care arrangements and podiatry, physiotherapy and dietetic services. Engagement in *Work It Out* can facilitate the use of primary healthcare services, which are important for chronic disease management for urban Aboriginal and Torres Strait Islander people.

Additional keywords: chronic disease management, Indigenous Australians, integrated care, primary health care.

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Introduction

Effective management of chronic disease has important public health significance in improving disease prognosis, increasing life expectancy and reducing expenditure in the health system (Department of Families Housing Community Services and Indigenous Affairs 2009; Thomas 2014). Chronic and preventable disease management is an Australian national health priority area, and critical to achieving health equality given the high prevalence of chronic diseases among Indigenous Australians (Department of Families Housing Community Services and Indigenous Affairs 2009). The Australian Medicare Benefits Schedule (MBS) supports government-subsidised medical services, including benefits for GP management plans and team care arrangements to support a structured approach to patients with chronic conditions (Kowanko *et al.* 2012; Australian Health Ministers' Advisory Council 2015).

Appropriate and comprehensive primary health care is an important component of chronic disease management. Regular primary healthcare intervention can prevent hospitalisation for Indigenous people with chronic conditions, improving health care and reducing costs to the health system (Australian Health Ministers' Advisory Council 2015). However, Indigenous Australians often encounter barriers to accessing, and engaging with, primary healthcare services (Askew *et al.* 2014a, 2014b; Kowanko *et al.* 2012). These barriers have been found to include a range of issues such as transportation difficulties, availability of integrated services and lack of trust relationships with health providers (Askew *et al.* 2014a, 2014b). Several strategies have been proposed to improve access to health services for Indigenous people such as promoting culturally safe service delivery and developing services around the holistic model of health and wellbeing (Hayman 2010; Ware 2013). However,

What is known about the topic?

- Integrated primary health care is important for effective chronic disease management, which is critical to achieving health equality in Australia.

What does this paper add?

- Attending *Work It Out*, a group chronic disease self-management program within an integrated care system, can facilitate increased uptake of a range of comprehensive health services.

there are few evaluation studies on the effectiveness of those strategies.

The Institute for Urban Indigenous Health (IUIH) works towards a holistic model of integrated care for Indigenous people in Queensland (Institute for Urban Indigenous Health (IUIH) 2016). It was established in 2009 by four Aboriginal and Torres Strait Islander Community Controlled Health Services (ATSICCHSs) in south-east Queensland. This network now comprises 20 inter-professional primary health clinics, which provide access to doctors, nurses, Aboriginal/Torres Strait Islander health workers, transport officers, community liaison officers and a range of specialist and allied health professionals under one roof in a 'one-stop-shop' model (IUIH 2017). The IUIH 'system of care', which underpins the delivery of comprehensive primary healthcare services throughout the network, aims to facilitate easy access and culturally responsive quality health services to Indigenous Australians, led by Indigenous Australians (IUIH 2016).

IUIH's *Work It Out* (WIO) program is a holistic chronic disease self-management and rehabilitation program that aims to improve clients' ability to self-manage their chronic diseases and live healthy, fulfilling lives. Indigenous people who have (or are at risk of developing) a chronic disease can obtain referrals to the WIO program at participating ATSICCHS clinics. The program typically runs twice a week and consists of a 1-h exercise physiologist-guided exercise session and a 45-min education session facilitated by a variety of health professionals. The same health professionals also deliver one-on-one services at the participating ATSICCHS and are accessible to WIO participants and non-participants alike. Participants who stay in the program for longer than a year are required to obtain a new referral from their GP. The program is offered in 10 locations that are geographically spread across south-east Queensland. Sessions outside of work hours are offered at Morayfield to accommodate those who are currently working.

The WIO program was initially commenced as a student-led clinical service, with funding obtained through the Commonwealth Department of Health and Ageing to roll the program out across south-east Queensland in 2011 and 2012. Since 2013, due to its popularity and increasing demand in the community, the program has continued with a blended funding model. The IUIH delivers the program to ATSICCHS using a combination of Medicare-generated income and a contracted program fee in each location in order to provide the program at no cost to clients.

The integrated approach of the program has been associated with significant improvements in participants' physical health and mental wellbeing, as well as engagement in chronic disease self-management (Mills *et al.* 2017; Nelson *et al.* 2016). However, less is known about the influence of health program participation on participants' use of health services (Jordan *et al.* 2008). The objective of this study was to examine the differences in comprehensive primary healthcare services use between WIO participants and non-participants. The hypothesis was that the WIO program is effective in increasing uptake of health services, thereby facilitating better chronic disease management in primary healthcare settings for urban Indigenous people in Queensland.

Methods

Ethical clearance was gained through The University of Queensland's Human Research Ethics Committee (2011001283) and the Board of The Institute for Urban Indigenous Health.

A retrospective observational study was conducted of a cohort of patients who were referred to the WIO program and had primary healthcare services use recorded between January 2012 and December 2017. The study utilised data from MMEx (ISA Healthcare Solutions, Bentley, WA, Australia), an electronic medical records system used across the majority of IUIH network ATSICCHS clinics in south-east Queensland and specific WIO program assessments datasets. The program assessment data were collected by accredited exercise physiologists, who conducted comprehensive initial and review assessments with each client. Initial assessment included anthropometric measurements, functional exercise ability tests and quality of life surveys. Participants were then reviewed using the same health indicators approximately every 12 weeks.

Clinical services use data were extracted from MMEx, and linked to the program assessments datasets using clients' full name and date of birth as the identifier. The data extracted from MMEx included demographics, date of registration in MMEx (indicating first contact at an IUIH clinic), date of last contact, as well as medical services use data indicated by billed MBS items and completed clinicians' calendar appointments (for non-billed contacts). The MBS items included are listed in Table 1 (Department of Health 2013). Additional service uses were identified through completed calendar appointments of clinicians, including psychologists, podiatrists, physiotherapists, Aboriginal health workers, dietitians, diabetes educators, occupational therapists and audiologists.

Patients who were referred to the program between January 2012 and September 2017 through 10 IUIH member clinics in south-east Queensland that used MMEx were included. Ninety-four patients who self-identified as neither Aboriginal nor Torres Strait Islander were excluded. In total, 815 patients were identified, with those who had been assessed initially and had at least one subsequent review assessment categorised as participants of the WIO program, and those who were initially assessed for WIO but failed to be reviewed were categorised as non-participants.

Demographic characteristics were compared among the WIO participants and non-participants using Chi-Square tests for

Table 1. Primary healthcare services and Medicare Benefits Schedule (MBS) item number included

Primary healthcare services	MBS items
Aboriginal and Torres Strait Islander health assessment	715
Aboriginal and Torres Strait Islander health service	10950, 81300
GP management plan	721
GP team care arrangement	723
GP mental health treatment plan	2700, 2701, 2712, 2715, 2717
GP mental health consultation	2713
Psychology service	10968, 81355, 80010, 80100, 80105, 80110, 80115
Podiatry service	10962, 81340
Physiotherapy service	10960, 81335
Dietetic service	10954, 81320
Diabetes education service	10951, 81305
Occupational therapy service	10958, 81330
Audiology service	10952, 81310

categorical variables and one-way analysis of variances/non-parametric tests for continuous variables. The number of primary healthcare services received between initial assessment and date of last clinical services contact was recorded for each participant, including the Aboriginal and Torres Strait Islander people health assessment, GP chronic disease management services and allied health services.

Multivariate logistic regression models were used to investigate differences in services use between WIO participants and non-participants. Among those who received a primary healthcare service, zero-truncated Poisson (or negative binomial where data were over-dispersed) models were used to examine the associations between services use and participation in the WIO program. To understand the pattern of services use among participants and non-participants before attending the WIO program, sensitivity analyses were conducted to compare the number of health services received before the initial assessment (from date of registration in MMEx).

A list of possible confounding factors including age, gender, number of pre-existing chronic diseases and conditions, program locations and the follow-up period within the IUIH member ATSICCHS clinics, were controlled for respectively in the above models. Additional confounding factors were controlled for in some models where appropriate. For dietetic services as a dependent variable, body mass index (BMI) was controlled as a confounding factor; for models where GP mental health treatment plans, consultations and psychological services were the dependent variables respectively, pre-existing mental disorders were added as a confounding factor; for diabetes education services, only those who had a self-reported diabetes mellitus diagnosis were included. A *P*-value of less than 0.05 was considered to be statistically significant. All analyses were conducted using Stata V14 (StataCorp LLC, College Station, TX, USA).

Results

Out of 815 clients identified, 294 were classified as participants of WIO. Participants were followed up in the program for an

average of 360 days (95% CI: 292–429), ranging from participation for 3 weeks up to 4 years. The majority (71.09%, 209/294) of participants stayed engaged with the program for longer than 6 months. Table 2 shows the demographic characteristics of participants and non-participants.

The numbers of health service contacts by WIO participants and non-participants are listed in Table 3. After adjusting for age, gender and other potential confounding factors, participants of the program were more likely to have used a service than non-participants for GP management plans (adjusted OR: 1.81, 95% CI: 1.14–2.86), GP team care arrangements (adjusted OR: 1.56, 95% CI: 1.00–2.42), as well as subsequent allied health services including psychology services, podiatry services, physiotherapy services, dietetic services, occupational therapy services and audiology services (Table 3). Table 4 details the results of zero-truncated Poisson or negative binomial regression models, demonstrating that among those who used a primary healthcare service, WIO participants had a higher rate of services use than non-participants for Aboriginal and Torres Strait Islander health assessments, GP management plans, GP team care arrangements, podiatry services, physiotherapy services and dietetic services. Sensitivity analyses revealed that before referral to the WIO program, the participants group had not used more health services than non-participants. Conversely, participants were less likely to have undertaken the Aboriginal and Torres Strait Islander health assessment than non-participants before participation in the WIO program (adjusted OR 0.60, 95% CI 0.39–0.93).

Discussion

This study found increased primary healthcare services use for chronic disease prevention and management in WIO participants compared with those who did not participate in the program. Findings of this study provide evidence that participation in the IUIH's WIO program may facilitate chronic disease management in primary healthcare settings. To the best of our knowledge, this is the first study to evaluate a chronic disease self-management program and its influence on a comprehensive range of health services use by Aboriginal and Torres Strait Islander people who have a range of chronic conditions in urban settings.

There is an association between WIO participation and increased services use. The proportion of completing at least one Aboriginal and Torres Strait Islander health assessment among the participants and non-participants is comparable after adjusting for age, gender and other confounding factors. Nevertheless, results show that WIO participants were more likely to receive regular health assessments, which support the early detection and treatment of a disease or condition. As there is a gap between the current rate of annual health assessments and the goal in the Aboriginal and Torres Strait Islander Health Plan 2013–23 to increase health assessment uptake (Australian Institute of Health and Welfare 2018), our findings potentially inform the usefulness of chronic disease group program participation integrated within comprehensive primary healthcare services as a successful strategy for accelerating rates of preventative health assessments for Aboriginal and Torres Strait Islander people.

Table 2. Demographic characteristics of 815 *Work It Out* participants and non-participants
Data are presented as *n* (%) unless otherwise stated. BMI, body mass index; ATSICHS, Aboriginal and Torres Strait Islander Community Controlled Health Services; CI, confidence interval

Variables	Participants 294 (36.07)	Non-participants 521 (63.93)	<i>P</i> value
Demographics			
Age (years)			
Mean (s.d.)	52.40 (14.18)	47.06 (14.62)	<0.001
≥16, <30	22 (7.48)	74 (14.20)	
≥30, <45	64 (21.77)	155 (29.75)	
≥45, <60	110 (37.41)	184 (35.32)	
≥60	98 (33.33)	108 (20.73)	
Gender			0.250
Female	180 (61.22)	340 (65.26)	
Employment status	47 (18.73)	103 (23.57)	0.138
BMI categories			0.262
Normal weight	18 (6.16)	45 (9.07)	
Over weight	52 (17.81)	96 (19.35)	
Obese	222 (76.03)	355 (71.57)	
Follow-up period within ATSICHS clinics (years)			<0.001
<1	27 (9.78)	171 (37.58)	
1–2	77 (27.90)	130 (28.57)	
2–3	69 (25.00)	100 (21.98)	
3–4	58 (21.01)	46 (10.11)	
≥4	45 (16.30)	8 (1.76)	
Program locations			0.395
Woolloongabba	43 (14.63)	77 (14.78)	
Woodridge	47 (15.99)	73 (14.01)	
Morayfield	58 (19.73)	113 (21.69)	
Capalaba	37 (12.59)	45 (8.64)	
Strathpine	26 (8.84)	61 (11.71)	
Deception Bay	32 (10.88)	78 (14.97)	
North Stradbroke Island	12 (4.08)	17 (3.26)	
Goodna	26 (8.84)	42 (8.06)	
Acacia Ridge	6 (2.04)	8 (1.54)	
Wynnum	7 (2.38)	7 (1.34)	
Pre-existing chronic conditions ^A			
No. of chronic conditions, median (95% CI)	6 (6–7)	5 (5–6)	<0.001
Diabetes mellitus	121 (42.91)	181 (35.28)	0.034
Mental disorder	154 (55.20)	280 (55.89)	0.852
Cardiovascular diseases	103 (36.92)	116 (23.15)	<0.001
Musculoskeletal conditions	196 (70.25)	317 (63.27)	0.049
Cholesterol disorders	135 (50.94)	125 (34.44)	<0.001

^APre-existing chronic conditions include cardiovascular diseases, diabetes mellitus, respiratory diseases, mental illness, musculoskeletal conditions, cancers, hepatitis, metabolic conditions, cholesterol disorders, obesity, hypertension and other conditions.

For effective chronic disease management, it is important that patients are regularly reviewed by primary healthcare providers and are offered integrated healthcare services where necessary (Mitchell *et al.* 2015). Within the IUIH 'system of care', which enables affordable and culturally responsive primary healthcare services in the same ATSICCHS clinic, clients with chronic diseases are linked to a variety of allied health services with ease after regular GP management plans and team care arrangements. Through engaging in the WIO program, participants were encouraged to work with their GPs to complete an annual management plan and team care arrangement plan to meet their

health needs. Supporting this, our research provides evidence that there was a higher use of primary healthcare services by people attending IUIH's WIO program than by those who did not attend the program. The results may suggest that WIO participants would subsequently be more likely to access a wider variety of allied health services, which would improve the management of their chronic conditions. In conjunction with other research regarding services and strategies for enhancing primary healthcare service access and use for Indigenous Australians (Askew *et al.* 2014a), these findings may have important public health significance in improving access and use

Table 3. Odds ratios of health services use between *Work It Out* (WIO) participants and non-participantsData are presented as *n* (%). OR, odds ratio; CI, confidence interval

Primary healthcare services	Participants	Non-participants	Crude OR (95% CI)	<i>P</i> value	Adjusted ^A OR (95% CI)	<i>P</i> value
Aboriginal and Torres Strait Islander health assessments	256 (87.07)	358 (68.71)	1.39 (0.83–2.35)	0.212	1.35 (0.78–2.35)	0.283
Aboriginal and Torres Strait Islander health services	242 (82.31)	347 (66.60)	2.33 (1.64–3.31)	<0.001	1.24 (0.77–1.98)	0.375
GP management plans	242 (82.31)	294 (56.43)	2.10 (1.37–3.21)	0.001	1.81 (1.14–2.86)	0.011
GP team care arrangements	236 (80.27)	293 (56.24)	1.76 (1.17–2.65)	0.007	1.56 (1.00–2.42)	0.050
GP mental health treatment plans	99 (33.67)	147 (28.21)	1.29 (0.95–1.76)	0.103	1.08 (0.73–1.60)	0.698
GP mental health consultations	63 (21.43)	72 (13.82)	1.70 (1.17–2.47)	0.005	1.71 (1.06–2.77)	0.028
Psychology services	87 (29.59)	102 (19.58)	1.73 (1.24–2.40)	0.001	1.98 (1.28–3.07)	0.002
Podiatry services	198 (67.35)	224 (42.99)	2.73 (2.03–3.69)	<0.001	1.52 (1.04–2.23)	0.030
Physiotherapy services	214 (72.79)	297 (57.01)	2.02 (1.48–2.75)	<0.001	1.91 (1.27–2.86)	0.002
Dietetic services	155 (52.72)	144 (27.64)	2.92 (2.17–3.94)	<0.001	2.36 (1.64–3.39)	<0.001
Diabetes education services ^B	73 (60.33)	76 (41.99)	2.10 (1.31–3.36)	0.002	2.36 (1.25–4.45)	0.008
Occupational therapy services	82 (27.89)	60 (11.52)	2.97 (2.05–4.30)	<0.001	1.79 (1.15–2.79)	0.011
Audiology services	57 (19.39)	32 (6.14)	3.68 (2.32–5.82)	<0.001	2.68 (1.59–4.52)	<0.001

^AAll multivariate regression models were adjusted for age, gender, program locations, total number of pre-existing chronic conditions and follow-up period within Institute for Urban Indigenous Health (IUIH) member Aboriginal and Torres Strait Islander Community Controlled Health Services (ATSICHS) clinics; additionally, for dietetic services as a dependant variable, body mass index (BMI) was controlled as a confounding factor; for models where GP mental health treatment plans, consultations and psychological services were the dependent variables respectively, pre-existing mental disorder was added as a confounding factor.

^BClients who had any type of diabetes mellitus were included (*n* = 302).

Table 4. Incidence rate ratio of health services uses between *Work It Out* (WIO) participants and non-participants who had one or more service contacts per service category

IRR, incidence rate ratio; CI, confidence interval

Primary healthcare services	Crude IRR (95% CI)	<i>P</i> value	Adjusted ^A IRR (95% CI)	<i>P</i> value
Aboriginal and Torres Strait Islander health assessments	1.21 (1.09–1.35)	<0.001	1.17 (1.06–1.29)	0.002
Aboriginal and Torres Strait Islander health services	1.19 (0.94–1.50)	0.160	1.05 (0.84–1.30)	0.673
GP management plans	1.30 (1.11–1.52)	0.001	1.29 (1.10–1.50)	0.001
GP team care arrangements	1.24 (1.06–1.45)	0.009	1.22 (1.05–1.42)	0.011
GP mental health treatment plans	0.92 (0.64–1.30)	0.624	0.93 (0.62–1.38)	0.718
GP mental health consultations	0.99 (0.55–1.78)	0.967	1.18 (0.63–2.21)	0.604
Psychology services	0.76 (0.42–1.40)	0.377	0.68 (0.42–1.09)	0.112
Podiatry services	1.47 (1.20–1.80)	<0.001	1.32 (1.09–1.60)	0.004
Physiotherapy services	1.85 (1.35–2.53)	<0.001	1.63 (1.25–2.11)	<0.001
Dietetic services	1.63 (1.10–2.43)	0.015	1.54 (1.11–2.15)	0.010
Diabetes education services ^B	0.94 (0.49–1.79)	0.842	0.92 (0.63–1.36)	0.682
Occupational therapy services	0.62 (0.38–1.00)	0.052	0.71 (0.47–1.09)	0.121
Audiology services	2.43 (0.59–9.98)	0.217	2.00 (0.46–8.79)	0.359

^AAll multivariate regression models were adjusted for age, gender, program locations, total number of pre-existing chronic conditions and follow-up period within Institute for Urban Indigenous Health (IUIH) member Aboriginal and Torres Strait Islander Community Controlled Health Services (ATSICHS) clinics; additionally, for dietetic services as a dependant variable, body mass index (BMI) was controlled as a confounding factor; for models where GP mental health treatment plans, consultations and psychological services were the dependent variables respectively, pre-existing mental disorder was added as a confounding factor.

^BPeople who had a type of diabetes mellitus and had used diabetes education service, were included (*n* = 149).

of primary healthcare services by urban Aboriginal and Torres Strait Islander people with chronic disease and ultimately improving health outcomes.

Apart from health services being affordable and accessible, coordinated care provided by a range of health professionals can play a positive role in enabling chronic disease management strategies with Aboriginal and Torres Strait Islander people (Kowanko *et al.* 2012). One possible explanation for increased access to services by the WIO participants is the increased exposure participants have to a diverse range of staff through the WIO education sessions. The health professionals not only provide participants with information regarding chronic disease

self-management in an informative ‘yarning’ style (Lin *et al.* 2016), but also have the opportunity to establish relationships with the participants, which is an important enabler of care access and engagement among Indigenous Australians (Davy *et al.* 2016). Further process evaluation research investigating how the program might be contributing to increased services use outcomes could provide valuable insights for programs in other contexts (Bauer *et al.* 2015).

Previous literature has indicated integrated care approaches had clinical benefits for patients with type 2 diabetes in Australia (Zwar *et al.* 2007; McRae *et al.* 2008). In remote communities of north Western Australia, support and involvement of Aboriginal

health workers and well-coordinated allied health services resulted in improved clinical outcome measures for Aboriginal diabetic patients (Stoneman *et al.* 2014). This study adds information for chronic disease management in urban Aboriginal and Torres Strait Islander people who are engaged in the IUIH integrated system of care. Future studies are warranted to examine the potential clinical benefits of enhanced chronic disease management among the WIO participants with multiple chronic conditions.

Limitations

The study has some limitations. Findings may apply only to urban Aboriginal and Torres Strait Islander people within an integrated system of care because the determinants of primary health services use in rural and remote Indigenous communities may be different. As this is a retrospective observational study, the causal relationship between attending the WIO program and increased use of primary healthcare services could not be confirmed because participants and non-participants were not randomly allocated. However, sensitivity analyses of services use data before the initial point of contact with WIO indicated the pattern of services use among participants and non-participants was comparable. With participation in the program, participants were more likely to access a service and have higher number of service contacts than non-participants. The exercise physiologist service use was excluded because participants are required to get a referral to exercise physiologist services from a GP annually to participate in the program.

Moreover, the availability and accuracy of the medical records may lead to information bias (Liaw *et al.* 2016). It is also a possibility that clients without clinical services use data in MMEx may have used primary healthcare services elsewhere. However, this is unlikely, given the integrated nature of IUIH services, availability of a variety of primary healthcare services within clinics and the fact that clients are unlikely to use a service elsewhere when they are registered with an ATSI CCHS.

Conclusion

While the Institute for Urban Indigenous Health 'system of care' facilitates integrated primary health care in one place, IUIH's *Work It Out*, a chronic disease self-management program for urban Aboriginal and Torres Strait Islander people in Queensland, showed positive effects in increasing participants' health services use for better chronic disease management. Further research is needed to investigate the mechanisms through which WIO effects and supports enhanced services use and access.

Conflicts of interest

The authors declare that they have no conflicts of interest.

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