



# Smoking cessation support strategies for Aboriginal and Torres Strait Islander women of reproductive age: findings from the Which Way? study

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**The known:** Reduction of smoking rates among Aboriginal and Torres Strait Islander women is urgently needed. However, evidence on acceptable smoking cessation support strategies is limited.

**The new:** Aboriginal and Torres Strait Islander women are interested in a range of cessation support strategies. Strategies with the highest levels of acceptability are group support and holistic approaches. Women want support from their health care providers — in particular, Aboriginal health workers at their Aboriginal health service.

**The implications:** Currently there are no consistent supports for health services to integrate smoking cessation care. Appropriate funding models, resources, and standardised training to support health care providers should be prioritised and implemented to address smoking prevalence among Aboriginal and Torres Strait Islander women, including during pregnancy.

Smoking during pregnancy is the most significant modifiable risk factor linked to adverse pregnancy and long term health outcomes for both expecting mother and child.<sup>1</sup> Out of every ten Aboriginal and Torres Strait Islander women who smoke, only one successfully quits during pregnancy,<sup>1</sup> so smoking during pregnancy is a recognised factor in the current health, wellbeing and life expectancy inequalities experienced by Aboriginal and Torres Strait Islander people.<sup>2</sup> The higher prevalence of tobacco use among Aboriginal and Torres Strait Islander women during the perinatal period is directly linked to colonisation and other social determinants of health.

Access to appropriate cessation supports, particularly in the primary care setting, is known to increase quitting rates in the general population.<sup>3,4</sup> Smoking cessation guidelines from the Royal Australian College of General Practitioners recommend integrating brief advice for all smokers during routine appointments, and follow-up for those making a quit attempt. This places health professionals in a key role in cessation care.<sup>5</sup> Behavioural support and counselling, coupled with first line pharmacotherapy (where appropriate) and follow-up, is recommended as best practice.<sup>5</sup> Among the general population, accessing and engaging with cessation support options, such as Quitline, can increase quitting success by 25% compared with pharmacotherapy alone.<sup>6</sup> Further, Australian health promotion initiatives have increased referrals to and uptake of cessation support services.<sup>7</sup>

It is critical to recognise that current guidelines and recommendations for best practice smoking cessation draw on general population evidence, and do not always reflect the

## Abstract

**Objective:** To identify smoking cessation support strategies that resonate with Aboriginal and Torres Strait Islander women.

**Design, setting and participants:** A national cross-sectional survey of Aboriginal and Torres Strait Islander women aged 16–49 years who were smokers or ex-smokers was conducted online during the period July to October 2020.

**Main outcome measures:** Preferred strategies, providers and locations for smoking cessation support.

**Results:** Among a total of 428 women who participated in the survey, group-based support and holistic support were the most preferred strategies (preferred by 31.8% and 22.2% of women, respectively). Use of an Aboriginal health service was positively associated with choosing holistic support programs (prevalence ratio, 1.14 [95% CI, ≥ 1.00–1.28]). Women with high or moderate nicotine dependency were more likely to consider group-based support to be helpful (prevalence ratio, 1.13 [95% CI, ≥ 1.00–1.27]) than those with low nicotine dependency. The most preferred providers for smoking cessation support were Aboriginal health workers (64.3%). Most women (73.4%) preferred face-to-face support at an Aboriginal health service, 38.8% preferred online support and 34.8% preferred phone support. A higher percentage of older women (≥ 35 years) preferred online or phone support (prevalence ratio, 1.70 [95% CI, 1.03–2.80]) compared with younger women (16–20 years). Use of an Aboriginal health service was positively associated with preference for an Aboriginal health worker (prevalence ratio, 1.35 [95% CI, 1.12–1.62]), and receiving face-to-face support at an Aboriginal health service (prevalence ratio, 1.28 [95% CI, 1.10–1.49]).

**Conclusion:** Aboriginal and Torres Strait Islander women prefer a range of cessation supports, with most women preferring group support and holistic approaches. Cessation supports that resonated with women varied by age, remoteness, nicotine dependence, and whether participants used an Aboriginal health service. Women want support to quit smoking from the Aboriginal health workers at their Aboriginal health service, at their health care providers and in their community. Comprehensive, multifaceted supports are required. Online support and phone-based support are also preferred by some women, which helps to increase accessibility. Appropriate models of care — including sufficient funding for Aboriginal health services and Aboriginal health workers — are required and should be developed in partnership with communities to implement meaningful and culturally safe cessation care. This research demonstrates the need for and importance of multifaceted, comprehensive cessation support strategies.

unique needs of Aboriginal and Torres Strait Islander people. There is new and emerging evidence for individualised support strategies, including mobile phone apps,<sup>8</sup> text message-based

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interventions<sup>9</sup> and internet-based interventions,<sup>10</sup> but limited evidence exists for interest in and uptake of such options among Aboriginal and Torres Strait Islander people. The limited access to culturally appropriate programs and services is a known barrier to Aboriginal and Torres Strait Islander people accessing and accepting smoking cessation support.<sup>5</sup>

The Which Way? project aims to develop an Indigenous-led evidence base for smoking cessation to support Aboriginal and Torres Strait Islander women to be smoke-free during pregnancy and beyond.<sup>11</sup> In this study, we sought to inform clinical practice and health care delivery by identifying smoking cessation support preferences among Aboriginal and Torres Strait Islander women, including preferred strategies, providers and locations.

## Methods

### Research team

As argued by Linda Tuhiwai Smith (former professor of Indigenous education at the University of Waikato), “When Indigenous peoples become the researchers, and not merely the researched, the activity of research is transformed.”<sup>12</sup> In keeping with this idea, our study was conceptualised and led by one of us (MK, Wiradjuri woman) in partnership with Aboriginal communities and women (HL, BF, PH). Our team brings together Aboriginal and Torres Strait Islander lived experience (MK, SM, CC, HL, FR, BGF, BF, JB), Indigenous lived experience (RM), and expertise in Aboriginal health services (AHSs) (PH, HL, FR, BGF, BF), Indigenous tobacco research (MK, CC, CH, RM) and epidemiology (CH, EB, RM). This self-location partly fulfils our respective relational protocols.

This work was directed by the interest and needs of Aboriginal and Torres Strait Islander women in New South Wales, Queensland and South Australia, and governed by the Which Way? governance committee, an Aboriginal and Torres Strait Islander governance group that includes partnering communities.<sup>11</sup> In addition to this governance, Aboriginal and Torres Strait Islander people were involved on a daily basis in all aspects of the study, from conception through to manuscript writing and dissemination of the study findings. This everyday engagement is further reflective of the relational nature of this work, embedding knowledge users in an integrated knowledge translation approach to help ensure Aboriginal and Torres Strait Islander community and health care delivery relevance, and scientific excellence.

### Data sources and categorisation

An online cross-sectional survey was conducted during the period July to October 2020, targeting Aboriginal and Torres Strait Islander women of reproductive age (16–49 years) who were smokers or ex-smokers. The survey details and sampling frame are reported elsewhere in this supplement.<sup>13</sup> Participants’ ages were categorised as 16–20 years, 21–34 years, or 35–49 years; remoteness as urban, or regional or remote; and education as completing up to year 11, completing year 12 or current student (TAFE or university) or apprentice, or having completed a degree or trade certificate. Participants were categorised as using an AHS or not; by smoking status (current smoker or ex-smoker [any intensity]); and by smoking intensity (0–5 in cigarettes per day [CPD], 6–10 CPD, or ≥11 CPD). The Heaviness of Smoking

Index was used to categorise participants as having moderate or high dependency (combined due to few participants), or low dependency. Urge frequency and urge strength were both categorised as high or low.

### Support strategies

Participants were asked “What type of program do you think would help Aboriginal women quit smoking?”, as a multiple choice question where participants could select all program types that they felt would be useful, and were then asked to rank their selections by specifying their first, second and third preferences. The 19 program types listed within the survey were categorised into seven broad groups (Box 1). If participants selected “other”, they were asked to specify their choice in an open-ended question, and responses to this were categorised into the seven broad groups.

### Support providers

Participants were asked “Who would you like to receive quit smoking support from?” and could select a single preference from the following options: doctor, nurse, midwife, Aboriginal health worker, my community (not health service), or someone I don’t know.

### Support locations

Participants were asked “If you decided you wanted to make a quit attempt, where would you rather receive support?” and could select one or more choices from the following options: face to face at my AHS, face to face with a non-Aboriginal service, over the phone, online, or other.

### Statistical analysis

The Which Way? governance committee oversaw the analysis, which was conducted by an Indigenous-led statistical team, using

#### 1 Categorisation of 19 program types into seven broad groups

Group-based support	<ul style="list-style-type: none"> <li>• Support groups at Aboriginal helath service</li> <li>• Support groups somewhere else</li> <li>• Facebook support groups</li> <li>• Other (where relevant)</li> </ul>
Holistic support	<ul style="list-style-type: none"> <li>• Acupuncture</li> <li>• Art/craft activities</li> <li>• Bush medicine</li> <li>• Exercise program</li> <li>• Yoga</li> <li>• Other (where relevant)</li> </ul>
Cultural programs	<ul style="list-style-type: none"> <li>• Cultural programs</li> <li>• Other (where relevant)</li> </ul>
One-on-one support	<ul style="list-style-type: none"> <li>• Caseworker support</li> <li>• One-on-one counselling, over video</li> <li>• One-on-one counselling, online</li> <li>• One-on-one counselling, face-to-face</li> <li>• Quitline</li> <li>• Other (where relevant)</li> </ul>
Self-directed support	<ul style="list-style-type: none"> <li>• QuitCoach</li> <li>• Phone app</li> <li>• Text message support</li> <li>• Other (where relevant)</li> </ul>
Cessation support	<ul style="list-style-type: none"> <li>• Free nicotine replacement therapy mailed out</li> <li>• Other (where relevant)</li> </ul>
Incentives	<ul style="list-style-type: none"> <li>• Incentives</li> <li>• Other (where relevant)</li> </ul>

NRT = nicotine replacement therapy. ◆

Stata 16 (StataCorp). Demographic and smoking characteristics were quantified for the full sample. Distribution of participants by preferred strategy (by broad categorisation groups, both any preference and first preference), preferred support provider, and preferred support location were examined.

Prevalence ratios (PRs) and 95% confidence intervals (CIs) for preferred support program (any preference only), support provider and support location by demographic and smoking characteristics were calculated using log binomial regression. Choice of doctor, nurse or midwife as preferred support provider, and choice of support location as online or over the phone were combined for the regression analysis. Choices made by fewer than 10% of participants were not explored in the regression analysis. As this analysis was exploratory in nature and as directed by the Which Way? governance committee (consistent with ethical practice), no additional factors were adjusted for in the models.

Participants were excluded from all analyses if they did not meet the inclusion criteria (determined in initial screening questions of the survey), specifically: Aboriginal and/or Torres Strait Islander woman, reproductive age (16–49 years), and a current or ex-smoker. An alpha level of 0.05 was the threshold for statistical significance (significance level).

## Ethics approval

The Which Way? study was developed by, and is co-owned with, Aboriginal communities in regional and urban NSW. The project upholds ethics principles of research with Aboriginal and Torres Strait Islander peoples. Ethics approvals were obtained from

the Aboriginal Health and Medical Research Council (1603/19) and the University of Newcastle (H-2020-0092). All participants provided informed consent.

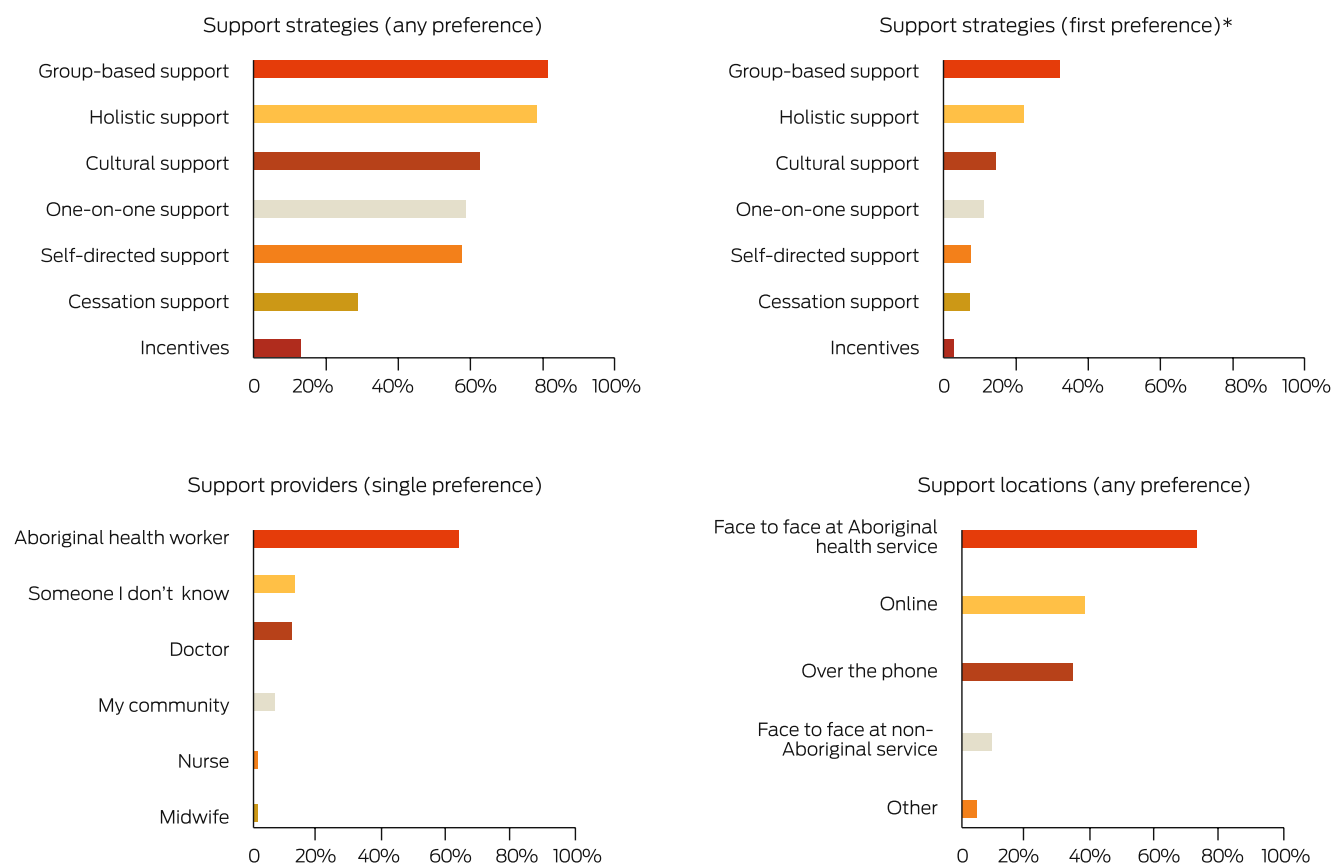
## Results

The sample demographics are detailed elsewhere in this supplement.<sup>13</sup> A total of 428 Aboriginal and Torres Strait Islander women with a mean age of 30.5 years completed the survey and were included in the analyses. Half resided in urban areas (49.5%). Most participants reported using an AHS (70.6%), and about two-thirds of participants (62.9%) were current smokers.

When asked to select all the support strategies that they thought would help Aboriginal and Torres Strait Islander women quit smoking, five of seven broad categories (group-based support, holistic support, cultural programs, one-on-one support, and self-directed support) were chosen by more than half of the participants (57.2% to 80.8%) (Box 2). When selecting first preferences (ie, the most helpful strategy), more than half chose group-based support or holistic support programs (31.8% and 22.2% of participants, respectively) (Box 2).

Interpretation of incentives, chosen by 12.6% of women, differed considerably. Based on responses to an open-ended question within the survey (data not shown), participants considered incentives to be a variety of motivations including activity-based rewards, financial incentives, tangible goods (eg, merchandise), incremental rewards, or assistance with saving and tracking money saved from no longer buying cigarettes.

### 2 Participants' preferences for support strategies, support providers and support locations (n = 428)\*



\* Data on first preference of support strategy were missing for 20 participants. ♦

**3 Associations between demographic and smoking characteristics and support preferences of women who participated in the Which Way? survey (n = 428)**

	Group-based support		Holistic support		Cultural programs		Self-directed support		One-on-one support		Cessation support		Incentives	
	Percentage (95% CI)	PR (95% CI)	Percentage (95% CI)	PR (95% CI)	Percentage (95% CI)	PR (95% CI)	Percentage (95% CI)	PR (95% CI)	Percentage (95% CI)	PR (95% CI)	Percentage (95% CI)	PR (95% CI)	Percentage (95% CI)	PR (95% CI)
<b>Age</b>														
16–20 years	93.4% (87.2–99.7%)	1 (Ref)	82.0% (72.3–91.6%)	1 (Ref)	65.6% (53.6–77.5%)	1 (Ref)	47.5% (35.0–60.1%)	1 (Ref)	60.7% (48.4–72.9%)	1 (Ref)	9.8% (2.3–17.3%)	1 (Ref)	16.4% (1.6–4.8%)	1 (Ref)
21–34 years	78.4% (73.0–83.9%)	0.84 (0.76–0.92)	78.4% (73.0–83.9%)	0.96 (0.83–1.10)	61.0% (54.5–67.5%)	0.93 (0.75–1.15)	59.8% (52.6–65.7%)	1.24 (0.94–1.66)	57.8% (51.2–64.4%)	0.95 (0.76–1.20)	27.5% (21.6–33.5%)	2.80 (1.27–6.16)	11.9% (7.6–16.2%)	7.28 (1.01–52.54)
35–49 years	79.2% (72.7–85.7%)	0.85 (0.76–0.94)	76.5% (69.7–83.3%)	0.93 (0.81–1.08)	62.4% (54.6–70.2%)	0.95 (0.76–1.19)	58.4% (50.5–66.3%)	1.23 (0.91–1.65)	59.0% (51.1–67.0%)	0.97 (0.76–1.24)	36.9% (29.1–44.7%)	3.75 (1.71–8.25)	18.1% (11.9–24.3%)	11.05 (1.54–79.55)
<b>Remoteness</b>														
Urban	78.8% (73.2–84.3%)	1 (Ref)	80.2% (74.8–85.6%)	1 (Ref)	63.7% (57.2–70.2%)	1 (Ref)	61.8% (55.2–68.4%)	1 (Ref)	59.0% (52.3–65.6%)	1 (Ref)	33.5% (27.1–39.9%)	1 (Ref)	14.2% (9.4–18.9%)	1 (Ref)
Regional or remote	82.9% (77.8–87.9%)	1.05 (0.96–1.15)	76.4% (70.7–82.1%)	0.95 (0.86–1.05)	60.6% (54.1–67.2%)	0.95 (0.82–1.10)	52.8% (46.1–59.5%)	0.85 (0.72–1.01)	58.3% (51.7–64.9%)	0.99 (0.84–1.16)	23.1% (17.5–28.8%)	0.69 (0.51–0.94)	11.1% (6.9–15.3%)	0.79 (0.48–1.30)
<b>Education</b>														
Up to year 11	81.4% (75.3–87.4%)	1 (Ref)	80.7% (74.6–86.9%)	1 (Ref)	57.8% (50.1–65.4%)	1 (Ref)	53.4% (45.7–61.1%)	1 (Ref)	54.7% (46.9–62.4%)	1 (Ref)	28.0% (21.0–34.9%)	1 (Ref)	9.3% (4.8–13.8%)	1 (Ref)
Year 12, or current student or apprentice	82.8% (77.1–88.5%)	1.02 (0.92–1.13)	76.9% (70.6–83.3%)	0.95 (0.85–1.07)	66.9% (59.7–74.0%)	1.16 (0.98–1.37)	57.4% (49.9–64.9%)	1.07 (0.88–1.30)	58.0% (50.5–65.5%)	1.06 (0.88–1.28)	26.7% (19.9–33.3%)	0.95 (0.67–1.36)	8.3% (4.1–12.5%)	0.89 (0.44–17.8)
Degree or trade certificate	76.5% (68.1–84.9%)	0.94 (0.82–1.07)	76.5% (68.1–84.9%)	0.95 (0.83–1.08)	61.2% (51.6–70.9%)	1.06 (0.86–1.30)	63.3% (53.7–72.8%)	1.18 (0.96–1.46)	66.3% (56.9–75.7%)	1.21 (0.99–1.48)	31.6% (22.4–40.9%)	1.13 (0.77–1.66)	25.5% (16.9–34.2%)	2.74 (1.52–4.93)
<b>Aboriginal health service used</b>														
No	78.6% (71.4–85.8%)	1 (Ref)	71.4% (63.5–79.3%)	1 (Ref)	57.9% (49.3–66.6%)	1 (Ref)	61.9% (53.4–70.4%)	1 (Ref)	59.5% (50.9–68.1%)	1 (Ref)	28.6% (20.7–36.5%)	1 (Ref)	11.1% (5.6–16.6%)	1 (Ref)
Yes	81.8% (77.4–86.2%)	1.04 (0.94–1.16)	81.1% (76.7–85.6%)	1.14 (1.00–1.28)	63.9% (58.5–69.3%)	1.10 (0.93–1.31)	55.3% (49.7–61.0%)	0.89 (0.75–1.06)	58.2% (52.7–63.9%)	0.98 (0.82–1.16)	28.1% (23.1–33.2%)	0.99 (0.71–1.37)	13.2% (9.4–17.1%)	1.19 (0.67–2.11)
<b>Smoking status</b>														
Ex-smoker	84.2% (78.5–89.9%)	1 (Ref)	76.6% (70.0–83.2%)	1 (Ref)	68.4% (61.1–75.6%)	1 (Ref)	53.8% (46.0–61.6%)	1 (Ref)	62.0% (54.4–69.6%)	1 (Ref)	27.8% (20.8–34.9%)	1 (Ref)	14.6% (9.0–20.1%)	1 (Ref)
Current smoker	78.9% (74.0–83.8%)	0.94 (0.86–1.03)	79.3% (74.4–84.1%)	1.03 (0.93–1.15)	58.5% (52.6–64.4%)	0.86 (0.74–0.99)	59.3% (53.4–65.1%)	1.10 (0.92–1.31)	56.7% (50.7–62.6%)	0.91 (0.78–1.07)	28.5% (23.1–33.9%)	1.02 (0.75–1.40)	11.5% (7.7–15.3%)	0.79 (0.48–1.30)
<b>HSI score</b>														
Low	75.8% (69.5–82.2%)	1 (Ref)	79.2% (73.2–85.2%)	1 (Ref)	59.0% (51.7–66.2%)	1 (Ref)	56.1% (48.9–63.5%)	1 (Ref)	56.2% (48.9–63.5%)	1 (Ref)	25.8% (19.4–32.3%)	1 (Ref)	9.0% (4.8–13.2%)	1 (Ref)
Moderate or high	85.7% (78.5–92.9%)	1.13 (1.00–1.27)	79.1% (70.7–87.5%)	1.00 (0.88–1.14)	58.2% (48.1–68.4%)	0.99 (0.80–1.22)	64.8% (55.0–74.7%)	1.15 (0.95–1.41)	58.2% (48.1–68.4%)	1.04 (0.83–1.29)	34.1% (24.3–43.8%)	1.32 (0.90–1.93)	16.5% (8.8–24.1%)	1.83 (0.95–3.54)

Continues

**1 (Continued)**

	Group-based support		Holistic support		Cultural programs		Self-directed support		One-on-one support		Cessation support		Incentives	
	Percentage (95% CI)	PR (95% CI)	Percentage (95% CI)	PR (95% CI)	Percentage (95% CI)	PR (95% CI)	Percentage (95% CI)	PR (95% CI)	Percentage (95% CI)	PR (95% CI)	Percentage (95% CI)	PR (95% CI)	Percentage (95% CI)	PR (95% CI)
<b>Smoking intensity</b>														
1-5 CPD	75.9% (66.8-84.9%)	1 (Ref)	81.6% (73.4-89.8%)	1 (Ref)	57.5% (47.0-67.9%)	1 (Ref)	60.9% (50.6-71.2%)	1 (Ref)	54.0% (43.5-64.5%)	1 (Ref)	13.8% (6.5-21.1%)	1 (Ref)	4.6% (0.2-9.0%)	1 (Ref)
6-10 CPD	78.3% (69.8-86.7%)	1.03 (0.88-1.21)	75.0% (66.1-83.9%)	0.92 (0.79-1.07)	59.8% (49.7-69.8%)	1.04 (0.81-1.33)	53.2% (43.0-63.5%)	0.87 (0.68-1.13)	55.4% (45.2-65.6%)	1.03 (0.79-1.34)	28.3% (19.0-37.5%)	2.05 (1.10-3.80)	8.7% (2.9-14.5%)	1.89 (0.59-6.06)
≥11 CPD	83.3% (75.6-91.1%)	1.10 (0.95-1.28)	81.1% (73.0-89.2%)	0.99 (0.86-1.14)	58.9% (48.7-69.1%)	1.02 (0.80-1.32)	63.3% (53.3-73.3%)	1.04 (0.83-1.31)	61.1% (51.0-71.2%)	1.13 (0.88-1.46)	43.3% (33.0-53.6%)	3.14 (1.77-5.59)	21.1% (12.6-29.6%)	4.59 (1.63-12.95)
<b>Urge frequency</b>														
Low	74.6% (67.5-81.8%)	1 (Ref)	76.1% (69.0-83.1%)	1 (Ref)	59.2% (51.0-67.3%)	1 (Ref)	57.0% (48.9-65.2%)	1 (Ref)	57.7% (49.6-65.9%)	1 (Ref)	24.6% (17.5-31.8%)	1 (Ref)	10.6% (5.5-15.6%)	1 (Ref)
High	84.3% (77.9-90.6%)	1.13 (≤ 1.00-1.27)	82.7% (76.0-89.3%)	1.09 (0.96-1.23)	58.3% (49.7-66.9%)	0.99 (0.81-1.20)	61.4% (52.9-69.9%)	1.08 (0.88-1.31)	55.9% (47.2-64.6%)	0.97 (0.79-1.19)	33.1% (24.9-41.3%)	1.34 (0.92-1.96)	12.6% (6.8-18.4%)	1.19 (0.61-2.31)
<b>Urge strength</b>														
Low	75.7% (68.8-82.5%)	1 (Ref)	80.9% (74.6-87.2%)	1 (Ref)	61.8% (54.1-69.6%)	1 (Ref)	58.6% (50.7-66.4%)	1 (Ref)	58.6% (50.7-66.4%)	1 (Ref)	23.7% (16.9-30.5%)	1 (Ref)	9.9% (5.1-14.6%)	1 (Ref)
High	83.8% (77.0-90.5%)	1.11 (0.98-1.25)	76.9% (69.3-84.6%)	0.95 (0.84-1.08)	54.7% (45.6-63.8%)	0.88 (0.72-1.09)	59.8% (50.9-68.8%)	1.02 (0.84-1.25)	54.7% (45.6-63.8%)	0.93 (0.76-1.16)	35.0% (26.4-43.7%)	1.48 (1.01-2.16)	13.7% (7.4-19.9%)	1.39 (0.71-2.69)

CPD = cigarettes per day. HSI = Heaviness of Smoking Index. PR = prevalence ratio. Ref = reference category. ♦

About two-thirds of women (64.3%) chose Aboriginal health worker as their preferred provider of cessation support (Box 2). Clinical support providers (doctors, nurses and midwives) were chosen by a total of 15.6% of women, 12.9% of women chose someone they did not know, and 7.2% of women chose their own community. Support provided face to face at an AHS was selected by 73.4% of women (Box 2). Online support was preferred by 38.8% of participants, and 34.8% of women preferred support over the phone. Face-to-face support with a non-Aboriginal service was preferred by 9.4% of participants, and 5.1% of participants preferred support provided at a different location, which included support provided at their own home with family or local groups.

Associations between demographic and smoking characteristics and support preferences are provided in Box 3. A higher percentage of older women considered cessation support (PR, 3.75 [95% CI, 1.71–8.25]) and incentives (PR, 11.05 [95% CI, 1.54–79.55]) helpful compared with women in the youngest age group, but a lower percentage considered group-based support helpful (PR, 0.85 [95% CI, 0.76–0.94]). The prevalence of considering incentives helpful was almost three times (PR, 2.74 [95% CI, 1.52–4.93]) as high for women with a degree or a trade certificate compared with women who had completed up to year 11. Fewer women in regional and remote areas considered cessation support helpful compared with women in urban areas (PR, 0.69 [95% CI, 0.51–0.94]). Choice of holistic support programs was 14% higher (PR, 1.14 [95% CI,  $\geq 1.00$ –1.28]) in women who reported using an AHS compared with those who did not.

Compared with ex-smokers, a lower percentage of current smokers considered cultural programs helpful (PR, 0.86 [95% CI, 0.74–0.99]). High smoking intensity ( $\geq 11$  CPD) and high urge strength were positively associated with choosing cessation support (PR, 3.14 [95% CI, 1.77–5.59] and 1.48 [95% CI, 1.01–2.16], respectively). Women with higher Heaviness of Smoking Index scores had a 13% higher prevalence (PR, 1.13 [95% CI,  $\geq 1.00$ –1.27]) of considering group-based support helpful, compared with women with lower Heaviness of Smoking Index scores. The percentage of women who considered incentives helpful was over four times as high among those who smoked  $\geq 11$  CPD compared with those smoking 0–5 CPD (PR, 4.59 [95% CI, 1.63–12.95]).

Older women ( $\geq 35$  years) were 1.7 times more likely to prefer support provided online or over the phone (PR, 1.70 [95% CI, 1.03–2.80]) than younger women (16–20 years), and a lower percentage of older women preferred support provided face to face at an AHS (PR, 0.84 [95% CI, 0.72–0.99]) compared with younger women (16–20 years). Among women who reported using an AHS compared with women who did not, the prevalence of selecting an Aboriginal health worker as preferred support provider was 35% higher (PR, 1.35 [95% CI, 1.12–1.62]) and the prevalence of selecting face-to-face support at an AHS was 28% higher (PR, 1.28 [95% CI, 1.10–1.49]). Using an AHS was inversely associated with choice of someone unknown as a support provider (PR, 0.47 [95% CI, 0.29–0.76]). Compared with ex-smokers, a lower percentage of current smokers preferred face-to-face support at an AHS (PR, 0.86 [95% CI, 0.77–0.96]). High urge frequency was positively associated with choosing an Aboriginal health worker as a support provider (PR, 1.22 [95% CI, 1.01–1.47]) (Supporting Information, Table 1 and Table 2).

## Discussion

Aboriginal and Torres Strait Islander women who smoke want to quit. They consider smoking cessation support acceptable and of interest, and prefer a range of support options. For five of the

seven broad categories of support, at least half of participants indicated that they thought the strategy would be helpful. There was no clear first preference of program, but the most frequently chosen program type was group-based support, which was selected by about one-third of women. However, preferences varied when considering age, remoteness, nicotine dependence, and use of an AHS.

Over three-quarters of women considered holistic support to be helpful. This included yoga and exercise, which has been reported to provide moderate effectiveness in short term smoking cessation outcomes when used to complement behavioural therapy in the general population.<sup>14,15</sup> However, this requires exploration within Indigenous contexts. Holistic supports also incorporated art activities, which have also been reported as being useful in the development of community-relevant Aboriginal tobacco campaigns.<sup>16</sup> A recent pilot program with Aboriginal and Torres Strait Islander women during pregnancy also showed that the incorporation of art activities with men's and women's groups was meaningful to participants.<sup>17</sup> However, details of these activities and their effectiveness have not been reported. Women in our study reported culture as being important. Culture is broadly acknowledged as a protective factor for health and wellbeing, but it is not yet known if this can specifically support smoking cessation.<sup>18,19</sup> In our study, cultural programs were more likely to be selected by ex-smokers. While it is not clear whether cultural programs are desired by ex-smokers to support quitting or to sustain cessation, there are opportunities for health messaging that incorporates culture and cultural practices to empower smoke-free behaviour.

Overseas, group-based smoking cessation support has been shown to be feasible, effective, and cost-effective.<sup>20–23</sup> However, there is limited evidence on the components and fidelity of an effective program.<sup>20</sup> In a maternal smoking cessation program with Aboriginal and Torres Strait Islander women, support groups had challenges such as transport, and the program's evaluation provided limited evidence on effectiveness.<sup>24</sup>

Experts have explored smoking cessation incentives with concerns about low evidence of effectiveness, the associated shame and stigma, and unethical exploitation of economic desperation.<sup>25</sup> While two recent interventions with Aboriginal and Torres Strait Islander women have incorporated incentives,<sup>17,24</sup> and a recent international Cochrane review concluded that financial incentives improve smoking cessation rates at long term follow-up,<sup>26</sup> few women in our study wanted incentives. In addition, they did not consistently interpret incentives as financial rewards. Notably, incentives were more likely to be selected by women with a degree or trade certificate, which may challenge incentive-associated economic desperation concerns.<sup>25</sup> Regardless, these findings highlight that other strategies may be preferred by Aboriginal and Torres Strait Islander women who may experience higher levels of socio-economic disadvantage.

Aboriginal and Torres Strait Islander women in our study want support to quit smoking in a variety of ways. About two-thirds of surveyed women (64.3%) wanted this support from their Aboriginal health worker, while others preferred their clinical support provider, their community, or someone they did not know. A range of support settings were appropriate and of interest to Aboriginal and Torres Strait Islander women in this study; face-to-face support at an AHS was preferred by most (73.4%), and just over one-third of women selected phone and online support. This study provides further evidence that there is no one-size-fits-all approach to culturally appropriate cessation care; women have different needs and preferences at different times.

Our findings show that AHSs are the preferred health provider for most Aboriginal and Torres Strait Islander women. This coincides with evidence that AHSs are well placed to mitigate and overcome the social and cultural determinants of health that impede access to health care.<sup>27</sup> We found that Aboriginal and Torres Strait Islander women who already use an AHS were more likely to select an Aboriginal health worker as their preferred provider for cessation support, and for this to be face to face at an AHS. This is likely due to positive community perceptions of AHSs,<sup>28</sup> including community ownership of programs and supports,<sup>29</sup> as well as women having established relationships with their health providers that could facilitate continuity of care during pregnancy, helping to embed smoking cessation care.

A suite of options for smoking cessation care is needed, as opportunities and access will vary between women and over time (before, during and after pregnancy). While Aboriginal and Torres Strait Islander-specific services may be preferred by most women, all health professionals should proactively offer support for quitting to Aboriginal and Torres Strait Islander women who smoke, consistent with clinical guidelines. Further, it is not always possible for women to attend their AHS, particularly during pregnancy, and women may receive health care from multiple providers.

## Conclusion

Aboriginal and Torres Strait Islander women who smoke want to quit. They are interested in a range of smoking cessation support strategies and want to receive support from a variety of health care providers. There is an opportunity to foster smoke-free pregnancies by systematically providing cessation services that cover the pre-conception, pregnancy, and post-partum periods, which should be embedded into clinical practice and health care delivery. Appropriate models of care, including funding for AHSs and Aboriginal health workers — in both mainstream health services and AHSs — are urgently required and should be developed in partnership with Aboriginal and Torres Strait Islander communities. This will help to decrease the burden of tobacco-related morbidity and mortality, improving health outcomes and reducing strain on the health care system. Aboriginal and Torres Strait Islander people require a health care system that provides culturally responsive care that meets the needs of women, families, communities and future generations.

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- 1 Australian Institute of Health and Welfare. Australia's mothers and babies. Canberra: AIHW, 2021. (AIHW Cat. No. PER 101.) <https://www.aihw.gov.au/reports/mothers-babies/australias-mothers-babies/contents/about> (viewed Nov 2021).
- 2 Boyle J, Eades S. Closing the gap in Aboriginal women's reproductive health: some progress, but still a long way to go. *Aust N Z J Obstet Gynaecol* 2016; 56: 223-224.
- 3 Zwar NA, Mendelsohn CP, Richmond RL. Supporting smoking cessation. *BMJ* 2014; 348: f7535.
- 4 Lindson N, Pritchard G, Hong B, et al. Strategies to improve smoking cessation rates in primary care. *Cochrane Database Syst Rev* 2021; (9): CD011556.
- 5 Royal Australian College of General Practitioners. Supporting smoking cessation: a guide for health professionals. Melbourne: RACGP, 2021. <https://www.racgp.org.au/clinical-resources/clinical-guidelines/key-racgp-guidelines/view-all-racgp-guidelines/supporting-smoking-cessation> (viewed Nov 2021).
- 6 Hartmann-Boyce J, Hong B, Livingstone-Banks J, et al. Additional behavioural support as an adjunct to pharmacotherapy for smoking cessation. *Cochrane Database Syst Rev* 2019; (6): CD009670.
- 7 Khan A, Green K, Khandaker G, et al. The impact of a regional smoking cessation program on referrals and use of Quitline services in Queensland, Australia: a controlled interrupted time series analysis. *Lancet Reg Health West Pac* 2021; 14: 100210.
- 8 Barnett A, Ding H, Hay KE, et al. The effectiveness of smartphone applications to aid smoking cessation: a meta-analysis. *Clin eHealth* 2020; 3: 69-81.
- 9 Whittaker R, McRobbie H, Bullen C, et al. Mobile phone text messaging and app-based interventions for smoking cessation. *Cochrane Database Syst Rev* 2019; (10): CD006611.
- 10 Taylor GMJ, Dalili MN, Semwal M, et al. Internet-based interventions for smoking cessation. *Cochrane Database Syst Rev* 2017; (9): CD007078.
- 11 Bovill M, Chamberlain C, Bennett J, et al. Building an Indigenous-led evidence base for smoking cessation care among Aboriginal and Torres Strait Islander women during pregnancy and beyond: research protocol for the Which Way? project. *Int J Environ Res Public Health* 2021; 18: 1342.
- 12 Smith LT. Decolonizing methodologies: research and indigenous peoples. London: Zed Books, 1999.
- 13 Kennedy M, Barrett E, Heris C, et al. Smoking and quitting characteristics of Aboriginal and Torres Strait Islander women of reproductive age: findings from the Which Way? study. *Med J Aust* 2022; 217 (2 Suppl): S6-S18.
- 14 Bock BC, Fava JL, Gaskins R, et al. Yoga as a complementary treatment for smoking cessation in women. *J Womens Health (Larchmt)* 2012; 21: 240-248.
- 15 Marcus BH, Lewis BA, Hogan J, et al. The efficacy of moderate-intensity exercise as an aid for smoking cessation in women: a randomized controlled trial. *Nicotine Tob Res* 2005; 7: 871-880.
- 16 Giles L, Bauer L. Working towards a tobacco-free Aboriginal community through an arts-based intervention. *Australian Indigenous Health Bulletin* 2019; 19 (4). <http://healthbulletin.org.au/articles/working-towards-a-tobacco-free-aboriginal-community-through-an-arts-based-intervention> (viewed Nov 2021).
- 17 Askew DA, Guy J, Lyall V, et al. A mixed methods exploratory study tackling smoking during pregnancy in an urban Aboriginal and Torres Strait Islander primary health care service. *BMC Public Health* 2019; 19: 343.
- 18 Hunter S-A, Skouteris H, Morris H. A conceptual model of protective factors within Aboriginal and Torres Strait Islander culture that build strength. *J Cross Cult Psychol* 2021; 52: 726-751.
- 19 Thurber KA, Banks E, Joshy G, et al. Tobacco smoking and mortality among Aboriginal and Torres Strait Islander adults in Australia. *Int J Epidemiol* 2021; 50: 942-954.
- 20 Stead LF, Carroll AJ, Lancaster T. Group behaviour therapy programmes for smoking cessation. *Cochrane Database Syst Rev* 2017; (3): CD001007.
- 21 Valera P, Acuna N, Vento I. The preliminary efficacy and feasibility of group-based smoking cessation treatment program for incarcerated smokers. *Am J Mens Health* 2020; 14: 1557988320943357.
- 22 Kotsen C, Santorelli ML, Bloom EL, et al. A narrative review of intensive group tobacco treatment: clinical, research, and US policy recommendations. *Nicotine Tob Res* 2018; 21: 1580-1589.
- 23 Bauld L, Boyd KA, Briggs AH, et al. One-year outcomes and a cost-effectiveness analysis for smokers accessing group-based and pharmacy-led cessation services. *Nicotine Tob Res* 2011; 13: 135-145.
- 24 Passey ME, Stirling JM. Evaluation of 'Stop Smoking in its Tracks': an intensive smoking cessation program for pregnant Aboriginal women

- incorporating contingency-based financial rewards. *Public Health Res Pract* 2018; 28: 28011804.
- 25 Hefler M, Thomas D. The use of incentives to stop smoking in pregnancy among Aboriginal and Torres Strait Islander women. Melbourne: Lowitja Institute, 2013. <https://www.lowitja.org.au/page/services/resources/Cultural-and-social-determinants/alcohol-and-other-drugs/Pregnancy-Incentives> (viewed Nov 2021).
- 26 Notley C, Gentry S, Livingstone-Banks J, et al. Incentives for smoking cessation. *Cochrane Database Syst Rev* 2019; (7): CD00430.
- 27 Davy C, Harfield S, McArthur A, et al. Access to primary health care services for Indigenous peoples: a framework synthesis. *Int J Equity Health* 2016; 15: 163.
- 28 Baba JT, Brolan CE, Hill PS. Aboriginal medical services cure more than illness: a qualitative study of how Indigenous services address the health impacts of discrimination in Brisbane communities. *Int J Equity Health* 2014; 13: 56.
- 29 Smylie J, Kirst M, McShane K, et al. Understanding the role of Indigenous community participation in Indigenous prenatal and infant-toddler health promotion programs in Canada: a realist review. *Soc Sci Med* 2016; 150: 128-143. ■

## Supporting Information

Additional Supporting Information is included with the online version of this article.