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BRIEF COMMUNICATION

Bridging the gap in sleep health: a study of obstructive sleep apnoea (OSA) in First Nations Australians residing in South East Queensland

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Abstract

Obstructive sleep apnoea (OSA) is common in Australia but underexamined among First Nations peoples. We conducted a retrospective cross-sectional analysis of 1563 adult sleep studies in South East Queensland (2022–2023). Thirty-eight participants (2.4%) identified as First Nations, of whom 74% had OSA. Comorbidities were more frequent among the First Nations cohort, though small sample size limited certainty. These findings reveal both under-identification of First Nations status and a substantial OSA burden, emphasising the need for culturally informed, community-led approaches to OSA care in Queensland.

Obstructive sleep apnoea (OSA), characterised by intermittent upper airway obstruction during sleep, results in intermittent hypoxia, sleep fragmentation and sympathetic activation. It is associated with numerous comorbidities, including hypertension, cardiovascular disease, diabetes, depression and adverse socioeconomic consequences, including increased healthcare utilisation and workplace incidents. The estimated prevalence of OSA in Australia ranges from 9% to 38%, depending on diagnostic criteria and population studied.[1] First Nations Australians experience a disproportionate burden of chronic disease and reduced life expectancy,[2–4] with a higher prevalence of OSA,[5,6] which may compound other chronic conditions and contribute to health disparities. Unfortunately, OSA remains underdiagnosed and under-researched among First Nations communities[7,8] who may present with distinct clinical profiles, symptom perception, anthropometric risk factors and comorbidity patterns that are not fully captured by standard OSA screening tools.[9–11]

We conducted a retrospective cross-sectional study of adults (≥18 years) referred for diagnostic sleep studies to Gold Coast University Hospital (public tertiary centre) and mySleep® Upper Mount Gravatt (private, community-based service), over a 12-month period between 2022 and 2023. Inclusion of both public and private services enabled assessment across different healthcare sectors. Data collected included demographics, anthropometric measures, documented comorbidities, Epworth Sleepiness Scale scores (ESS) and polysomnographic parameters. The study received ethics approval from the Gold Coast Hospital and Health Service (GCHHS) Human Research Ethics Committee (HREC-GC-123456). Descriptive statistics were used to summarise the characteristics of participants who self-identified as First Nations or Caucasian. Caucasian participants were selected as the comparator group because most widely used OSA screening instruments, clinical risk scores and funding eligibility model have been derived from Caucasian population data, allowing results to be interpreted in the context of existing frameworks. Continuous data are presented as means and standard deviations if normally distributed or medians with interquartile ranges (25th and 75th percentiles) for non-normally distributed variables. Categorical variables are presented as frequencies and percentages. Between-group comparisons were performed using chi-squared tests (when expected frequency ≥ 5 in each cell) or Fisher's exact tests (when expected frequency < 5 in

each cell) for categorical data, and Mann–Whitney U tests or t-tests for continuous variables, as appropriate. Statistical significance was defined as $P < 0.05$.

Of the 1563 patients referred for diagnostic sleep studies during the study period, 38 (2.4%) identified as First Nations Australians. OSA was diagnosed in 28 (74%, $n = 38$) First Nations patients, with a comparable distribution of severity: 26.3% no OSA, 26.3% mild, 26.3% moderate and 21.1% severe. Comorbidities such as hypertension (37% vs 31%, $P = 0.52$), chronic lung diseases (29% vs 22%, $P = 0.32$) and coronary heart disease (11% vs 6%, $P = 0.24$) were numerically more prevalent in the First Nations cohort. Polysomnographic measures, including nadir oxygen saturation and sleep efficiency, were similar. Non-supine Apnoea-Hypopnoea Index (AHI) was lower in the First Nations cohort (median 5.5 vs 8.0 events/h, $P = 0.03$), though this difference is likely of limited clinical significance. Table 1 summarises the clinical features of First Nations and Caucasian cohorts. Among patients with moderate to severe OSA (AHI ≥15), no significant differences were observed in anthropometrics, ESS, hypertension or gender between First Nations and Caucasian cohorts as shown in Table 2. A trend toward lower weight was noted in First Nations patients.

Discussion

Our study demonstrates a higher burden of OSA among First Nations Australians referred for diagnostic sleep studies, consistent with previous reports.[5,6] We observed OSA in 74% of First Nations patients, comparable to 76% reported by Lindfield *et al.*[12] and lower than the ~89% reported by Heraganahally *et al.*, who studied a

Table 1 Demographic, anthropometric and clinical characteristics of First Nations and Caucasian cohorts

Characteristic	All cohorts ($N = 1563$)	Caucasians ($N = 1525$)	First Nations ($N = 38$)	P-value
Gender (Female), *n* (%)	635 (40.6%)	615 (40.3%)	20 (52.6%)	0.13
Age, mean (SD), years	51.7 (15.3)	51.7 (15.2)	51.6 (17.5)	0.97
Weight, median (IQR), kg	96.4 (84.4–113.4)	96.4 (84.3–113.5)	95.0 (85.05–109.2)	0.84
Height, mean (SD), cm	173.3 (0.1)	173.3 (0.1)	170.5 (9.1)	0.07
Body mass index, median (IQR), kg/m^2	32.1 (27.9–37.3)	32.0 (27.9–37.3)	32.7 (29.2–36.3)	0.40
Neck circumference, mean (SD), cm	41.5 (4.8)	41.5 (4.8)	41.5 (4.4)	0.89
Epworth Sleepiness Scale (ESS)				0.49
<12, *n* (%)	877 (56%)	855 (56%)	22 (58%)	
12–15, *n* (%)	350 (22%)	344 (23%)	6 (16%)	
≥16, *n* (%)	319 (20%)	309 (20%)	10 (26%)	
Missing, *n* (%)	17 (1%)	17 (1%)	0 (0%)	
Smoking status, *n* (%)				0.19
Never	821 (53%)	805 (53%)	16 (42%)	
Current or ex-smoker	742 (47%)	720 (47%)	22 (58%)	
Obstructive sleep apnoea (OSA), n (%)				0.21
Normal (<5.0/h)	243 (16%)	233 (16%)	10 (26%)	
Mild (5.0–14.9/h)	497 (32%)	487 (32%)	10 (26%)	
Moderate (15.0–29.9/h)	356 (23%)	346 (23%)	10 (26%)	
Severe (≥30.0/h)	467 (30%)	459 (30%)	8 (21%)	
Nadir SpO2, median (IQR), %	83.0 (78.0–87.0)	83.0 (78.0–87.0)	83.0 (80.0–86.75)	0.90
Supine AHI, median (IQR), events/h	28.0 (10.0–59.0)	28.0 (10.0–59.0)	19.8 (3.3–50.0)	0.12
Non-supine AHI, median (IQR), events/h	8.0 (3.0–22.0)	8.0 (3.0–22.3)	5.5 (1.0–12.28)	0.03
Sleep efficiency, median (IQR), %	86.3 (77.0–92.0)	87.0 (77.0–92.0)	85.0 (77.75–93.0)	0.78
Hypertension, *n* (%)	481 (31%)	467 (31%)	14 (37%)	0.52
Ischaemic heart disease, *n* (%)	94 (6%)	90 (6%)	4 (11%)	0.24
Asthma, *n* (%)	274 (18%)	265 (17%)	9 (24%)	0.43
COPD/Bronchitis, *n* (%)	65 (4%)	63 (4%)	2 (5%)	0.67
Stroke/CVA, *n* (%)	40 (3%)	38 (2%)	2 (5%)	0.25
Depression, *n* (%)	442 (28%)	431 (28%)	11 (29%)	0.67
Hypercholesterolaemia, *n* (%)	330 (21%)	322 (21%)	8 (21%)	0.80
Thyroid disorder, *n* (%)	92 (6%)	92 (6%)	0 (0%)	0.26

Note: This table summarises demographic, clinical, and polysomnographic characteristics of all patients referred for sleep studies by First Nation Australian status. Data are presented as mean (standard deviation), median (interquartile range), or number (percentage). Missing data were not included in statistical comparisons. AHI, Apnoea-hypopnoea index; BMI, body mass index; COPD, chronic obstructive pulmonary disease; CVA, cerebrovascular accident; IQR, interquartile range; SD, standard deviation; SpO2, peripheral capillary oxygen saturation.

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Table 2 Comparison of clinical characteristics in patients with moderate to severe OSA (AHI ≥ 15 events/h) by First Nations Australian status

Characteristic	Caucasians ($N = 803$)	First Nations ($N = 18$)	*P*-value
Weight, median (IQR) kg	103.10 (90.95–119.85)	101.85 (85.75–115.97)	0.47
Body mass index, median (IQR) kg/m^2	34.14 (30.20–39.62)	34.45 (28.97–38.69)	0.79
Neck circumference, mean (SD) cm	43.09 (4.74)	42.83 (4.64)	0.89
Gender, *n* (%)			0.80
Female	279 (35%)	7 (39%)	
Male	524 (65%)	11 (61%)	
Epworth Sleepiness Scale (ESS), median (IQR)	11.00 (9.00–14.00)	11.00 (8.25–15.75)	0.80
Hypertension, *n* (%)			0.99
No	502 (62.5%)	11 (61.1%)	
Yes	301 (37.5%)	7 (38.9%)	

Note: This table compares selected clinical and demographic variables in patients diagnosed with moderate to severe obstructive sleep apnoea (AHI ≥ 15 events/h), stratified by First Nations Australian status. Continuous variables are presented as median (first and third quartiles) or mean (for neck circumference). Categorical variables are presented as counts. IQR, interquartile range; SD, standard deviation.

similar clinical cohort utilising more granular OSA classification.[13] This likely reflects structural inequities in sleep healthcare, including reduced community awareness of OSA, limited access to diagnostic services and constrained referral pathways. Importantly, regional demographic and sociocultural differences must be considered when interpreting comparisons across studies, particularly between Northern Territory (NT) and South East Queensland (SEQ) First Nations populations.

First Nations Australians accounted for 2.4% of participants in our cohort, indicating under-representation even relative to local population proportions.[14,15] Aboriginal and/or Torres Strait Islander peoples made up 3.2% of the Gold Coast population and 2.4% of the Upper Mount Gravatt population, both below the Queensland average of 4.6%. Similar under-representation has been reported in other Australian studies.[16] Contributing factors may include geographic isolation, cultural mistrust of healthcare systems, stigma and systemic under-identification of First Nations Australian status in clinical records. However, the implications of under-representation differ by setting: while First Nations people represent a substantial demographic proportion in the NT, they constitute a small minority within urban SEQ. This difference influences service visibility, system responsiveness and opportunities for culturally embedded models of care, with SEQ services potentially 'seeing' fewer First Nations patients and, thus, being less attuned to their specific needs.

Emerging evidence highlights that clinical presentations and polysomnographic characteristics (such as symptom perception and severity) among First Nations Australians may differ from those of the Caucasian population,[9–11] further highlighting the importance of population-specific clinical characterisation. Standard OSA screening tools may inadequately capture the lived experience of First Nations communities and may lack cultural validity, potentially underestimating symptoms or disease severity.

Recent reviews further emphasise that many OSA screening tools were developed in predominantly Caucasian populations and may perform inconsistently across ethnically diverse groups. The Top End Sleepiness Scale (TESS), developed specifically for First Nations Australians, has demonstrated promise through improved cultural relevance and symptom recognition compared with conventional tools.[17,18] Notably, TESS was developed in a NT context characterised by strong cultural continuity and high indigenous language use. Australian Bureau of Statistics (ABS) indicates that Australian Indigenous languages are spoken at home by approximately 58.5% of First Nations people in the NT, compared with only 2.9% in Upper Mount Gravatt and 1.6% on the Gold Coast.[14,15] As language is intrinsically linked to identity, cultural obligation and communication of health concepts, these differences may influence health literacy, symptom perception, help-seeking behaviours and responsiveness to screening tools. While culturally appropriate instruments remain essential, their transferability across regions with distinct linguistic and cultural environments requires careful evaluation.

Refining predictive and assessment tools that account for population-specific factors, such as anthropometric variations and comorbidity patterns, could help reduce diagnosis inequities. In our cohort, we observed a trend toward lower weight among First Nations patients diagnosed with OSA, suggesting that conventional anthropometric thresholds may not adequately reflect disease risk. This aligns with evidence that reliance on fixed body mass index (BMI) cut-offs may contribute to inequitable referral and funding decisions within primary care.[10] This finding has important clinical and policy implications, as current BMI-based criteria used in clinical scoring systems and Medicare eligibility for sleep

studies may not align with the characteristics of First Nations populations. Further investigation into larger cohorts is warranted to confirm this association and to define more appropriate thresholds.

Our polysomnographic analyses revealed broadly similar sleep characteristics between First Nations and Caucasian patients. Compared with the NT cohort,[9,13] the First Nations participants in our study demonstrated lower OSA severity and lower overall AHI, despite broadly similar anthropometric characteristics. These findings underscore that results from predominantly NT-based research may not be directly generalisable to SEQ First Nations populations. Differences are plausibly explained by variation in geography, remoteness and access to healthcare, with delayed referral in remote settings contributing to more advanced disease at presentation. The NT cohort was characterised by younger age, predominantly very remote residence and higher cardiometabolic and respiratory burdens, whereas our study cohort was largely from urban or regional settings and exhibited OSA phenotypes more comparable to the Caucasian population. Differences in cultural context, language environment and socioeconomic conditions are likely to shape clinical presentation and should be explicitly considered in future research and service planning.

Although First Nations participants had a statistically lower non-supine AHI than Caucasian participants, the difference was small and not associated with differences in OSA severity or clinical outcomes, suggesting limited clinical significance. Nevertheless, this finding highlights the potential influence of sleep behaviours, postures and culturally specific sleeping environments, which warrant further investigation.

Previous research has highlighted both the burden and treatable nature of OSA in First Nations populations. Lindfield *et al*. demonstrated substantial improvements in sleep parameters with continuous positive airway pressure (CPAP) therapy,[12] while the A5 study showed that sustained CPAP adherence was achievable when care was delivered through culturally responsive models.[13] Elevated rates of cardiovascular and respiratory disease, including hospitalisation, have also been reported.[2,4,9] The high comorbidity burden observed in our cohort reinforces the importance of recognising OSA as a modifiable contributor to broader health disparities and the need for culturally appropriate strategies to improve identification, assessment and management.

The limitations of our study must be acknowledged. The small number of First Nations participants reduced statistical power, limiting the ability to detect significant differences in clinical and anthropometric characteristics. Patient self-identification of First Nations status may have contributed to under-representation, reflecting broader systemic challenges in accurately and consistently collecting and recording Indigenous status in healthcare datasets. Additionally, our study was limited to two urban SEQ sleep centres, which may not be representative of First Nations patients in rural or remote settings, where access to diagnostic services and the prevalence of comorbidities may differ. Finally, the retrospective study design limited our capacity to contemporaneously consider and address ethical and cultural considerations, which are of particular importance when researching First Nations communities.

Despite these limitations, this study provides important insights into OSA prevalence and comorbidity patterns among First Nations Australians in our region and highlights several avenues for improving care. Strategies to enhance identification, including culturally validated screening tools and improved capture of Indigenous status in healthcare records, are critical. Additionally, community co-design of research and clinical interventions can ensure that programmes are culturally safe, acceptable and effective. Expanding access to diagnostic services in both urban and remote settings, integrating predictive and assessment tools tailored to First Nations populations and addressing broader social determinants of health are all essential to closing the gap in sleep health outcomes.

OSA remains an under-recognised yet significant condition among First Nations Australians. Our findings suggest broadly similar clinical and polysomnographic profiles between First Nations and Caucasian cohorts, albeit with notable under-representation. Addressing the disparity in outcomes requires improved identification, adoption of culturally appropriate screening tools and the design of prospective studies with strong community engagement. Aligning research and service delivery with the Collective Benefit, Authority to Control, Responsibility, and Ethics (CARE) and Findable, Accessible, Interoperable, and Reusable (FAIR) principles will be essential in promoting equitable sleep health outcomes.

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Country, culture and community continue to enrich this region.

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Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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