Which demographic factors influence Pacific women's attendance at colposcopy clinics in New Zealand?

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ABSTRACT

AIM: The aim of this study was to examine the demographic factors associated with attendance at colposcopy clinics among Pacific women following a high-grade cytology in New Zealand.

METHODS: A retrospective cohort study was undertaken of Pacific women following high-grade cytology between January 2010 and December 2015. Univariate and multivariate binary logistic regression was undertaken to assess whether socioeconomic deprivation, age and Pacific ethnicity were associated with colposcopy attendance.

RESULTS: Colposcopy attendance for Pacific women was 84.9% at 90 days and 93.5% at 180 days following referral. Pacific women residing in the most deprived areas were less likely to attend at both 90 days (OR=0.37 95% CI: 0.21–0.67) and 180 days (OR=0.19 95% CI: 0.60–0.63). Older women were more likely to attend their colposcopy appointment at 90 days when compared to the reference group aged <24-years-old. There was no association between Pacific ethnicity and attendance when adjusting for deprivation and age.

CONCLUSIONS: The overall attendance rates for Pacific women were higher than expected. Despite Pacific women engaging with cervical screening, Pacific women living in the most deprived areas were less likely to be seen by colposcopy services following a high-grade cytology. Targeted interventions are required to improve service utilisation and reduce health inequities.

Since New Zealand introduced organised cervical screening in the 1990s, both the incidence and mortality of cervical cancer has reduced significantly.[1] Although high levels of cervical screening coverage are key to reducing the incidence and mortality of cervical cancer, colposcopy follow-up is another essential component of the cervical screening pathway.[2,3] Cancelled or missed colposcopy appointments contribute to the inefficient use of health resources, increased financial costs and longer waiting times.[4] Delayed colposcopic assessment following a high-grade cytology should be minimised to reduce patient anxiety and the risk of adverse outcomes.[2,5] Immediate referral to colposcopy is indicated following a high-grade cytology, and the current National Cervical Screening Programme (NCSP) guidelines recommend that women are seen within 20 working days of receipt of referral.[6]

Pacific women experience considerable disparity accessing colposcopy services in New Zealand: following a high-grade cytology, 25% of Pacific women are not seen by colposcopy clinics within 90 days compared to 8.2% of European/other women. Non-attendance improves at 180 days to 13.3%, but it still remains higher than European/other women, whose non-attendance rate at 180 days is 5.6%.[7] There is no research examining which demographic factors are associated with Pacific women's attendance at colposcopy services,[8] and a better understanding of these factors is required to improve access to colposcopy care and reduce health inequities for Pacific women.

A number of international studies have been undertaken to identify the demographic factors associated with colposcopy non-attendance. Socioeconomic deprivation

has been shown to be associated with non-attendance at colposcopy clinics. A large retrospective cohort study by Douglas et al in the United Kingdom reported that women residing in the most deprived areas and younger women were less likely to attend their colposcopy appointment.[9] A Canadian study reported similar results in regard to socioeconomic deprivation, although they reported that older women aged 60–69 were less likely to attend their colposcopy appointment.[10] These studies offer useful insight, but both used area level income alone to determine deprivation, which has some limitations because a number of factors can influence socioeconomic deprivation. Using income alone can limit the findings.[11] It is unknown whether individual Pacific ethnicity is associated with colposcopy attendance, which raises the question of whether patient information and education programmes need to be tailored to specific groups of Pacific women. Culturally tailored and language-specific cervical screening education programmes have already been successful in engaging Pacific women to participate in cervical screening.[12–14]

The aim of this exploratory study was to evaluate the colposcopy attendance rate of Pacific women following a high-grade cytology, and to examine whether socioeconomic deprivation, age and Pacific ethnicity were associated with attendance at colposcopy clinics. Understanding these factors is important for developing health policy and improving service provision for Pacific women, given the disparity they experience accessing colposcopy services.

Methods

The data were sourced from the NCSP register (NCSP-R). The NCSP-R is a national computer-based database that collects demographic data, cervical screening laboratory information and colposcopy referral and visit data. These data are confidential. All women are placed on the register at the time of cervical screening, but women may choose to opt off the register. Data on all Pacific women with an index high-grade cytology during the period 1 January 2010 and 31 December 2015 were extracted from the NCSP-R. High-grade cytology included atypical squamous cells suspicious for high-grade (ASC-H), high-grade squamous intraepithelial lesion (HSIL), atypical glandular or endocervical cells (AGUS) and adenocarcinoma in situ (AIS).[15] Women with evidence or suspicion of cancer or endometrial abnormalities on cytology were excluded from this study.

Two subsets of data were provided for this study, as it was part of a larger study: (1) women with a histology sample taken at colposcopy and (2) women with no histology taken within 90 days following high-grade cytology. Because this study was examining colposcopy attendance, a review of NCSP-R online screening histories of the women with no histology at 90 days was undertaken to identify women who had been seen by colposcopy clinics within 90 days with no histology sample taken. The retrospective review (described in Figure 1) identified two datasets: (1) women seen within 90 days and (2) women not seen within 90 days.

The index cytology date was defined as the date the high-grade cytology sample was taken. Women were classified according to whether they attended a colposcopy at 90 days and at 180 days after their index cytology report. The 90-day and 180-day time intervals were selected because they are currently used by the NCSP as quality indicators to assess timeliness to assessment.[16]

Age was recorded at the time of the high-grade cytology. Categorical age groups were defined as ≤24 years, 25–34 years, 35–44 years, 45–54 years, 55–64 years and >65 years. The reference age category was selected to take into account the changes in NCSP screening recommendations in New Zealand (eg, cervical screening now commences at aged 25).[17]

Socioeconomic status was based upon domicile at the time of the data extract. The New Zealand Index of Deprivation (NZDep) quintiles relate to the level of deprivation of the neighbourhood in which a woman resides and is a measure of nine factors collected in the national census. These include transport access, home ownership, living space, education, single-parent family, communication, income, employment and benefits. Quintile 1 represents the least deprived 20% of areas, and quintile 5 represents 20% of the most deprived areas.[18]

Women who did not have a deprivation quintile documented were excluded from the deprivation analysis.

Prioritisation level two coded ethnicity data is self-identified and up to three ethnic groups are provided. Prioritisation level two coded ethnicity data was provided so women who identified as both Māori and Pacific could be included. This also allowed for the different Pacific ethnicities, as defined by the Ministry of Health coding, to be identified, so any differences between New Zealand's diverse Pacific communities could be assessed.[19]

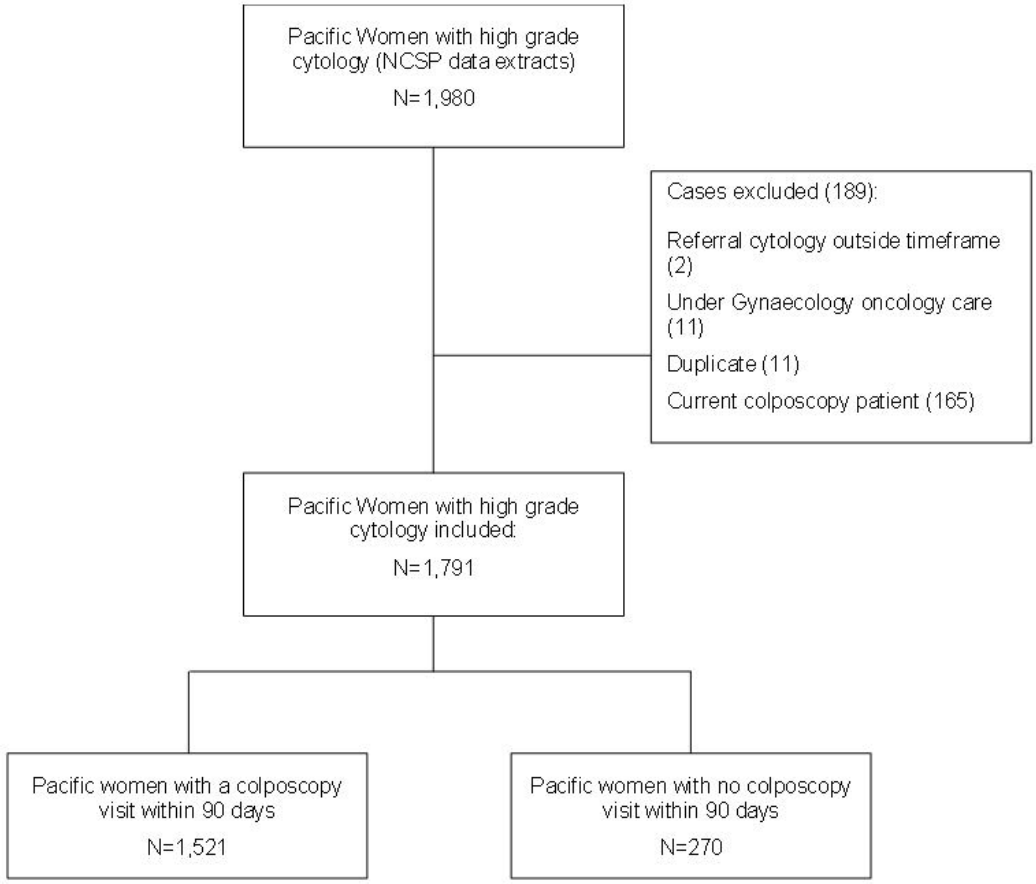
Data was analysed using SPSS (IBM Corporation, New York, USA) version 25 for Mac. Logistic regression was undertaken to regress colposcopy attendance status at 90 day and 180 days against age, NZDep and Pacific ethnicity, prior to and after adjusting each variable. Statistical significance was defined as $p<0.05$ and results were expressed as odds rations (OR) with 95% confidence intervals.

Results

During 2010 and 2015, there were 1,791 Pacific women with a high-grade index cytology recorded on the NCSP-R. Women had a mean age of 34 (standard deviation=12.0) and they typically resided within the two most deprived quintiles (Table 1). At 90 days, 84.9% of Pacific women attended their colposcopy appointment (Table 1). In unadjusted analyses, women in the most deprived quintile had lower odds of attendance at 90 days compared with women in the least deprived quintile (77.0% compared to 90.3%, odds ratio (OR)=0.35, 95% CI: 0.20–0.63). When adjusted for age and Pacific ethnicity in the multivariate model similar results were reported (OR=0.36 95% CI: 0.20–0.66).

Women in the age categories 25–34 years (OR=1.47 95% CI: 1.07–2.01), 35–44 years (OR=2.17 95% CI: 1.43–3.28) and 55–64 years (OR=3.96 95% CI: 1.68-9.33) were more likely to attend within 90 days in the unadjusted

Figure 1: Retrospective cohort dataset assessing Pacific women's colposcopy attendance within 90 days.



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model compared to women in the reference category, aged <24 years. When adjusted for Pacific ethnicity and NZDep, the analysis reported similar results, with women in the age categories 25–34 years (OR=1.48 95% CI: 1.07–2.06), 35–44 years (OR=2.05 95% CI: 1.32–3.17) and 55–64 years (OR=4.34 95% CI: 1.70–11.1) being more likely to attend than the reference group.

Fijian women were more likely to attend their colposcopy appointment at 90 days when compared to the reference group in the unadjusted model (OR=1.92 95% CI: 1.12–3.30). However, the multivariate model showed there was no association with Pacific ethnicity and attendance when adjusting for age and deprivation.

At 180 days, 93.5% of Pacific women attended their colposcopy appointment. In the unadjusted analysis, there was an association between attendance and deprivation. Women in the most deprived quintile had lower odds of attendance compared with women in the least deprived quintile (89.1% compared to 97.2%, (OR=0.19, 95% CI: 0.59–0.69)). When adjusted for age and Pacific ethnicity, similar results were reported (OR=0.24 95% CI: 0.08–0.67).

Women in the age category 35–44 years (OR=2.05 95% CI: 1.11–3.80) were more likely to attend within 180 days in the unadjusted model compared to that of the women in the reference category, aged <24 years. When adjusting for Pacific ethnicity and NZDep, the analysis produced similar results, with women in the age category 35–44 years (OR=1.99 95% CI: 1.03–3.85) more likely to attend within 180 days. There was no association between attendance and Pacific ethnicity in both the unadjusted and multivariate models at 180 days.

Discussion

This is the first study to examine the demographic factors associated with Pacific women's attendance at colposcopy clinics in New Zealand following a high-grade cytology. The rates of attendance at 90 days and 180 days were higher than expected: 84.9% and 93.5% respectively. Attendance improved at 180 days, and this was seen across deprivation quintiles, which is similar to the rates reported in the literature.[9,10] This likely reflects the processes put in place by colposcopy clinics, primary care providers and NCSP-R to minimise the loss to follow-up and engage women. These include utilising cultural support to services funded by the NCSP or district health boards, sending reminder letters, informing the primary care provider of the non-attendance and NCSP-R follow-up of non-attenders with primary care providers.[6]

Although in this study overall attendance was higher than expected, 15% of Pacific women still experienced delayed colposcopy assessment following their high-grade cytology. The importance of timely colposcopy assessment is crucial for reducing the impact of cervical cancer among Pacific women. A retrospective review of cervical cancer occurrences in New Zealand identified that 34% of women diagnosed with cervical cancer had an abnormal smear in the preceding 6–84 months, which represent missed opportunities to diagnosis and prevent cancer.. Among this group, Pacific women were over-represented, particularly when the cytology was high grade: Pacific women accounted for 53% of cases compared to 16% for European women.[20] For cervical screening programmes to be effective it is essential that timely follow-up and treatment of cervical abnormalities are achieved.[2,3]

Pacific women's rates of attendance in this study were higher than those reported in NCSP Independent Monitoring Report (IMR), which reported that 74.6% of Pacific women had been seen at 90 days, compared to 84.9% reported in our study. At 180 days the NCSP IMR reported 86.7% compared to our 93.5%.[7] A possible explanation for these differences could be that the study excluded cases with a suspicion or evidence of cancer and endometrial abnormalities. The results from this study more accurately reflect current access to colposcopy care for Pacific women with high-grade cytology, because some women with cervical cancer or endometrial abnormalities may be referred directly to gynaecology or gynaecology oncology services and therefore would not have a colposcopy visit recorded on the NCSP-R. Although this study measures attendance for Pacific women, one limitation is that comparisons cannot be made with other ethnic groups. Given the attendance rates

Table 1: Analysis of colposcopy attendance within 90 days and associated variables.

	Sample column % (n)	90-day attenders row % (n)	Unadjusted model		Multivariate model*	
			OR (95% CI)	P-value	OR (95% CI)	P-value
	100 (1,791)	84.9 (1,521)				
NZDep quintile						
Q1 (least deprived)	8.1 (145)	90.3 (131)	1.00		1.00	
Q2	9.0 (161)	90.6 (146)	1.04 (0.48–2.23)	0.920	1.00 (0.46–2.16)	0.997
Q3	15.8 (283)	91.5 (259)	1.15 (0.57–2.30)	0.686	1.14 (0.57–2.30)	0.700
Q4	24.5 (439)	89.0 (391)	0.87 (0.46–1.63)	0.665	0.88 (0.47–1.66)	0.704
Q5 (most deprived)	37.6 (674)	77.0 (519)	0.35 (0.20–0.63)	0.001	0.36 (0.20–0.66)	0.001
Missing data	4.9 (89)	4.9 (75)				
Age						
<24	25.2 (452)	79.6 (360)	1.00		1.00	
25–34	36.2 (649)	85.2 (553)	1.47 (1.07–2.01)	0.016	1.48 (1.07–2.06)	0.018
35– 44	19.0 (342)	89.4 (306)	2.17 (1.43–3.28)	0.001	2.05 (1.32–3.17)	0.001
45– 54	11.6 (209)	83.2 (174)	1.27 (0.82–1.95)	0.274	1.29 (0.82–2.03)	0.265
55– 64	5.5 (99)	93.9 (93)	3.96 (1.68–9.33)	0.002	4.34 (1.70–11.1)	0.002
65+	2.2 (40)	87.5 (35)	1.79 (0.68–4.69)	0.237	2.28 (0.77–6.72)	0.132
Ethnicity						
Samoan	37.6 (674)	85.1 (574)	1.00		1.00	
Fijian	11.4 (205)	91.7 (188)	1.92 (1.12–3.30)	0.017	1.43 (0.81–2.54)	0.212
Cook Island Māori	20.3 (364)	83.5 (304)	0.88 (0.62–1.25)	0.483	0.82 (0.57–1.20)	0.320
Tongan	16.3 (293)	83.9 (246)	0.91 (0.62–1.33)	0.632	0.85 (0.57–1.26)	0.428
Niuean	7.7 (138)	79.7 (110)	0.68 (0.42–1.09)	0.111	0.68 (0.41–1.10)	0.121
Other Pacific	6.5 (117)	84.6 (99)	0.95 (0.55–1.65)	0.878	0.91 (0.50–1.67)	0.776

*Multivariate model: Adjusted for age, ethnicity and deprivation.

Table 2: Analysis of colposcopy attendance within 180 days and associated variables.

	Sample column % (n)	180-day attenders row % (n)	Unadjusted model		Multivariate model*	
			OR (95% CI)	P-value	OR (95% CI)	P-value
	100 (1,791)	93.5 (1,675)				
Deprivation index						
Q1 (least deprived)	8.0 (145)	97.2 (141)	1.00		1.00	
Q2	8.9 (161)	98.1 (158)	1.65 (0.27–10.3)	0.586	1.46 (0.32–6.66)	0.624
Q3	16.5 (283)	97.1 (275)	0.71 (0.18–2.73)	0.621	0.96 (0.28–3.28)	0.960
Q4	24.5 (439)	95.8 (421)	0.58 (0.16–2.06)	0.405	0.67 (0.22–2.03)	0.483
Q5 (most deprived)	37.6 (674)	89.1 (601)	0.19 (0.59–0.69)	0.006	0.24 (0.08–0.67)	0.007
Missing data	4.9 (89)	4.7 (79)				
Age						
≤24	25.2 (452)	91.3 (413)	1.00		1.00	
25–34	36.2 (649)	94.1 (611)	1.51 (0.95–2.41)	0.078	1.48 (0.91–2.41)	0.106
35–44	19.0 (342)	95.6 (327)	2.05 (1.11–3.80)	0.021	1.99 (1.03–3.85)	0.039
45–54	11.6 (209)	92.8 (194)	1.22 (0.65–2.26)	0.527	1.40 (0.71–2.77)	0.327
55–64	5.5 (99)	94.9 (94)	1.77 (0.68–4.62)	0.240	1.91 (6.59–5.56)	0.233
65+	2.2 (40)	90.0 (36)	0.85 (0.28–2.51)	0.769	1.11 (0.32–3.90)	0.861
Ethnicity						
Samoan	37.6 (674)	93.4 (630)	1.00		1.00	
Fijian	11.4 (205)	96.0 (197)	1.72 (0.79–3.71)	0.168	1.29 (0.56–2.99)	0.538
Cook Island Māori	20.3 (364)	92.3 (336)	0.83 (0.51–1.37)	0.482	0.78 (0.46–1.32)	0.369
Tongan	16.3 (293)	94.1 (276)	1.13 (0.63–2.02)	0.670	1.05 (0.57–1.94)	0.854
Niuean	7.7 (138)	92.0 (127)	0.80 (0.40–1.60)	0.540	0.77 (0.38–1.57)	0.477
Other Pacific	6.5 (117)	93.1 (109)	0.95 (0.43–2.07)	0.901	1.29 (0.56–2.99)	0.538

*Multivariate model: Adjusted for age, Pacific ethnicity and deprivation.

were higher than expected, a disparity still exists when compared to the IMR data for European/other women, whose attendance rate was 92.8% at 90 days.[7]

Pacific women residing in the most deprived areas in New Zealand were less likely to attend at both the 90-day and 180-day time-periods, even when adjusting for ethnicity and age. Our findings are consistent with international studies that have reported socioeconomic deprivation is associated with non-attendance at colposcopy clinics.[9,10,21] Since previous studies have utilised income quintiles alone, one strength of our study was that NZDep area level deprivation quintiles are based on a number of factors, including transport access, home ownership, living space, education, single-parent family, communication, income, employment and benefits.[9]

Although access to secondary healthcare services such as colposcopy is free, there are still barriers to attending colposcopy services for Pacific women living the most deprived areas. This research contributes to the growing body of evidence that identifies the socioeconomic determinants of health result in inequities for Pacific people accessing healthcare in New Zealand. Pacific people are more likely to have higher unemployment rates and lower median household incomes, and to live in "high deprivation" areas.[22] Although colposcopy services are free, the costs associated with attendance, such as time off work, transport and parking, are likely to be barriers to accessing healthcare.[23–27]

This study does not explore Pacific women's experiences or examine other possible causes for delays or non-attendance. There are many factors that influence non-attendance at colposcopy clinics, including knowledge and education, language, psychological aspects, the health system and financial, practical and cultural barriers.[4,23–27] Cervical screening literature has highlighted the importance of cultural beliefs and cultural competence in regard to Pacific women engaging with cervical screening services. However, there is no research into the topic for Pacific women accessing colposcopy services.[8,13] Further research into Pacific women's experiences is required to better understand the interplay between socioeconomic deprivation and other factors and to identify why Pacific women do not engage with colposcopy services.

Older women were more likely to be seen at both the 90-day and 180-day time-periods when compared the reference group of women aged ≤24 years. As has been reported by previously published research, there was non-linear association between attendance and age.[9,10] Women >24 years of age were less likely to attend and represented a quarter of the study sample. This is consistent with other studies that have reported older women being more likely than younger women to attend their colposcopy appointment. [4,9,21,23–28] Conversely, other studies have shown older women are less likely to attend their colposcopy appointment.[10,29] These studies do not explain why younger women are less likely to attend their colposcopy appointment. Primeau et al identified that younger women were more likely to experience more social service barriers, such financial problems, unemployment, housing issues and childcare issues. These barriers resulted in delayed assessment and were less likely to be resolved when compared other barriers like transportation issues, location of the health facility and fear.[30] With the recent change for cervical screening to commence at age 25, colposcopy attendance among Pacific women will likely improve in the future.

Pacific ethnicity was included as a variable in this study because of the culturally diverse nature of the Pacific community. When adjusting for deprivation and age, the type of Pacific ethnicity is not associated with attendance at 90 days or 180 days. The results suggest targeted interventions based on Pacific ethnicity alone are not required and that the impact of socioeconomic deprivation has a stronger association in regard to non-attendance.

There are some limitations with this NCSP-R dataset. The register does not hold information for women who have opted off the register, and thus their data are not present in the dataset. However, it is reassuring that Pacific women's rate of withdrawal from the NCSP-R is very low (0.002%).[7] One more limitation is that the NZDep data provided were the domiciles of women at the time of the data extract and not at the time of the high-grade cytology.

A strength of this study is that, because the data has come from the NCSP-R, which is a national dataset, the dataset of Pacific women is close to complete. This allowed all colposcopy visit follow-up data to be held in one place.

Conclusion

It is encouraging to see higher rates of attendance at colposcopy clinics for Pacific women following a high-grade cytology. However, despite their engagement with cervical screening, Pacific women living in the most deprived areas are less likely to be seen by colposcopy services following a high-grade cytology. It is important that consideration is given to how we engage with Pacific women from the most deprived areas in New Zealand to improve access to colposcopy care and reduce cervical cancer risk. Further research is required to understand the relationship between deprivation and other potential barriers to attending colposcopy services for Pacific women and, ultimately, to enable health policy development and to find solutions to improve access to colposcopy services particularly with the implementation of primary HPV screening.

Competing interests:
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