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Acne prevalence in secondary school students and their perceived difficulty in accessing acne treatment

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Abstract

Aims To describe the epidemiology of acne in New Zealand adolescents and their access to acne treatment.

Methods Secondary analysis of data collected in the 'Youth2000' survey. A random sample of 12,934 Year 9–13 students, from 133 secondary schools across New Zealand, was invited to participate. The survey included items asking about self-perceived acne and access to acne treatment.

Results The 'Youth2000' school response rate was 85.7%, the student response rate 75.0%, and the overall response rate 64.3%. Of the 9570 students who completed the questions on acne, 67.3% reported having acne. 'Problem acne' was reported by 14.1% of students and was more frequently reported by female, Pacific, and older students. Students with 'problem acne' (as well as female, Maori, and Pacific students) were significantly more likely to report difficulty accessing medical treatment for acne (46.0% vs 13.3%; OR 5.29). These differences persisted after controlling for socioeconomic factors.

Conclusions Acne is perceived as a significant health problem by nearly 1 in 7 adolescents. For those with 'problem acne,' effective treatment is available but not necessarily accessible. There are also disparities in access to treatment, particularly for females, Maori, and Pacific ethnic groups. This important youth health issue needs to be addressed.

Acne vulgaris is a disease caused by inflammation of the pilosebaceous follicles. Signs of acne include increased sebum production, comedones, papules, pustules, and deeper inflamed nodules. It may result in scarring. Acne occurs most frequently on the face, back, and chest. Typically, it begins in adolescence and resolves in early adulthood, although lesions may persist through adult life.

Acne is associated with puberty and so usually has an earlier onset in females, who enter puberty at a younger mean age than males. Females usually self-report acne at a higher rate than males, but population studies using clinical examination report severe acne to be more prevalent in males, particularly aged 15–18 years.[1–4] The estimated prevalence of acne in the adolescent population varies between 23 and 100%.[1–8] The wide range in prevalence is likely to be in part due to studies using different systems to diagnose and grade severity of acne, and sampling from significantly different populations.

It has been suggested that the prevalence and severity of acne, and the need for dermatologist consultation in the school-age population, have fallen over the last 20 years—perhaps because of improved over the counter treatments.[3] There have been

few studies of acne in New Zealand adolescents and no nationwide population-based studies to date.

Treatment of acne has improved in recent decades, both in the range of topical treatments available and with the development of isotretinoin for use in moderate-severe acne.[9] However many New Zealand students demonstrate a poor understanding of the causes of acne and are not aware of available effective treatments. Most rely on information gained from parents and friends rather than seeking help from health professionals.[10] Little is known about the ability of young people to access medical treatment for acne, or whether they face barriers to care.

This study reports on the epidemiology of self-reported acne in New Zealand high school students and their perceived ability to access to treatment.

Methods

This is a secondary analysis of data collected in 2001 from a national secondary school youth health and wellbeing survey—'Youth2000'. The methodology and early findings have been reported in detail elsewhere.[11,12]

In brief, a questionnaire was developed after consultation with health and community groups. This was transformed into a multimedia computer-assisted self-interviewing (M-CASI) survey tool, which was piloted and found to be acceptable to students. The final questionnaire had 523 items that were administered via laptop computer. With regards to acne, students were asked 'Have acne or pimples been a problem for you?' to which they had a choice of responses: 'it hasn't been a problem for me', 'not too bad', 'really bad', 'terrible'. Those replying that acne had been 'really bad' or 'terrible' were classified as having 'problem acne' for the purposes of further analysis.

Regarding access to treatment, students were asked 'Have you ever wanted to get treatment from a doctor or specialist for acne or pimples but been unable to or couldn't afford to?' to which they could reply: 'yes', 'no', or 'does not apply to me'.

In total, 12,934 year 9 to 13 (ages 12 to 18 years) students were randomly selected and invited to participate from 133 randomly selected secondary schools. Students were excluded if they were not New Zealand residents, had insufficient English language skills (less than Year 6), or had a disability preventing them from using a standard laptop computer.

Ethics approval was gained from the University of Auckland Human Subjects Ethics Committee. Written informed consent was obtained from all participating schools and students.

Students were recruited using a clustered sample design with unequal probabilities of selection. In all analyses, the data have been weighted and the variance of estimates adjusted to allow for correlated data from the same school. Chi-squared tests were used to test for differences in proportions between males and females. Prevalences and their 95% confidence intervals (95%CI) are presented adjusted for the sampling design.

Socioeconomic status was calculated by combining variables of school decile, overcrowding, being in a two parent family, family owning a car and telephone, and whether someone in the home was in paid employment. All analyses have been conducted using either SAS version 8.2, or SUDAAN version 7.5.

Results

Sample characteristics—The school response rate to the survey was 85.7% and the student response rate 75.0%—resulting in an overall response rate of 64.3%. The surveyed sample represents 4.0% of the total number of students on the New Zealand secondary school roll in 2001. Details of the demographics have been reported previously.[11]

Prevalence and associations with 'problem acne'—A total of 9398 (98.2%) students answered the question regarding presence of acne, with 32.7% (31.5-33.8) reporting that acne had 'not been a problem', 53.2% (51.7-54.6) stating that acne had

been ‘not too bad’ a problem, 10.0% (9.4-10.6) stating that acne had been ‘really bad’, and 4.1% (3.6-4.7) stating it was ‘terrible’. The frequency of self-reported ‘problem acne’ was 14.1% (13.3-14.9).

Table 1. Frequency of self-reported ‘problem acne’

		Frequency	Odds ratio I*	Odds ratio II†	P value‡
		% (95%CI)	OR (95%CI)	OR (95%CI)	
Gender	Female	15.5 (14.3–16.7)	1.26 (1.11–1.42)	1.26 (1.11–1.42)	P=0.0003
	Male	12.5 (11.5–13.6)	1	1	
Age (years)	<13	9.9 (8.6–11.3)	0.60 (0.48–0.74)	0.60 (0.48–0.75)	P<0.0001
	14	12.5 (11.1–13.9)	0.76 (0.62–0.93)	0.76 (0.62–0.93)	
	15	14.9 (13.3–16.4)	0.95 (0.78–1.15)	0.95 (0.78–1.16)	
	16	18.8 (16.6–21.1)	1.27 (1.04–1.55)	1.27 (1.04–1.55)	
	>17	16.0 (13.7–18.3)	1	1	
Ethnicity	Maori	13.3 (11.8–14.7)	1.00 (0.86–1.16)	0.97 (0.83–1.14)	P=0.08
	Pacific Island	20.2 (16.5–23.9)	1.49 (1.21–1.84)	1.34 (1.05–1.71)	
	Asian	14.6 (11.8–17.4)	1.06 (0.83–1.35)	1.06 (0.83–1.14)	
	Other	11.1 (8.4–13.8)	0.85 (0.62–1.18)	0.86 (0.62–1.19)	
	NZ European	13.7 (12.7–14.7)	1	1	
Total N=9398		14.1 (13.3–14.9)			

*Adjusted for age, sex and ethnicity; †Adjusted for selected age, sex, ethnicity, and selected socioeconomic variables; ‡From model II.

Table 1 shows the frequency of ‘problem acne’. ‘Problem acne’ was more likely to be reported by female than male students (odds ratio [OR] 1.29; 1.15–1.45). Reports of ‘problem acne’ increased during the teenage years to peak at the age of 16 years for both genders. Pacific students were more likely to report ‘problem acne’ than New Zealand European students (OR 1.53; 1.27-1.89).

Age ($p<0.001$), gender ($p=0.0002$), and ethnicity ($p=0.003$) all showed an independent association with ‘problem acne’ when included as explanatory variables in a logistic regression analysis. Accordingly, the highest frequency of self-reported ‘problem acne’ was among female Pacific students (24.4%; 19.9–29.0). The

frequency among Pacific male students (14.3%; 9.3–19.4) was similar to those of males from other ethnic groups.

Logistic regression analyses were performed adjusting for age, gender, and ethnicity. The second model also included adjustment for selected socioeconomic variables with little effect on the odds ratios; although there was slightly less evidence for an association with ethnicity (p=0.08). However, Pacific students still remained at higher risk of reporting 'problem acne' than their New Zealand European peers.

Prevalence and associations with difficulty accessing acne treatment—Only students reporting some acne (ie, responding that acne was a 'not too bad', 'really bad', or 'terrible' problem) were included in the analysis of access to acne treatment (n=6299). Those students who reported that acne had 'not been a problem' were excluded (n=3054), as were 45 who said they had acne but did not answer the question on treatment.

Table 2. Self-reported difficulty in accessing treatment for acne

		Frequency	Odds ratio I*	Odds ratio II†	P value‡
		% (95% CI)	OR (95%CI)	OR (95% CI)	
Gender	Female	23.5 (21.3–25.6)	1.46 (1.27–1.68)	1.45 (1.26–1.67)	<0.0001
	Male	16.4 (14.8–17.9)	1	1	
Age (years)	<13	17.3 (15.0–19.6)	0.96 (0.74–1.23)	0.91 (0.71–1.18)	0.005
	14	19.5 (17.2–21.8)	1.11 (0.87–1.40)	1.06 (0.84–1.34)	
	15	21.1 (18.9–23.3)	1.20 (0.96–1.52)	1.19 (0.94–1.50)	
	16	23.8 (21.2–26.5)	1.35 (1.07–1.71)	1.36 (1.08–1.73)	
	>17	18.3 (15.1–21.5)	1	1	
Ethnicity	Maori	24.1 (21.8–26.4)	1.73 (1.47–2.03)	1.40 (1.18–1.67)	0.0001
	Pacific Island	38.3 (32.0–44.7)	2.71 (2.14–3.44)	1.74 (1.32–2.30)	
	Asian	20.4 (16.4–24.4)	1.28 (0.97–1.70)	1.23 (0.92–1.64)	
	Other	20.2 (15.2–25.2)	1.32 (0.92–1.90)	1.28 (0.89–1.85)	
	NZ European	16.2 (14.9–17.6)	1	1	
Acne severity	'Problem acne'	46.0 (42.3–49.7)	5.29 (4.59–6.10)	3.27 (2.94–3.63)	<0.0001
	Acne 'not too bad'	13.3 (12.3–14.4)	1	1	

*Adjusted for age, sex, ethnicity and acne severity; †Adjusted for age, sex, ethnicity, acne severity and selected socioeconomic variables; ‡From model II.

Overall 20.2% (18.6–21.7) of students with acne reported that they wanted treatment but were unable to access (or afford) treatment from a doctor or specialist. A further 73.7% (71.9–75.4) reported no problem with access, and 6.2% (5.5–6.8) responded that the question did not apply to them. These two groups were combined to form a group of students with acne who did not have a problem accessing treatment.

Table 2 shows the frequency of reported difficulty in accessing acne treatment. Difficulty accessing treatment was more commonly reported by female than male students (OR 1.58, 1.39–1.79). The frequency of difficulty in accessing acne treatment increased during the teenage years to peak at age 16 years. Students belonging to Maori or Pacific ethnic groups reported difficulty accessing treatment more frequently than New Zealand Europeans (Maori OR 1.65, 1.42–1.91; Pacific OR 3.15, 2.55–3.89).

Those students with 'problem acne' were significantly more likely to report difficulty in accessing treatment than those whose acne was 'not too bad' a problem (OR 5.55; 4.84–6.36).

Logistic regression analysis adjusting for age, gender, ethnicity, and acne severity confirmed the findings above and is shown in Table 2. The variables of gender ($p<0.0001$), age ($p=0.01$), ethnicity ($p<0.0001$), and acne severity ($p<0.0001$) were all independently associated with difficulty accessing treatment. After including selected socioeconomic variables in the second logistic regression model, female and 16-year-old students remained more likely to report difficulty in accessing treatment for acne.

The effect of ethnicity and acne severity was reduced, but (as they reported) access to acne treatment remained a significant problem for Maori and Pacific students, and for those with 'problem acne'.

Discussion

This data comes from the largest randomly selected group of secondary school students studied in New Zealand, and offers contemporary data on the national population of adolescents. Acne is common—and females, Pacific, and older students report 'problem acne' more frequently than other groups. Reported difficulty in accessing treatment is associated with more severe self-reported acne, female gender, older age, and Maori or Pacific ethnicity. Nearly half of all students with 'problem acne' report difficulty in accessing treatment from a doctor or specialist.

In this study, the presence of 'problem acne' was assessed subjectively by participating students. This may result in variability due to individuals' differences in their perceptions of severity of acne. Studies have found that subjects may under-report or over-report the severity of acne when compared with clinical assessment by a trained examiner.[1,3,13,14]

A comparison of self-report of the presence of acne with clinical examination in Australian school students found self-report had a sensitivity of 70% and a specificity of 94%.[7] Self-report studies have generally found higher rates of acne in females, whereas studies using clinical examination usually rate acne as more severe in males. This may be due to females being more sensitive to (and hence likely to self-report) the presence of acne, particularly in its milder forms.

An accurate measure of the prevalence of acne from this study is limited, as the survey question asked about whether acne is a problem rather than the presence of acne. However it may be argued that acne (that results in a problem for the young person) is more clinically relevant, as it may result in psychosocial morbidity and the desire for medical intervention. The degree of embarrassment and social disability associated with acne has been found to be associated with patient rating of severity, but not with dermatologist rating.[14]

A computer-assisted survey of Australian adolescents found that 81% of students had some acne in the past 12 months, and that female students reported acne more frequently than males.[1] Older students reported acne more frequently and there was a significant linear trend of acne associated with advancing pubertal development. These results are consistent with our findings.

In comparison, a study by Lello et al of 847 16–19 year-old Auckland high school students (using objective assessment by trained investigators) found acne to be present in 91% of males and 79% of females.[2] Severe acne was present in 6.9% of male and 1.1% of female students. No association was found between moderate-severe acne versus parental occupational group or ethnicity. The higher rates of acne in Lello's study may reflect the diagnosis being made by clinical rather than subjective assessment as discussed above, and the older age of their study population in whom the prevalence of acne is higher.

In this study, Pacific students (particularly Pacific females) reported acne with greater frequency than students from other ethnic groups. The reasons for this are not clear. It may be that acne is more common among Polynesian peoples, although this was not found by Lello et al using clinical examination.[2] Differences due to cultural definitions and perceptions of the importance of acne may be significant.

Genetic and biological factors may explain different rates of acne. For example, there is a potential role for obesity and polycystic ovarian syndrome in the incidence of acne among female students, which this study was not designed to address. Indeed, with a high incidence of obesity noted in New Zealand young people (especially of Pacific ethnicity) one could postulate that a corresponding increase in polycystic ovarian syndrome and acne may occur.[15]

Those students with 'problem acne' were significantly more likely to report difficulties in accessing treatment from a doctor or specialist than those whose acne was 'not too bad'. Young people tend to rely on family and friends for advice regarding treatment, rather than seeking help from a doctor or pharmacist.[7,10] It may be that part of the cause of poor access of medical treatment for acne lies with a lack of public awareness of the availability of therapies. Many of these students could probably have been successfully treated in primary care. However those with moderate-to-severe acne vulgaris are more likely to require treatment with isotretinoin—the use of which is restricted to dermatologists.

The proportion of students reporting 'problem acne' that would be eligible for treatment with isotretinoin could not be assessed in this study. It is possible that many of those with 'problem acne' would have benefited from specialist dermatologist care, and reported difficulties in accessing treatment may reflect limited access to specialist services.

This study confirms that acne is a common problem for New Zealand adolescents. Perceived barriers to medical treatment were more frequently found among females, and Pacific and Maori students. It is concerning to note that nearly half of students with 'problem acne' also reported difficulty in accessing treatment. This has important implications when we consider the way acne treatment services to this age group are planned and delivered.

Reducing disparities in health status and access to health services are critical issues for Maori and Pacific young people. More research is required to gain a deeper understanding of the barriers young people face in accessing medical treatment for acne—and access to both primary and secondary medical services for young people needs to be improved. It is likely that there will continue to be limited availability of some acne treatments to this population, due to the ongoing cost of drug treatments (through primary or private care, and current pressures on publicly funded dermatology services).

Of increasing concern is the recognition of the link between acne and adverse psychological effects, such as embarrassment, impaired socialisation, anxiety, and depression.[13,14] Indeed, with effective treatment for acne being available but not necessarily accessible, there may be significant downstream health and social costs to bear if the New Zealand public health system does not urgently respond to this important youth health issue.

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