Title Page

Title: *Costs incurred by patients with acne prior to dermatological consultation and their relation to patient income*

Authors:

1. Claire Felmingham – corresponding author
 - a. Affiliation: Alfred Health
 - b. Email address: clairefelmingham@gmail.com
 - c. Phone: +61401840194
 - d. Postal address: The Alfred, 55 Commercial Road, Melbourne, VIC 3004
 - e. ORCID id: 0000-0002-3443-8065
2. Amelia Kerr
 - a. Affiliations: Melbourne University and Monash Health
3. Emma Veysey
 - a. Affiliation: St Vincent's Hospital Melbourne

No funding or conflict of interest to declare

Ethics approval: obtained from St Vincent's Hospital Melbourne

Key words: acne vulgaris; cost of illness; economics; surveys and questionnaires; evidence-based medicine; quality of life

This is the author manuscript accepted for publication and has undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the [Version of Record](#). Please cite this article as [doi: 10.1111/AJD.13324](https://doi.org/10.1111/AJD.13324)

This article is protected by copyright. All rights reserved

Article type : Research Letter

Title: *Costs incurred by patients with acne prior to dermatological consultation and their relation to patient income*

Key words: acne vulgaris; cost of illness; economics; surveys and questionnaires; evidence-based medicine; quality of life

Acne is common (1) and can have a significant impact on quality of life and psychological health (2-4). Family, friends, and the internet are more commonly consulted than doctors for acne information (3, 5, 6), and acne is often trivialised as a cosmetic rather than a medical problem (5). Many therefore pursue over the counter (OTC) therapies before seeking medical advice, and few of these OTC therapies are evidence based (7).

Of the studies investigating costs to patients of acne management (8), most have focused on prescription medications (9, 10). Total spending has not previously been assessed in relation to patient income. It is speculated that those with acne prioritise spending on treatments and skin care, regardless of income and affordability.

The aims of this study were to determine the total financial acne management costs incurred by patients (prior to seeing a dermatologist), and whether this correlated with income.

A cross-sectional questionnaire study was conducted at a single private dermatology clinic in a semi-rural setting in Australia. Between February and May 2019, consecutive new patients (aged over 16 years) referred with acne were asked to complete a questionnaire. Anonymous Research Ethics Committee approved the study.

The questionnaire enquired about: patient demographics, including household income; acne severity and impact on quality of life; time spent on acne management; reasons for delay in seeking or obtaining a dermatological consultation, if applicable; and acne-related spending over the preceding 6 months. Participants were asked to list items and services they had used to treat acne, along with their known or estimated cost. These costs were divided into five categories: General Practitioner (GP) out-of-pocket costs; prescriptions; alternative medicines; OTC products; and tools/instruments.

Data were analysed using Microsoft Excel software. One-way ANOVA was used to calculate p values. A p value ≤ 0.05 was considered statistically significant.

Of the 49 patients who met inclusion criteria, 46 completed the questionnaire. Of these, 63% (29/46) were female, 65% (30/46) were aged between 16 and 24, 85% (39/46) were Caucasian, and 74% (34/46) rated the impact of acne on their quality of life as either moderate-severe or severe (Table 1).

Patients had spent an average of \$850 on their acne management in the preceding 6 months. The median amount spent was \$416.75 (range \$0 – 3000). There was no statistically significant difference in acne spending between income brackets ($p = 0.56$) (Figure 1).

OTC costs were responsible for the greatest expenditure in both females (84% of spending) and males (68%). In comparison, prescription costs accounted for 3% of spending in females, and 24% in males (Figure 2).

There was no statistically significant correlation between expenditure in these cost categories and income brackets. Average prescription expenditure increased positively with increasing income, but this was not statistically significant ($p = 0.49$) (Figure 3 - Supplementary).

There was a statistically significant positive correlation between acne expenditure and: 1) impact on quality of life ($p = 0.01$) (Figure 4 - Supplementary); 2) time spent on acne management ($p = 0.002$) (Figure 5 - Supplementary); and 3) facial distribution of acne ($p = 0.02$).

Thirty-nine percent (18/46) of participants reported that they delayed consulting a dermatologist. Of these 18 participants, 14 (78%) reported that the cost of the consultation was at least part of their reason for delay, and 11 (61%) delayed the consultation by at least one year (Table 1).

Similarly, Alsheri *et al* (6) reported that 61% of acne-affected individuals waited for more than 1 year before seeking medical advice. Population-based studies have shown that those with acne often do not seek medical advice, even when it is significantly impacting their quality of life (3, 4). This is unfortunate because when doctors are consulted, there is improved treatment satisfaction (8).

Many studies assessing acne treatment behaviours have reported high rates of OTC compared with prescription usage (5, 6, 8). This is consistent with our finding that OTC costs were responsible for greatest expenditure. OTC products are considered to be convenient and cheap (in the short term) compared to consulting a specialist (7).

The main limitations of our study include the small sample size and selection bias. Recall bias was limited as participants were asked to report acne treatments and costs from the preceding 6 months only. Participants were from a single private dermatology practice, and were predominantly Caucasian, with moderate to severe acne.

In conclusion, we have found that acne has a significant financial impact on patients, irrespective of household income. It is likely that seeking a consultation earlier could save patients from unnecessary acne-management costs.

References

1. Vos T, Flaxman AD, Naghavi M, Lozano R, Michaud C, Ezzati M, et al. Years lived with disability (YLDs) for 1160 sequelae of 289 diseases and injuries 1990-2010: a systematic analysis for the Global Burden of Disease Study 2010. *Lancet*. 2012;380(9859):2163-96.
2. Tan JK, Bhate K. A global perspective on the epidemiology of acne. *Br J Dermatol*. 2015;172 Suppl 1:3-12.
3. Smithard A, Glazebrook C, Williams HC. Acne prevalence, knowledge about acne and psychological morbidity in mid-adolescence: a community-based study. *Br J Dermatol*. 2001;145(2):274-9.
4. Pearl A, Arroll B, Lello J, Birchall NM. The impact of acne: a study of adolescents' attitudes, perception and knowledge. *N Z Med J*. 1998;111(1070):269-71.
5. Karciauskiene J, Valiukeviciene S, Stang A, Gollnick H. Beliefs, perceptions, and treatment modalities of acne among schoolchildren in Lithuania: a cross-sectional study. *Int J Dermatol*. 2015;54(3):e70-8.
6. Alshehri MD, Almutairi AT, Alomran AM, Alrashed BA, Kaliyadan F. Over-the-counter and Prescription Medications for Acne: A Cross-Sectional Survey in a Sample of University Students in Saudi Arabia. *Indian Dermatol Online J*. 2017;8(2):120-3.
7. Decker A, Graber EM. Over-the-counter Acne Treatments: A Review. *J Clin Aesthet Dermatol*. 2012;5(5):32-40.
8. Suh DH, Shin JW, Min SU, Lee DH, Yoon MY, Kim NI, et al. Treatment-seeking behaviors and related epidemiological features in Korean acne patients. *J Korean Med Sci*. 2008;23(6):969-74.
9. Patel P, Lin HC, Feldman SR, Fleischer AB, Jr., Nahata MC, Balkrishnan R. Medication choice and associated health care outcomes and costs for patients with acne and acne-related conditions in the United States. *J Drugs Dermatol*. 2011;10(7):766-71.
10. Balkrishnan R, Kulkarni AS, Cayce K, Feldman SR. Predictors of healthcare outcomes and costs related to medication use in patients with acne in the United States. *Cutis*. 2006;77(4):251-5.

Tables

Table 1 – Participant Demographics

Gender		n/46 (%)
Female		29 (63)
Male		17 (37)
Age		
16 - 17		14 (30)
18 - 24		16 (35)
25 - 34		9 (20)
35 - 44		3 (7)
Did not specify		4 (9)
Ethnicity		
Caucasian		39 (85)
Asian		3 (7)
Mixed race		2 (4)
Hispanic		1 (2)
Did not specify		1 (2)
Self-rated acne severity		
Mild		2 (4)
Mild - moderate		3 (7)
Moderate		21 (46)
Moderate - severe		19 (41)
Severe		1 (2)
Length of delay to see dermatologist		
No delay		28 (61)
Delayed under 1 year		7 (15)
Delayed around 1 year		8 (17)
Delayed between 1 – 3 years		1 (2)
Delayed more than 3 years		2 (4)

Figure legend

Figure 1 – Average total acne management costs in the previous 6 months per annual household income.

Figure 2 – Categorical breakdown of total acne management expenses of females and males (%).

Figure 3 (Supplementary) – Average prescription expenditure in the previous 6 months per annual household income.

Figure 4 (Supplementary) – Average total acne management costs in the previous 6 months per self-reported impact on quality of life.

Figure 5 (Supplementary) – Average total acne management costs in the previous 6 months per time spent on managing acne.

ajd_13324_f1.png

Minerva Access is the Institutional Repository of The University of Melbourne

Author/s:

Felmingham, C;Kerr, A;Veysey, E

Title:

Costs incurred by patients with acne prior to dermatological consultation and their relation to patient income

Date:

2020-05-10

Citation:

Felmingham, C., Kerr, A. & Veysey, E. (2020). Costs incurred by patients with acne prior to dermatological consultation and their relation to patient income. AUSTRALASIAN JOURNAL OF DERMATOLOGY, 61 (4), pp.384-+. <https://doi.org/10.1111/ajd.13324>.

Persistent Link:

<http://hdl.handle.net/11343/275734>