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Review Article

An audit of phototherapy services at the department of dermatology in Inkosi Albert Luthuli Central Hospital: A 12-year cross-sectional study (2013-2024).

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Abstract

Background
Phototherapy uses ultraviolet light to treat a range of dermatological diseases. An audit is necessary to provide a deeper understanding of the factors that may influence patient compliance with treatment.

Methods
A quantitative descriptive, retrospective chart review study that included all dermatology patients who were treated with phototherapy at Inkosi Albert Luthuli Central Hospital during the study period. The data was obtained from the hospital information system and paper records.
The data was analysed for age, gender, race, diagnosis, and patient address. Patient records were also reviewed to determine reasons for stopping treatment.

Results
167 patients were treated during the study period. 98 were females, and 69 were males. Most patients were African (51%), followed by those of Indian or Asian ethnicity (43%); White and Coloured patients comprised 2% each. The mean age was 48 years (SD 16.2, range 12-87). Overall, most patients treated had either vitiligo (38%) or psoriasis (34%). At the end of the study period, the proportion of patients still undergoing phototherapy was 24.55%, while those who had discontinued for various reasons were 75.45%. The reasons for stopping phototherapy included being lost to follow-up in 37%, financial constraints such as transport costs in 20%, treatment cessation due to improvement in 13%, side effects in 10%, work commitments in 10%, and lack of improvement or poor response to therapy in 10%. Forty-seven per cent of the patients lived within 20 kilometres of the hospital, 38% lived within 20-50 kilometres, and 16% resided at least 50 kilometres away.

Conclusion
Vitiligo and psoriasis are the most treated conditions with phototherapy at our centre. The distance of residence has no direct link to treatment cessation.

Recommendations
Further research is needed to determine the optimal treatment durations required for disease clearance and how this may impact adherence to phototherapy.

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Introduction

IALCH is a quaternary hospital and the first in KwaZulu-Natal (KZN) to implement a public-private partnership for

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service delivery. About 78.6% of the province's population depends on public healthcare. Some individuals use both public and private healthcare, with most relying on public services for quaternary healthcare needs.[1] The hospital potentially serves around 11.5 million people in KZN and neighbouring regions, requiring quaternary public hospital services.

The dermatology department at Inkosi Albert Luthuli Central Hospital (IALCH) is staffed by three consultant dermatologists and rotating registrars from the University of KwaZulu-Natal. The unit provides phototherapy treatment that effectively manages many inflammatory and neoplastic conditions. This treatment is usually delivered three times a week, but it remains difficult for many impoverished patients living far from the hospital. Patients who live at a distance from the hospital often find it hard to adhere to the treatment because of financial and logistical difficulties.

Until this study, no formal audit of the phototherapy services at IALCH has been carried out. Conducting such an audit will provide a deeper understanding of the factors that may influence patient compliance with full treatment. This could lead to improvements in the current services and enable us to make recommendations for other phototherapy units in the province and potentially across the country.

This descriptive study seeks to describe the demographics of patients treated with phototherapy at IALCH over 12 years (2013 – 2024), to describe the spectrum of diseases treated using phototherapy, the demographics of patients treated with phototherapy and to explore the reasons for treatment cessation in the patient population.

This study aims to perform an audit of phototherapy services in the Department of Dermatology at the Inkosi Albert Luthuli Central Hospital over 12 years (2013-2024). The objectives are to determine the demographics of patients treated with phototherapy at IALCH over 12 years (2013 – 2024), to describe the spectrum of conditions treated, to determine the reason for treatment cessation, and to determine whether there is any correlation between the distance of the patient's home and compliance with treatment.

Methodology

Study design

A cross-sectional study was conducted at the IALCH Department of Dermatology, including all patients treated with phototherapy during the study period, 2013-2024.

Study setting

The study centre is at Inkosi Albert Luthuli Central Hospital during the study period for the period 2013-2024

Participants

Inclusion

The study included patients of all age groups and all demographics who were treated with phototherapy for a dermatological condition at Inkosi Albert Luthuli Central Hospital during the study period, 2013-2024

Exclusion

The study excluded patients who had missing or incomplete clinical data.

Bias

To minimise selection bias, all patients treated for a dermatological condition who were treated with phototherapy were included during the study period. All patients were treated within the same unit. Patients were grouped into 3 categories of distance of location from the hospital to reduce classification biases.

Data collection

The data was obtained from the Austrian Medical Equipment Africa Healthcare (AME)
information system and paper records in the Dermatology Clinic at Inkosi Albert Luthuli Central Hospital from 2013-2024.

Statistical analysis

The data was entered into a Microsoft Excel® (Microsoft Corporation, Redmond WA, USA) spreadsheet and analysed for the age, gender, and race of each patient, diagnosis, and distance of residence from the hospital and analysed using the Statistical Package for Social Sciences (SPSS) version 22.0 (IBM Corporation, Somers, NY, USA). Individual patient records were reviewed within the Meditech® record system to determine reasons for stopping treatment according to clinician records.

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Descriptive statistics such as percentages were used to summarise categorical variables, while continuous variables were described using either means and standard deviations or medians and interquartile range as appropriate.

We also retrieved information on the patient's address, which was then used to calculate the distance from the patient's residence to the treatment centre (IALCH) using Google Maps® services.

Ethical consideration

Ethical clearance was obtained from the University of KwaZulu-Natal's Bioethics Research Committee (BREC/00007239/2024). Research permission was also obtained through the Department of Health National Research Database to conduct research within the public sector. Gatekeeper hospital permission was also obtained from IALCH to access Meditech records.

Confidentiality was ensured by using a de-identified "flat" database design to facilitate statistical analysis: Each row contained one complete case (anonymised), and each column a specified data field. Missing data was "entered" as empty fields. The data was kept in password-protected cloud storage.

Results

A total of one hundred sixty-seven (167) patients were seen during this period under study (2013 to 2024).

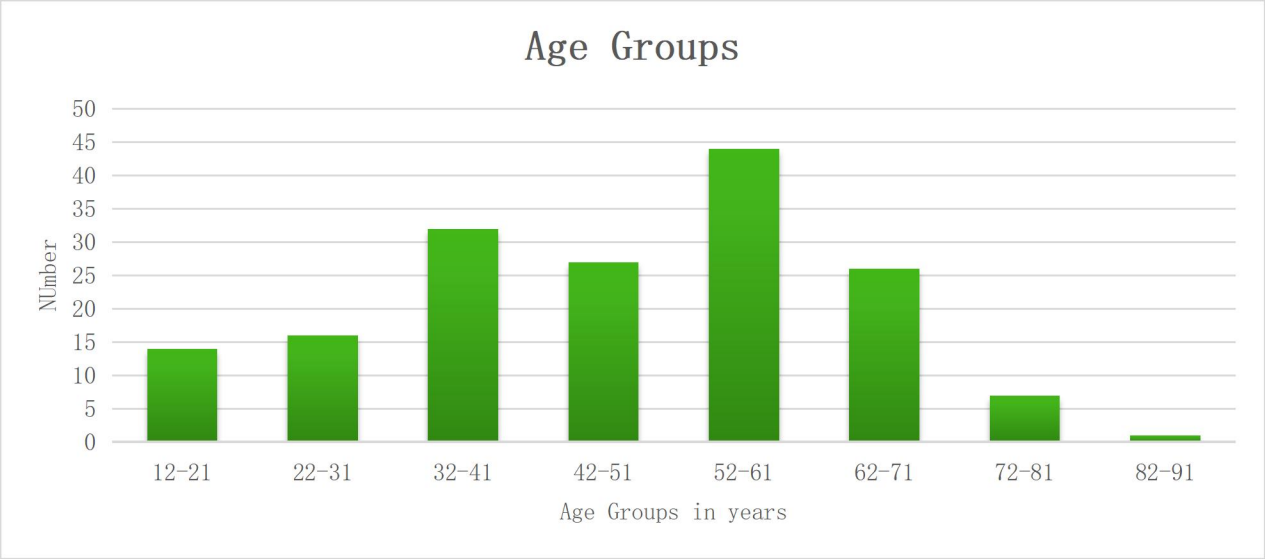
The gender distribution of patients was 98 females and 69 males, representing a 59% and 41% split, respectively.

Most patients were of African ethnicity (51%), followed by Indian or Asian ethnicity (43%), and White and Coloured patients were similar (2%, each). There was one patient who was identified as "other".

There was a mean age of 48 (standard deviation 16.2, range 12-87). The age spread amongst the age groups was 14 patients in the age group 12-21, 16 patients in the age group 22-31, 32 patients in the age group 32-41, 27 patients in the age group 42-51, 44 patients in the age group 52-61, 26 patients in the age group 62-71, 7 patients in the age group 32-41 and 1 patient in the 82-91 age group (Graph 1).

The youngest patient was a 12-year-old Indian/Asian male with atopic dermatitis; the oldest patient was an 87-year-old African female with vitiligo.

In the younger age group (10-21), there were fourteen patients, and most of the patients were treated for atopic dermatitis (50%) and vitiligo (36%). The other patients (14%) had localised scleroderma and other pruritic conditions.



Graph 1: Patient distribution according to age groups

In terms of diagnoses, most patients treated had either vitiligo (38%) or psoriasis (34%). The rest of the conditions included mycoses fungoides, lupus, atopic dermatitis, and others (Graph 2).

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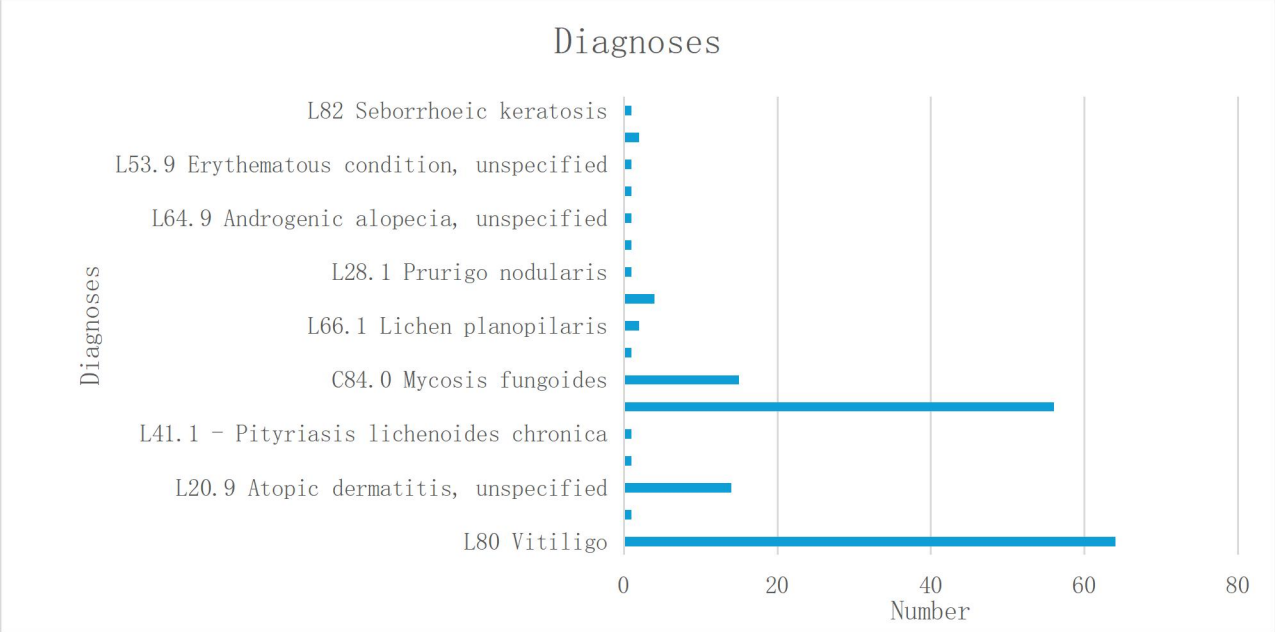
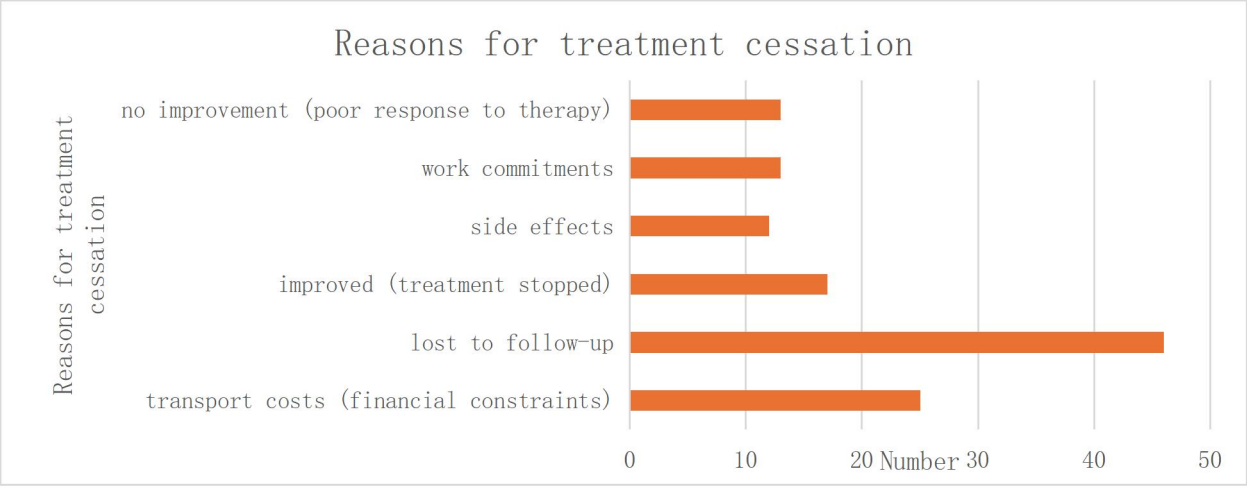


Graph 2: Patient diagnoses

At the end of the study period, the proportion of patients who were still on phototherapy was forty-one (24.55%), while those who had stopped phototherapy for various reasons were one hundred and twenty-six (75.45%).

Of the 126 patients who were no longer on treatment, the reasons for cessation of therapy ranged from transport costs (financial constraints) in 25 patients (20%), lost to follow-up in 46 patients (37%), improved (treatment stopped) in 17 patients (13%), side effects in 12 patients (10%), work commitments in 13 patients (10%) and no improvement (poor response to therapy) also in 13 patients (10%) Graph 3).



Graph 3: Reasons for treatment cessation

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Overall, 47% of the patients stayed within 20km distance from the hospital, 38% stayed within 20-50km, and 16% stayed at least 50km away from the hospital.

Of those who were lost to follow-up, a majority of them stayed within a 20km radius of the hospital (48%), while 33% of those patients stayed within 20-50km of the hospital, and 20% were from a distance of 50km or more from the hospital.

Those who had to stop treatment due to transport costs (financial constraints) were also predominantly from a distance of 20km or less (44%), 32% were from 20-50km away, and 24% from 50km or more from the treatment centre.

Those who had to stop treatment due to work commitments were 46% from a distance of 20km or less (44%), and similarly, 46 % were from 20-50km away, and only 8% from 50km or more from the treatment centre.

Those who were still on treatment were also mostly from a distance of 20km or less from the hospital (49%), while 44% were from 20-50km away, and only 7% from 50km or more from the treatment centre.

Discussion

This study demonstrated that most patients who had phototherapy were predominantly of African and Asian/Indian descent. This is in keeping with our regional population demographics.[1]

Most patients were female, with a 9% difference from male patients. Interestingly, other studies reviewed in the literature do not comment on gender trends of utilisation in their studies.

Most of the patients were treated for either vitiligo or psoriasis. These two conditions alone accounted for 72% of the overall number of cases. This can be interpreted to mean that a majority of patients seen at this phototherapy centre have these two conditions.

This is in keeping with other studies, such as the Korean population, where they found that 70.2% of patients treated had vitiligo, while 28% had psoriasis.[2] Similarly, in a Malaysian study, it was found that psoriasis and vitiligo accounted for the majority of conditions treated (73.3%) in total. The difference with this study is that cases of psoriasis were proportionally more than cases of vitiligo, 46.6% and 26.7% respectively.[3]

Most of the patients were between 22 and 71 years old, representing 87% of the study's participants. This can be interpreted to mean that this centre sees a wide age distribution. No other research has reported similar age profiles. It is worth noting that nearly all comparable studies in the current literature lack a detailed breakdown of age groups. Therefore, it is difficult to determine whether this pattern is common among other population groups.

Different authors have reported the safe use of phototherapy in various conditions within the paediatric population; however, all our younger patients (aged 10-21) were primarily treated for atopic dermatitis and vitiligo. This aligns with other studies that exhibited a similar disease profile in the paediatric group. [4-7]

The main reason why most of the patients stop treatment is predominantly due to loss to follow-up, followed by transport costs (financial reasons). This means most of our patients default to treatment without any documented explanation. There is a dearth of data within similar studies that look at reasons for treatment cessation other than side effects. Most studies report side effects as the primary reason for stopping treatment, whereas in the study, side effects accounted for only 10% of the cases where treatment was not completed. [8, 9]

One of the research questions that motivated doing this study was determining whether the distance from the patient's residence to the hospital was a significant factor in non-compliance.

According to the results, most of the patients who stopped treatment were due to being lost to follow-up, and these patients tended to stay relatively close to the hospital. Similarly, the majority of those who stopped treatment due to transport costs were also relatively close to the hospital. This means that the distance from the hospital doesn't have a direct correlation with defaulting on treatment.

What was of interest and maybe can help deduce an inverse correlation was the trend was also seen with those patients who were still on treatment – these patients were constituted by a large percentage of who stay within a relatively close distance to the hospital, with only a few patients who stayed further than 50km from the hospital still being on treatment.

This was an important finding as one of this study's main objectives was to determine if there is a direct relationship between patients' distance from the hospital and level of compliance with treatment, and whether this correlated with undue treatment cessation.

Based on the results of this study, it can be deduced that the distance of residence from the hospital is not a direct cause of undue treatment cessation in our population. A postulation of other probable reasons includes factors like unemployment, school commitments, or even death.

Generalizability

While the findings of this study are significant, they must be interpreted within the context of its design and setting.

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The results are to be interpreted to represent the local population phenomenon.
Inkosi Albert Luthuli Central Hospital serves a wide catchment area and caters to a socioeconomically diverse population; therefore, the results do provide valuable insight into real-world patient profiles.

Conclusion

Vitiligo and psoriasis are the most treated conditions with phototherapy at Inkosi Albert Luthuli Central Hospital. Most of the patients who discontinue treatment do so due to being lost to follow-up or because of transport costs (financial reasons). A significant number of patients complete their treatment with positive outcomes.
The distance of residence has no direct correlation with treatment cessation.
This is the first study to examine phototherapy within this setting.

Limitations

The study is retrospective and consequently possesses a weaker strength of evidence.
The data did not include details on the type of phototherapy used and the exact number of sessions undertaken. This omission stemmed from a lack of comprehensive and concise information within the system. Additionally, the study did not provide specific details regarding patient skin types and side effects, as most records failed to specify either the skin type or the type of reaction experienced by the patient.

Recommendations

Further research is needed to determine the optimal treatment durations required for disease clearance and how this may impact adherence to phototherapy.
Additionally, further studies at multiple centres are needed to gain an understanding of the factors that influence phototherapy services in low-to medium-income settings.
Additionally, further research is required to determine the optimal treatment durations before disease clearance for patients who improved and had their treatment discontinued, to identify the optimal dosing regimen for other patients.

List of abbreviations

IALCH – Inkosi Albert Luthuli Central Hospital
KZN – KwaZulu-Natal
UVB – ultraviolet B

Author biographies

Dr. Lindelani Shelembe – Postgraduate Student at the University of KwaZulu-Natal
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Disclosure

Disclosure that no artificial intelligence (AI)-assisted technologies (such as Large Language Models [LLMs], chatbots, or image creators) have been used in the production of this submitted work.

Data availability statement

The data supporting the findings of this study are not publicly available due to restrictions related to participant confidentiality. Anonymised data may be made available from the corresponding author upon reasonable request and with approval from the Institutional Review Board of the University of KwaZulu-Natal.

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I would like to recognise all staff involved in recording the data, as well as the biostatisticians who contributed to the analyses. I would also like to deeply thank my husband, Lindelani, and my son and daughter (Kuye and Adaya) for their unwavering support throughout this process.

Conflict of interest

The authors declare no conflict of interest.

Grant information

The authors declare that no grants were involved in supporting this work.

Author contributions

Dr. Lindelani Shelembe – principal investigator
Prof Anisa Mosam – co-supervisor
Dr. Antoinette Chateau – co-supervisor

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