

A cross-sectional, comparative study of home vs in-office NB-UVB phototherapy for vitiligo

To the Editor,

Narrowband ultraviolet B (NB-UVB) phototherapy is an effective treatment for vitiligo, resulting in up to 75% repigmentation in 9 months; however, compliance is often poor due to the economic burden and inconvenience associated with this form of therapy.^{1,2} Home phototherapy has been shown to be an effective treatment for a variety of skin conditions, including vitiligo.³ Despite this evidence, home phototherapy for vitiligo is considered experimental and investigational by health insurance providers.^{4,5} We conducted a comparative study of patients receiving in-office or home phototherapy for vitiligo.

1 | METHODS

All patients with generalized vitiligo who were consented and enrolled in the IRB-approved Dallas Vitiligo Registry at the University of Texas Southwestern Medical Center (UTSW) from April 2013 to August 2015 were reviewed. Patients were included if they had a history of receiving phototherapy 2-3 times weekly with a three-panel, Panasol 3D NB-UVB phototherapy unit with ten bulbs, each 6 feet long (National Biological Corp., Beachwood, OH) at home or in a NB-UVB booth (Houva II, National Biological Corp., Beachwood, OH) in the phototherapy unit at UTSW. Pairs were matched for skin phototype, distance from home to the clinic and length of time they had received phototherapy prior to the start of the study in order to control for duration of the treatment sessions.

Starting dose for in-office phototherapy patients was 200 mJ, with an increase of 15% per session until pink erythema was achieved. Patients were instructed to stand in the center of the phototherapy booth. Home phototherapy patients were instructed to stand 6-9 inches away from the light bulbs and treat with 20 seconds of exposure to the front and back of the body with an increase of 15% per treatment until pink erythema was achieved. The increase was the same at every treatment for both home and in-office treatments. A chart with exact duration of treatment for each session was given to all home therapy patients. The dose was held once pink erythema had been achieved and increased again by 15% if erythema resolved.

Mean time required for three separate sessions was recorded, including setting up the machine, undressing, exposure to NB-UVB, dressing, and machine storage. Treatment time for the in-office group

included travel to the phototherapy unit, wait time, length of the treatment session, and travel to the next destination. Mean in-office treatment cost was obtained from billing documents for all nine patients and included both insurance reimbursement and patient out-of-pocket expenses. The cost was based on collection data and not simply the amount billed. The mean cost per treatment was multiplied by the number of treatments the patients were expected to receive over 1 year, assuming a thrice-weekly treatment regimen. The cost of therapy for the patients on home phototherapy group participant was \$4,590, which is the price of the Panasol 3D unit. Because the lifespan of the bulbs far exceeds 1 year for a typical home phototherapy patient, the cost to replace bulbs was not included in our estimate. Improvement was determined by estimating the body surface area (BSA) involvement by vitiligo lesions from the baseline visit to their second follow-up visit using a hand unit to represent 1% of the BSA. Safety was determined by documenting all side effects during treatment.

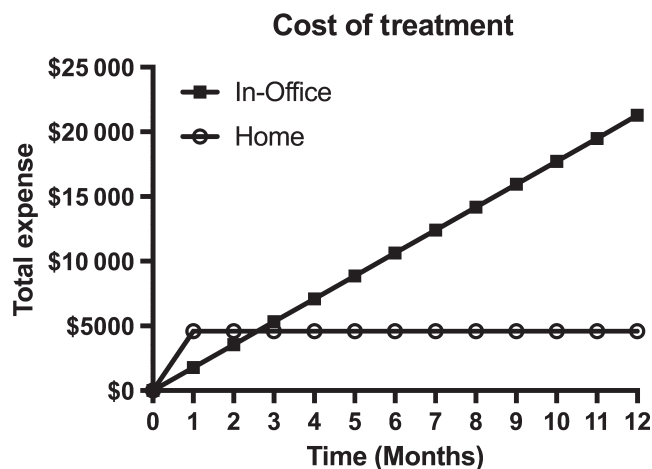
2 | RESULTS

Nine pairs of patients with vitiligo receiving home or in-office phototherapy fit the inclusion criteria. All patients had generalized vitiligo with lesions on the head, trunk, or extremities. Patients were not included if they only had lesions on the hands, feet, elbows, and knees, as these locations are resistant to treatment. The mean time for follow-up for both groups was 6 months. Mean treatment time for the home group was 22 minutes vs 86 minutes for the in-office group (Table 1, $P=.0032$, 95% CI [-99.15, -28.41]). Annual cost for the home group was \$4590 vs \$21 270 for the in-office group (Figure 1 $P<.0001$, 95% CI [-21 690.55, -11 671.21]). The cost of in-office phototherapy performed three times weekly exceeded the cost of home phototherapy after 3 months of treatment. Baseline BSA involvement with vitiligo was 7.2% for the home group and 12.9% for the in-office group. Improvement in BSA involvement for the home group was 42% vs 45% for the in-office group, which was not a significant difference ($P=.81$, 95% CI [-0.25, 0.31], Cohen's $d=0.08$). Irradiance was measured for two home units which showed fluences of 1.97 and 1.62 mW/cm², respectively (mean 1.8 mW/cm²). The in-office unit irradiance was 2.2 mW/cm², which is about 18% more than the home units. Despite this difference, improvement in pigmentation was similar in both groups. Review of side effects for the home group revealed 3 episodes of mild erythema vs 2 for the in-office group.

This study has been approved by the University of Texas Southwestern Medical Center IRB.

TABLE 1 Mean treatment time for three phototherapy sessions in patients with vitiligo receiving in-office vs home phototherapy

	Home Phototherapy (min)	In-Office Phototherapy (min)
Pair 1	25	91
Pair 2	20	62
Pair 3	11	95
Pair 4	15	181
Pair 5	45	84
Pair 6	13	103
Pair 7	40	53
Pair 8	13	62
Pair 9	16	41
Average	22	86

**FIGURE 1** Graph of projected cost of treatment of home vs in-office phototherapy for vitiligo showing significant cost savings with home phototherapy after 3 mo of treatment

3 | DISCUSSION

Although home phototherapy has been available for many years, the inconvenience and economic burden associated with this treatment limit its use. The results of this pilot study suggest that home phototherapy may be an excellent option for patients with vitiligo. Treatments that are more convenient and require less out-of-pocket costs are likely to improve compliance, which should ultimately improve results and patient satisfaction. Limitations of this study include its small size and lack of controlling for dosimetry between both groups. Further research comparing in-office and home phototherapy for vitiligo is needed.

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None.

CONFLICTS OF INTEREST

The authors have no conflicts of interest to declare.

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KEYWORDS

burden, clinical research, epidemiology, health services research, phototherapy, pigmentation, quality of life, vitiligo

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