

## Research Letter

### Financial Burden of Parking Fees for Phototherapy Patients: A Cross-Sectional Study

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Narrow band UVB phototherapy is a common treatment for many dermatologic conditions. Although, it is often covered by insurance or by safety net hospitals, there may still be significant treatment-associated parking costs as patients frequently require multiple sessions per week at a designated clinical site. Parking fees for cancer patients can approach thousands of dollars annually, posing a barrier for financially disadvantaged patients.<sup>1</sup> This cross-sectional study aimed to assess parking fees associated with phototherapy across the United States and to investigate geographic associations with cost of living and transit access.

Clinical sites were identified as those affiliated with U.S academic dermatology residency programs. The following information for each site was ascertained via phone calls and online search, if available: phototherapy center address, transit score, city cost of living score, public transit information, parking rates and reimbursement for phototherapy patients (supplemental methodology available at [https://data.mendeley.com/datasets/376wv4\\_4c9b/1](https://data.mendeley.com/datasets/376wv4_4c9b/1)). Mean, median, and range of each score and cost were calculated, and a

Spearman correlation was calculated for two variables.

Of 343 identified clinical sites, 314 responded while 29 did not respond. Of the 314 participant sites, 69 sites did not offer phototherapy services, and 6 sites did not have on-site parking. Full information (parking costs, city cost of living and transit score) was only available for 177 sites (**Table 1**). Of the sites with full available information, 124 (124/177; 70.1%) offered free or validated parking for all patients, and 65 (65/177; 36.7%) have public transportation information available on their website. Hourly parking costs were associated with transit score (**Fig. 1A**;  $r = 0.241$ ,  $p = .0004$ ) and city cost of living (**Fig. 1B**;  $r = 0.207$ ,  $p = 0.006$ ).

Parking fees represent significant nonmedical financial barrier to patients undergoing phototherapy treatment, especially if multiple times per week. In our study, 8.5% (29/343) of phototherapy sites did not detail parking fees on their websites nor provide such information via telephone inquiry. This can lead to unexpected financial costs related to medical treatment which in turn could lower patients' willingness to pay for care.<sup>2</sup> We also found that cities with a

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**Table 1.** Transit score, transit score correlations with/without free parking and with/without public transportation information online, city cost of living score, city cost of living score correlations with/without free parking and with/without public transportation information online and, parking costs.

Variable	n	Mean $\pm$ SD	Median (IQR)	Range, low-high	T test (p value)
Phototherapy center address transit score <sup>a</sup>	177 <sup>c</sup>	7.99 $\pm$ 2.05	8.50 (7.10 - 9.60)	0.00 – 10.00	-
Phototherapy center address transit score in sites with free parking	132	7.77 $\pm$ 2.13	8.30(7.10 – 9.30)	0.00 – 10.00	0.0004
Phototherapy center address transit score in sites without free parking	45	8.61 $\pm$ 1.69	9.50 (8.20 – 9.70)	1.50 – 10.00	
Phototherapy center address transit score with public transportation information online	112	7.66 $\pm$ 2.04	8.20(7.00 – 9.20)	0.00 – 9.90	0.0049
Phototherapy center address transit score without public transportation information online	65	8.55 $\pm$ 1.97	7.30 (8.30 – 9.70)	1.50 – 10	
City cost of living score	177 <sup>c</sup>	108.1 $\pm$ 19.19	102.00 (93.70 - 118.70)	87.30 – 183.00	-
City cost of living score in sites without free parking	132	106.0 $\pm$ 17.71	100.30 (93.50 – 110.5)	87.30 – 183.00	0.0057
City cost of living score in sites with free parking	45	114.3 $\pm$ 22.06	105.30 (96.9 – 128.0)	88.20 – 183.00	
City cost of living score in sites without public transportation information online	112	104.9 $\pm$ 16.53	100.25 (93.42 – 108.20)	90.07 – 183.00	0.0033
City cost of living score in sites with public transportation information online	65	113.6 $\pm$ 22.13	105.3 (95.8– 128.0)	87.30 – 181.10	
Cost of parking, \$					
Hour	53 <sup>d</sup>	5.10 $\pm$ 5.55	4.00 (2.00 – 5.00)	0.00 – 26.00	-
Day	53 <sup>d</sup>	12.7 $\pm$ 9.22	10.0 (6.0 – 15.0)	0.00 – 44.00	-

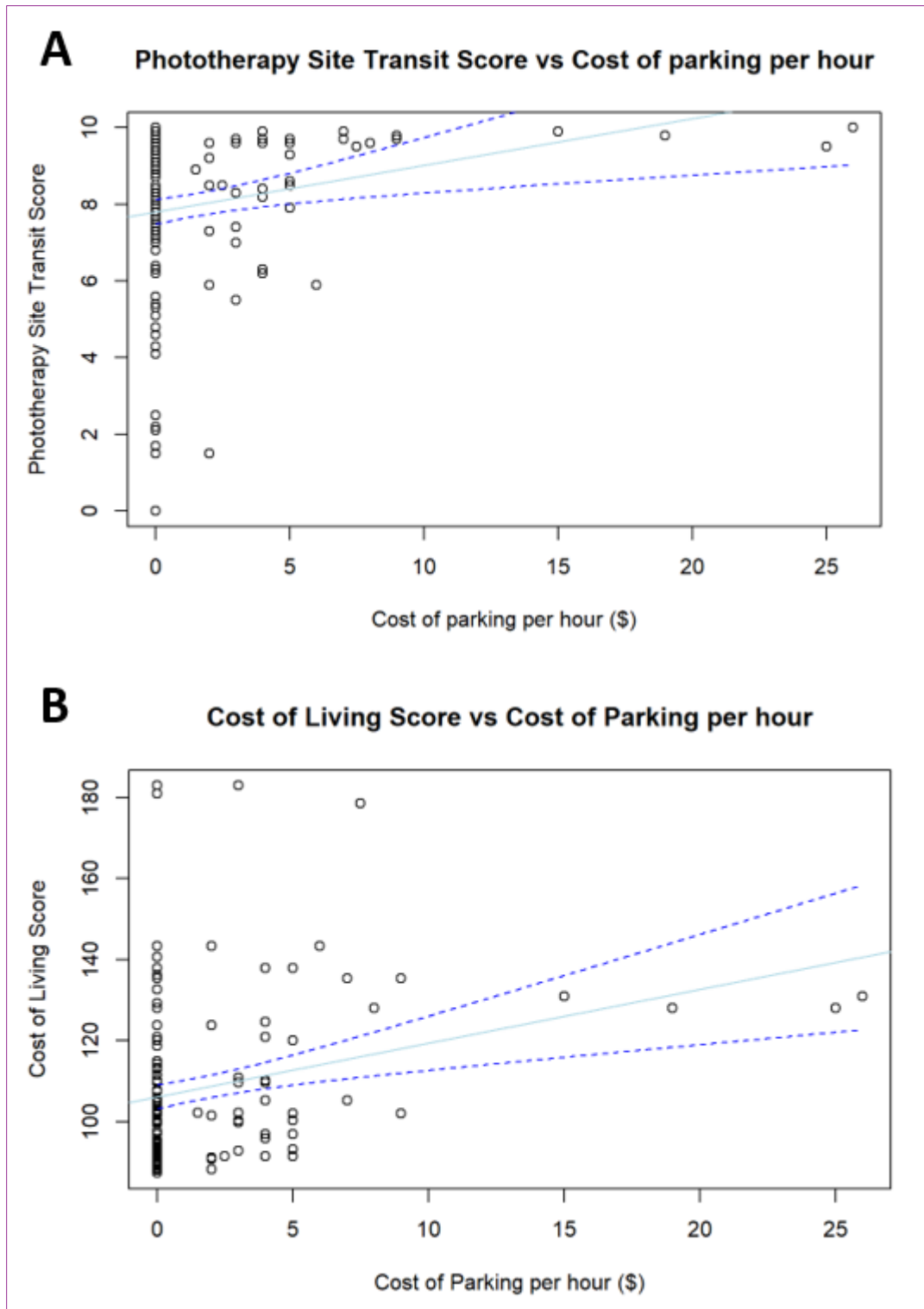
Abbreviation: IQR = Interquartile Range.

<sup>a</sup> The transit score range is from 0-10, with 0-3 indicating minimal transit options and 8-10 indicating efficient and accessible transportation.

<sup>b</sup> The city cost of living was indexed to 100, with 100 being the average cost of living and index values above 100 indicate that the city has a cost living above the average, while values below 100 indicate a cost of living below the average.

<sup>c</sup>The n value represents the clinical sites with full information available for analysis (parking costs, city cost of living and transit score)

<sup>d</sup>The n value represents the clinical sites that charges parking fees for patients



**Figure 1A & B.** Pearson Correlations Between Transit Score and City Cost of Living with Hourly Parking Costs. Each plotted dot represents a medical center that offer phototherapy services. Abbreviation: d = day. Hourly parking costs were associated with transit scores (Fig 1A;  $r=0.241$ ,  $p=.0004$ ) and cost of living (Fig 1B;  $r=0.207$ ,  $p=0.006$ ).

higher cost of living do not have as much free parking, compounding financial barriers. The average median parking cost in our study was \$5.10, amounting to \$798.15 annually for thrice weekly therapy. Home phototherapy units range from \$900 to \$1500 and can be more cost-effective given similar clinical efficacy to office-based phototherapy and elimination of non-medical costs such as parking fees.<sup>3,4</sup> As inconvenience and therapy-associated costs are lead reasons for patient discontinuation of phototherapy, home unit provision should be pursued in an effort to reduce long-term costs and improve patient adherence.<sup>5</sup> For patients requiring in-office phototherapy, clinical sites should offer validated or free parking to eliminate non-medical financial barriers.

Study limitations include limited number of sites that were available for data collection, as those that could not be reached through website and/or telephone as well as those without full information from data sources were not included in the study. Our study sample was limited to academic/teaching centers and thus may not be representative of all sites offering phototherapy. There could also be inaccuracy of costs that were collected through website and/or telephone, as websites and site staff may not have updated information available.

Phototherapy remains a first-line treatment modality for various dermatological conditions, given its great efficacy, high tolerability and low cost profile. With an increase usage of phototherapy services among Medicare and Medicaid beneficiaries, it is important for clinicians to be aware of non-medical costs such as parking fees that could further contribute to the health disparities of the population.<sup>6</sup>

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