

SHORT COMMUNICATION

The Behavioral Addiction Indoor Tanning Screener (BAITS): An Evaluation of a Brief Measure of Behavioral Addictive SymptomsJerod L. Stapleton¹, Joel J. Hillhouse², Rob Turrisi³, Katie Baker², Sharon L. Manne¹ and Elliot J. Coups¹¹Division of Population Sciences, Rutgers Cancer Institute of New Jersey, Rutgers, The State University of New Jersey, 195 Little Albany Street, Room 5570, New Brunswick NJ, 08901, ²Department of Community and Behavioral Health, East Tennessee State University, Johnson City, ³Department of Biobehavioral Health, The Pennsylvania State University, University Park, PA, USA. E-mail: staplej@cinj.rutgers.edu

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The use of indoor tanning beds (IT) that emit artificial ultraviolet radiation (UVR) is associated with an increased risk of skin cancer, particularly among frequent users (1–3). The physiologically reinforcing nature of UVR (4) may lead to symptoms of addiction to tanning among a subset of frequent IT users (5, 6). There is a need for evidence-based brief screening assessments to identify such users in order to further our understanding of the experience of tanning addiction. Although tanning addiction assessments have been developed by adapting existing substance addiction assessments (7), researchers have raised concerns about their validity (5, 8, 9) and assessment results do not appear to correspond to actual tanning behavior (9).

The aim of this study is to evaluate the Behavioral Addiction Indoor Tanning Screener (BAITS), a novel screening assessment for symptoms of IT addiction. The BAITS was developed based on the behavioral addiction disorder model described for the first time in the recently published Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (10). The fundamental feature of a behavioral addiction is diminished control over a behavior that subsequently becomes disruptive, problematic, or harmful to an individual (10, 11). Diminished control over addictive behavior is characterized by impulses and temptations that lead to urges or cravings for the behavior that are difficult to resist. The BAITS is designed to capture the experience of diminished control and urges to use IT that would be expected in a behavioral addiction model of IT. Following our preliminary analyses of the BAITS assessment survey items (see Appendix S1¹), we created scoring criteria to classify participants as symptomatic of IT addiction based on their responses to the BAITS. In this study, we examined the validity of these classifications by comparing IT users who screened positive on the BAITS to those who did not on The Structured Interview for Tanning Abuse and Dependence (SITAD) clinical assessment (8) as well as IT behavior assessed 6 months later.

METHODS AND MATERIALS

Participants were undergraduate students aged 18 years and older who attended a southeastern United States university. E-mail in-

vitations to the online survey study were sent to a random sample of 700 students drawn from a University-provided student list. E-mail receipt was confirmed for 360 individuals and 325 (90%) participated. Participants completed an online baseline survey that included the BAITS in the fall (October–November) and a 6-month follow-up survey to assess their subsequent IT use (April–May). Study compensation was \$10 for each completed assessment. Participants were excluded from the analysis if 1) they reported no prior use of IT ($n = 106$), 2) were over the age of 25 years ($n = 26$), or 3) did not complete the follow-up assessment ($n = 29$). The university's Institutional Review Board approved the study and all participants provided informed consent.

BAITS assessment items were designed to reflect diminished control over IT and urges to use IT. Our preliminary analyses of the BAITS (see Appendix S1¹) were used to refine the measure by analyzing participants' response patterns to the assessment items. Table I presents the refined version of the BAITS that was used in the current analyses. In addition to the BAITS, the baseline assessment included the SITAD, a clinical assessment used to diagnose IT users as tanning dependent based on criteria for opioid dependence (8). The SITAD utilizes more than 50 items and a detailed scoring algorithm to produce these diagnoses. On the follow-up assessment, participants reported the number of times they used IT in the past 6 months using an item with an open-ended response (8). Extreme outliers were recoded to 3.29 standard deviations (SD) above the mean for analytic purposes (12).

Based on the findings from our preliminary analyses, we classified participants into one of 3 groups according to their responses to the BAITS: 1) participants who endorsed none of the items, 2) those who endorsed one item, and 3) those who endorsed two or more items. To assess the validity of these BAITS classifications, we compared these groups on their classification of tanning dependence on the SITAD (8) using a χ^2 difference test as well as the number of IT sessions reported on the follow-up survey using one-way ANOVA.

Table I. *The Behavioral Addiction Indoor Tanning Screener (BAITS)*

Instructions: Please read each of the following statements regarding your feelings and experiences related to your indoor tanning use. If you agree at all with the statement, please circle "Yes". If you do not agree at all, please circle "No".

I think about indoor tanning too much.	Yes No
At times I have used money intended for something else such as bills or school fees to pay for my indoor UV tanning sessions.	Yes No
I would continue to indoor tan, even if it meant I could spend less time on my hobbies and other interests.	Yes No
I would be greatly distressed if I could not indoor tan anymore.	Yes No
My urges to indoor tan keep getting stronger if I don't indoor tan.	Yes No
Sometimes I think about indoor tanning as soon as I wake up.	Yes No
It's hard to ignore an urge to indoor tan.	Yes No

When scoring the BAITS, a "yes" response to 2 or more of the items is considered a positive screen for symptoms of indoor tanning addiction.

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RESULTS

The 164 participants were primarily female (82.3%) with a mean (SD) age of 20.1 (2.0) years. Fitzpatrick's skin type (13) was distributed as: I=7%, II=20%, III=39%, IV=29%, and V=5%. The majority of participants (81%) did not endorse any BAITS items. Of the remaining participants, 10% endorsed one BAITS item and 9% endorsed two or more. Participants who endorsed two or more items were more likely to be identified as tanning dependent on the SITAD (73%) compared to those with one response (25%) or 0 responses (1%) (χ^2 (2, $n=164$)=85.34, $p<0.001$). A significant main effect was observed for 6-month IT frequency ($F(2,161)=21.96$, $p<0.001$) such that participants who endorsed two or more BAITS items reported the highest rates of IT. Specifically, participants who endorsed two or more items reported a mean rate of IT (mean 47.10, [50.92]) more than 2.5X higher than those with one endorsed item (mean 18.28 [SD 18.16]) and more than 4.5X times compared with none (mean 10.15 [SD 14.37]).

DISCUSSION

Participants who endorsed two or more BAITS items were highly likely to be diagnosed as tanning dependent on the SITAD and reported IT at a greatly elevated frequency compared to other participants. These findings support the validity of using the BAITS to identify IT users who may be exhibiting tanning addiction symptoms and using IT at a high frequency. The documentation of diminished control and urges related to IT is novel and provides important evidence that supports the conceptualization of tanning as a behavioral addiction and reinforces the need for future research using this model.

There are limitations of this research. We sampled college-aged participants because IT rates are highest in this group (14). Future studies should include more representative samples to determine if findings are consistent across other populations. We also recruited participants from a single area and the extent to which the findings can be extrapolated to other populations and settings remains to be determined.

The BAITS represents a promising screening tool for symptoms of tanning addiction with preliminary evidence of validity. The BAITS could be utilized for classifying IT users as symptomatic of tanning addiction in studies of the biological, neurological, and genetic underpinnings of tanning addiction as well as in examining its comorbidities and risk factors. In addition, clinicians and healthcare providers could use the BAITS to identify patients in particular need of counseling to avoid IT. Although there is a lack of behavioral interventions targeted to individuals who evidence tanning addiction, even brief counseling by clinicians regarding addictive behaviors, like smoking, can lead

to measureable reductions in use (15). The findings also suggest the need for novel IT interventions that address the feelings of diminished control or urges to use IT that may make cessation efforts difficult among users experiencing tanning addiction symptoms.

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