Introduction and Objectives

- Cannabis demand (i.e., relative value), assessed cross-sectionally via a hypothetical marijuana purchase task (MPT), has been associated with cannabis use, problems, and dependence symptoms, among others.
- However, neither the prospective stability of the MPT, nor the cyclical relationship between demand and use over time has been investigated. Moreover, behavioral economic research among veterans is extremely limited.
- This study assessed stability and change in cannabis demand over six months using two waves of data from a veteran sample reporting past 6-month cannabis use. Autoregressive cross-lagged panel models assessed the longitudinal associations between demand (i.e., intensity, \(O_{\text{max}}\), \(P_{\text{max}}\), breakpoint) and use.

Methods

- **Participants (n = 133):**
  - Recently returned combat veterans from Operation Enduring Freedom, Operation Iraqi Freedom, and Operation New Dawn (OEF/OIF/OND)
- **Inclusion Criteria:**
  - Past 180-day cannabis use at baseline or 6-months
- **Procedure:**
  - Veterans were screened for eligibility by telephone
  - Potentially eligible participants completed an in-person screening session during which they provided informed consent and completed measures
- **Two additional sessions at 6 and 12 months (this study utilized data from baseline and 6-months)**
  - Participants compensated $50 per visit
- **Measures:**
  - Demographics verified through VHA medical record
  - Timeline follow-back (TLFB) assessment for past 6-month cannabis and other substance use
  - Marijuana purchase task (MPT), has been associated with cannabis use, problems, and dependence symptoms, among others.
- **Demand Index Generation:**
  - Intensity (consumption at zero cost), \(O_{\text{max}}\) (maximum expenditure), \(P_{\text{max}}\) (maximum price), breakpoint (price suppressing consumption to zero)
- **Cross-Lagged Models:**
  - Prospective bidirectional relations between each cannabis demand index and cannabis use frequency were examined using cross-lagged panel models (CLPM) in Mplus version 8.2

Results

Table 1. Sample demographics, substance use, and demand.

<table>
<thead>
<tr>
<th>Age</th>
<th>Sex</th>
<th>Race</th>
<th>Other Substance Use</th>
<th>Income</th>
<th>Annual Household Income</th>
<th>Daily cannabis use BL</th>
<th>Daily cannabis use 6M</th>
</tr>
</thead>
<tbody>
<tr>
<td>21.43 (SD = 33.20)</td>
<td>.016</td>
<td>.033</td>
<td>.317</td>
<td>'131</td>
<td>-.132</td>
<td>-.194</td>
<td>46 (34.6%)</td>
</tr>
<tr>
<td>Breakpoint</td>
<td>Intensity</td>
<td>Max</td>
<td>Max</td>
<td>SD = 33.01</td>
<td>.22</td>
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Table 2. Correlations among demographic variables, cannabis use, and observed demand indices at baseline and 6-months.

<table>
<thead>
<tr>
<th>Path</th>
<th>Intensity</th>
<th>(O_{\text{max}})</th>
<th>Breakpoint</th>
<th>(P_{\text{max}})</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL Cannabis Use BL (0.05)**</td>
<td>-.72 (0.05)**</td>
<td>.73 (0.05)**</td>
<td>.74 (0.04)**</td>
<td>.74 (0.04)**</td>
</tr>
<tr>
<td>BL Demand 6M Demand (0.08)**</td>
<td>.39 (0.08)**</td>
<td>.22 (0.08)**</td>
<td>.28 (0.08)**</td>
<td>.22 (0.09)**</td>
</tr>
<tr>
<td>Cross-lagged</td>
<td>BL Cannabis Use 6M Demand (0.08)**</td>
<td>.32 (0.08)**</td>
<td>.37 (0.08)**</td>
<td>.28 (0.08)**</td>
</tr>
<tr>
<td>BL Demand 6M Cannabis use (0.06)*</td>
<td>.14 (0.06)*</td>
<td>.11 (0.06)</td>
<td>.12 (0.06)*</td>
<td>.12 (0.06)*</td>
</tr>
</tbody>
</table>

Table 3. Model fit statistics with cannabis demand indices and cannabis use days with and without covariates. The full intensity model included income as a covariate, while models with breakpoint and \(P_{\text{max}}\) included age as a covariate. *Socio-demographic variables were not correlated with \(O_{\text{max}}\), thus, this model was not conducted with covariates.

Conclusions

- Cannabis demand indices demonstrated prospective stability over six months and varied along with natural changes in cannabis use.
- Importantly, intensity, \(P_{\text{max}}\), and breakpoint displayed bidirectional predictive associations with cannabis use, and across indices, the prospective pathway from use to demand was consistently stronger.
- Findings highlight the value of assessing cannabis demand longitudinally, particularly among clinical samples, to determine how demand fluctuates in response to experimental manipulation, intervention, and treatment.

Conflict of Interest Statement: The authors report no conflict of interest in the performance or publication of this research. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health, the Department of Veterans Affairs, or the United States Government.

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