Medical Marijuana Education for Medical Students
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BACKGROUND

Introduction

- The use of medical marijuana (MMJ) has been approved in 28 American states for a variety of indications, with large variability in evidence base supporting these indications.
- Voters approved MMJ in Massachusetts in 2012. Dispensaries began opening in 2015. There are currently nine functioning dispensaries.
- There are over 34,000 active MMJ patients in Massachusetts.
- Randomized-controlled trials (RCT) of MMJ support its use in chronic pain and spasticity due to multiple sclerosis; however, its use is not supported by RCT evidence in the majority of conditions named by MA state law.
- There is currently no formal medical marijuana education in the UMassM curriculum.

Objectives and Presentation

- Create a sixty-minute learning session for medical students focusing on four broad themes:
  - Biology of cannabis and the endocannabinoid system
  - Legal issues surrounding MMJ
  - Medical evidence regarding cannabinoids
  - Clinical considerations for MMJ
- Conduct pre/post assessments to investigate three categories of information among session participants:
  - Knowledge of legal and medical status of MMJ
  - Confidence in ability to handle clinical scenario involving MMJ
  - Attitude towards MMJ

METHOD

Pre/Post Survey Development

1. The survey asks students to answer questions about 12 different medical conditions. Six of the listed indications (multiple sclerosis, Parkinson disease, glaucoma, cancer, hepatitis C, and HIV/AIDS) can make patients eligible for MMJ in Massachusetts and the other six indications (Alzheimer disease, epilepsy, Tourette syndrome, PTSD, severe chronic pain, and terminal illness with life expectancy less than one year) were chosen from other states with legal MMJ. Based on the literature review, the following conditions were considered to have RCT evidence supporting treatment with MMJ and presented as such: multiple sclerosis, epilepsy, cancer, severe chronic pain, and HIV/AIDS.
2. Session participants were recruited via school-wide email and asked to complete identical pre/post surveys via a Google Form assessing knowledge of MMJ, confidence in clinical situations involving MMJ, and attitude towards MMJ.
3. The differences in results of the pre/post surveys were compared using two-tailed t-test analyses.

Pre/Post Survey

3. Please complete the following table. Circle either true or false in both categories: evidence for medical marijuana and approved indication by Massachusetts’ 2012 law.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Evidence for Medical Marijuana</th>
<th>Approved Indication by Massachusetts’ 2012 Law</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple Sclerosis</td>
<td>True</td>
<td>True</td>
</tr>
<tr>
<td>Parkinson Disease</td>
<td>False</td>
<td>False</td>
</tr>
<tr>
<td>Alzheimer Disease</td>
<td>True</td>
<td>True</td>
</tr>
<tr>
<td>Epilepsy</td>
<td>False</td>
<td>False</td>
</tr>
<tr>
<td>Tourette Syndrome</td>
<td>False</td>
<td>False</td>
</tr>
<tr>
<td>Post-traumatic Stress Disorder</td>
<td>True</td>
<td>True</td>
</tr>
<tr>
<td>Glaucoma</td>
<td>False</td>
<td>False</td>
</tr>
<tr>
<td>Cancer</td>
<td>False</td>
<td>False</td>
</tr>
<tr>
<td>Hepatitis C</td>
<td>False</td>
<td>False</td>
</tr>
<tr>
<td>Severe chronic pain</td>
<td>False</td>
<td>False</td>
</tr>
<tr>
<td>HIV/AIDS</td>
<td>False</td>
<td>False</td>
</tr>
<tr>
<td>Terminal illness with life expectancy below 1 year</td>
<td>True</td>
<td>True</td>
</tr>
</tbody>
</table>

Participants completed a Likert scale as seen on the left for the following statements:

a. I am confident in my ability to identify indications for MMJ in a clinical setting.
b. I am confident in my ability to identify contraindications for MMJ in a clinical setting.
c. I am confident in my ability to counsel a patient on the benefits and drawbacks of MMJ.
d. I am confident in my ability to counsel a patient on the differences between federal law and Massachusetts’ state law regarding MMJ use.
e. I am confident in my knowledge of how to navigate the system for certifying a patient for MMJ in Massachusetts.
f. I support the use of MMJ.
g. I plan to include MMJ in my future medical practice.
h. I believe the UMassM curriculum should include more material focusing on MMJ.

Confidence and Attitudes

- The statistical analysis of pooled responses to statements a, b, and c support a statistically significant increase in mean self-confidence, with the mean rising from 1.9 to 3.6, p-value of 9.5x10^-16.
- Pooled responses to questions d and e showed that participant self-confidence in knowledge about the legal status of MMJ also increased from a mean of 1.6 to 3.6, p-value of 1.8x10^-14.
- Individual mean strength of agreement with statements f, g, and h, increased significantly.
- All changes were statistically significant.

RESULTS

- Fifty-six students responded to the initial email announcement; 26 completed the pre-survey; 15 completed the post-survey.
- At the end of the course, 15 participants completed the MMJ Pre/Post Survey, achieving 93.3% completion rate.

Pre/Post Survey Participation:

- Total: 15 respondents (100%)
- Pre-survey: 15 respondents (100%)
- Post-survey: 15 respondents (100%)

Pre-survey:

- Participants completed the pre-survey at the start of the UMassM curriculum.

Post-survey:

- Participants completed the post-survey at the conclusion of the UMassM curriculum.
- The differences in results of the pre/post surveys were statistically significant.

Conclusions

- UMM students are currently not comfortable with addressing medical marijuana in a clinical setting. Student knowledge about evidence for MMJ and laws surrounding MMJ is poor.
- There is a strong interest in learning about MMJ within the UMM students’ body; 56 students initially responded to the email inviting attendees.
- A student-coached course was effective in improving knowledge level of MMJ law and self-confidence regarding MMJ scenarios.

Next Steps

- UMM has both the opportunity and responsibility to include MMJ education in its curriculum.
- Next steps could include a mandatory survey of students’ attitudes toward MMJ education, introduction of an MMJ module during the pre-clinical pharmacology course, or creation of a full Interstellar Day dedicated to Substance Use including both medical and recreational marijuana.