

Proposal for an Interdisciplinary Minor in Cannabis Studies

Date: March 2018

Title

Cannabis Studies

Contacts

Ekaterina Sedia (BIOL) and Carra Hood (Assoc. Provost)

Working Group Members

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Interim Dean Elizabeth Calamidas, School of Health Sciences

Dean Robert Gregg, School of General Studies

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Dean Peter Straub, School of Natural Sciences and Mathematics

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Edward Walton (HLTH)

Focus

This minor provides students with a generalist knowledge of medical/recreation marijuana research, foundational knowledge of marijuana-related legal and policy issues, and an overview of the cannabis industry from a combination of legal, business, and healthcare perspectives.

Academic Home

General Studies

First Offered

Fall 2018

Rationale and Demand

The interdisciplinary minor in Cannabis Studies offers students a foundation for understanding the burgeoning cannabis industry. New Jersey is among the 29 states and the District of Columbia that currently have legal medical marijuana. In addition, 9 states also have legal recreational marijuana. As a result of the swift growth in medical and recreational marijuana and the impending debates regarding

legalization of recreational marijuana in New Jersey, Stockton students may find the marijuana industry an attractive one to enter after graduation. The minor will expose students to some of the types of employment they might pursue.

A recent article in *The New York Times* (<https://nyti.ms/2E0O6iu>), "California Marijuana Start-Ups, Shut Out from Banks, Turn to Private Backing," chronicles the variety of job opportunities available in the medical and recreational marijuana industry. As the author of *The New York Times* article emphasizes, the industry needs individuals with broad-based education, ethical grounding, understanding of legal issues and policy-making practices, and knowledge of the marketplace and related concerns. The minor in Cannabis Studies, as an interdisciplinary minor, will provide Stockton students with not only the basic knowledge of cannabis industry business models and cultivation practices but also the recognition of complex historical, cultural, and social/political/economic contexts. In addition, this minor will offer all students an inclusive experience, drawing on a variety of backgrounds and modes of understanding, in addition to emphasizing how societal structures have affected drug legislation, business ownerships, and the current and future challenges anyone entering this industry is likely to face.

The minor in Cannabis Studies is a distinctive one in the state of New Jersey. No other public or private institution offers a minor of this type that addresses issues specifically related to the cannabis industry. Currently, no other college or university in the United States offers such a minor either. The cannabis industry is an expanding one. In the event that the New Jersey legislature increases the number of medical marijuana dispensaries, New Jersey and the federal government ease regulation of cannabis, and the federal government revises its policy and legislation regarding growing and researching hemp-based treatments and non-medicinal products, employment opportunities for Stockton graduates who have taken this minor may increase accordingly.

See the attached labor market projections for data regarding future demand in fields encompassing the cannabis industry.

Population of Students Who Will Benefit

All Stockton students benefit from this minor.

Number of Faculty Members Involved

The Cannabis Working Group includes faculty members from across the campus, deans, and administrators. The total number of faculty member is 11, including 2 adjuncts with specialized knowledge related to this area of work/study.

Number of Courses for Students to Choose

As is the case with other interdisciplinary minors, this minor consists of 5 courses. All students take Introduction to Medical Marijuana (GSS 2XXX, conversion of a current GIS 4438), Cannabis Legal and Policy Issues (GSS 3XXX), Internship Preparation (GEN 3XXX, including Cannabis research and basic understanding of small business operations), and a credit-bearing Internship with Reliance Health Care's marijuana grow facility and dispensary in Atlantic City (GIS 4800). Students can intern in a wide-variety of areas: cultivation, energy efficiency, small business operations, communications, social media, retail, patient research, etc. At present, in addition to the agreement with Relevant, we have a partnership with LaQuay Laun'Juel, President of Obsidian Elite Investment Association, an investor in cannabis industries in New Jersey, and a relationship with a local doctor, specializing in pain reduction, who has a license to make recommendations for medical marijuana. Like Relevant, both have expressed interest in providing internships for Stockton students.

The fifth course is an elective. Students can choose an elective from related General Studies' courses (such as Hydroponics, GNM 3164 or Social and Ethical Considerations of Business, GIS 3348) and first-year seminars (such as Business and Life, GNM 1014) or from courses in the Holistic Health minor as well as Economic Botany (GNM 2XXX), or any other program course in a student's specific area of interest.

Impact on Other Majors and Minors

This minor does not affect resource allocation to or enrollment in any other major or minor. Students with any major can take this minor.

See the letters of support from the Dean of the School of Natural Sciences and Mathematics and Dr. Vince Papaccio, the principle at Relevance, a division of Reliant Health Care.

Required Resources and Institutional Support

This minor does not require extraordinary resources or support beyond those available to all other interdisciplinary minors.

Contributions from Academic Programs

All courses in this minor are General Studies' courses, except for the elective, which can include a relevant program course.

Course Descriptions for the Minor in Cannabis Studies

GIS 4483 Medical Marijuana in NJ (in progress converting to GEN 2XXX)

This class focuses on the use of medical marijuana to treat patients in New Jersey and beyond. We discuss the history of cannabis, as well as the evolving political and medical landscape that has shaped the legislation regarding medical marijuana. Focus will also be placed on the treatment of the patients who qualify for the program versus their experience with traditional pharmaceuticals.

GSS 3XXX Cannabis Law and Policy (in progress)

This class examines the ways in which the legal system and public policy making have informed the current climate for legalization of medical and recreational marijuana. In addition, the course provides a foundation for understanding the public policy process and the steps in public policy formulation. The class will also explore the business community's role in making cannabis policy and contributing to changes in legalization and decriminalization.

GSS 3XXX Internship Preparation

This class provides students with the tools to succeed at the capstone internship. Because students will intern in the cannabis industry, they examine cannabis business and financing structures in this class, cannabis research, the ethical challenges of working in the cannabis industry, and the "soft skills" necessary for success in any workplace. Each student in collaboration with a faculty preceptor and the internship supervisor will draft a plan for the internship.

GXX 4800 Internship

Students will register for the Internship and will receive 4 credits for successful completion. Although students' internship focuses will differ, based on the plan drafted during the Internship Preparation course, each will submit weekly reflective journals, produce a final report/presentation, display best course work in an e-portfolio, and provide a response to the internship supervisor's evaluation.

Elective

Each student should work with their preceptor and minor course instructors to select an elective that best suits the student's academic, personal, and career goals. Students can choose a course in a major program as an elective or a General Studies' course. Among the electives student might choose are:

- AFAN 2000x African Americans and the Law
- AFAN 2350 Black Men in America
- GAH 3206 Race and U.S. Culture
- GSS 2351 Herbal Psychopharmacology
- GSS 3124 Entrepreneurial Thinking and Behavior
- GIS 3207 Contemporary Issues in Bioethics
- GIS 3319 Addictions
- GNM 2206 Herbal Medicine

GNM 2253 The Science of Gardening
GNM 3164 Practical Hydroponics
GNM 2230 Plant Science
GNM 2142 Horticulture: The Science and Art of Gardening
POLS 2245 Race and Politics
SOCY 2213 Minority-Majority Relations
SOCY 2355: Black Lives: Social and Economic Realities
SOWK 2504 Ethnic and Minority Relations

In addition, students may take courses in the Holistic Health minor or choose to take program courses across the curriculum in line with their interest and career focus.

Learning Goals and Assessment Plan for the Minor in Cannabis Studies

Students who complete this minor will encounter opportunities to develop all of Stockton's Essential Learning Outcomes as well as goals specific to this minor. The minor specific goals include:

1. History of medical marijuana in New Jersey and in the nation
2. Healthcare implications of medical legalization
3. Social benefits and effects of decriminalization and recreational use/legalization
4. Ethical challenges of working in the cannabis industry/consuming cannabis-based products legally
5. Research on medicinal and recreational effects of marijuana products
6. Legal and policy making issues associated with medical legalization, decriminalization, and recreational use/legalization
7. Experiential Learning

Minor Goal	ELOs	Course	Assessment Method
1. History of medical marijuana	Communication Skills, Critical Thinking, Information Literacy	Medical Marijuana in NJ GEN 2XXX (currently GIS 4483)	Research Paper, Rubric
2. Healthcare implications	Communication Skills, Critical Thinking, Information Literacy	Medical Marijuana in NJ	Research Paper, Rubric
3. Social Benefits	Communication Skills, Critical Thinking, Information Literacy	Medical Marijuana in NJ	Research Paper, Rubric
4. Ethical Challenges	Adapting to Change, Communication Skills, Critical Thinking, Ethical Reasoning, Information Literacy, Teamwork & Collaboration	Internship Prep GSS 3XXX	Presentation, Rubric
5. Research	Adapting to Change, Communication Skills, Critical Thinking, Global Awareness, Information Literacy, Quantitative Reasoning, Teamwork & Collaboration	Internship Prep	Annotated Bibliography, Rubric
6. Legal and Policy Making	Communication Skills, Critical Thinking, Global Awareness, Information Literacy	Cannabis Law and Policy GSS 3XXX (in progress)	Objective Exam
7. Experiential Learning & Integration/Synthesis of Learning Goals 1-6	Adapting to Change, Communication Skills, Creativity & Innovation, Critical Thinking, Global Awareness, Information Literacy, Quantitative Reasoning, Teamwork & Collaboration	Internship GEN 4800	Weekly Reflective Journals, Final Presentation & Report, Portfolio & Rubric, Supervisor Evaluation & Student Response

Course assessment will occur in the context of the required courses and program assessment will occur at the end of the 2-course internship sequence.

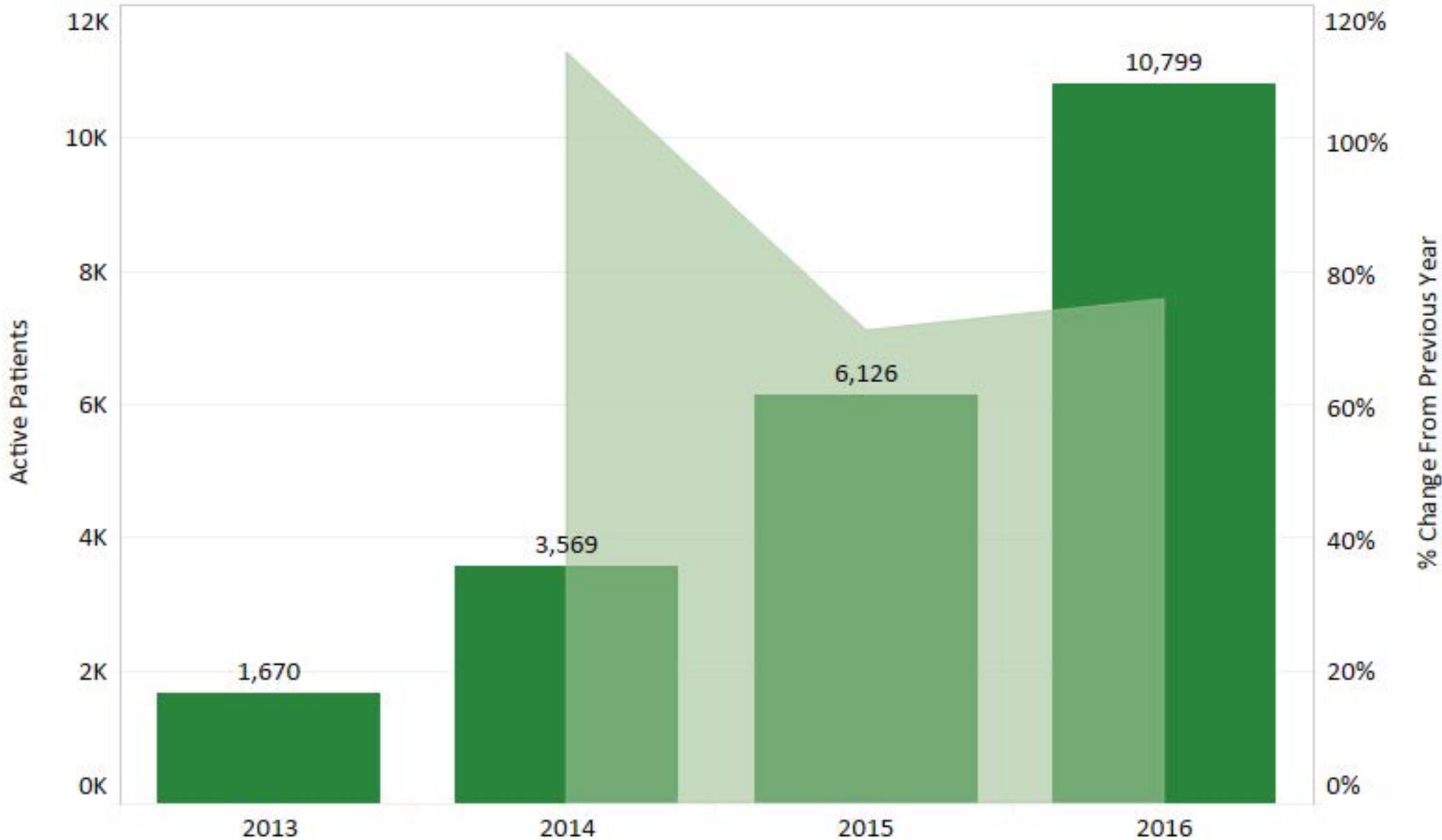
The first course is an internship preparation course; the second course is the hands-on internship with the Reliance Health Care group, Relevant (see letter of intent).

The Association of American Colleges & Universities considers internships a high-impact practice (<https://www.aacu.org/resources/high-impact-practices> and <https://www.aacu.org/leap/hips>). That means, these 2 internship courses combine to provide students with complex learning of the sort that asks students to integrate and synthesize all of the learning goals for the course of study.

New Jersey Medical Marijuana Patient Count By Year

Active Patients

% Change From Previous Year

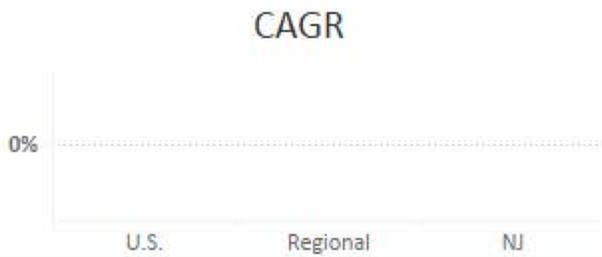
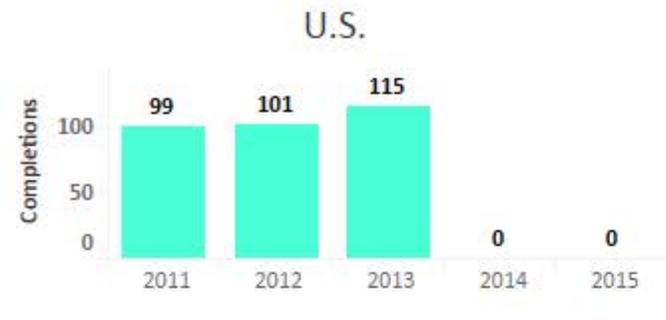


Source: New Jersey Department of Health

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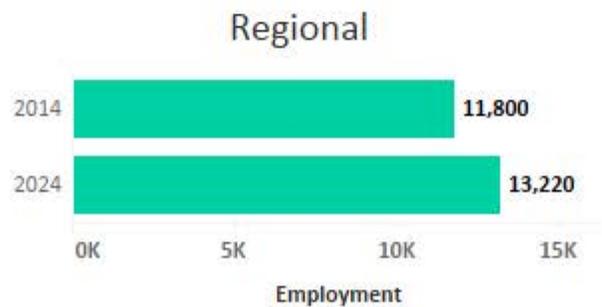
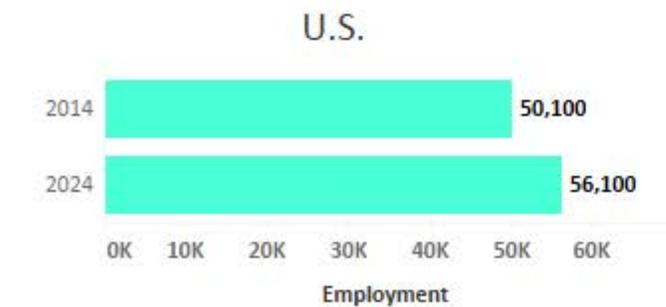
Completions

Select CIP 51.3300: Alternative and Complementary Medicine and Medical Systems, General



Labor Market Projects

Select CIP 51.3300: Alternative and Complementary Medicine and Medical Systems, General.



US Change #	6,000
US Change %	11.98%
US Openings	1,770

Regional Change #	1,420
Regional Change %	12.03%
Regional Openings	400

NJ Change #	390
NJ Change %	17.81%
NJ Openings	90

Completions

Select CIP 51.3306: Holistic Health

U.S.



Regional



New Jersey



AAC



CAGR



Standard Deviation



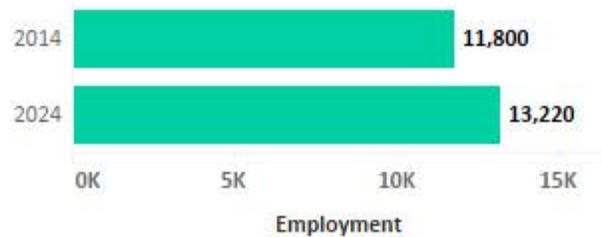
Labor Market Projects

Select CIP 51.3306: Holistic Health.

U.S.



Regional



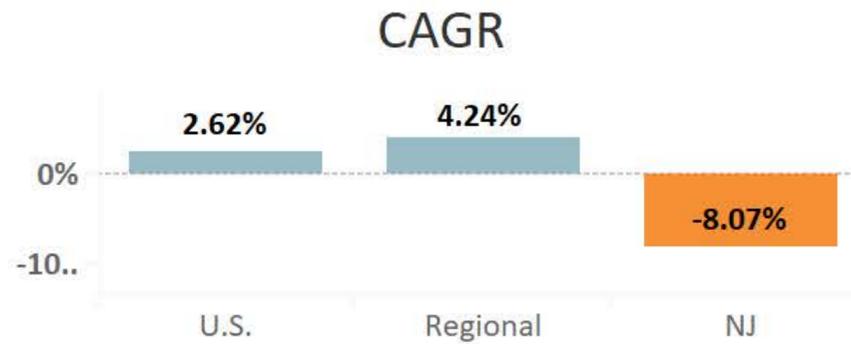
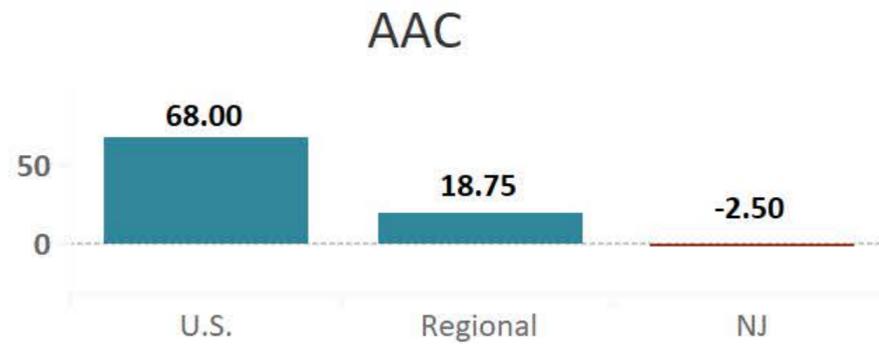
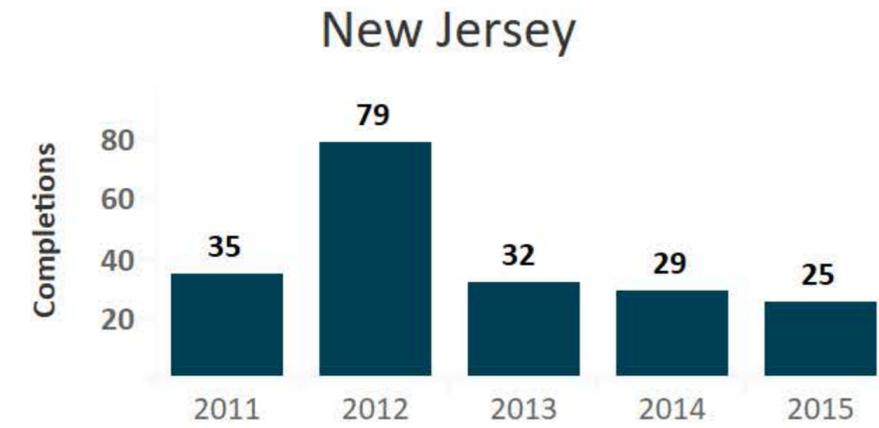
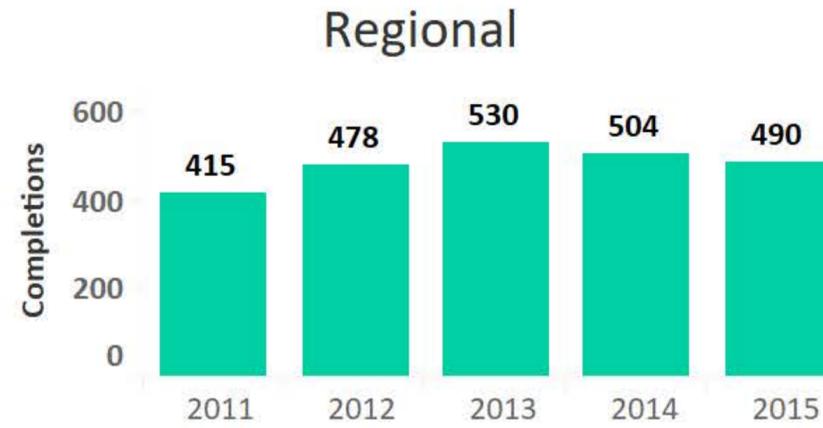
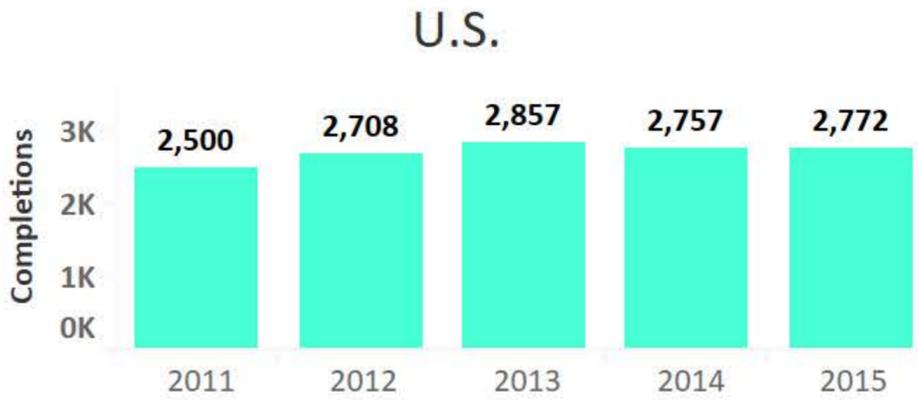
New Jersey



US Change #	6,000	Regional Change #	1,420	NJ Change #	390
US Change %	11.98%	Regional Change %	12.03%	NJ Change %	17.81%
US Openings	1,770	Regional Openings	400	NJ Openings	90

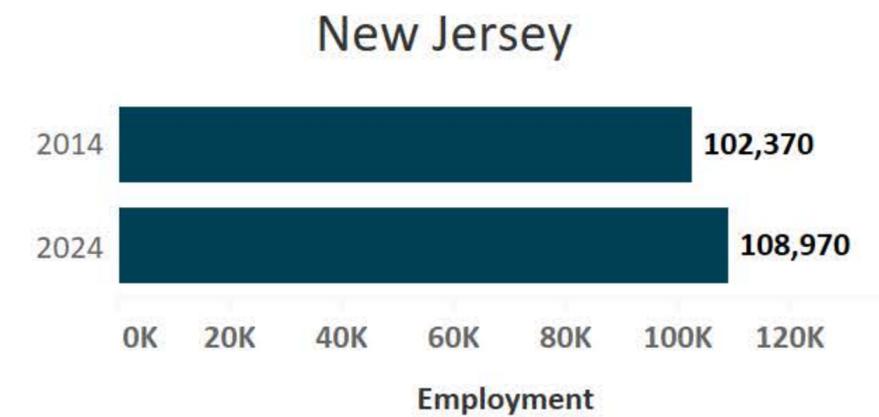
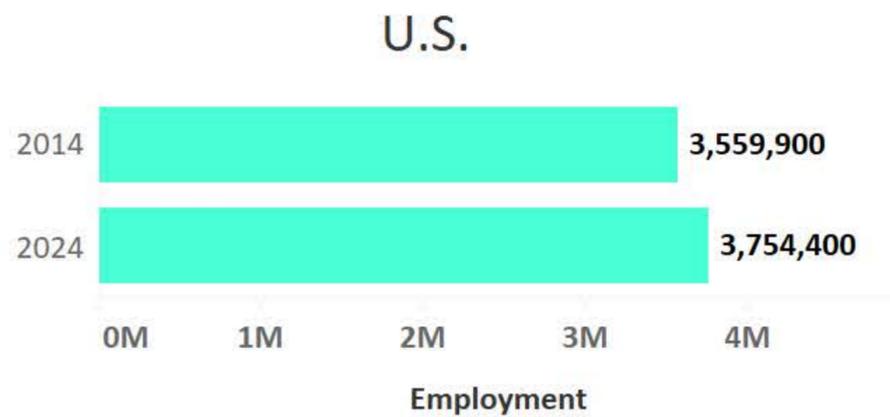
Completions

Select CIP 52.0701: Entrepreneurship/Entrepreneurial Studies



Labor Market Projects

Select CIP 52.0701: Entrepreneurship/Entrepreneurial Studies.



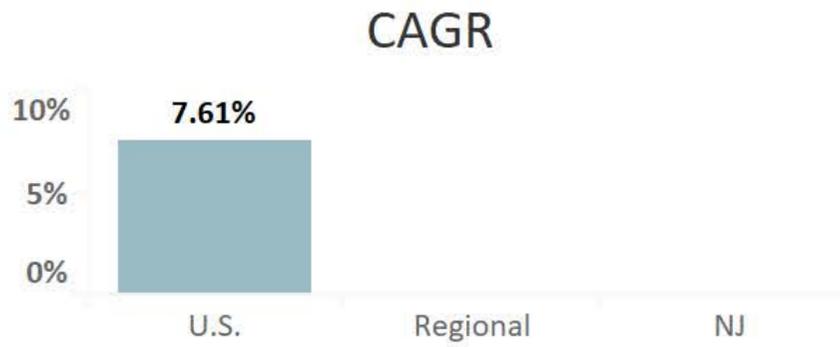
US Change #	194,500
US Change %	5.46%
US Openings	103,090

Regional Change #	55,190
Regional Change %	9.66%
Regional Openings	18,660

NJ Change #	6,600
NJ Change %	6.45%
NJ Openings	3,060

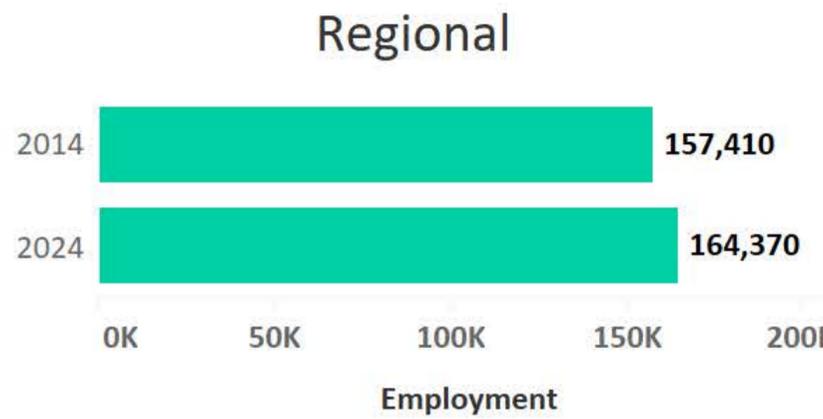
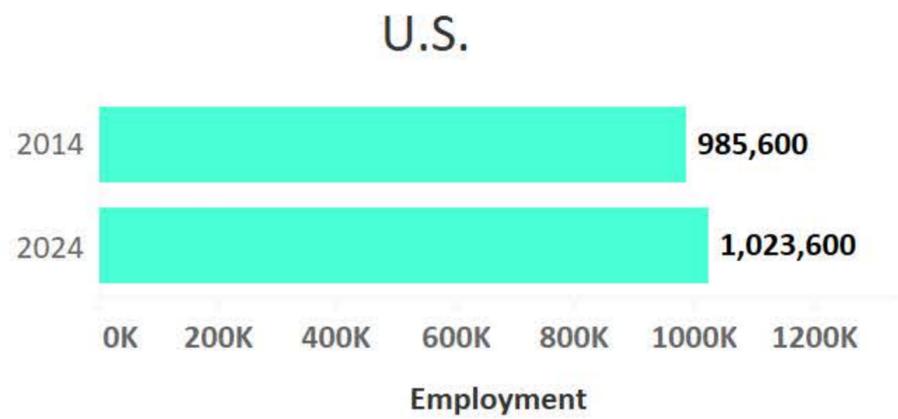
Completions

Select CIP 52.0703: Small Business Administration/Management



Labor Market Projects

Select CIP 52.0703: Small Business Administration/Management.



US Change #	38,000
US Change %	3.86%
US Openings	25,540

Regional Change #	6,960
Regional Change %	4.42%
Regional Openings	4,190

NJ Change #	2,750
NJ Change %	5.32%
NJ Openings	1,420

101 Vera King Farris Drive | Galloway NJ 08205-9441
stockton.edu

To: APP Committee of Faculty Senate
From: Dean Peter Straub
Date: 2/21/2018
Re: Minor in Cannabis Studies

Dear APP Committee members: I have been asked to comment on aspects of the proposed Minor in Cannabis Studies that is in discussion before the committee. Unfortunately, I will be unable to attend the meeting on March 29, 2018 at 4:30 PM and so will provide comments by letter.

The intent of this proposal was never to create a new “science” discipline and thus it was not proposed as a new major under NAMS. The same is true for health as it is not designed to produce any health care practitioner. However, the minor as put forward attempts to provide a scaffold for understanding an emerging global market that is estimated to be worth 50 billion dollars by 2025.¹ This industry, both medical and recreational, which has seen exponential growth in the US and many state governments, including NJ’s with new governor Murphy, has promoted legislation to drive economic growth and to provide public benefits from taxation. To understand this growth and to prepare students who may participate in this industry in the future, a broad liberal arts base was proposed with students defining their areas of potential interests. Students who might potentially work with operations involving “growing” need to have an understanding of plants and growth conditions but may not necessarily benefit from a degree in biology. Students need a basic understanding of the chemical basis of the neurological action of the active ingredients in cannabis but do not necessarily need advanced chemistry or pharmacology. That said, it would be possible for students in the minor to major in a science discipline (biology, chemistry, etc.) if their goal was ultimately to interface with regulatory agencies or work in product development alongside research chemists and biologists. This minor is designed to provide exposure to the cannabis industry and to supplement students’ major.

I am of the opinion that current and proposed G-courses could cover the broad-based liberal arts needs of minor students. Given the strength of the G-program at Stockton I am confident that proper

¹ <https://www.bloomberg.com/news/articles/2016-09-12/cannabis-industry-to-expand-to-50-billion-by-2026-analysts-say>

course selection would give minor students the background they would need to understand the cannabis industry in NJ and across the United States. As the Dean of NAMS, I remain committed to providing general education courses that would provide rigorous scientific training to the generalist audience of this minor. With increased greenhouse and growth facilities in the soon to open USC-2, there are greater opportunities to provide hands on training in this area through the G-curriculum.

Sincerely,

A handwritten signature in blue ink that reads "Peter F. Straub". The signature is fluid and cursive, with a long horizontal stroke extending from the end of the name.

Peter F. Straub Ph.D
Dean and
Professor of Biology

From: Mary Lou Galantino
To: Carra Hood and Kathy Sedia
Date: April 5, 2018

Dear Carra,

Thank you for our meeting this morning regarding the plans for the newly proposed minor in Cannabis Studies.

This correspondence serves as confirmation that the Biobotanical Track will no longer be offered through the Holistic Health Minor as of fall 2018. Formerly, this initiative was to explore student interest and enrollment in this area.

However, the courses relevant to medical marijuana will continue to serve both minor programs.

Continued research is needed in application of patient and community care and I hope to assist in that area of focus as we advance this initiative forward.

Thank you and wishing you well, Mary Lou

*Mary Lou Galantino, PT, MS, PhD, MSCE
Professor of Physical Therapy
Holistic Health Minor Coordinator
School of Health Sciences Office: G-233
Stockton University
101 Vera King Farris Drive
Galloway, NJ 08025
Phone: 609-652-4408
Fax: 609-652-4858
DPT and t-dpt Program web site: www.stockton.edu/dpt
Holistic Health Minor web site*



March 6, 2018

Harvey Kesselman, Ed.D.
President
Stockton University
101 Vera King Drive - Room K203
Galloway, New Jersey 08205-9441

RE: Internship Commitment

Dear President Kesselman:

Please accept this correspondence as our organization's formal written commitment to accept Stockton University student internships into Relevant's cannabis enterprise.

If appropriate and necessary, we would welcome student internships in the early stages of our development, as the industry is just being expanded into the State of New Jersey. In such regard, at this stage, it would be an opportunity for a student interested in a small business development experience. We anticipate receiving licensure and, as such, would accept internships in the following areas:

- | | |
|--------------------------|------------------------|
| Retail | Growing, Soil & Energy |
| Marketing | Packing & Distribution |
| Social Media | Public Health |
| Graphics & Communication | Administration |
| Research | Legal |

The above fields are only intended to be used as examples, as we are available to any student who may be interested in exploring our internship program.

We welcome the opportunity to work together with you and/or your designated representatives concerning this internship opportunity and, as always, look forward to continuing our positive business relationship with Stockton University.

Very truly yours,

Jon M. Rogis, M.D.

President

=====
cc: Cara Hood

NOTE from Stockton's General Counsel Regarding Internship Agreement and Indemnification

From: Kowalski, Brian
Sent: Friday, May 4, 2018 10:50 AM
To: Sedia, Kathy
Subject: RE: Legal Question

Kathy, our standard form of Affiliation Agreement contains sufficient indemnification to protect the University if students intern at medical facilities, which presumably will be licensed by the State of New Jersey. The medical facility also is required to possess insurance to protect the University.

Brian Kowalski

General Counsel

Stockton University

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Galloway, NJ 08205

609-652-4494

Brian.Kowalski@stockton.edu



Understanding Patients' Process to Use Medical Marijuana: A Southern New Jersey Community Engagement Project

Journal of Patient Experience
Volume 3: 1-7
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DOI: 10.1177/2374373516667002
jpejournal.sagepub.com


Tara L. Crowell¹

Abstract

Given the necessity to better understand the process patients need to go through in order to seek treatment via medical marijuana, this study investigates this process to better understand this phenomenon. Specifically, Compassion Care Foundation (CCF) and Stockton University worked together to identify a solution to this problem. Specifically, 240 new patients at CCF were asked to complete a 1-page survey regarding various aspects associated with their experience prior to their use of medicinal marijuana—diagnosis, what prompted them to seek treatment, level of satisfaction with specific stages in the process, total length of time the process took, and patient's level of pain. Results reveal numerous patient diagnoses for which medical marijuana is being prescribed; the top 4 most common are intractable skeletal spasticity, chronic and severe pain, multiple sclerosis, and inflammatory bowel disease. Next, results indicate a little over half of the patients were first prompted to seek alternative treatment from their physicians, while the remaining patients indicated that other sources such as written information along with friends, relatives, media, and the Internet persuaded them to seek treatment. These data indicate that a variety of sources play a role in prompting patients to seek alternative treatment and is a critical first step in this process. Additional results posit that once patients began the process of qualifying to receive medical marijuana as treatment, the process seemed more positive even though it takes patients on average almost 6 months to obtain their first treatment after they started the process. Finally, results indicate that patients are reporting a moderately high level of pain prior to treatment. Implication of these results highlights several important elements in the patients' initial steps toward seeking medical marijuana, along with the quality and quantity of the process patients must engage in prior to obtaining treatment. In addition, identifying patients' level of pain and better understanding the possible therapeutic value of medical marijuana are essential to patients and health practitioners.

Keywords

patients perspective, medical marijuana, cannabis, policies and procedures, community engagement project

Introduction

Based on new laws, there are 23 states and the District of Columbia that are legally able to prescribe the use of medical marijuana. However, given the relative novelty of this practice coupled with the federal illegal classification of cannabis, the use of it for medicinal purposes is anything but straightforward (1). As more and more states pass laws legalizing the use of marijuana for medicinal purposes and as research highlights its therapeutic values (2-11), so too will patient demand. However, currently little is known about the process that patients experience prior to obtaining the use of medical marijuana.

The US Drug Enforcement Administration lists marijuana and its cannabinoids as schedule 1 controlled substances. This means that they cannot legally be prescribed under

federal law due to (a) high potential for abuse, (b) no currently accepted medical use in treatment in the United States, and (c) lack of accepted safety for use under medical supervision (2). Despite this however, some physicians and the general public alike are in broad agreement that Cannabis sativa shows promise in combating diverse medical illnesses (1). Given the federal law, physicians could wind up in jail for writing a prescription for medical marijuana, and thus,

¹ Stockton University, Galloway, NJ, USA

Corresponding Author:

Tara L. Crowell, Stockton University, 101 Vera King Drive, Galloway, NJ 08205, USA.

Email: tara.crowell@stockton.edu



many states have passed laws allowing the use for medicinal purposes. In those states, health-care practitioners provide an “authorization” for that use and, based on previous court action, are considered by federal courts to be protected physician–patient communication (12). However, even though by law health-care practitioners are able to prescribe medical marijuana, it is not clear what patients must go through in order to be eligible to receive it and specifically how long this process takes.

Medical Marijuana and Patients’ Process

Senate Bill 119, approved in January 2010, protects “patients who use marijuana to alleviate suffering from debilitating medical conditions, as well as their physicians, primary caregivers, and those who are authorized to produce marijuana for medical purposes” from “arrest, prosecution, property forfeiture, and criminal and other penalties.” It also provides for the development and implementation for alternative treatment centers (ATCs); specifically, the creation of at least 2 each in the northern, central, and southern regions of the state. (13) Physicians determine how much marijuana a patient needs and gives written instructions to be presented to an ATC. The maximum amount for a 30-day period is 2 ounces. The approved conditions for the use of medical marijuana are as follows—seizure disorder, including epilepsy, intractable skeletal muscular spasticity, glaucoma; severe or chronic pain, severe nausea or vomiting, cachexia, or wasting syndrome resulting from HIV/AIDS or cancer; amyotrophic lateral sclerosis (Lou Gehrig disease), multiple sclerosis, terminal cancer, muscular dystrophy, or inflammatory bowel disease, including Crohn disease; and terminal illness, if the physician has determined a prognosis of less than 12 months of life or any other medical condition or its treatment that is approved by the Department of Health and Senior Services.

As of April 23, 2014, there were ATCs with permits to operate in all 3 regions of the state as designated by the medical marijuana program—north, central, and south. Compassionate Care Foundation (CCF; note 1) is one of these ATCs located in the southern region of New Jersey. Compassionate Care Foundation by law is only required to assess patient level of pain every 90 days, but given their commitment to this process and their patients, CCF wanted to identify the process that patients had to go through prior to treatment. The ability of Compassionate Care Foundation to gather such data would hopefully shed light on this new endeavor in order to not only better understand the process but also provide solid data to legislators to help shape the policies and procedures regarding the availability and dissemination of medical marijuana. In light of this situation, CCF decided to reach out to Stockton University hoping to partner in this problem-solving solution.

The goal of this partnership was to better understand the process that patients experienced in order to be eligible to receive medical marijuana. Specifically, to understand the following about patients seeking the use of medical marijuana (a) patient diagnosis, (b) what prompted patients to seek treatment, (c) patients’ level of satisfaction with specific stages in the process, which entails locating certified physician, referrals, making appointments; navigating Web sites that includes payment, getting approval, communications with the state, contact an ATC, and overall satisfaction with the process, (d) total length of time of this process, and (e) patient’s level of pain. Compassionate Care Foundation’s vision is that a better understanding of patients’ experience will provide valuable information that can help shape future policies and procedures for patients’ use of medical marijuana. Therefore, the following research questions (RQs) were posed:

RQ1: For what diagnosis are people using medical marijuana?

RQ2: How did patients begin the process to seek medical marijuana?

RQ3: a. What did patients experience during the process?

b. How long did the process take?

c. How satisfied were patients with the overall experience?

RQ4: What was patient’s base level of pain?

Methodology

The Public Health Program at Stockton University, located in Galloway, New Jersey, partnered with CCF in order to ascertain the process that patients experienced prior to receiving treatment—the use of medical marijuana, at CCF. In order to accomplish this, a 6-month-long study was conducted to explore various aspects associated with what patients experienced prior to receiving their first treatment at CCF.

Variables

Compassionate Care Foundation reached out to Stockton’s Public Health Program to assist with constructing an instrument that would identify specific variables associated with patients’ process prior to their first treatment of medical marijuana at CCF (14). This level of research is not yet required by law but illustrates CCF’s dedication to understanding this process to help guide future policies and procedures. Specifically, this preliminary study was designed to discover initial behavior that patients engaged in to start the process. This was measured nominally by asking patients to indicate what first prompted them to seek alternative treatment, whether they did their own research and if so, where did they obtain their information. Next, patients were asked to report their specific experience with different stages of

getting approved to use medical marijuana, overall experience, length of time the process took, and baseline pain of patients prior to their first treatment at CCF. In order to measure the 9 variables associated with the process, along with overall satisfaction, a 10-point systematic differential scale (negative to positive) was developed, 1 question per variable due to patient time restraints (see Appendix A for the entire 1-page survey). In addition, time of process was operationalized by months, and baseline pain was operationalized by a pictorial version of the pain scale (Wong-Baker Face pain rating scale; this scale was chosen by CCF administration).

Procedures

Data were collected for 8 months between the months of June 2014 and January 2015 and were completely voluntary (informed consent was also provided). Any patient seeking treatment for the first time at CCF during these months was asked to fill out the above 1-page survey.

Sample

By the end of the 8 months, paper surveys were filled out by $N = 240$ total new patients: 32.4% female, 50.7% male, and 17% missing for gender. The age of the patients ranged from 9 to 84 years, with a mean of 49.3 and standard deviation of 13.6.

Results

In order to answer the above RQs, basic descriptive and frequency statistics were computed on SPSS. The following are the results:

RQ1: For what diagnosis are people using medical marijuana?

Rank	Diagnosis	n	Percentage
1st	Intractable skeletal spasticity	72	30%
2nd	Chronic/severe pain	62	26%
3rd	Multiple sclerosis	41	17%
4th	Inflammatory bowel disease	24	10%
5th	Seizure disorder	14	
6th	Terminal illness/cancer	12	5%
7th	Glaucoma	10	4%
8th	Muscular dystrophy	4	0.016%
9th	Lateral sclerosis	3	0.012%
	Cancer (specific types)	3	0.012%
	Crohn disease	3	0.012%
10th	Nausea	2	Less than 1%
11th	Reflex Sympathetic Dystrophy	2	Less than 1%
12th	Depression/anxiety/bipolar	1	Less than 1%
	Epilepsy	1	Less than 1%
	Rheumatoid Arthritis	1	Less than 1%
	Langerhans cell histiocytosis	1	Less than 1%

RQ2: How did patients begin the process to seek medical marijuana?

What prompted patients to seek treatment	Total number	Percentage
Their physician	132	55
Written information	37	15
Friend	31	13
Media	25	10
Relative	21	8
Website	8	3
Support group	3	1
Conducted their own research on alternative treatments	187	78
Used the Internet to conduct research	104	43
Sought information from a physician	15	6

RQ3: a. What did patients experience during the process?

Steps in the process	Range	Mean	Standard Deviation
Locating a certified Myeloma physician	1-10	8.37	2.46
Setting up an appointment	1-10	8.60	2.32
Getting a referral number	1-10	8.4	2.46
Communication from state	1-10	8.02	2.65
Wait time to get approval	1-10	7.70	2.74
Navigating the website	1-10	7.90	2.47
Providing documents via website	1-10	7.67	2.84
Payment online	1-10	8.43	2.50
Contacting an ATC	1-10	9.20	1.62

b. How long did the process take?

Range	Mean	Standard Deviation
1-36 months	5.8 months	6.87 months

c. How satisfied were patients with the overall experience?

Range	Mean	Standard Deviation
1-10	8.75	1.91

RQ4: What was patient's level of pain?

Range	Mean	Standard Deviation
0-10	7.57	2.14

Discussion

Given the necessity to better understand the process patients need to go through in order to seek treatment via medical marijuana, this study investigates this with hopes to paint a

clearer picture of this process. Specifically, these findings shed light on various aspects associated with patients' experience prior to their use of medicinal marijuana. First, results reveal numerous patient diagnoses that medical marijuana is being prescribed. The top 4 most common are intractable skeletal spasticity, chronic and severe pain, multiple sclerosis, and inflammatory bowel disease. Next, results of basic descriptive statistics indicate the majority of patients (a little over half) were first prompted to seek alternative treatment from their physicians. However, it is important to understand that physicians will not be prescribing marijuana for patients; rather, they will be certifying that a patient has a "debilitating medical condition" eligible for medical marijuana according to state regulations. Also, physicians are not required to certify any patient, and some may decline to do so, given the federal ban or limited clinical evidence (15).

While the remaining patients indicated that other sources such as written information along with friends, relatives, media, and the Internet persuaded them to seek treatment. These data indicate that a variety of sources play a role in prompting patients to seek alternative treatment and is a critical first step in this process. Continued research on the therapeutic value of medical marijuana will provide physicians and patients with accurate and updated information.

Patients also indicate whether they engaged in any research on their own prior to seeking treatment. A little over three-quarters of the sample indicate doing their own research on seeking alternative treatments. Further investigation revealed that almost half of participants conducted this research via the Internet, while only a small percentage did so by obtaining information from their physician. Mostly likely, given the format of this question (open ended), half of the participants left this question blank. This is consistent with past research that states that physicians are no longer autonomous when it comes to patients' health. As stated by Ludwig and Burke (16) article entitled *Physician–Patient Relationship*:

The historical model for the physician–patient relationship involved patient dependence on the physician's professional authority. Believing that the patient would benefit from the physician's actions, a paternalistic model of care developed. Patient's preferences were generally not elicited, and were over-riden if they conflicted with the physician's convictions about appropriate care. However, during the second half of the twentieth century, the physician–patient relationship has evolved towards shared decision making. This model respects the patient as an autonomous agent with a right to hold views, to make choices, and to take actions based on personal values and beliefs. Patients are acknowledged to be entitled to weigh the benefits and risks of alternative treatments, including the alternative of no treatment, and to select the alternative that best promotes their own values.

Thus, as evaluating the details of one's medical history and current condition is his/her doctor's job, the more informed a patient is about their own health, the more empowered and confident they will feel about effectively managing their illness or injury.

Further implication of these results highlights 2 important elements in the patients' initial steps toward seeking medical marijuana. First, the patients will look toward physicians to provide them with information regarding the use of medical marijuana. However, many physicians may still be on the fence and searching for information themselves. As Thorson, president-elect for Nelson (17) states:

Some health care providers are sitting out completely while others are ready to start certifying patients, most are waiting to decide whether they'll play a role, hoping for answers to concerns that range from dosing and side effects to the risk of losing out on funding by violating federal law, which still bans dispensing marijuana. There are a lot of unanswered questions here and it will be a work in progress. We just have to realize that.

Thus, the role that physicians play in this process is still developing. One thing for sure is that many patients will look toward them for knowledge and guidance.

As a result of this guidance, the second implication for the physician–patient communication is critical. Specifically, physicians may have to take the lead on the initial dialogue regarding medical marijuana. Marijuana is a controversial substance that has been painted in an intensely negative light by decades of moral condemnation, punitive legislation, and fear-mongering media coverage and public service announcements. For many patients, particularly those among the older generations, asking their doctor about medical marijuana may not be as easy as inquiring about the benefits of "normal" medications produced by pharmaceutical manufacturers. For example, best-selling, name-brand prescription drugs are not scheduled substances—they simply don't invoke the same attitudes and anxieties (18). Thus, given that patients may be uncomfortable initially broaching the subject, physicians may need to take the lead in this communication. However, patients still need to play an active role, especially if their physician is less supportive about this possible option. Ultimately, patients need to keep in mind that their health and well-being is also in their control. Thus, if physicians are not supportive or judgmental about patients' questions regarding medical marijuana, those patients have a right to be proactive and ask questions/seek medical advice on this line of treatment. Patient must take an active role in their own health care, seeking a variety of sources to help make better informed decisions about their care. Again, continued research on medical marijuana will positively contribute to this stage of the process for both physicians and patients.

Once patients began the process of qualifying to receive medical marijuana as treatment, the process seemed more positive than not. Specifically, patients reported between 70% and 80% positive experience with regard to locating a certified MM physician, getting a referral, and setting up an appointment. Similarly, patients report favorable experience with communication with the state, wait time, and the web-site—which included navigating the site, providing documents, and payment. Finally, patients' easiest step in the process was contacting an ATC. Thus, these individual variables are consistent with patients' high overall satisfaction with the experience. Finally, results indicate that on average it takes patients almost 6 months to obtain their first treatment after they started the process. In light of these findings, the length of time patients reported for the overall process seems even more interesting. Although almost 6 months seems rather lengthy to obtain treatment, patients are reporting an overall high satisfaction and ease with going through the process. Thus, these results may suggest that while patients are able to navigate through the steps, maybe the time required to go through each of these steps needs to be revisited. This is where future policies and procedures could revisit each level to ascertain whether the process could be more efficient in terms of the length of time. Results of the last RQ indicate patients report on average a moderately high level of baseline pain prior to seeking treatment via medical marijuana. This coincides with the second highest patient diagnosis of chronic/severe pain and past research that suggests that medical marijuana may be an effective option for not only pain relief but also for other physical and mental health problems, especially given the epidemic of addiction and overdose deaths from prescription opioids (19). Cannabis and its active ingredients are a much safer therapeutic option and effective for many forms of chronic pain and other conditions but have no overdose levels. Thus, these results appear consistent with current literature and indicate many chronic pain patients could be treated with cannabis alone or with lower doses of opioids (19,20). Identifying patients' level of pain and better understanding the possible therapeutic value of medical marijuana are essential to patients and health practitioners.

As with most studies, there are several limitations to this study. This was a voluntary self-report survey, which lends to more predictive rather than causal relationships. In addition, given the voluntary nature of the study, not all patients participated. Also, variables were only measured quantitatively and with 1 item. These factors along with time constraints associated with administering the surveys certainly

influence the quantity and quality of information obtained. Thus, results should be interpreted with such knowledge of methodology and sample construction. In addition, the sample consisted entirely of residents of New Jersey (mostly Central and Southern New Jersey) and may be a factor to consider with external validity/generalizability of results.

Therefore, the overall purpose of this study is to investigate the process in which patients experience in order to seek the use of medical marijuana as treatment to health-related conditions. Specifically, this community engagement project investigated patients' process to seek and obtain the use of medical marijuana, along with patient diagnosis and baseline pain.

Results provide insight into many aspects associated with what prompted patients to seek the use of medical marijuana and how physicians, along with access to reliable and valid information, play an essential role in this process. In addition, patients indicate a high level of satisfaction with the various steps associated with getting approval for the use of medical marijuana, even in light of the average length of time the whole process takes.

Future efforts should focus on each of these steps to determine the efficiency of each phase as it relates to the process as a whole. Overall, patients' knowledge about what they can expect to experience in each phase of this process provides insight to the types of tasks they will need to perform and how long each step may take. This can better prepare them for when they may want to begin this process, especially given that patients report a fairly high level of baseline pain prior to starting the use of medical marijuana as an alternative treatment. Also, understanding how each is connected may provide ways to reduce the amount of time the entire process takes. Despite its limitation, this partnership between CCF and Stockton University provides valuable knowledge regarding patients' process toward seeking the use of medical marijuana as treatment with a key message:

Although patients are overall satisfied with the process, it may take up to 6 months, and since patients report experiencing moderately high levels of pain, starting the process as early as possible is advisable.

Understanding and sharing this information with the community will hopefully contribute to building and maintaining an effective and efficient process for physicians and patients to understand and access medical marijuana as an alternative treatment for health-related conditions.

Appendix A

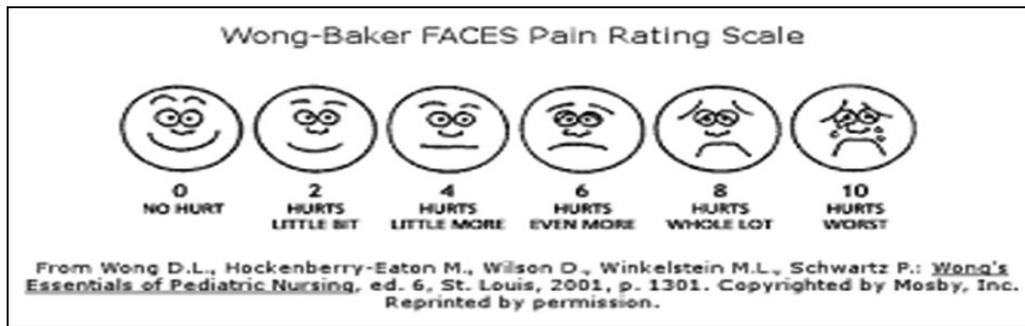
This survey is to be filled out once by each patient

Please respond to the following questions prior to obtaining services at Compassionate Care.

1. What initially prompted you to seek alternative treatment for your condition? (circle all that apply) Physician relative Friend relative Written information media Web site Support group Other
2. Did you do any research on your own about alternative treatment? Yes No
If yes, where did you obtain your information?
3. Once you decided to start the process of alternative treatment, please rate the following steps in terms of your experience (1 = negative to 10 = positive)

Locating a certified MM physician	1	2	3	4	5	6	7	8	9	10
Setting up an appointment	1	2	3	4	5	6	7	8	9	10
Getting a referral number	1	2	3	4	5	6	7	8	9	10
Communication from the state	1	2	3	4	5	6	7	8	9	10
Wait-time to get approval	1	2	3	4	5	6	7	8	9	10
Navigating the Web site	1	2	3	4	5	6	7	8	9	10
Providing documents via website	1	2	3	4	5	6	7	8	9	10
Payment online	1	2	3	4	5	6	7	8	9	10
Contacting an ATC	1	2	3	4	5	6	7	8	9	10
Overall experience	1	2	3	4	5	6	7	8	9	10

4. Approximately how long did it take you to received Alternate Treatment Care for your condition, from start to finish (once you decided to seek treatment until your first treatment): _____
5. Please use the scale below and circle your level of baseline pain



Inter-office use only (to be filled out by Staff)

Date: _____	Patient ID # _____	Gender: M	F
Age: _____	Condition: _____		

Note

1. CCF is a nonprofit corporation organized in the state of New Jersey to provide therapeutic relief by dispensing pharmaceutical-grade medical marijuana to patients with qualifying medical conditions. Founded in 2011, Compassionate Care is led by a board of directors whose members are medical professionals, former health department regulators, community leaders, and researchers. Compassion Care Foundation is committed to providing New Jersey patients with safe and affordable medical marijuana. Compassion Care Foundation has 2 charitable missions—the first is to provide high-quality medicine to patients in need and the second is to expand the understanding of the clinical effects of medical marijuana and how it should be used in the treatment of different diseases and conditions. The Foundation is committed to providing qualifying patients, their caregivers, and their health-care providers with current, scientifically accurate care and information about medical marijuana. Compassion Care Foundation serves residents of New Jersey through their office located in Egg Harbor Township.

Declaration of Conflicting Interests

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Running head: Therapeutic Value of Medical Marijuana

**Therapeutic Value of Medical Marijuana in New Jersey Patients:
A Community Partnership Research Endeavor**

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**Therapeutic Value of Medical Marijuana in New Jersey Patients:
A Community Partnership Research Endeavor**

ABSTRACT

Objective: The Public Health Program at the Stockton University in New Jersey partnered with Compassionate Care Foundation (CCF) to ascertain the impact of Medical Marijuana on patients.

Methods: Patients completed a survey once a month for 8 months to explore various aspects associated with patients' use of medical marijuana. Patients volunteered to complete a survey to identify their use, form and strain of medical marijuana and then how it influences not only their pain, but 12 other physical and mental health variables. In addition, patients are asked about an increase or decrease in other medication they are taking and whether or not they have experienced any unexpected outcomes. While the database is made up of 950 patients, the total number of participants varies from N=501 for visit 1, N=290 for visit 2, and N=179 for visit 3.

Results: Results provide insight into what diagnosis patients are using medical marijuana for along with the strains they are using. In addition, results indicate the following: increase mood, general overall condition and energy as the highest consequences; level of pain in the middle range; most frequent usage as 3-4 times a day; 85% didn't experience anything unexpected; and 50–65% indicate a reduction in the use of other pain medication. Results of a repeat measures from patients visit one to visit two posits that patients reported 8 statistically significant differences after using medical marijuana: increase general quality of life, mobility, and mood, while a decrease inflammation, intraocular pressure, spasms, seizures, and pain. Additional results from visit one to three indicate 7 significant differences: decrease seizures, intraocular pressure, spasms, nausea and pain, along with increase energy and mobility. No differences were found for these results by patient diagnosis or age. However, woman report higher decrease inflammation and increase of mood, but males reported higher increase of energy.

Conclusion: Results support positive therapeutic benefits of medical marijuana and despite methodological limitations, contribute to the growing body of literature that points toward the need to reclassify medical marijuana and the continuation of research.

Keywords: Medical Marijuana, Cannabis, Patient Pain, Therapeutic Value of Marijuana, Community Partnership

INTRODUCTION

As more and more states pass laws legalizing the use of marijuana for medicinal purposes, the need for accurate information regarding the possible therapeutic effects are necessary. In order for individuals to make informed decisions about the use of traditionally prescribed pharmaceutical drugs versus non-pharmaceutical alternatives, such as marijuana and cannabinoid products, more information is needed.

Currently, The US Drug Enforcement Administration lists marijuana and its cannabinoids as Schedule 1 controlled substances. This means that they cannot legally be prescribed under federal law due to its: 1). high potential for abuse; 2). no currently accepted medical use in treatment in the United States and 3). lack of accepted safety for use under medical supervision¹. Despite this however, some physicians and the general public alike are in broad agreement that *Cannabis sativa* shows promise in combating diverse medical illness².

As with opium poppies before it, study of a drug containing the plant has resulted in the discovery of an endogenous control system at the center of neurobiological function whose manipulation has significant implications for the development of novel pharmacotherapies³.

Given the Federal Law, physician could wind up in jail for writing a prescription for medical marijuana and thus many states have passed laws allowing the use for medicinal purposes. In those states, a health care practitioner provide an “authorization” for that use and based on previous court action, is considered by federal courts to be protected physician-patient⁴.

Based on new laws there are 23 States and The District of Columbia that are legally able to prescribe the use of medical marijuana. However, given the relative novelty of this practice coupled with the Federal illegal classification of cannabis, the use of it for medicinal purposes is

anything but straightforward. The body of research on the possible therapeutic values of cannabis is still extremely young and given the restriction of a Schedule I controlled substance makes broad based research difficult. As stated above states there have been fewer studies of marijuana than cannabinoid pharmaceutical, in part due to regulatory regulation restrictions and current studies on medical marijuana had a tendency to enroll small number of patients¹. These gaps in available evidence likely adversely influence the quality of decisions by patients and clinicians. However, marijuana and cannabinoid pharmaceuticals have been studied for a number of medical applications including treatment of nausea, pain, anorexia and weigh loss, seizures, spasticity and glaucoma and shown promising results¹. Similarly, studies on the effects of medical marijuana with HIV patients found a decrease in neuropathic pain^{5,6}. In addition, medical marijuana studies have found positive results inflammatory bowel disease⁷; possible reduction of blood pressure⁸; as an agent for treating psychotic disorders⁹; and a pain mechanism in chemotherapy with cancer patients^{10,11,12,13}. Additional studies of marijuana and cannabinoid pharmaceuticals in the treatment of a number of medical conditions would better educate the clinical effects of the various strains of marijuana¹.

Medical Marijuana in New Jersey

Senate Bill 119, approved in January 2010, protects "patients who use marijuana to alleviate suffering from debilitating medical conditions, as well as their physicians, primary caregivers, and those who are authorized to produce marijuana for medical purposes" from "arrest, prosecution, property forfeiture, and criminal and other penalties." It also, provides for the development and implementation for alternative treatment centers; specifically, the creation of at least two each in the northern, central, and southern regions of the state. The first two centers issued a permit in each region shall be nonprofit entities, and centers subsequently issued

permits may be nonprofit or for-profit entities." Then, in August 2012, the New Jersey Medical Marijuana Program opened a web-based patient registration system and patients were required to have a physician's recommendation, a government-issued ID, and proof of New Jersey residency to register¹⁴.

Physicians determine how much marijuana a patient needs and give written instructions to be presented to an alternative treatment center. The maximum amount for a 30-day period is two ounces. The approved conditions for the use of medical marijuana is as follows: Seizure disorder, including epilepsy, intractable skeletal muscular spasticity, glaucoma; severe or chronic pain, severe nausea or vomiting, cachexia, or wasting syndrome resulting from HIV/AIDS or cancer; amyotrophic lateral sclerosis (Lou Gehrig's Disease), multiple sclerosis, terminal cancer, muscular dystrophy, or inflammatory bowel disease, including Crohn's disease; terminal illness, if the physician has determined a prognosis of less than 12 months of life or any other medical condition or its treatment that is approved by the Department of Health and Senior Services¹⁵.

In October 2012, the Department of Health issued the first dispensary permit to Greenleaf Compassion Center, allowing it to operate as an Alternative Treatment Center and dispense marijuana. As of Apr. 23, 2014, there were Alternative Treatment Centers with permits to operate in all three regions of the state as designated by the medical marijuana program: north, central, and south. CCF (Compassionate Care Foundation) is one of these Alternative Treatment Centers located in the southern region of New Jersey.

CCF is a non-profit corporation organized in the state of New Jersey to provide therapeutic relief by dispensing pharmaceutical-grade medical marijuana to patients with qualifying medical conditions. Founded in 2011, Compassionate Care is led by a Board of Directors whose members are medical professionals, former health department regulators,

community leaders, and researchers. CCF is committed to providing New Jersey patients with safe and affordable medical marijuana. CCF has two charitable missions: the first is to provide high quality medicine to patients in need, and the second is to expand the understanding of the clinical effects of medical marijuana and how it should be used in the treatment of different diseases and conditions. The Foundation is committed to providing qualifying patients, their caregivers, and their healthcare providers with current, scientifically accurate care and information about medical marijuana. CCF serves residents of New Jersey through their office located in Egg Harbor Township.

CCF by law is required to assess patient level of pain every 90 days, but given their commitment to this process and their patients wanted to include a research element into their facility. Thus, the purpose of this study is to investigate the use of medical marijuana and its possible impact on patients' pain and overall well being; therefore, the following research questions were posed:

RQ1a: For what diagnosis are people using medical marijuana?

RQ1b: How often are they using medical marijuana?

RQ1c: In what form are they using medical marijuana?

RQ1d: What strains of medical marijuana are being used?

RQ2a: In what ways is medical marijuana influencing patients?

RQ2b: Do these influences change over time?

RQ3: Are there difference in the influences of medical marijuana based on diagnosis?

RQ4: Are there difference in the influences of medical marijuana based on gender?

RQ5: Are there difference in the influences of medical marijuana based on age?

METHODOLOGY

The Public Health Program at the Stockton University, located in Galloway New Jersey, partnered with Compassionate Care Foundation (CCF) in order to ascertain the impact of Medical Marijuana. In order to accomplish this, an 8 month long study was conducted to explore various aspects associated with patient's use of medicinal marijuana.

Variables: CCF reached out to Stockton's Public Health to assist with constructing an instrument that would not only measure patients' pain (a required element by law), but would also identify other physical and mental elements that may be associated with the use of medicinal marijuana. This level of research is not yet required by law, but illustrates CCF's dedication to understanding a more holistic impact of medical marijuana and a commitment to this process and their patients

Specifically, this preliminary study was designed to investigate the impact of medical marijuana on the following 12 patient variables: improvement of general condition; decreased pain; decreased inflammation; increased appetite; improved quality of life; decreased nausea; decreased intraocular pressure; decreased spasms; decreased seizures; increased mobility; increased mood; and increased energy. In order to measure these variables, a 10 point systematic differential scale was developed, one question per variable due to patient time restraints (see Appendix A for the entire one page survey). In addition, the survey included questions regarding the form, strain, usages and unexpected outcomes of patients' use of medical marijuana. Also, half way through the study, a pictorial version of the pain scale¹⁶ (Wong-Baker Face Pain Rating Scale) was included to also assess level of pain.

Procedures: Data was collected for 8 months between the months of June 2014-to January 2015. Data was collected once a month on voluntary patients; this varies each month depending on which patients are seeking treatment that month. Given the sheer number of patients, along with the inconsistency of patient visits, there was no attempt control the logistics of these visits. Participation was strictly on a voluntary basis. Patients could chose to do it every month they came or not, thus, there was no consistency in whom or when patients participated.

Once patients pick up their prescription, if they desired, they would complete the one page survey before they left.

Sample: By the end of the 8 months, CCF's data base consisted of N=955 total patients; 309 (32.4%) females, 484 (50.7%) males, and 162 missing for gender (17%). Out of these patients, surveys were filled out by 501 patients for visit 1; 290 patients for visit 2; and 179 patients for visits. The age of the patients ranged from 9-84 years, with a mean = 49.3, and standard deviation = 13.6.

RESULTS

Research question one investigates basic descriptive statistics of patients using medical marijuana. In order to answer this, the following four specific research questions are posed:

RQ1a: For what diagnosis are people using medical marijuana?

Conditions: Total of 17 different conditions from 798 responses (some participants listing more than one condition): Cancer (specific types) = N= 7; Terminal Illness / Cancer = N = 44; Chronic / Severe Pain N = 189; Crohn's disease N = 6; Depression / Anxiety / Bi-polar = N=1; Epilepsy N = 1; Glaucoma N = 30; Inflammatory Bowel Disease N = 87; Intractable Skeletal Spasticity N = 223; Lateral Sclerosis N= 10; Multiple Sclerosis N = 128; Muscular Dystrophy N = 13; Seizure Disorder = 48; Nausea N = 2; RSD N= 3; RA N= 1; and Lang. Cell Hist. N = 1.

RQ1b: How often are they using medical marijuana?

The most frequently reported response for how often people are using is 3-4 times a day (41.6%-37.9%) and the second is 1-2 times a day (38.7% - 27.1%); see chart below for each response for times 1, 2 and 3.

INSERT TABLE 1

RQ1c: In what form are they using medical marijuana? For all three times, participants indicated smoking as the most frequent form of medical marijuana; chart below indicates all responses.

INSERT TABLE 2

RQ1d: In what strains of medical marijuana are being used? The following chart reports strains of medical marijuana for each of the three visits, along with the total frequency and percentage. The top three reported strains are Pineapple, Various / Mixed and NS / Nightshade.

INSERT TABLE 3

RQ2a: In what ways is medical marijuana influencing patients? Results of frequencies and descriptive statistics indicate the following: participants' improvement to general condition and quality of life, decrease in pain, inflammation, nausea, intraocular pressure, spasms, seizure, and increased in appetite, mobility, mood and energy; level of pain; unexpected consequences; and reduction of other medication as an influence of medical marijuana.

INSERT TABLE 4

*See Appendix B for means of all 12 variables for all 3 times.

RQ2b: Do these influences change over time? Differences between Visit # 1 and Visit # 2:

13 General Linear Model Repeat Measures were run between visits 1 and 2 (independent Variable) and pain scale and the following 12 dependent variables: participants' improvement to general condition and quality of life, decrease in pain, inflammation, nausea, intraocular pressure, spasms, seizure, and increased in appetite, mobility, mood and energy. Results indicate 8 statistically significant differences between these visits: IV = Visits and DV= Increase in General Condition, $F = 6.131$, $df (281)$, $p = .014$; IV = Visits and DV= Decrease Inflammation,

F = 4.209, df (240), p = .041; IV = Visits and DV= Decrease Intraocular Pressure, F = 13.09, df (161), p = .000; IV = Visits and DV= Decrease Spasms, F = 9.50, df (242), p = .002; IV = Visits and DV= Decrease Seizures, F = 13.72, df (142), p = .000; IV = Visits and DV= Increase Mobility, F = 8.3.81, df (253), p = .004; IV = Visits and DV= Increase in Mood, F = 4.321, df (283), p = .039; and IV = Visits and DV= Pain Scale, F = 4.301, df (280), p = .04.

Differences between Visit # 1 and Visit # 3: 13 General Linear Model Repeat Measures were run between visits 1 and 2 and pain scale and the above 12 variables. Results indicate 7 statistically significant differences between visits and these variables: IV = Visits and DV= Decrease Seizures – Linear F = 13.72,(sums of square 92.49), df (73); p = .000; Quadratic F = 4.813, (sums of square 30.83), df (73), p = 4.813, p = .023; IV = Visits and DV= Pain Scale – Linear F = 5.05, df (175), p = .03; IV = Visits and DV= Increase Energy, Quadratic F = 3.75, df (168), p = .05; IV = Visits and DV= Decrease Spasms – Quadratic F = 10.12, df (145), p = .002; IV = Visits and DV= Decrease Intraocular Pressure – Linear F = 5.25, df (129), p = .023; IV = Visits and DV= Decrease Nausea – Linear F = 5.258, df (129), p=.023; and IV = Visits and DV= Increase Mobility - Quadratic F = 10.12, df (149), p = .002.

RQ3: Are there difference in the influences of medical marijuana based on diagnosis?

Results of 13 different General Linear Model Repeat Measure with visits as independent variable and the dependents of pain scale and 12 variables listed above as within subject and diagnosis (7 different diagnoses) as between subject indicates no significant difference based on diagnosis.

RQ4: Are there difference in the influences of medical marijuana based on gender?

Results of 13 different General Linear Model Repeat Measure with visits as independent variable and the dependents variables of pain scale and 12 variables listed above as within subject and

gender as between subject indicates 3 significant differences based on gender: Decrease Inflammation – Linear $F = 4.21$, $df (110)$, $p = .043$, women higher; Increase Mood – Linear $F = 5.069$, $df (131)$, $p = .026$, women higher; and Increase Energy – Linear $F = 4.733$, $df (129)$, $p = .031$, men higher.

RQ5: Are there difference in the influences of medical marijuana based on age? Results of 13 different General Linear Model Repeat Measure with visits as independent variable and all 13 dependent variables of pain scale and 12 variables listed above as within subject and age as between subject indicates no significant difference based on gender. However, as the below chart indicates, the total N for each group are unequal (18-29 N=18; 30- 39 N=26; 40-49 N=40; 50-59 N=50; 60+ N= 39; given the low number of participants under 18, these few subjects were not included) and may be too small to detect a significant difference.

DISCUSSION

Given the need to better understand the influences of medical marijuana; this study investigates the use of medical marijuana and its possible impact on patients' pain and overall well being. Specifically, these findings shed light on various aspects associated with the use of medicinal marijuana. First, results of basic descriptive statistics indicate patients are using marijuana most often three to four times a day, with one to two times as a close second. In addition, results reveal numerous patient diagnoses that medical marijuana is being prescribed. The top four most common are intractable skeletal spasticity, chronic and severe pain, multiple sclerosis and inflammatory bowel disease. Results also indicate the different strains that are being prescribed and in which form patients are using these strains. Smoking by far was indicated as the most common form; this has implications both social and medical.

The overwhelming majority of the patients' use of smoking as their preferred method is not surprising, especially given that inhalation of the marijuana or cannabinoid may be better than oral ingestion for treating their condition¹. Specifically, research states:

“Smoked cannabis offers both rapid response and easy titration based on the number of inhalations. In the manner of patient-controlled analgesia (the bed side narcotics pumps used in medical settings), smokers can dose themselves repeatedly throughout the day, inhaling enough THC to get analgesic benefit but not enough to sustain mother or psychoactive adverse effects that will dissipate rapidly, if they occur at all^{17, 18, 19}.

However, despite this research, many negative stereotypes are still associated with the use of marijuana, especially the image of smoking marijuana. For example, it has been stated that “marijuana makes users stupid and lazy” or the image of the “stoner” movies such as Cheech and Chong's *Up in Smoke*, cloud our ideas of what actually is happening²⁰. This idea contradicts what happens to most occasional users who only experience temporary mild perceptual changes accompanying a general sense of well-being and ease with the world².

In addition to the social implication of patients' chosen form of medical marijuana, there may be other medical implications. Consider that marijuana smoke contains toxins and carcinogens and their link to other negative health illnesses, vaporization may be preferable as a way to inhale because it has less potential to harm. Past research states smoking is not an optimal delivery; long-term use of smoked cannabis is associated with symptoms of obstructive lung disease²¹. Similarly, the American Lung Association²² (2015) posits: Smoke is harmful to lung health, whether from tobacco or marijuana, toxins and carcinogens are released from the combustion of materials. Smoke from marijuana combustion has been shown to contain many of the same toxins, irritants and carcinogens as tobacco smoke. In addition, marijuana is typically smoked differently than tobacco. Marijuana smokers tend to inhale more deeply and hold their breath longer than cigarette smokers, which leads to a greater exposure per breath to tar. Research shows that smoking marijuana causes chronic bronchitis and marijuana smoke has been shown to injure the cell linings of the large

airways, which could explain why smoking marijuana leads to symptoms such as chronic cough, phlegm production, wheeze and acute bronchitis^{23, 24}. Another potential threat to those with weakened immune systems is *Aspergillus*²³ a mold that can grow on marijuana, which if then smoked, exposes the lungs to this fungus, which can cause a lung disorder. Thus, it identifies a need for quality studies that can assess the long term effects of different forms of marijuana and cannabinoid products. This supports other's claims that additional high-quality studies of marijuana and cannabinoid pharmaceuticals would better elucidate the clinical effects of the various strains of marijuana and the bioactive compounds found within it¹. These studies could better assess how best to administer marijuana and its bioactive components.

These results paint a clearer picture of some of the logistics associated with the patients' use of medical marijuana. While further findings indicate some of the impacts associated with patients' use of medical marijuana; specifically, low to moderate amount of pain, over half reduced number of other medication and the majority reported no unexpected consequences. Based on the limited qualitative data from open ended questions, the following are the drugs patients report a reduction with: Aspirin, Bceclofen, Dorzolimize, Lynce Amteplen, Morphine, Oxicondon, Painkillers, and Zolpiden; and the unexpected outcomes were elimination of tremors and a better sleep experience.

Along with the above results, statistics analysis provide insight into medical marijuana use and patients' level of decreased pain, inflammation, nausea, intraocular pressure, spasms, seizures, and increase in mobility, mood, energy, appetite, quality of life, and general condition; and how this impact may change overtime. Although time varied from patients' visit one to visit two, statistical differences were found for nine of the variables. Results indicate that patients using medical marijuana reported an increase in overall general condition, mobility and mood

between visit one and visit two. Along with these increases, patients reported a decrease in inflammation, intraocular pressure, spasms, seizures, and pain. Further analysis on patients' visit one compared to patients' visit three continued to show significant relationships, although the sample size decreased. Significant differences between these periods still include patients' decrease in seizures, pain, spasms, and intraocular pressure and an increase in mobility. However, results also indicate a statistically significant relationship between medical marijuana and increased energy and decreased nausea from visit one to visit three.

Statistically significant relationships between these variables and patients' use of medical marijuana continue to strengthen the literature on the health benefits of such use. A better understanding of the correlations, whether positive, negative or curvilinear, between patient pain and other physical and mental health is critical. This knowledge will help to validate the use of medical marijuana and provide scientific evidence of its possible therapeutic value to both health practitioners and patients. These results are consistent with patients' indications that they have decreased other medication and for the most part haven't experienced any unexpected side effects. Thus, these results support past studies that suggest that medical marijuana may be an effective option for not only pain relief, but other physical and mental health problems; especially given the epidemic of addiction and overdose deaths from prescription opioids²⁵. Cannabis and its active ingredients are a much safer therapeutic option and effective for many forms of chronic pain and other conditions, but have no overdose levels. Thus, these results appear consist with current literature indicates many chronic pain patients could be treated with cannabis alone or with lower doses of opioids^{25, 26}.

Additional analysis investigated whether the impact of medical marijuana and the above variables differed depending on patient diagnosis, gender or age. Results revealed no differences

based on diagnosis and age. These preliminary findings could hold promise as to general impact of medicinal marijuana regardless of diagnosis or age and supported by past research indicating therapeutic finds for the use of medical marijuana with various illnesses^{1,5,6,7,8,9,10,11,12,13}.

However, these relationships should be further investigated with studies that break down patients based on specific diagnosis. Some patients in this study reported more than one diagnosis and other diagnosis were underrepresented which resulted in unequal groups. Similarity, patients' age should be equally represented.

Results did reveal a difference between medical marijuana use and energy, inflammation and mood for males and females. Females were more likely to report a decrease in inflammation and an increase in mood, while males were more likely to report an increase in energy. These findings support psychologist Janet Shibley Hyde *Gender Similarities Hypothesis* which states discovering that males and females from childhood to adulthood are more alike than different on most psychological variables²⁷. However, many other studies do find significant gender difference. For instance, one researcher observed across dozens of studies, there are legitimate main differences along with other gender differences that may depend on the context in which they were measured or may fluctuate with age, growing smaller or larger at different times in the lifespan²⁸. Regardless, future studies on medical marijuana need to continue to explore possible gender difference, as well as interaction effect with gender and age, as more information regarding the impact of medical marijuana becomes available.

As with most studies, there are several limitations to this study. This was a voluntary self-report study which lends to more predictive rather than causal relationship. In addition, given the voluntary nature of the study, not all patients participated; at times data was missing from those that did participate; and as expected, there was attrition as visits continued. Also,

certain factors such as diagnosis and age were unequal; at times diagnosis was broadly defined (e.g., severe or chronic pain, but the source of the pain was not identified) and some patients indicated multiple diagnoses. These factors along with time constraints associated with administering the surveys certainly influence the quantity of information obtained. Thus, results should be interpreted with such knowledge of methodology and sample construction. In addition, although the sample size provided enough power to identify statistically significant results, the total N did decrease between visits. Also, the sample consisted entirely of residences of New Jersey (mostly Central and Southern New Jersey) and may be a factor to consider with external validity / generalizability of results.

The primary purpose of this study was to better understand not only the logistics associated with patients' use of medical marijuana but also its impact on patients. Results provide insight into many aspects associated with use of medicinal marijuana and despite limitations, add to the valuable knowledge to the much needed field of study. Studies such as this may hopefully contribute to a larger purpose such as a federal reclassification of medical marijuana. The Schedule II classification of these pharmaceuticals not only has a healthy respect for their addictive potential but also a robust appreciation for their medical value. The reclassification would be a first step toward reconciling federal and state law and permitting long-stifled research into a potential trove of therapeutic applications to commence². Although much future research is still needed, this study provides valuable support and may be one more step in the journey to scientifically proving the numerous therapeutic values of medical marijuana.

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