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Social Perception on Medical Marijuana Among Medical Students in Melaka Manipal Medical College: A Cross-Sectional Study

Leow Kah Siew[1], Tee Jing Yang[2, *], Ushananthini Maniam[3], Cecelia Sneha Kondapaneni[4], Ian Bong Zhe[5]

Faculty of Medicine, Melaka-Manipal Medical College (Manipal Academy of Higer Education), Melaka, Malaysia

Email address

jake-tee@hotmail.com (T. J. Yang), leowrebecca2648@gmail.com (L. K. Siew)

[*]Corresponding author

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Abstract

Marijuana is the most widely used illicit drug and with that, it comes with a lot of stereotypes and stigma. The most widely known stigmas would be like it acts as a gateway drug for use of other illicit substances etc. We conducted an analytical cross-sectional study that analyses the difference in the social perception of participants based on their gender, race, ethnicity, religion, socioeconomic status, knowledge about medical marijuana and knowledge on people who used or using medical marijuana in order to find out if the medical students need additional education on the topic. The total participation of 215 participants has completed the survey. 87.44% of participants have a neutral perception of medical marijuana. 65.12%(140) felt comfortable discussing medical marijuana, but based on the social perception scores, 87.44% of participants were neutral on their standpoint about medical marijuana. Medical students in Melaka Manipal Medical College has a neutral social perception towards medical marijuana and may be due to the lack of proper knowledge regarding the topic. With an increasing number of countries adopting medical marijuana use, further proper education on the topic should be given to the students in their curriculum as the results suggest lacking proper knowledge on medical marijuana among the medical students.

Keywords

Medical Marijuana, Social Perception, Medical Students

1. Introduction

Since the late 1960s, there has been a dramatic paradigm shift in rates of marijuana use especially in America [1], and its stigma. In a study done in the United States from 1991 to 1992 and 2001-2002, during 1991-1992 the prevalence of marijuana use increased by 1.2%, and from 2001-2002 it was an increased by 1.5% [2]. With the rise of social media portrayal of marijuana and also the social movement pushing for legalization, it reflects on the steady increase in the prevalence of marijuana use be it recreational or medicinal. The ever-increasing exposure to marijuana in modern media plays a significant role in the prevalence of marijuana use. One study has found a significant correlation between daily music use and increasing odds of smoking marijuana among adolescents [3] Medical Marijuana is are substances extracted from cannabis plants that are available only by prescription to treat a variety of medical conditions. The active ingredients tetrahydrocannabinol (THC) and cannabidiol (CBD) are the main focus of medical marijuana. A study done on adolescent marijuana use from 2002 to 2008, compared the prevalence of marijuana use with states with Medical Marijuana Laws has found that states with medical marijuana laws had a higher average of the frequency of use and also the lower perception of risk [4]. Marijuana has been largely stigmatized as a gateway drug. In a study done in 2002, those who had never been exposed to marijuana had an estimated probability of 13% to be exposed to cocaine while those who smoked marijuana had a 75% probability of future exposure to cocaine [5]. In another study done in 4 Harvard colleges, found that more than 98% of students who smoke marijuana and use of other illicit drugs used other substances apart from what they are currently

using [6]. In light of recent events like the push for legalization of medical marijuana in Thailand, which would be the first Asian country to legalize if the bill is passed, has added pressure to Malaysia to revisit its marijuana laws. Little to no studies about marijuana has been done in Malaysia especially with regards to Malaysians social perception. This has been one of the motivating factors for the purpose of our study. Many of marijuana's negative effects are well known but are not as exaggerated as the stigmas around it. Although some stigma does indeed contain half-truths. For example, the stigma concerning marijuana that believes marijuana causes hallucination, schizophrenia, and psychosis. A study done on Australian adolescents aged 13-17 years who admitted to frequent use of marijuana, has found that among the 1261 adolescents, 8.4% of them reported hallucinations [7]. Although those who reported hallucinations were the minority, 8.4% of 1261 is 106 participants. It is still a significant amount that merits some acknowledgment of the correlation between marijuana smoking and hallucinations. Apart from that, marijuana has been widely associated with cognitive decline and slowness. A cohort study which followed 1037 individuals from birth all the way to adolescents and some even 38 years, found that there is a significant cognitive decline in terms of executive functioning and speech in adolescent-onset marijuana users but not seen in adult-onset marijuana use [8]. Much has also been said about the association of marijuana use and cardiovascular diseases. One case study on a 22-year-old female observed marijuana induced atrial fibrillation and arythmias [9]. This has only been the third reported case as of 2005 and more studies will need to be conducted to merit this claim. Apart from negative stigmas, there are positive stigmas of marijuana. Most common of all, marijuana has been said to be a good reliever of pain. A study done to study the effects of cannabis cigarettes in neuropathic pain has shown great promise in relief of the psychoactive effects related to neuropathic pain but not the physical aspect of the pain itself [10]. THC based antiemetics have been approved in the United States for a while now, but a recent randomized controlled trial was done to investigate the antiemetic effects of cannabis-based agents that have shown that cannabis-based agents do indeed relief nausea significantly as compared to a placebo group [11]. Another widely known medical use of marijuana is for the management and treatment of neurological disorders like epilepsy and multiple sclerosis. Although a review of four past clinical trials that used CBD as an adjunct with other antiepileptic medications has concluded that although there were no major adverse effects, the efficacy of CBD in the management of epilepsy is inconclusive [12]. A randomized controlled trial on oral THC and its efficacy showed that THC might be useful in the management of anorexia and dementia but showed no effect on breathlessness, chemotherapy-induced nausea and dyskinesia [13]. In the states in the USA that have legalized medical marijuana, the most common legal use of medical marijuana is cancer pain, an anticancer drug, glaucoma, HIV and multiple sclerosis [14]. Marijuana plants contain over 400 substances and of those, over 60 are cannabinoids. Of particular focus is cannabidiol which is a THC antagonist with probably antipsychotic effects [15]. A data analysis of data collected for medicinal cannabis use in the treatment of cancer in 2970 patients, 95.9% reported improvement in the alleviation of pain and sleep difficulties. From that same data collected, the team also investigated the effects of medical marijuana on elderly patients and concluded that it is safe and efficacious for use in elderly patients [16]. A review of 10,000 scientific abstracts on cannabis and its effects concluded conclusively that cannabinoids are effective for the treatment of pain in adults associated with chemotherapy, multiple sclerosis, and disorders of muscle spasticity [17]. With the legalization of medical marijuana, proper guidelines that cover both ethical and legal considerations must be implemented [18]. In another study, strong preliminary evidence suggests the efficacy of cannabinoids in painful medical conditions like fibromyalgia and rheumatoid arthritis as an analgesic and also little to no adverse effects were found [19]. The use of cannabinoids as anticancer drugs has also been on the rise. One animal study on rodents suggests that marijuana plant extracts can slow the growth of cancer cells in brain cancer, also there is evidence that purified extracts of THC potentiate the cancer-killing effects of radiation [20].

In summary, our study aims to correlate MMMC students social perception of medical marijuana. The student's perception will depend on knowledge on the stigmas, health, and risks of marijuana, and also their upbringing and culture.

Research Question: What is the relationship between gender, ethnicity, religion, age, socioeconomic status, knowledge on medical marijuana, knowledge of people who have used marijuana and their social perception of medical marijuana?

Research Objective: To determine the relationship between gender, ethnicity, religion, age, socioeconomic status, knowledge on medical marijuana, knowledge of people who have used marijuana and their social perception of medical marijuana.

Research Hypothesis: There is a correlation between gender, ethnicity, religion, age, socioeconomic status, knowledge on medical marijuana, knowledge of people who have used marijuana and their social perception of medical marijuana.

2. Methodology

2.1. Study Design, Study Place and Study Time

An analytical cross-sectional study was conducted among medical students of Melaka-Manipal Medical College regarding their social perceptions of medical marijuana. Participants for this study comprised of students who have enrolled for the MBBS in Melaka-Manipal Medical College in both the Muar and Melaka campus. Our study population was clinical phase students from batch 34, 35, 36, 37 and 38.

2.2. Sample Size and Sampling

Out of a population size of roughly 430 MMMC medical students ranging from batches 34, 35, 36, 37, and 38, a purposive sampling was utilized to obtain an adequate sample size for our study. The sample size was calculated by the following formula to estimate the prevalence:

$$\mathrm{n} = \frac{z^2\left(1-\frac{\alpha}{2}\right)P(1-P)}{e^2}$$

n =Sample size

$z^2\left(1-\frac{\alpha}{2}\right) = 1.96^2$

P = prevalence of student having correct answers for epilepsy =73% (0.73)

(1 – P) = 1 – 0.73

e^2 = precision (6%)

$$\mathrm{n} = \frac{1.96^2 \times 0.59 \times (1-0.59)}{0.06^2}$$

n = 210

$$\mathrm{n} = \frac{\text{number calculated}}{1 - \text{(Drop out 30\%)}}$$

n_{final} = 210 / (1-0.3)

= 300

The sample size was obtained by using the study proportion formula where a 0.05 error rate (α = 0.05) is accepted with a confidence level of 95%. The minimum sample size calculated was 210 students, taking into account a 30% non-response rate from the sample size of 300 students.

The sample size population was obtained from batches 34, 35, 36, 37, and 38 from students who willingly gave their consent to participate in the study, while those who have not given their consent were excluded from the study. Also, students who were absent on the day of data collection and also those who did not complete the surveys completely were also excluded.

2.3. Data Collection

A 37 items questionnaire was distributed to MBBS students of MMMC, batches 34, 35, 36, 37, and 38, to assess the social perception of medical marijuana among medical students in MMMC. The questionnaire was administered in two ways, hard copy and online google surveys, Batch 34, 35 and 36 will receive anonymous surveys through online google surveys which were accessed through participants own device or device provided whereas, for batch 37 and 38, the questionnaire was administered as anonymous surveys through hard copy.

The survey consists of 3 domains which are demographics, knowledge on medical marijuana, and social perception towards medical marijuana. Components of demographic background and knowledge on medical marijuana act as independent variables in our research. The demographics part, data were collected on gender, age, ethnicity, religion, family household income, knowledge of someone who has used marijuana and from where did their main source of knowledge of marijuana come from. The second component assesses the knowledge on medical marijuana in terms of medicinal use and laws surrounding it which could potentially affect attitudes and social perception towards medical marijuana. The third component which is the dependent variable of this study assesses the participants' social perception and also attitudes regarding medical marijuana.

2.4. Data Analysis

Microsoft Excel, Epi Info software Version 7 and 2018 GraphPad Software were used to analyze the data collected. Frequency, percentage, mean and standard deviation were used for the descriptive statistics of our research.

Unpaired t-test and ANOVA were used to determine the association between determining the association between the gender, ethnicity, religion, age, socioeconomic status, knowledge on medical marijuana, knowledge on people who had used marijuana and their social perceptions. The level of significance of 0.05 ($p<0.05$) was used in our study.

2.4.1. Knowledge of Medical Marijuana

Each selection that was answered correctly will attain 1 mark and 0 marks for every wrong answer. The total marks obtained were calculated and based on the total marks obtained they are classified into 3 categories. *High (score >27 / >70%), Moderate (score 20-27 / 50%-70%)* and *Low (score <20/ <50%) Level of Knowledge on Medical Marijuana.*

2.4.2. Socioeconomic Status

Participants were classified into *Low, Middle and High socioeconomic status* by monthly income of *less than RM 3860.00, RM 3860.00 – RM 8319.00 and more than RM 8319.00* respectively.

2.4.3. Social Perception

Likert scale was used in our questionnaire to assess the social perception of participants towards medical marijuana. Scale of 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree.

Based on the total score calculated, the participants were categorized into 3 groups which were *Negative Perception (score 24-56)*, *Neutral Perception (57-88)* and *Positive Perception (89-120)*.

The total score was calculated, with a minimum score of 24 and a maximum score of 120. The higher score indicates a more positive social perception and lowers the score indicates a negative social perception of medical marijuana.

2.5. Ethics

The objective, reason, and instructions of the study for answering the questions were clearly explained to the participants. Informed written consent was prepared in which willing participants signed to signify voluntary participation. They are assumed that data collected will remain confidential

and exclusively for the purpose of the study. Names and enrolment members of the participants will not be asked to maintain anonymity. We have managed to attain approval from the Research Ethics Committee, faculty of medicine of Melaka-Manipal Medical College.

3. Results

Table 1. *Socio-demographic profile.*

VARIABLE	n (%)
Age	
≤22	153 (71.16%)
≥23	62 (28.84%)
Mean (SD)	22.1 (1.1)
Gender	
Female	127 (59.07%)
Male	88 (40.93%)
Ethnicity	
Indian	92 (42.99%)
Chinese	61 (28.50%)
Others	37 (17.29%)
Malay	24 (11.21%)
Religion	
Hinduism	69 (32.09%)
Buddhism	60 (27.91%)
Christianity	40 (18.60%)
Islam	24 (11.16%)
Others	22 (10.23%)
Household Income	
Upper	102 (50.25%)
Middle	82 (40.39%)
Lower	19 (9.36%)

Our total sample size is 215 participants with a mean age of 22.1 years. It consisted of 40.93% male and 59.07%. The majority of the sample were Indians (42.99%) followed by Chinese (28.50%) than others (17.29%) which are ethnicities like Sinhalese and Bumis, lastly Malay (11.21%). Of these ethnicities, most were Hindus (32.09%), followed by Buddhism (27.91%), Christianity (18.60%), Islam (11.16%) and any other religion were classed under others (10.23%). Participants were also categorized based on their household income to Lower (9.36%), Middle (40.39%), and Upper (50.25%).

Table 2. *Knowledge regarding medical marijuana.*

Variables	n (%)
Knowledge on People with the previous Usage of Medical Marijuana	
Yes	158 (73.83%)
No	56 (26.17%)
Reading on Medical Marijuana from Other Sources (except school)	
Yes	114 (53.02%)
No	101 (46.98%)

This table summarizes the frequency and percentage of participants who have knowledge of people who use or have used medical marijuana and sources of information for medical marijuana. These two variables will be cross-related to associations and perceptions of medical marijuana. 73.83% (158) reported that they have no knowledge of anyone who used or using medical marijuana. The next variable assesses where do participants get their information on medical marijuana from, 46% (101) reported that apart from schools, they gather information from internet, seminars, and formal literature while 53.02% (114) reported that they don't learn about medical marijuana from other sources besides what was taught in schools.

Table 3. *Knowledge regarding the therapeutic effects of medical marijuana.*

Therapeutic Indication	n (%)
Approved	
Cancer	139 (64.65%)
Muscle spasm	75 (34.88%)
Migraine	66 (30.70%)
Epilepsy	60 (27.91%)
Alzheimer's Disease	58 (26.98%)
Huntington's Disease	53 (24.65%)
Multiple Sclerosis	44 (20.47%)
Glaucoma	43 (20.00%)
Crohn's Disease	32 (14.88%)
Amyotrophic Lateral Sclerosis	29 (13.49%)
HIV	24 (11.16%)
Non-approved	
Cystic Fibrosis	204 (94.88%)
Vertigo	191 (88.84%)
Schizophrenia	168 (78.14%)
Tourette's Disease	167 (77.67%)
Parkinson's Disease	116 (53.95%)

Table 3 summarizes the assessment of the participant's knowledge of medical marijuana based on its approved indications and non-approved indications. The approved indications were cancer, glaucoma, migraines, HIV, multiple sclerosis, Amyotrophic lateral sclerosis, Muscle spasm, Crohn's disease, epilepsy, Huntington's disease, Alzheimer's disease, and Parkinson's disease. The non-approved indications include cystic fibrosis, vertigo, Tourette's disease, and schizophrenia. Participants who answered correctly for cancer (64.65%), glaucoma (20.00%), migraine (30.70%), HIV (11.16%), Multiple sclerosis (20.47%), Amyotrophic lateral sclerosis (13.49%), muscle spasms (34.88%), Crohn's disease (14.88%), epilepsy (27.91%), Huntington's disease (24.65%), and Alzheimer's disease (26.98%). As for the non-approved indications, participants who answered correctly for Parkinson's disease (53.95%), Cystic fibrosis (94.88%), vertigo (88.4%), Tourette's disease (77.67%) and schizophrenia (78.14%).

Table 4. *Knowledge regarding adverse effects of medical marijuana.*

Adverse Effects	n (%)
Approved	
Hallucination	159 (73.95%)
Memory Impairment	155 (72.09%)
Paranoia	113 (52.56%)
Anxiety	96 (44.65%)
Tachycardia	92 (42.79%)
Dizziness	83 (38.60%)
Blurred Vision	81 (37.67%)
Depression	79 (36.74%)
Insomnia	67 (31.16%)
Nausea	60 (27.91%)
Worsening Asthma	48 (22.33%)
Lung Cancer	39 (18.14%)
Birth Defects	36 (16.74%)

Adverse Effects	n (%)
Seizures	26 (12.09%)
Stroke	18 (8.37%)
Non-approved	
Diabetes	210 (97.67%)
Anaemia	204 (94.88%)
Cataracts	201 (93.49%)
Increased Bleeding	193 (89.77%)
Constipation	191 (88.84%)

Table 4 follows the format of Table 3 but instead, it assesses the knowledge of participants on the adverse effects of marijuana. The correct adverse effects and percentage of participants who answered correctly are memory impairment (72.09%), paranoia (52.56%), hallucinations (73.95%), worsening asthma (22.33%), dizziness (38.6%), blurred vision (37.60%), anxiety (44.65%), lung cancer (18.14%), tachycardia (42.79%), depression (36.74%), nausea (27.91%), birth defects (16.74%), insomnia (31.16%), seizures (12.09%), stroke (8.37%). For the wrong adverse effects and participants who answered correctly are constipation (88.84%), cataracts (93.49%), increased bleeding (89.77%), anemia (94.88%), and diabetes (97.67%).

Table 5. *Knowledge regarding therapeutic effects, legal aspect and pharmaceutical form of medical marijuana.*

Variables	n (%)
Cannabis Derivatives Have Therapeutic Effect	
Yes	200 (93.02%)
No	15 (6.98%)
Knowledge of Legal Aspect Of Medical Marijuana	
Yes	117 (54.42%)
No	98 (45.58%)
Knowledge of Pharmaceutical Form of Marijuana	
Yes	123 (57.21%)
No	92 (42.79%)

Table 5 assesses the general knowledge on marijuana based on Yes and No questions which are "cannabis derivatives have the therapeutic effect", "knowledge on the legal aspect of medical marijuana" and "knowledge on pharmaceutical form of marijuana". For knowledge on cannabis derivatives and its therapeutic effect, 93.02% answered yes. While knowledge on its legal aspect, the percentage who answered yes were 54.42%. Lastly the pharmaceutical forms of marijuana, those who answered yes were 42.79%.

Table 6. *Frequency of social perception on medical marijuana.*

Items	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Medical marijuana should be legalized for medicinal used.	4 (1.87%)	17 (7.94%)	72 (33.64%)	88 (44.12%)	33 (15.42%)
Marijuana is safe when used responsibly for medicinal used.	2 (0.93%)	7 (3.26%)	44 (20.47%)	122 (56.74%)	40 (18.60%)
Legalizing medical marijuana will increase crime rates.	18 (8.41%)	46 (21.50%)	66 (30.84%)	57 (26.64%)	27 (12.62%)
Legalizing medical marijuana will hurt the “war on drugs” effort.	12 (5.63%)	37 (17.37%)	94 (44.13%)	53 (24.88%)	17 (7.98%)
Most people who support medical marijuana legalization are drug abusers.	30 (13.95%)	80 (37.21%)	75 (34.88%)	24 (11.16%)	6 (2.79%)
I am concerned about the safety of medical marijuana.	9 (4.19%)	19 (8.84%)	61 (28.37%)	107 (49.77%)	19 (8.84%)
I am concerned about the consistency in the quality of medical marijuana.	3 (1.14%)	12 (5.63%)	69 (32.39%)	105 (49.30%)	24 (11.27%)
I am concerned about the regulations regarding medical marijuana.	2 (0.94%)	11 (5.16%)	60 (28.17%)	119 (55.87%)	21 (9.86%)
I am concerned that there is a potential addiction to marijuana use.	8 (3.74%)	13 (6.07%)	46 (21.50%)	105 (49.07%)	42 (19.63%)
I am concerned that there is limited evidence of the therapeutic benefits of medical marijuana.	12 (5.66%)	32 (15.09%)	79 (37.26%)	75 (35.38%)	14 (6.60%)
People usually have a good time when using marijuana.	7 (3.29%)	14 (6.57%)	77 (36.15%)	82 (38.50%)	33 (15.49%)
Marijuana is a dangerous drug.	23 (10.75%)	38 (17.76%)	85 (39.72%)	49 (22.90%)	19 (8.88%)
I would be concerned if friends or family were using medical marijuana.	17 (7.94%)	32 (14.95%)	55 (25.70%)	79 (36.92%)	31 (14.49%)
I would be willing to use medical marijuana if prescribed.	15 (6.98%)	23 (10.70%)	85 (39.53%)	64 (29.77%)	28 (13.02%)
Medical marijuana may result in dependence.	7 (3.26%)	20 (9.30%)	60 (27.91%)	106 (49.30%)	22 (10.23%)
Medical marijuana will act as a gateway drug to the use of other illicit drugs.	9 (4.19%)	31 (14.42%)	72 (33.49%)	76 (35.35%)	27 (12.56%)
Benefits of using medical marijuana outweigh the harms and risk associated.	7 (3.27%)	30 (14.02%)	93 (43.46%)	64 (29.91%)	20 (9.35%)
The use of medical marijuana will lead to marginalization by society.	6 (2.79%)	22 (10.23%)	118 (54.88%)	58 (26.98%)	11 (5.12%)
I am familiar with the current laws and regulations regarding medical marijuana in Malaysia.	20 (9.35%)	52 (24.30%)	60 (28.04%)	52 (24.30%)	20 (9.35%)
The use of medical marijuana can lead to recreational use and eventually lead to abuse.	6 (2.82%)	15 (7.04%)	70 (32.86%)	97 (45.54%)	25 (11.74%)
Dispensing cannabis and its derivatives in pharmacies would expose the pharmacies to certain dangers (robbery, insisting on prescribing without prescription etc…)	6 (2.79%)	19 (8.84%)	72 (33.49%)	89 (41.40%)	29 (13.49%)
Doctor’s prescription is mandatory for dispensing medical marijuana and its derivatives.	4 (1.86%)	9 (4.19%)	40 (18.60%)	94 (43.72%)	68 (31.63%)
The use of medical marijuana and its derivatives is justified in the case of terminally ill patients.	3 (1.40%)	1 (0.47%)	67 (31.31%)	86 (40.19%)	57 (26.64%)
I feel comfortable discussing about medical marijuana.	6 (2.79%)	9 (4.19%)	60 (27.91%)	78 (36.28%)	62 (28.84%)

Table 6 consist of 24 questions which answers using the Likert scale (Strongly disagree, Disagree, Neutral, Agree and Strongly agree) in 5 columns which will then be summed and scored to assess their social perception towards medical marijuana in terms of its health risk and social issues. The first component asks whether medical marijuana should be legalized for medicinal use, a majority (88, 44.12%) agree while those who strongly agree (33, 15.42%), and those who reported strongly disagree were only (4, 1.87%). The second question has similar results as the first with slightly more reporting agree (122, 56.74%) and strongly agree (40, 18.60%) regarding the safety of medical marijuana. The fifth question assesses the participants' stigma that those who support the legalization of medical marijuana were drug abusers, majority reported disagree (80, 37.21%) while those who strongly disagree (30, 13.95%). Those reported agree (24, 11.16%) and strongly agree (6, 2.79%) totaling up to 13.95%. The total of those who strongly disagree and disagree was 51.16%, while the remaining 34.88% were neutral. The next question also assesses the student's perception on stigma, which is the use of medical marijuana can lead to its abuse, 105 (49.07%) reported they agreed to this while only 21 (9.81) reported strongly disagree and disagree. Question 20 is similar in this regard to question 9 as it concerns abuse and addiction. The total of those who agree and strongly agree (122, 57.28%) while the total of those who disagree and strongly disagree (21, 9.86%), and those who were neutral were 32.86% (70). The stigma that marijuana acts as a gateway drug was assessed in question 16, the majority agreed (76, 35.35%) while the second majority were neutral (72, 33.49%), only 4.19% (9) reported strongly disagree and 14.42% (31) reported disagree. Question 12 assess the participant's perception of the safety of marijuana, the majority reported neutral (85, 39.72%) but the total of those who agreed and strongly agreed were 31% (49+19) while the total of those who disagree and strongly disagree was 28.51% (38+23), the remaining were neutral (85, 39.72%).

Table 7. *Frequency of knowledge and social perception of medical marijuana.*

Variables	n (%)
Knowledge	
Low (<50%)	128 (59.53%)
Moderate (50-70%)	77 (35.81%)
High (>70%)	10 (4.65%)
Mean (SD)	18.7 (3.8)
Perception	
Neutral (57-88)	188 (87.44%)
Positive (24-56)	14 (6.51%)
Negative (89-120)	13 (6.05%)
Mean (SD)	70.9 (10.1)

Table 7 contains two independent variables which describe the participant's knowledge and social perception on medical marijuana. The knowledge component was assessed and scored by section 2 of the questionnaire and the max score is 39. The social perception component was assessed and scored in section 4 of the questionnaire and the max score is 120. 4.65% (10) of participants have high knowledge followed by 35.81% (77) of moderate knowledge and the majority of them has low knowledge (128, 59.53%), while the mean knowledge score of the sample was 18.7. 6.51% (14) participants show a positive perception of medical marijuana and those who were negative were 6.05% (13). The majority of them are neutral (188, 87.44%).

Table 8. *Association between sociodemographic background and social perception of medical marijuana.*

Sociodemographic Background	Social Perception Mean (SD)	t (df) / F (df_1, df_2)	P value
Socioeconomic Status			
Upper	71.8 (11.4)		
Middle	70.8 (8.8)	0.96 (2, 200)	0.385
Lower	68.5 (7.0)		
Gender			
Male	73.1 (10.6)	-2.81 (213)	0.005
Female	69.3 (9.5)		
Age			
≥23	72.9 (12.6)	-1.90 (213)	0.058
≤22	70.0 (8.8)		
Ethnicity			
Indian	73.4 (10.6)		
Others	69.4 (10.4)	3.67 (3, 210)	0.013
Chinese	68.9 (9.1)		
Malay	68.3 (8.9)		
Religion			
Others	75.0 (10.7)		
Hinduism	73.1 (10.1)		
Christianity	71.5 (9.8)	4.30 (4, 210)	0.002
Buddhism	67.9 (9.1)		
Islam	67.0 (9.8)		

Mean, standard deviation and results of analysis of variance (ANOVA) among study variables are presented in Table 8. ANOVA was used to examine whether socioeconomic status was associated with the social perception of medical marijuana. There was an observational difference in social perception among different socioeconomic statuses with an individual of the upper class having the highest mean social perception score, middle class second and the lower class having the lowest score. However, results were not as significant as the p value>0.05 (p=0.385). For gender, males scored 3.8 points than females and the difference was significant as the p-value <0.05 (p=0.005). As for age and ethnicity, there was only an observational difference and both p values were higher than 0.05 (p>0.05). Interestingly, there is a significant association with religion with a p value>0.05 (p=0.002), and those who reported others as their religion scored the highest.

Table 9. *Association between knowledge of people with the previous usage of medical marijuana, reading on medical marijuana from other sources except for school and social perception.*

Variable	Social Perception Mean (SD)	t (df) / F (df1, df2)	P value
Knowledge on People with the previous Usage of Medical Marijuana			
Yes	76.5 (11.7)	-5.15 (212)	<0.001
No	68.8 (8.7)		
Reading on Medical Marijuana from Other Sources Except from School (eg: Internet, journal etc)		-3.01 (213)	0.003
Yes	73.0 (11.2)		
No	68.9 (8.7)		

Students with knowledge of people with the previous usage of medical marijuana have significant higher perception scores compare to people who do not. Students who read on medical marijuana from other sources except for school also have a significantly higher perception score.

Table 10. *Association between knowledge and social perception of medical marijuana.*

Knowledge	Social Perception Mean (SD)	t (df) / F (df_1, df_2)	P value
High	67.6 (10.2)		
Moderate	69.7 (9.5)	1.6 (2, 212)	0.206
Low	71.8 (10.4)		

Table 10 shows the relationship observed between knowledge and social perception of medical marijuana. Knowledge of medical marijuana was assessed and participants were categorized based on their scores. The results showed participants with high knowledge has the lowest mean of perception score (M=67.6, SD=10.2) followed by moderate (M=69.7, SD=9.5) and finally, low knowledge has the highest mean of perception score (M=71.8, SD=10.4) There was no significant association between knowledge and social perception p=0.206 (p>0.05)

4. Discussion

A cross-sectional study was done to find out the relationship between social perception and various factors affecting it among medical students in MMMC.

The majority of the students (59.53%) have a low knowledge score on medical marijuana in terms of its indications and adverse effects. Similarly, a similar study was done but instead done on pharmaceutical students, found that there was an apparent lack of accurate knowledge about marijuana as well [25]. One possibility for this result is that people with personal experiences with marijuana as in personal use or knowing someone they know personally who use medical marijuana tend to have more knowledge than those who have no exposure at all. As shown in Table 2, only 26.17% of the participants of this study have knowledge on people using or previous use of medical marijuana and also they scored higher mean social perception score.

Most of the participants correctly identified cancer as an indication of medical marijuana (64.65%) while having insufficient knowledge (<50%) on other approved indications of medical marijuana. However, most of the participants are more aware of the adverse effects of medical marijuana. Adverse Effects like a hallucination, memory impairment, and paranoia were correctly identified by 73.95%, 72.09%, and 52.56% respectively. The majority of the participants (93.02%) believe that marijuana derivatives have therapeutic effects.

The total score for social perception was 120. Of the 216 participants, only 14 (6.51%) had scores that qualify as positive social perception while 13 (6.05%) had scores for negative social perception meaning a disagreeable standpoint on the use of medical marijuana. The remaining 188 (87.44%) of participants were neutral in their standpoint. Although when participants were asked if cannabis derivatives had therapeutic effects, 93.02% (200) answered yes, but in the social perception component of the questionnaire, when participants were asked if they were concerned about the lack of evidence supporting therapeutic benefits of marijuana, only 6% (14) answered strongly agree and 35.48% (75) answered agree while majority were neutral (79, 37.26%). This may be so due to lack of knowledge and information as we can conclude from Table 2 and also knowledge scores of this study, that only 46% (101) read up about marijuana from other sources like the internet, scientific literature, journals and other outside sources besides what is being taught in schools which are usually information that are stigmatized and outdated. There are indeed numerous studies conducted especially in recent years that strongly suggest that marijuana and its derivatives do indeed have a medicinal role. A study on marijuana use in epilepsy found that marijuana use decreases seizure frequency in 68% of the participants who had epilepsy [21]. Medical marijuana has also been shown to be effective as an antiemetic agent [22].

Out of a study done among family physicians, most agreed that marijuana poses serious mental (64%) and physical (61%) health risks [23] thus supporting the view on thinking it is a dangerous drug. In our study, the same was assessed and it was reported 31.78% reported in totally agreed and strongly agreed while 28.54% strongly disagree and disagree that medical marijuana is a dangerous drug.

Marijuana has also been largely stigmatized as a potential addiction and abuse liability. A study in 2010, concluded that marijuana use does lead to its abuse and dependence

especially in disinhibitory personalities [24]. When asked about this in our study, 69.7% in total agreed and strongly agreed that marijuana has potential addiction liabilities. This may partly be due to what is taught in the medical school syllabus as our participants were of the medical field.

The social perception of medical marijuana and knowledge was also correlated and it was found to have no significant association, although based on mean, those under the high knowledge class had lower mean scores on social perception as compared to the moderate and low knowledge class. This may be so due to the design of the knowledge component of the study which can be improved by including more specific questions and using multiple choice or similar designs. Despite majority of the participants are lack of accurate knowledge regarding medical marijuana, most of our participants (59.54%) support the legalization of medical marijuana supporting the finding from a research conducted by Karen E. Moeller and Barbara Woods in 2015 among pharmaceutical students that have 59% of participants supporting the legalization of marijuana for medical use [25]. However, our study results contrast markedly from Burke and Marx's study conducted more than 40 years ago that stated only 15.7% of medical students favoring the legalization of medical marijuana [26]. This further supports the claim of changes in other countries legalization, cultural acceptance, news, and social media coverage, and decreased the perception of risk have undoubtedly combined to shift opinions over the past 4 decades. [25]

Socioeconomic status based on household income was also correlated with social perception and similarly, there was no significant association. Just as before, there is an observational difference in the mean scores of social perception. The upper class scored a higher mean social perception score followed by the middle class and finally the lower class. The cause of this is definitely multifactorial, but it can be assumed that the upper class is more positive and tolerant due to more exposure to all things related to marijuana such as movies, music, travel and other forms of media.

According to Table 8, it was found that males have a higher mean score of social perception which suggests a more positive attitude as compared to females. A study was done on the initiation and problematic use of cannabis based on genetic influences reflects the same result, which reported that males do indeed have a higher prevalence than females in the initiation of using cannabis or its continual use [27]. This is the same for the prevalence of smoking between genders as males have always had a higher prevalence of smoking as compared to females [28]. This could be because, among non-marijuana smokers, men are more sensitive to the subjective effects of delta9-THC alone than women [29], thus making marijuana more addictive for men than women

The correlation of ethnicity and social perception based on Table 8 was found that Indians had higher mean scores of social perception as compared to the other ethnicities and Malays scored the lowest. This may be so due to the cultural background as marijuana has a long history in Indian culture as traditional medicine or adjuvants for use of meditations. Similar results were found when religions were correlated to social perception score. Muslims and Buddhists scored the lowest in social perception score (67 and 67.9 respectively) while Hindus and others (73.1 and 75 respectively). This result showed a significant association between religions and social perception score ($p=0.002$). Individuals stated others as their religion may score higher as they are majority atheists or agnostics, which are those who hold no belief in God (atheist) or that nothing can be known or be known about god meaning God can neither be proven nor disproved hence the idea is not entertained (agnostics) tend to be more liberal as they are not bounded by religious boundaries. Individuals who are religious tend to have a lower percentage in medical marijuana usage as suggested by Amy M. Burdette, Noah S. Webb, Terrence D. Hill, Stacy Hoskins Haynes and Jason A. Ford in their research [30], hence the lower perception score in people who have religions in our study. This may be due to the long-held religious prohibitions against substance use coupled with the unlawfulness of marijuana use. Hindus have the highest mean social perception score among other remaining religions can be due to marijuana's association with Shiva (Hindu's God). According to religious rites, cannabis is believed to cleanse sins, unite one with Shiva and avoid the miseries of hell in the future life.

Table 9 correlates whether the participants know anyone personally who has used medical marijuana and this was correlated against social perception score. Those who personally know people who used or are using medical marijuana scored higher mean scores (76.5) than those who do not know who anyone who uses (68.8) with a P value of <0.001. This result can be extrapolated to assume that those who are exposed to it more are more tolerant and have more receptive attitudes compared to those who lack the exposure.

The main limitation of our study is that it was conducted in a single institution. Due to this the sample size was limited and also the sample population consisted only of medical students which did not include the dentistry department. This, in turn, does not reflect the overall perception of the Malaysian population or even the general population. Furthermore, the participants of this study ranged mostly from 19-24 with a few outliers. This cannot be used to reflect the perception of Malaysians as a whole because it doesn't investigate the perception of others outside this age group. The other limitation would be that the questionnaires were self-filled with no supervision of the investigators. It is understandable that there may be some misinterpretation of the questions asked in the questionnaire.

5. Conclusion

Medical students in Melaka Manipal Medical College has a neutral social perception towards medical marijuana and may be due to the lack of proper knowledge regarding the topic. If the use of medical marijuana was to be legalized in Malaysia, more educations should be given to the medical field workers as there is an apparent lacking of knowledge

regarding the issue. The control and regulation of medical marijuana should be closely supervised as the safety and misuse of the drug are one of the few main concerns of our participants in the study.

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