Comfort and Preparedness for Navigating Challenging Clinical Scenarios Among Clinical Year Medical Students: A Cross-Sectional Study

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Abstract

Medical schools teaching mainly places an emphasis on clinical training and yet falls short in preparation to address difficult clinical situations, particularly when it comes to concerns of diversity. Our objective was to assess the comfort and preparedness with patients, peers and supervisors among undergraduate medical students in Melaka Manipal Medical College (MMMC) to overcome these varying types of distinctive, diversifying and clinically challenging scenarios. A two parts online survey was administered to clinical undergraduate medical students of Melaka Manipal Medical College in the MBBS program. The survey addressed a variety of different encounters with patients, peers and supervisors, based on seven subject areas such as gender, age, religion, race / ethnicity, sexual orientation, politics, and disability. The participants scored their degree of comfort across a 5-point Likert scale with response choices ranging from 1 to 5 (1= Very uncomfortable to 5= Very comfortable). The data were processed using Microsoft Excel and analysed using Epi info version 7.2.2.6, from 130 students. This study reported the lowest overall comfort score (2.67) followed by low comfort with all three level-specific interactions and the higher comfort with religion-related interactions (3.40). Moreover, multiple male and female response patterns showed evidence of neutral comfort level in politically associated scenarios. All religions felt least comfortable for political subject and highest comfort for disability subject. All ethnicities feel very comfortable at peer level scenarios and somewhat uncomfortable to neutral for political subject scenarios. International students scored higher comfort levels in all the three levels compared to Malaysian students. Our study documented there were no significant differences in MMMC students comfort level across gender, age, ethnicity, religion, nationality and semester. In conclusion, students reported lowest comfort with peer interactions compared to patient and upper level interactions. A low comfort level for all of the subject-specific issues was reported, except for sexual orientation and identity and religion-related issues which they reported to have a neutral comfort level. Medical students may benefit from simulation-based training in order to prepare themselves for navigating diversity-related conflicts when entering the medical workplace.

Keywords

1. Introduction

As seen in most traditionally run medical colleges or setups, the available programs present a few hurdles in which medical students must navigate through the course. On many occasions, medical students will have to face a perilous task of transitioning from a preclinical classroom-based scenario to a clinical one. [1] No more will there be hypothetical scenarios, treatment regimens or complications. Now as undergraduates, they are expected to apply the knowledge and skills that has been thought prior during their pre-clinical stage, not only at an effective yet rather rapid pace. [2]

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During this point of transition, undergraduates must be able to quickly adapt from a comfortable learning environment like a lecture hall and simulated patients to a more rapid-paced and intense learning in the hospital with peers, real patients and attending in which knowledge must be quickly taken in and applied. Medical students feel that due to the lack of resources, inadequate clinical exposure, and the absence of theoretical and practical correlation during their pre-clinical phase, it has put them at a severe disadvantage when faced with tasks such as clinical performance and patient management during their clinical phase of education. This has set a precedence in which the students' sense that they lack knowledge and clinical skills ahead of graduating and joining their housemanship.

Medical undergraduates not only have to adapt to this transition, but now they are also plagued with several other challenges which arise as they enter the clinical aspect of their course such as the amount of tremendous work in hand, minimal time to review their pre-clinical knowledge, facing diverse group of patients who are chronically ill, moderate assessment and direct monitoring from their clinical superiors [3] and peer-team relationships. [4] All these circumstances may add to students' dislike, raise their stress and discomfort, and at points it leads them to experience a burnout moment. [5, 6] This can be further proven by a review conducted, to study the perception of medical students on the transition to undergraduate clinical training, was often described negatively as 'difficult', 'a problem' and 'a struggle'. [7] Hence, this leads medical students to frequently place their major focus on adapting into the professional setting, rather than studying. Several studies also have shown that in Problem based learning (PBL) curriculum, the students understand the concepts and incorporate the learnt skills in solving complicated tasks and therefore suggested that it makes the transition much easier and less intricate. [2, 8] One of the studies conducted on students' perception of transition to clinical phase described about a way for preparing the medical students for clerkship is to have prior patient contacts and thereby can control the "shock of practice". [9] A Study reported about lack of courage among medical students continued in the clinical practise even till their final years of medicine and emphasised more on following houseman doctors thereby permitting them to involve directly in a team which they are about to become and help them to overcome the 'transition shock'. [10]

While there are various studies conducted on challenges faced by undergraduate medical students during their clinical phase, most of these studies focus primarily on academic related challenges, [11] patient and student interactions, [12] student and superior interaction on gender and hierarchy aspects. A study conducted by Jody. E Steinauer concluded that although students use some learned strategies in interactions in which they feel negative emotions toward patients, they desire more preparation and support during their clinical rotations. [13] It is essential to further analyse the underlying root cause and other contributing factors on a much deeper aspect. Diversity exists more than just on gender or cultural basis. It also includes ethnicity, politics, age, sexual orientation, disability, and religion. Studies have addressed that physicians lack familiarity with proper techniques when handling disable patients, which leaves both physicians and patients feeling uncomfortable. Thus, preparing medical students to care for people with disabilities could lead to a significant change in many aspects linked to their comfort when dealing with disabled patients later on during their clinical phase. [14] Hence, earlier assessment of preparedness of medical students in regard to working with disable patients, and even peers, enables them to train themselves to cope better with the situation.

An existing pilot research was carried out to explore how medical students that are educated in a conventional program actually view their confidence and preparation with respect to various styles of interpersonal experiences and challenging scenarios resulting from disparities in gender, race/ethnicity, politics, age, sexual orientation/identity, disability, and religion. [15] However, the pilot study was conducted on medical students of White, Black, Mexican American, Asian Pacific Islanders ethnicity. It still remains unclear how these factors affect comfort and preparedness of medical students of Asian population, moreover in a multicultural country such as Malaysia. Consequently, and to our knowledge this will be the first study to analyse comfort and preparedness for navigating challenging clinical scenarios with patients, peers and supervisors among undergraduate medical students in our institution, Melaka Manipal Medical College (MMMC), Malaysia. The idea of gender and ethnicity in students having difficulty at handling various clinical scenarios is supported based on a study that was done at four medical schools in United States of America, to assess the role of ethnicity and gender, in standardized patient assessments of medical students' empathy, in which significant results were obtained. Female medical students scored higher empathy than their male peers while African American students scored the highest compared to white and Asian/Pacific Islander students. [16] Moreover, an analysis suggested medical students have major issues when coping with some facets in LGBT health, especially with transgender patients as they felt "comfortable, but not fully prepared, to care for LGBT patients". [17] The subject in recent years that has been highly discussed is whether healthcare professionals' political affiliations are associated with how they provide care for patients. A study published from a therapeutic standpoint, in the United States, indicates

that for end-of-life treatment recipients, professional political biases are not linked to the quality of care that they offer. However, at present, there is insufficient data and evidence to conclude this, hence it is crucial to further investigate how political preferences can affect patient care due to unpreparedness in tackling the challenging scenario. [18]

Most of the studies shows that the third-year medical students face varying types of obstacles during their transforming period from pre-clinical classroom-oriented learning style to clerkship rotations in hospital wards. [2] The efficacy of student learning has been influenced by various aspects like different types of patients they see, guidance provided by supervisors, management skills, co-students studying in a same clinical rotation. [19] The perception of medical students will be vital in this study because they are aware about the factors that are obstructing during their day to day clinical settings and can put forward solutions for overcoming those challenges. [19] A similar study conducted stated that the need of medical schools to enhance their preparedness during this transition period by introducing fundamental clinical skills and training medical students to build rapport with the patients throughout the university program. [3] It is clear that medical students' comfort and preparedness when interacting with diverse groups of patients and working with their peers when clerking is essential during the clinical phase. Hence, the primary objective of our study is to assess the medical student's comfort and preparedness when faced with varying types of distinctive, diversifying and clinically challenging scenarios that happen with patients, peers and clinical superiors based on seven factors that includes gender, race/ethnicity, age, politics, sexual orientation/identity, politics and religion.

2. Methodology

2.1. Study Design, Setting, Time and Population

A cross sectional study was conducted from March 2020 to April 2020 among the undergraduate medical students of Melaka Manipal Medical College (MMMC). Our college has a campus in India and two campuses in Malaysia; one situated in Melaka and the other in Muar, Johor, respectively. However only the Malaysia campuses were chosen to be part of this study. This college offers three courses which are Bachelor of Medicine and Bachelor of Surgery (MBBS), Bachelor of Dental Surgery (BDS), and Foundation in Science (FIS), wherein there are a total of 10 semesters for the MBBS program. The research population consisted of the medical students who are presently in their clinical phase of training in semester 6, 7, 8, 9 and 10 of the MBBS program. There are approximately 600 students in semester 7 to 10,

wherein this study included students of semester 7, 8, 9, 10 and the semester 6 students were excluded from our study as they were not enrolled into the clinical phase in Muar as part of Melaka Manipal Medical College-MBBS program.

2.2. Sample Size

Based on the previous study conducted at the University of North Carolina at Chapel Hill among the third year medical students, it was shown that 5.9% of the medical students responded completely comfortable in 12 or more challenging clinical scenarios, from which an expected frequency of 5.9% was taken. [15] The estimated sample size for this research was calculated using Epi info version 7.2.6.6 with the population size of 600, expected frequency of 5.9%, acceptable margin of error 5% was allowed with a 95% of confidence level. We obtained sample size of 75 and upon allowing non response of 30% and rounding off, we concluded our final sample size as 107.

The formula used for obtaining our final sample size was:

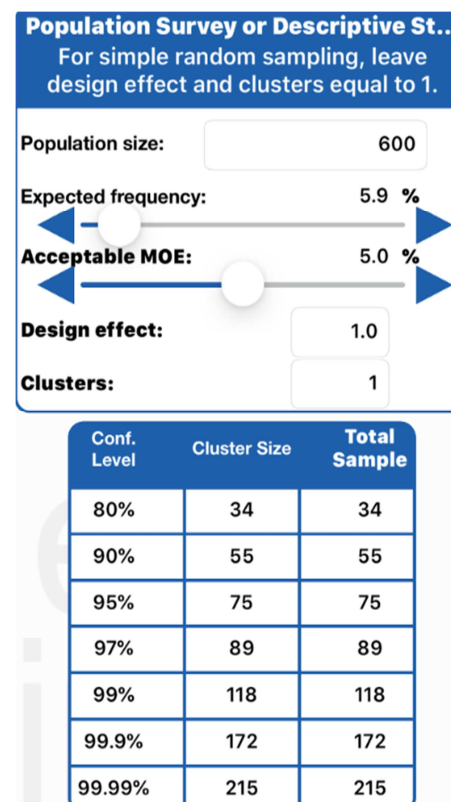n final = n calculated/ (1- non response%)

= 75/1-0.3 = 107.

Figure 1. Sample size.

2.3. Sampling

Purposive non-probability sampling was used in this study. The inclusion criteria include semester 7, 8, 9 and 10 students of the MBBS course and willing to participate in this study.

The students who did not provide informed consent and did not complete the questionnaire were excluded. Students who are from Foundation in Science (FIS), Bachelor of Dental Surgery (BDS) students and preclinical year MBBS students were excluded from our study.

2.4. Data Collection

The independent variables were the gender, age, ethnicity, religion, culture of the individual. Moreover, their political views, known disabilities and sexual orientation were also important independent factors to our study. The comfort and preparedness for navigating challenging clinical scenarios among undergraduates is the dependent variable for our study. The data for our study was collected among the desired MMMC students by distributing our Questionnaire online using google form. The questionnaire consists of a main front page which describes our study and contains a participant consent form which does not impose on the individual and the individual has the rights to decline in participating in this study. Our study was also designed to keep the privacy of the individual and ensure that their participation was anonymous. Our questionnaire comprises two parts, the first part being the basic information of the participant such as their age, gender, ethnicity, religion, nationality and current semester they are studying in. The second part would be the 24 scenarios of our questionnaire. The first 3 scenarios asked the students how they would react to certain scenarios from a political standpoint. The next 5 scenarios were scenarios based on the religion and cultural views of the people they would interact with. The next 10 scenarios were about situations which the students have to deal with in a hospital setting, primarily when dealing with patients and hospital personnel. Furthermore, the subsequent 3 scenarios were regarding undergraduates dealing with gender and various sexual orientation related scenarios while the last 3 scenarios were how the undergraduates deal with individuals with disabilities. All the 24-items were answered using a 5-point Likert scale containing Very Comfortable (5), Somewhat Comfortable (4), Neutral (3), Somewhat Uncomfortable (2), and Very Uncomfortable (1). The total score was calculated for each student. A higher score indicated higher comfort and preparedness.

2.5. Data Processing and Analysis

The raw data was processed using Microsoft Excel and thereafter analysed using Epi info version 7.2.2.6. The interpretation of the results was focused on a mixture of descriptive tables. Frequency and percentage of independent variables such as age, gender, ethnicity, religion, nationality and current semester were calculated. For each of the seven and three level specific areas, the variables were described using mean and standard deviation (SD) and the median and range (Q1, Q3). Level of significance was set at 0.05. The association between independent variables and dependent variables found out using the statistical tests were compiled in a tabular format.

Table 1. Statistical tests used in this study.

Independent Variable	Dependent Variable	Statistical test
Age	Level-specific and subject specific comfort	Mann-Whitney
Gender	Level-specific and subject specific comfort	Mann-Whitney
Ethnicity/Race	Level-specific and subject specific comfort	Mann-Whitney
Religion	Level-specific and subject specific comfort	Mann-Whitney
Nationality	Level-specific and subject specific comfort	Mann-Whitney
Current Semester	Level-specific and subject specific comfort	Mann-Whitney

2.6. Ethics

This research was approved by the Research Ethics Committee, Faculty of Medicine, Melaka Manipal Medical College (MMMC), Malaysia. The participants were told that participation in this study was completely voluntary and they were provided with an option to participate which was indicated by clicking in the checkbox of the written informed consent, provided in the Google form. All data obtained from the participants were kept confidential.

3. Results

A Google form consisting of 24 survey items was distributed through online to the medical students in our Melaka Manipal Medical College and we received a total of 130 responses. The results in Table 2 depicts the frequency and percentage of different independent variables such as age, gender, ethnicity, nationality, religion and current semester. As for age, 42.32% belonged to ages less than or equal to 22, the highest percentage was 57.69% from ages more than 22. The mean age was 22.7 years with a standard deviation of 1.0. As for gender, majority of the responses were from females (71.5%), leaving a total response of 37 to be that of males (28.5%). In terms of ethnicity, the highest response group came from the Indian community (34.6%), the Malay community (24.6%) was the second highest ethnicity that responded to our survey, followed by the Chinese community (20.8%) and others (20.00%). Whereas for religion, we had highest respondents who were Hindus (32.3%) followed by

Buddhist (21.5), Islam (26.2%), Christian (14.6%) and others (5.4%). A large proportion of the participants were from the semester 7 (73.1%), followed by semester 8 (20.8%) and the least participants were students of semester 9 (6.2%). A total of 120 participants were Malaysian students (92.3%) and 10 of them were international students (7.7%).

Table 2. Demographic characteristics of clinical year medical students (n = 130).

Variables	Frequency (%)
Age	
<=22	55 (42.3)
>22	75 (57.7)
Mean (SD)	22.7 (1.0)
Minimum – Maximum	20.0 – 27.0
Gender	
Male	37 (28.5)
Female	93 (71.5)
Ethnicity	

Variables	Frequency (%)
Malay	32 (24.6)
Chinese	27 (20.8)
Indian	45 (34.6)
Others	26 (20.0)
Religion	
Islam	34 (26.2)
Hindu	42 (32.3)
Christian	19 (14.6)
Buddhist	28 (21.5)
Others	7 (5.4)
Nationality	
Malaysian	120 (92.3)
International	10 (7.7)
Current semester	
7	95 (73.1)
8	27 (20.8)
9	8 (6.2)
10	0 (0.0)

Table 3. Navigating Challenging Clinical Scenarios Survey Questions, with level and subject among clinical year medical students (n=130).

Level [a]	Subject	Challenging Clinical Scenario	Mean (SD)	Median (Q1, Q3)
Patient	Political	1. You enter a room to care for a patient that has many buttons, a hat, and T-shirt of a political nature that does not align with your political beliefs. She asks you who you voted for in the last election.	2.6 (0.8)	3.0 (2.0, 3.0)
Upper level	Political	2. After rounds, the discussion drifts to current political concerns. From the discussion, it becomes clear that your attending has different political views than you do. She asks you what you think about the current political situation.	2.9 (0.8)	3.0 (2.0, 3.0)
Peer	Political	3. After rounds, fellow medical students on your team makes inflammatory comments about another student's political views.	2.4 (0.8)	2.0 (2.0, 3.0)
Patient	Religion	4. You enter a room wearing your traditional religious symbol (headscarf, cross, star of David, or Yarmulke, tattoo etc.), and the patient asks about its meaning.	3.8 (0.9)	4.0 (3.0, 5.0)
Upper- level	Religion	5. Your attending requests that the team pray with her after the loss of a patient on service.	3.8 (1.0)	4.0 (3.0, 5.0)
Patient	Religion	6. You walk into a room and your patient has religiously offensive tattoos on his arms.	3.1 (0.9)	3.0 (3.0, 3.0)
Upper- level	Religion	7. Your attending in a rural practice ask you to cover your religious accessories or tattoos, as it may offend some of his patients.	3.0 (1.1)	3.0 (2.0, 4.0)
Peer	Religion	8. A patient request that a medical school colleague pray with her; your colleague asks you to join them.	3.3 (1.0)	3.0 (3.0, 4.0)
Patient	Age	9. You are asked to see a patient in the ED by your team, but the patient refuses to see such a "young, inexperienced" doctor or medical student.	2.4 (0.8)	2.0 (2.0, 3.0)
Peer	Age	10. A medical school colleague requests that you see the demented elderly patient in the ED, as she "can't stand smelly, old people that can't talk to you", even though she is up for the next admission.	2.5 (1.0)	3.0 (2.0, 3.0)
Upper level	Age	11. You pull up your phone to look up a question on rounds. Your attending turns to you and says, "Put Facebook away and please join us back here on rounds."	2.3 (0.9)	2.0 (2.0, 3.0)
Patient	Race/Ethnicity	12. You are sent to relay the information that your team declines to give a patient the requested narcotic prescription. The patient states that if she were another race, you would be more than happy to help her.	2.2 (0.8)	2.0 (2.0, 3.0)
Peer	Race/Ethnicity	13. After an exhausting night of admissions, you overhear 2 of your student team members complaining about a difficult patient using derogatory language, including racial slurs.	2.1 (0.9)	2.0 (1.0, 3.0)
Upper level	Race/Ethnicity	14. You notice that your attending preferentially mentors and offers favouritism to other members of your team of the same race.	1.9 (0.8)	2.0 (1.0, 2.0)
Patient	Gender	15. A patient of a particular religion presents with a non-emergent medical issue and requests a provider of the same sex. Due to staffing, you are unable to meet that request.	2.7 (0.8)	3.0 (2.0, 3.0)
Patient	Gender	16. You are examining a patient with another medical student. The patient prefers that the 'good looking doctor' do the abdominal/GU exam.	2.4 (0.9)	2.0 (2.0, 3.0)
Peer	Gender	17. A colleague is inappropriately flirtatious with the nurses to the point of being disruptive to the team and patient care.	1.8 (0.8)	2.0 (1.0, 2.0)
Upper- level	Gender	18. An older attending is calling you "honey" and "dear", and occasionally resting their hand on your arm.	2.0 (1.1)	2.0 (1.0, 3.0)
Patient	Sexual Orientation	19. You are asked to see a transgender patient in the ED with complications related to transitioning. The patient corrects your pronoun misuse.	3.1 (0.9)	3.0 (2.0, 4.0)

Level [a]	Subject	Challenging Clinical Scenario	Mean (SD)	Median (Q1, Q3)
Upper- level	and Identity Sexual Orientation and Identity	20. Your attending asks you to see a patient, because they believe that you are the same sexual orientation and may identify better with the patient.	3.4 (0.9)	3.0 (3.0, 4.0)
Peer	Sexual Orientation and Identity	21. Prior to a clinical skills exam, a group of students are gathered and joking that a student in your group may be more familiar with the pelvic exam given their sexual orientation.	2.4 (0.9)	2.0 (2.0, 3.0)
Peer	Disability	22. A student member of your team is in a wheel chair, and team is clearly getting frustrated regarding the extra time it takes to navigate the small room, and subsequent delay of rounds.	2.6 (0.9)	3.0 (2.0, 3.0)
Upper- level	Disability	23. Your senior resident asks you to see a known, challenging patient in the ED with impaired hearing, using derogatory language regarding persons with disabilities.	2.6 (1.0)	3.0 (2.0, 3.0)
Patient	Disability	24. You are performing a physical exam on a child with a disability. The mother is hypervigilant and continually questioning your knowledge on the patient's disease and plan.	2.7 (1.0)	3.0 (2.0, 3.0)

[The mean and standard deviation (SD) and the median and Q1, Q3 of student scores are depicted, where the range is 1 ("Very Uncomfortable") to 5 ("Very Comfortable").

[a] Patients refers to scenarios with inpatient and outpatient patients, peer refers to scenarios with other medical students, and upper level refers to scenarios with residents and attending physicians.]

Table 3 depicts the mean and standard deviation and the median with Q1, Q3 of student scores regarding navigating challenging clinical scenario based the 24 survey items, on patient, peer, upper level and seven subject areas, where the score 1 represented 'Very uncomfortable' to the score of 5 represented 'Very comfortable'. For the political-related patient and upper- level scenarios, the students comfort level was neutral with median (Q1, Q3) score being 3.0 (2.0, 3.0) and 3.0 (2.0, 3.0). The students reported lowest comfort for political based questions at peer level with median (Q1, Q3) being 2.0 (2.0, 3.0). It is interesting to note that the students reported high level of comfort for religion related patient and upper level scenarios with the median (Q1, Q3) being 4.0 (3.0, 5.0) and 4.0 (3.0, 5.0) respectively and neutral level of comfort at all three levels for religion specific with the median (Q1, Q3) being 3.0 (3.0, 3.0), 3.0 (2.0, 4.0), 3.0 (3.0, 4.0) respectively.

Followed by for the age related patient and upper level scenarios 9, and 11, the students were uncomfortable with the median (Q1, Q3) being 2.0 (2.0, 3.0) and 2.0 (2.0, 3.0) but they have shown neutral comfort for peer level - age based scenario 12, where the median score (Q1, Q3): 3.0 (2.0, 3.0). Furthermore, the students were uncomfortable for all three level- ethnicity related scenarios 12, 13 and 14 with the median score (Q1, Q3): 2.0 (2.0, 3.0), 2.0 (1.0, 3.0), 2.0 (1.0, 2.0) respectively. The students have shown neutral comfort level for patient level-gender associated scenario 15-median (Q1, Q3) of 3.0 (2.0, 3.0), whereas for scenario 16 the students reported low comfort with median (Q1, Q3) of 2.0 (2.0, 3.0), followed by peer, upper level ethnicity related scenarios 17, 18 also students have shown low level of comfort with a median (Q1, Q3) of 2.0 (1.0, 2.0), 2.0 (1.0, 3.0) accordingly. There were differences in comfort across sexual orientation and identity related scenarios (19, 20), where the students reported neutral level of comfort with patient and upper level with a

median (Q1, Q3) of 3.0 (2.0, 4.0), 3.0 (3.0, 4.0) and low comfort with peer level scenario 21 with a score of 2.0 (2.0, 3.0), respectively. In addition, the students have shown a neutral level of comfort across all three level-disability oriented scenarios 22, 23 and 24 with a median score (Q1, Q3) being 3.0 (2.0, 3.0), 3.0 (2.0, 3.0), 3.0 (2.0, 3.0), respectively.

Table 4. Overall, Level-Specific, and Subject-Specific Comfort with Challenging Clinical Scenarios among clinical year medical students (n = 130)

Variables	Median (Q1, Q3)
Overall score [x]	2.67 (2.38, 2.92)
Level-Specific scenarios [y]	
Patient	2.78 (2.44, 3.00)
Peer	2.43 (2.14, 2.86)
Upper level	2.81 (2.38, 3.00)
Subject-Specific Scenarios [z]	
Gender	2.25 (1.75, 2.50)
Ethnicity	2.00 (1.67, 2.67)
Age	2.33 (2.00, 3.00)
Politics	2.67 (2.33, 3.00)
Sexual orientation and identity	3.00 (2.67, 3.33)
Disability	2.67 (2.00, 3.00)
Religion	3.40 (3.00, 3.80)

x: Scores range from 1 ("Very uncomfortable") to 5 ("Very comfortable"). Overall score represents average comfort scores across all 24 scenarios.
y: Scores range from 1 ("Very uncomfortable") to 5 ("Very comfortable"). Level-specific scores represent average comfort scores across scenarios that described specific interactions with patients, peers (i.e. other medical students), and upper-levels (i.e. supervising residents and attending physicians)
z: Scores range from 1 ("Very uncomfortable") to 5 ("Very comfortable"). Subject-specific scores represent average comfort scores across scenarios that described interactions revolving around a specific subject (7 total subjects including gender, race/ethnicity, politics, age, sexual orientation and identity, disability, and religion).

Table 4 reports student-perceived comfort scores overall, across the three level specific scenarios and seven subject areas. As for the three level specific scenarios, students have shown lowest comfort with all three (patient, peer and upper

level) based interactions with the median (Q1, Q3) of 2.78 (2.44, 3.00), 2.43 (2.14, 2.86), 2.81 (2.38, 3.00), respectively. Students reported the highest comfort with religion-related interactions with the median (Q1, Q3) of 3.40 (3.00, 3.80) and the lowest comfort with gender, race/ethnicity, age, politics and disability related interactions (median (Q1, Q3): 2.25 (1.75, 2.50), 2.00 (1.67, 2.67), 2.33 (2.00, 3.00), 2.67 (2.33, 3.00) and 2.67 (2.30, 3.00)), respectively. For sexual orientation and identity related interactions, students' responses were neutral with a score of 3.00 (2.67, 3.33). The overall score of the students also reported lowest comfort with a score of 2.67 (2.38, 2.92).

Table 5. Association between Gender and Overall, Level-Specific, and Subject-Specific Comfort with Challenging Clinical Scenarios.

Variables	Males Median (Q1, Q3)	Females Median (Q1, Q3)	p-value
Overall Score	2.88 (2.56, 3.20)	2.84 (2.56, 3.08)	0.627
Level-Specific Scenarios			
Patient	4.61 (4.16, 5.22)	4.62 (4.14, 4.99)	0.600
Peer	5.30 (4.71, 5.99)	5.27 (4.72, 5.73)	0.608
Upper level	5.01 (4.50, 5.70)	5.01 (4.46, 5.44)	0.572
Subject-Specific Scenarios			
Gender	3.94 (3.42, 4.37)	3.82 (3.40, 4.17)	0.551
Race/Ethnicity	3.73 (3.29, 4.21)	3.700 (3.32, 4.03)	0.596
Age	3.69 (3.22, 4.15)	3.63 (3.30, 3.91)	0.576
Political	3.07 (2.72, 3.41)	3.03 (2.76, 3.30)	0.622
Sexual orientation and identity	4.02 (3.57, 4.53)	4.01 (3.54, 4.29)	0.481
Disability	4.12 (3.66, 4.64)	4.09 (3.67, 4.45)	0.611
Religion	3.52 (3.11, 3.92)	3.51 (3.18, 3.80)	0.611

Table 5 illustrates the association between gender and overall, three level-specific and subject- specific comfort levels with Challenging Clinical Scenarios. The p-value 0.627 showed no significant differences across gender with regards to overall score, where both genders reported low median comfort (Q1, Q3): 2.88 (2.56, 3.20) and 2.84 (2.56, 3.08) respectively. Both genders have shown highest median comfort levels for patient, peer and upper level interactions with median (Q1, Q3): 4.61 (4.16, 5.22), 5.30 (4.71, 5.99) for males and 4.62 (4.14, 4.99), 5.27 (4.72, 5.73), 5.01 (4.46, 5.44) for females respectively. The p-values of gender for patient, peer and upper level 0.600, 0.608 and 0.572 have also shown no significant association between gender and all three level-specific scenarios. Both genders showed higher comfort with sexual orientation, and disability related interactions with median (Q1, Q3): 4.02 (3.57, 4.53), 4.12 (3.66, 4.64) and 4.01 (3.54, 4.29), 4.09 (3.67, 4.45) respectively. The p-values of gender for sexual orientation and disability, 0.481 and 0.611, also depicted there was no

significance. Interestingly, multiple male and female response patterns showed evidence of neutral comfort level in politically associated scenarios with median (Q1, Q3): 3.07 (2.72, 3.41) and 3.03 (2.76, 3.30) accordingly. The p-value 0.622 showed no significant association between gender and political specific scenarios. Males reported reasonably high comfort level related to gender-based interactions with median (Q1, Q3): 3.94 (3.42, 4.37) compared to females with median (Q1, Q3): 3.82 (3.40, 4.17). The p-value of 0.551 showed no significant association between gender and gender-based interactions. For scenarios based on ethnicity, age and religion, both genders reported moderate extent of comfort with median (Q1, Q3): 3.73 (3.29, 4.21), 3.69 (3.22, 4.15), 3.52 (3.11, 3.92) for males and 3.70 (3.32, 4.03), 3.63 (3.30, 3.91), 3.51 (3.18, 3.80) for females. There is no significant association between gender and ethnicity, age and religion specific interactions was shown by the p-values 0.596, 0.576 and 0.611, respectively.

Table 6. Association between Ethnicity and Overall, Level-Specific, and Subject-Specific Comfort with Challenging Clinical Scenarios

Variables	Malay Median (Q1, Q3)	Chinese Median (Q1, Q3)	Indian Median (Q1, Q3)	Others Median (Q1, Q3)	p-value
Overall score	2.80 (2.60, 2.94)	2.80 (2.60, 3.20)	2.88 (2.52, 3.20)	2.92 (2.68, 3.08)	0.608
Level-Specific Scenarios					
Patient	4.51 (4.18, 4.76)	4.52 (4.14, 5.15)	4.66 (4.05, 5.16)	4.74 (4.29, 4.99)	0.708
Peer	5.16 (4.77, 5.45)	5.20 (4.81, 5.93)	5.30 (4.59, 5.99)	5.43 (4.90, 5.73)	0.671
Upper level	4.89 (4.52, 5.20)	4.95 (4.55, 5.58)	5.01 (4.38, 5.67)	5.17 (4.68, 5.44)	0.721
Subject-Specific Scenarios					
Gender	3.73 (3.47, 3.99)	3.85 (3.53, 4.36)	3.80 (3.33, 4.35)	3.97 (3.65, 4.16)	0.518
Race/Ethnicity	3.61 (3.33, 3.88)	3.73 (3.23, 4.13)	3.70 (3.16, 4.13)	3.83 (3.49, 4.00)	0.599
Age	3.55 (3.31, 3.80)	3.65 (3.23, 3.98)	3.66 (3.14, 4.01)	3.73 (3.48, 3.88)	0.668
Political	2.96 (2.73, 3.13)	2.99 (2.80, 3.38)	3.0 (2.72, 3.41)	3.07 (2.88, 3.30)	0.664
Sexual orientation and identity	3.89 (3.62, 4.14)	4.01 (3.68, 4.48)	4.0 (3.53, 4.52)	4.11 (3.77, 5.08)	0.587
Disability	4.01 (3.70, 4.23)	4.04 (3.74, 4.60)	4.12 (3.58, 4.64)	4.21 (3.82, 4.44)	0.654
Religion	3.4 (3.20, 3.74)	3.52 (3.22, 3.81)	3.54 (3.11, 3.95)	3.57 (3.36, 3.77)	0.853

As for the overall score, depicted in Table 6, all ethnicities have scored below comfort level. Malay and Chinese ethnicities have the lowest score ranging between somewhat uncomfortable to neutral with a median of 2.80, however Indian ethnicity score leans more towards neutral, with median being 2.88, as compared to Malay and Chinese. The highest median score is 2.92. It is the closest score to neutral which was scored by other ethnicities, however, despite being the highest, it still lies below comfort. As for Level-specific scenarios score at patient level, all ethnicities scored between somewhat comfortable to very comfortable, although other ethnicities scored the highest again with a median of 4.74, as compared to Malay ethnicity with the lowest median of 4.51. Chinese and Indian ethnicities scored 4.52 and 4.66, respectively. Similar trend of results are depicted for level-specific scenarios at peer and upper levels, as well, where Malay ethics have the lowest median score (5.16 and 4.89) and other ethnicities has the highest (5.43 and 5.17), while Chinese and Indians have scored (5.20 and 4.95) and (5.30 and 5.01) respectively. Nevertheless, participants of all ethnicities feel somewhat comfortable to very comfortable tackling challenging scenarios at patient, peer and upper levels. As for gender, race/ethnicity and age subjects, the scores for all ethnic groups are within neutral, lying just below somewhat comfortable. Chinese scored slightly higher compared to Indians for gender and race/ethnicity subjects, however Indians scored better than Chinese for the age subject. Malay ethnicity scored the lowest with median score of 3.73, 3.61, and 3.55 respectively, while other ethnicities scored the highest, 3.97, 3.83, and 3.73, for gender, race/ethnicity and age subjects. As for sexual orientation and identity subject Malay ethnicity scored neutral, almost close to somewhat comfortable while Chinese, Indian and other ethnicities scored somewhat comfortable, with others being the highest. The median scores for disabilities are all somewhat comfortable for all ethnicities with Malay being the lowest with a median score of 4.01, followed by Chinese close behind with a score of 4.04 and Indians scoring slightly higher 4.12, while other ethnicities scored the highest with 4.21. Religion subject wise, all ethnicities scored neutral to somewhat comfortable, however Malay ethnicity scored the lowest with 3.46, falling closer to neutral as opposed to somewhat comfortable. An overview of level-specific and subject-specific scenarios shows all ethnicities feel very comfortable at peer level scenarios and somewhat uncomfortable to neutral for political subject scenarios. That being said, ethnicity had no significance in the comfort and preparedness of medical undergraduates navigating challenging clinical scenarios.

Table 7. Association between Religion and Overall, Level-Specific, and Subject-Specific Comfort with Challenging Clinical Scenarios

Variables	Islam Median (Q1, Q3)	Buddhist Median (Q1, Q3)	Hindus Median (Q1, Q3)	Christian Median (Q1, Q3)	Others Median (Q1, Q3)	p-value
Overall score	2.80 (2.56, 2.96)	2.92 (2.64, 3.16)	2.98 (2.52, 3.28)	2.76 (2.68, 3.04)	2.92 (2.40, 3.04)	0.620
Level-Specific Scenarios						
Patient	4.51 (4.16, 4.76)	4.68 (4.25, 5.10)	4.50 (4.28, 5.92)	4.84 (4.05, 5.36)	4.51 (4.16, 4.76)	0.715
Peer	5.16 (4.71, 5.46)	5.38 (4.88, 5.88)	5.55 (4.59, 6.10)	5.13 (4.90, 5.67)	5.43 (4.40, 5.64)	0.675
Upper-level	4.89 (4.50, 5.21)	5.10 (4.64, 5.55)	5.29 (4.38, 5.81)	4.95 (4.71, 5.39)	5.17 (4.19, 5.34)	0.714
Subject-Specific Scenarios						
Gender	3.73 (3.42, 4.00)	3.94 (3.60, 4.33)	4.06 (3.33, 4.44)	3.81 (3.47, 4.06)	3.98 (3.26, 4.06)	0.614
Race/Ethnicity	3.61 (3.32, 3.90)	3.73 (3.44, 4.13)	3.86 (3.16, 4.30)	3.66 (3.31, 4.88)	3.83 (3.15, 3.91)	0.732
Age	3.55 (3.30, 3.83)	3.69 (3.36, 3.98)	3.76 (3.14, 4.22)	3.61 (3.28, 3.85)	3.76 (3.09, 3.90)	0.766
Political	2.96 (2.72, 3.14)	3.11 (2.82, 3.34)	3.13 (2.72, 3.49)	2.95 (2.84, 3.22)	3.07 (2.60, 3.19)	0.659
Sexual orientation and identity	3.89 (3.57, 4.16)	4.07 (3.70, 4.44)	4.20 (3.53, 4.62)	3.93 (3.64, 4.25)	4.11 (3.39, 4.22)	0.578
Disability	4.01 (3.66, 4.24)	4.19 (3.79, 4.56)	4.30 (3.57, 4.73)	3.98 (3.81, 4.39)	4.21 (3.43, 4.39)	0.656
Religion	3.46 (3.19, 3.77)	3.57 (3.28, 3.81)	3.61 (3.11, 4.02)	3.48 (3.16, 3.78)	3.62 (3.03, 3.73)	0.865

As for overall score, depicted in Table 7, all religions scored between somewhat uncomfortable and neutral. Hindus scored the highest median score of 2.98 which is closest to neutral, followed by Buddhist and other religions score of 2.92, Islam scored 2.80, and Christians had the lowest median score of 2.76, which however are also close to neutral. As for level-specific scenarios score at patient level, Christians scored the highest (4.51), almost very comfortable on the Likert scale though scoring the lowest overall, followed by Buddhist (4.68). Islam and other religions had the same median score of 4.51, while Hindus had the lowest score of 4.50, as opposed to them having the highest score overall, but even so their score is within the range of somewhat comfortable to very comfortable, as the other religions at patient level. There were differences across peer level with regards to median comfort and distribution of scores as Hindus scored the highest (5.55), indicating that they are very comfortable at peer specific scenarios. The second highest were other religions (5.43), followed by Buddhist (5.38) and Islam (5.16). The lowest score was of Christians (5.13), however

still within the very comfortable range of the scale. As for upper-level specific scenarios, Hindus scored the highest (5.29), followed by other religions (5.17), Buddhist (5.10), and Christians (4.95). Islam scored the lowest with median score of 4.89. That being said, all religions were within the somewhat comfortable to very comfortable range. Thus, for level-specific scenarios in general, all religions were somewhat comfortable to very comfortable. Based on subject-specific scenarios, a same trend was seen for gender and race/ethnicity subjects, where Hindus scored the highest (4.06, 3.86) respectively, followed by other religions (3.98 and 3.83), Buddhist (3.94 and 3.73), and Christian (3.81 and 3.66). Islam scored the lowest for these two subjects with median scores of 3.73 and 3.61, respectively. All religions were within neutral to somewhat comfortable scale for gender and race/ethnicity subjects. As for age subject, Hindus and other religions scored the highest with median of 3.76 and Islam scored the lowest with median of 3.55. Buddhists, and Christians scored 3.69 and 3.61, respectively. All religions were within the neutral to somewhat comfortable scale. Next as for political subject, Islam and Hindu both scored the lowest with 2.95 and 2.96, indicating that their felt somewhat uncomfortable to neutral. Buddhist, Christian and

other religions scored, 3.11, 3.13, and 3.07. As for sexual orientation and identity the highest, were Hindus (4.20) and lowest were Islam (3.89). Buddhist, Christian and other religions had scores of 4.07, 3.93, 4.11, accordingly. All religions were within neutral to somewhat comfortable scale. As for disability, Hindus yet again, had the highest score, 4.30, while Christians had the lowest, 3.98. Islam, Buddhist, and other religions had scores of 4.01, 4.19, and 4.21. All religions were at the somewhat comfortable scale with Christian being slightly higher than neutral. As for religion, Islam scored the lowest (3.46), and other religions scored the highest (3.62). Buddhist, Hindu and Christians scored 3.57, 3.61, and 3.48, respectively. All religions were within the neutral to somewhat comfortable scale. An overview of level-specific shows all religions have highest comfort at peer level and least comfort at patient level, however, their scores were within somewhat comfortable to very comfortable. As for subject-specific scenarios, all religions felt least comfortable for political subject and highest comfort for disability subject, the scores were somewhat uncomfortable to neutral. That being said, religion had no significance in the comfort and preparedness of medical undergraduates navigating challenging clinical scenarios.

Table 8. Association between Nationality and Overall, Level-Specific, and Subject-Specific Comfort.

Variables	Malaysian students Median (Q1, Q3)	International Students Median (Q1, Q3)	p-value
Overall score	2.82 (2.54, 3.12)	3.00 (2.84, 3.24)	0.103
Level-Specific Scenarios			
Patient	4.54 (4.08, 5.03)	4.82 (4.50, 5.21)	0.179
Peer	5.21 (4.65, 5.76)	5.53 (5.22, 6.01)	0.135
Upper-level	4.95 (4.40, 5.46)	5.19 (4.93, 5.67)	0.179
Subject-Specific Scenarios			
Gender	3.81 (3.39, 4.21)	4.01 (3.87, 4.41)	0.104
Race/Ethnicity	3.70 (3.29, 4.04)	3.82 (3.66, 4.20)	0.152
Age	3.62 (3.22, 3.94)	3.74 (3.62, 4.05)	0.167
Political	2.99 (2.72, 3.30)	3.17 (3.03, 3.45)	0.102
Sexual orientation and identity	3.97 (3.53, 4.36)	4.17 (4.01, 4.55)	0.152
Disability	4.05 (3.62, 4.47)	4.29 (4.06, 4.66)	0.131
Religion	3.51 (3.13, 3.81)	3.61 (3.47, 3.89)	0.235

Table 8 depicts association between nationality and overall, level-specific, and subject-specific comfort scores. Overall, both groups' comfort scores leaned towards neutral comfort level, with the Malaysian students and International students scored median (Q1, Q3) score of 2.82 (2.54, 3.12) and 3.00 (2.84, 3.24) respectively. Students reported that they are very comfortable at the level-specific interactions. However, International students scored higher comfort level in all the three levels (patient-level, peer-level and upper-level) interactions compared to Malaysian students. For the patient-level interaction, the International students scored median (Q1, Q3): 4.82 (4.50, 5.21) while Malaysian students scored median (Q1, Q3): 4.54 (4.08, 5.03). As for peer-level interaction, International and Malaysian students scored median (Q1, Q3): 5.53 (5.22, 6.01) and 5.21 (4.65, 5.76)

respectively, and for upper-level interaction, 5.19 (4.93, 5.67) and 4.95 (4.40, 5.46) respectively. Next as for subject-specific comfort level, all students reported that they are comfortable, depicted by median score of all the subject-specific scenarios were more than 3.5, except for politic-specific scenarios, where the Malaysian students scored median (Q1, Q3): 2.99 (2.72, 3.30) and International students scored 3.17 (3.03, 3.45). However, all of the above associations were not statistically significant (p-value ≥ 0.05). P-values of overall score, patient-level, peer-level, upper level, gender-specific, race-specific, age-specific, political-specific, sexual orientation and identity-specific, disability-specific and religion-specific scenarios were 0.103, 0.179, 0.135, 0.179, 0.104, 0.152, 0.167, 0.102, 0.152, 0.131 and 0.235 respectively.

4. Discussion

This cross-sectional study was conducted among undergraduate medical students of Melaka Manipal Medical College (MMMC) in Malaysia. The objective of our study was to assess the medical student's comfort and preparedness when faced with varying clinically challenging scenarios across patients, peers and superiors based on seven focus areas that included gender, race/ethnicity, age, politics, sexual orientation/identity, politics and religion.

A remarkable finding has shown that MMMC medical students reported the lowest overall comfort score followed by lower comfort with all three level-specific interactions and the higher comfort with religion-related interactions. With regards to gender, race/ethnicity, age, politics and disability related interactions, students reported lowest comfort and have shown a neutral comfort level related to sexual orientation and identity specific-interactions. These results are comparable with a similar cross-sectional study which was conducted on third year medical students at the University of North Carolina at Chapel Hill which reported lower comfort with clinically challenging scenarios that involved their peers and superiors and higher median comfort with scenarios associated with religion and sexual orientation and identity in addition to that they also discovered the lowest median comfort score overall. [15]

Our study documented there were no significant differences in MMMC students across gender with regards to overall score but have shown higher median comfort levels for sexual orientation, identity and disability oriented scenarios followed by the highest comfort that involved patient, peer and upper level interactions. It was noted that both male and female response patterns showed evidence of neutral comfort level in politically associated scenarios. Males reported reasonably high comfort levels related to gender-based interactions compared to females whereas for ethnicity, age and religion-based scenarios both males and females reported moderate extent of comfort. In a study previously done among third year medical students at UNC-CH reported noteworthy differences across gender with respect to overall median comfort score and males were notably found to have a higher comfort level for upper-level, gender and religion oriented scenarios and highest comfort with respect to sexual orientation and identity based scenarios. [15] This was in line with another cross-sectional study done among MMMC students to assess the levels of piousness and empathy in medical students and their attitude towards homosexuality found that males have higher Homosexual Attitude Score (HAS) scores compared to females, thus males have higher tolerance towards homosexuality. [20] However, another study carried out among clinical-year medical students in

Malaysia, reported no statistical differences between genders related to sexual orientation and identity related interactions. [21].

According to an article published in the commonwealth fund organisation, ethnic minority communities are less likely to seek basic health services and are provided with lower-quality treatment. [22] Thus, an element widely used in analysis of health inequalities is ethnicity, therefore we included Malay, Chinese, Indian and medical students of other ethnicities in our study to determine comfort and preparedness for navigating challenging ethnicity related clinical scenarios with peer, patient and supervisors. And based on the results we obtained, there was evidence of small variations in comfort levels of the different ethnic groups at level and subject specific scenarios, however in general, all ethnicities have scored below comfort level ranging from somewhat uncomfortable to neutral. As for patient, peer and upper levels, all ethnicities reported somewhat comfortable to very comfortable, with other ethnicities having the highest median score, and Malay being the lowest at every level. As for an overview of the subject-specific scenarios on the other hand, all ethnicities reported most comfortable with disability scenarios, and least comfortable with political scenarios. Moreover, for each of the seven subject-specific scenarios, Malay ethic group scored the lowest while other ethnicities scored the highest, that being said, all ethnicities reported neutral to somewhat comfortable. While it may seem surprising, based on our results, ethnicity seemed to have no significance in the comfort and preparedness of medical undergraduates managing various difficult clinical scenarios, as all ethnic groups were always within the same range of comfort score for each and every scenario despite the small differences. This does not correspond with similar study conducted in the United States of America, documented scenarios involving ethnicity as one of lowest comfort scores with median of 2.0 and significant variations across the seven subject-specific scenarios. [15]

A study conducted at a university in Malaysia, generally reported, medical students have low comfort around individuals of various religious backgrounds [23]. However, our study, had shown that there was no significance between the undergraduates' religion and their comfort levels and preparedness in navigating certain clinical scenarios based on the overall scores, subject specific score and level specific scores which also corresponds to a study conducted in the United States of America, that reported no significance in any religious affiliations having an effect on medical students in certain scenarios. [24] Additionally, our study also reported no significance between the nationality of the undergraduates and their comfort levels as both International students and Malaysian students, generally reported being

within the same range of comfort (2.82, 3.00) when dealing with the various difficult scenarios at all three levels, which differs to a study conducted to assess the performance in clinical-practical exams of German, EU (European Union) and non-EU medical students, in which a significant difference was found, whereby International students obtained poorer results. [25]

Our study contained few limitations. Firstly, we conducted a cross-sectional which prevented us from observing the changes in participants' comfort levels. Secondly, our study was limited to one inner-city private medical college. Therefore, the results are not applicable to other settings. Moreover, there was no participation from final year students and junior year students that can affect the results as senior clerkship- students would have encountered more patients whereas junior students would have less experience that might change their comfort levels. In addition, there are more female participants compared to male participants in our study, therefore the result may not represent the population. An online google form was used to collect the data that lead to low response from the participants.

The results of this study suggests that the medical student's comfort when faced with varying clinically challenging situations can be overcome by the development of awareness programmes and conducting workshops to promote essential skills that enhance their preparedness across varying aspects of medical practise as well as gradually inculcate special training component in the curriculum that focuses on building positive attitude and confidence in medical students during their diverse and distinctive clinical learning environment. There is a need for similar studies on this topic in Malaysia to find out the comfort of medical students towards clinically challenging situations. We would like to recommend future researchers to include early junior and senior clerkship students, houseman, dental students, nurses and other healthcare professionals and a larger sample size should be assessed to obtain more accurate results.

5. Conclusion

This is the first comprehensive study to assess MMMC undergraduate medical students comfort and preparedness for navigating challenging clinical scenarios across varying levels (patient-, peer- and upper-level), and covering a wide range of diversity related issues which are gender, ethnicity, age, political, sexual orientation and identity, disability and religion issues. MMMC undergraduate medical students primarily reported insufficient comfort and preparedness to tackle the diverse clinical scenarios. Strikingly, the students reported highest comfort with supervisors and lowest comfort with peer interactions. In subject-specific scenarios, the students reported low comfort level for all subject-specific issues, except for sexual orientation and identity, and religion-related issues where medical students reported to have neutral comfort level to navigate those issues. Medical students may benefit from simulation-based training and workshops in order to prepare themselves for navigating diversity-related issues in the workplace.

Acknowledgements

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