MEDICAL STUDENTS' PERCEPTION ON ANATOMY EDUCATION ENVIRONMENT IN UPM- A COMPARATIVE STUDY OF GENDER AND PHASE OF CLINICAL STUDY

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CHAPTER 1

INTRODUCTION

1.1 Background

Anatomy is defined as the study of human or animal form, by observation or examination of the living being, examination or dissection of dead specimens, microscopic examination, and/or textbooks (MedicineNet 2018). Anatomy education which comprises gross anatomy, histology and embryology is one of the most basic important learning in medical studies as it resembles the insights of human body structure. Hence, its basic necessary knowledge helps students to understand future pathology and clinical problems. Traditionally, cadaveric dissection is the sole pedagogy anatomy learning for medical students. Owing to inadequate allocated times and insufficient cadavers for the current anatomy teaching, the practical perspective has been improvised to the multiple extents in anatomy module lectures; plastination models, prosected model, computer-assisted learning and problem-based learning. Integration of newer anatomy curriculum will encourage student's interest and expand their knowledge and has its own clinical relevance. Medical students, therefore, need to equip themselves with enough understanding in anatomy education for the aim of patient's safety as well as satisfaction as professional medical personnel.

Unexpectedly, Turney (2007) has reported that anatomy education is gradually being shaved away from the medical curriculum due to the subject's rigidness. In earlier years of anatomy education, students were required to blindly memorize without much understanding. Instead of a requirement, it has merely become a subject that students brush through. In a study in the Netherlands conducted by Prince et al. (2005), the comparison was made between the anatomy knowledge of medical students with the expectation levels of

several professionals. They concluded that there was a significant difference between the two, wherein the students scored lower than expected, leading to public worry. Therefore, in Turney's (2007) study, he suggested intervention in anatomy education. In order to adjust for this adaptation, anatomy education must be incorporated into the ever-changing waves of technology. However, he also emphasizes the importance of traditional teaching methods. Instead of comparing its superiority, traditional and modern methods should exist in harmony to ensure the best of anatomy education delivery for medical students.

A study by Paracha et al. (2011) on the assessment of the preclinical students' satisfaction regarding anatomy curriculum at Kust Institute of Medical Sciences in Kohat revealed that most of them were satisfied with the studied course contents, internal evaluation system and teachers' performance. The study suggested mandatory periodical revision of the anatomy curriculum based on the feedback from the students in graduating reliable and competent doctors. Furthermore, Hadie et al. (2013) emphasized the students' perception assessment of specific areas of interest such as anatomy which has an impact on the success of the feedback process. Their perception may provide useful information on potential deficiencies in anatomical education and would also mitigate the inconsistencies between the current and the desired understandings or their performances.

1.2 Problem Statement

Anatomy is one of the most challenging medical subjects in view of its memory knowledge retention as well as its learning and focusing process. Hadie et al. (2013) had observed the difficulties of medical students in learning the anatomy subject and also to maintain this knowledge for future practice, hence reflecting the possible flaws in anatomical education. This study also defined the students' perception of anatomical teaching and learning is a pre-emptive measure required by educators, in order to achieve an ideal anatomical education environment and to bridge the gaps in education. As a result, Universiti Sains Malaysia (USM) had developed the Anatomy Education Environment Measurement Inventory (AEEMI) as a valid inventory tool to specifically measure the quality of anatomy education environment.

Following the development of AEEMI, we are taking this opportunity to utilize this tool for UPM medical students in evaluating the perception of our anatomical education environment. By doing a detailed evaluation, we can detect the area of concern, what aspect we need to improve and the positive area of our Anatomy education environment.

1.3 Significance of Study

Through this research, we could identify medical students' perception of the anatomy education environment in UPM. Thus, the Anatomy Department of the Faculty of Medicine and Health Sciences of UPM could gain a better view and insight on how they can improve the anatomy education environment based on the feedback yielded from this research. For the students, we hoped that this would benefit them to succeed in anatomy subject by appreciating the importance of anatomy knowledge, gaining enthusiasm for learning anatomy and making self-effort in learning anatomy. As a result, knowledge and skills are

applicable in their future clinical duties. Moreover, we are believed that the Human Anatomy Department of FMHS of UPM will be able to provide better future education environment as having high-quality knowledgeable anatomy teachers and providing well-managed and well-maintained anatomy learning resources including histology practical facilities in FMHS, UPM.

1.4 Research Questions

1. What is the perception of medical students towards anatomy teachers in UPM based on knowledge content and teaching behaviours?
2. What is the perception of medical students about the importance of anatomy knowledge?
3. What is the medical students' self-perception regarding their intrinsic interest and effort in learning anatomy subject?
4. What is the medical students' perception of anatomy education learning resources and teaching tools in UPM?
5. What is the perception of medical students of the quality of histological learning facilities in UPM?
6. What is the distribution of socio-demographic factors (gender and phase of study) among UPM's medical students?
7. What is the relationship between socio-demographic factors with the perception of UPM's medical student on anatomy education?

1.5 Research Hypothesis

1.5.1 Null hypothesis

There are no differences in the UPM's medical students' perception of anatomy education environment with its socio-demographic factors.

1.6 Objectives

1.6.1 General objective

The general objective of this study was to evaluate the perception of UPM's medical students on anatomy education environment via Anatomy Education Environment Measurement Inventory (AEEMI).

1.6.2 Specific objectives

1. To determine the differences of the mean scores of the 6 domains of AEEMI between male and female students.
2. To determine the differences of the mean scores of the 6 domains of AEEMI between phases of study.

1.7 Limitation of Study

The data collected did not represent all medical students in Malaysia as the study was only conducted among medical students of UPM. Apart from that, due to the COVID-19 pandemic, physical classes and lectures were not possible. Therefore, the study was affected as the students were not able to partake in normal face-to-face classes. The differences in the current first-year UPM medical curriculum also might influence their perceptions.

CHAPTER 2

LITERATURE REVIEW

2.1 Anatomy Education

In the world of science, people are observing and appreciating before understanding and gaining knowledge about it. Anatomy is a branch of the science field where it emphasizes more on witnessing and perceiving the detailed part of living things. Anatomy is defined by the Cambridge Dictionary as the scientific study of the body and how its parts are arranged. Swetha & Thenmozhi (2019) claimed that anatomy is composed of gross anatomy, histology and embryology, which cover the animal's body structures at three different levels; gross anatomy, microanatomy and developmental anatomy.

According to the article "The Need to Have a Valid and Reliable Tool to Measure the Anatomy Education Environment" by Hadie et al. (2013), anatomy is a discipline which highly has strong clinical relevance in medical education. However, nowadays anatomy is reportedly less taught via dissection since they are presumed a heavy subject and to be overly time-consuming. Hence, the anatomy content of the medical curriculum with its total hours of anatomy learning has been lessened to cater newer medical subjects such as molecular biology and genetics, following a massive overhaul in the medical curriculum from traditional to problem-based learning (PBL) and system-based. Given adjustments in the anatomical education environment, anatomical awareness among medical students and trained physicians or surgeons appears to be ignored. With that, sufficient anatomical knowledge is needed for safe practice. Additionally, this article also claimed that the anatomy

teaching procedure nowadays are more into models-oriented, plastinated specimens, imaging techniques and simulation software rather than cadaveric dissection, which is still debatable.

On the other hand, Swetha & Thenmozhi (2019) undoubtedly mentioned the importance of the traditional methods, in which students often rapidly forget the important information they obtained through lectures, so it is vital to change the anatomy teaching methods. Thus, the institutions are obligated to identify the best and effective methods in order to provide effective anatomy learning education, in producing quality doctors or academics.

2.2 Anatomy Educators

It is without a doubt that anatomy educators play an important role in providing comprehensive anatomy knowledge for the students. As stated by Adanir et al. (2019), the number of educators in the anatomy department in the medical institution is of high importance. They also mentioned that there was a rise in the number of medical schools and students, but the unparallel number of anatomy educators. Adanir et. al's study deduced that the educators in the Anatomy Department were overworked, resulting in a negative effect on anatomy education.

In a study conducted by Gövsa et al. (2020) to study the factors that health science students skipped the anatomy classes, 40% of the students made their decision depending on the traits of the lecturer, such their capabilities in promoting learning or either, being too dull. It was concluded that many students thought that lectures and anatomy lecturers were uninteresting and that the academicians who are specialists in their field of study, might not be good educators.

Arzuman et. al (2017) carried out a study to gauge preclinical medical students' perception of their educational environment at SEGi University Malaysia using the Dundee Ready Education Environment Questionnaire (DREEM) questionnaire. From the survey, they found that students agreed that their educators were well-versed and were competent in teaching. However, the students had a negative perception of the educator-student relationship, leading the researchers to propose that the students thought their educators were stern during the lessons. This study had advised that educators should take this feedback into account and partake in training workshops to further improve themselves and keeping up to date with the advances in medical education.

2.3 Importance of Anatomy Knowledge

For medical students worldwide, anatomy is the most core subject to be learned as it is the major part of the basic sciences of medicine which includes gross anatomy, histology, and embryology. To perform safe and efficient interventions in medicine, having enough anatomy knowledge is a prerequisite as what has been advised by the clinical specialists. It is necessary for medical students to apply anatomy knowledge during the clinical approach to minimize errors. Indirectly, it enhances the student's skills if they acknowledge the importance of applied anatomy (Swetha & Thenmozhi, 2019).

A study in Seoul National University was conducted among the medical students to learn about their perceptions regarding the importance of anatomy knowledge demonstrated the greatest importance of anatomy knowledge was to fully appreciate and understand the structure of the human body. The clinical clerkship preparation and basic medical terms acquisition are also being emphasized as one of the importance by the majority of the students. Acquiring basic medical terminologies and understanding the structure of the

human body are being implied by the students that such knowledge has helped them through their clinical studies. The other aspects such as valuing human dignity, reflecting life and death or professionalism fostering are badly not being acknowledged by the students. However, almost half of the students had the opportunity to reflect on life and death with the discursive potential that has been improved through anatomy education.

The hands-on dissection laboratory is the biggest contributor towards gaining anatomical knowledge compared with anatomy module lectures, organ-based integrated course lectures or clinical clerkship lectures. The physical examination and clinical procedures that are related to anatomical knowledge must be validated as helpful towards the clinical students for their clerkship. The students of Ulm University Faculty of medicine responded to a study and as a result, anatomy was ranked as the essence of preclinical subjects in medical courses. This concludes that anatomical knowledge is useful to prep preclinical students for their future clinical postings on conducting a correct physical examination and clinical procedures toward the patients (Cho & Hwang, 2013).

2.4 Students' Interest and Effort in Learning Anatomy

Students' interest and motivation to learn are affected by the educational environment which resulted in their attitudes, values, and insights in completing a learning task. An incomprehensive environment, for instance, poor teaching resources and an unpleasant class atmosphere will demotivate a student's internal motivation. As a result, no concentration was gained from the instruction's content hence affecting their learning negatively.

Maslow's hierarchy of needs for motivating learning stated few factors that should be considered to fulfil a good educational environment which is fulfilling the student's physical needs such as providing a safe environment during learning activities by implementing clear rules and regulations in class, growing a sense of belonging in student's self by allowing them to cooperate with similar background colleagues and boosting student's self-esteem through positive and constructive comments after the examination (Burleson & Thoron 2014). Students would be able to reach the greatest level where they become independent learners hence fuelling their motivation to succeed after these four levels of hierarchy are achieved (Hadie et al. 2013).

2.5 Anatomy Education Learning Resources

The study conducted by Benly (2014) listed several learning resources normally used in anatomy education, which are the traditional method, dissection method, and ultrasound imaging method (USS).

According to this study, the traditional method, which is incorporated during lectures, involves the use of chalk and blackboard. Although, this method is widely being replaced by powerpoint presentations which are more convenient than its predecessor.

Dissection has long been used by anatomists to educate medical students (Hasan et al. 2011). It helps by giving students a better view of the position and orientation of the organs, which aids them when performing surgeries. (Aversi-Ferreira et al. 2008; Benly 2014).

Benly (2014) explains that USS is an up and coming non-invasive method applied to assist in anatomy education in certain medical schools.

Another method not mentioned by Benly is the prosection method. Prosection method is useful in situations where there are too many students, lack of educators trained in dissection, lack of time and lack of cadavers (Tübingens et al. 2010; Hasan et al. 2011).

2.6 Quality of Histological Learning

"Histology is the study of normal tissue morphology and it is a fundamental basic science component in the medical curriculum" (Simok et al. 2019). Chimmalgi (2018) states that Conventional Microscopy (CM) has and still is the conventional technique in disseminating histology education. However, in the same study, Chimmalgi listed down a few disadvantages with the CM technique. He claims that this technique does not allow

student access apart from the allocated time, a waste of resources as slides require continuous replacement and maintenance, takes up space in laboratories, is not efficient when there is a lack of experienced educators, and the variable of slides means students do not have the same opportunities in observing quality slides. Therefore, he mentions that many medical schools are leaning towards using Virtual Microscopy (VM).

In a study comparing 2 groups, where one group attended a lecture using CM and another using VM, conducted in Universiti Sains Malaysia by Simok et al., the students using VM had significantly higher confidence in their self-ability to understand the lecture compared to the students in the CM group.

2.7 Socio-demographic Factors

2.7.1 Gender

Gender is one of the most under reviewed socio-demographic factors for teaching and learning, yet to be discussed. Hardly explained, most of the studies demonstrated an insignificant statistic upon the comparison of mean scores between the gender; male and female. For instance, in a study carried out by Mohsena et al. (2016) found that there was no significant difference of mean score between male and female students on student's perception of learnings and their teachers. Surprisingly, this study revealed a significant difference in mean score on student's academic self-perceptions, where the average scale score for males was higher than for females. Interestingly, it was further explained that females have not completely understood the learning objectives, low confidence level on passing the exams, and underprepared for their future perspective.

As in medical learning, a gender comparison study of academic achiever versus academic under-achiever conducted by Mayya & Rof (2004) revealed that male students

were less unhappy among the academic achiever's group. Additionally, male students perceived their teachers were considerably less angry in the class as compared to the female students' perspective. Otherwise, items representing the satisfaction of the course, the vibe during the seminars or tutorials, the clarity of the examples, the significance of the topics to be learned, and the pleasantness of surrounding students' accommodation were perceived significantly low by male students as compared to female students.

2.7.2 Phase of Clinical Study

In a study conducted by Latiff et al. (2019) to understand the perception of medical students on anatomy education in Cyberjaya University College of Medical Sciences, Malaysia, they concluded that students from both phases of study (clinical and preclinical) understood the significance and applicability of anatomy knowledge for their future careers as clinicians. Furthermore, a majority of students believed that anatomy education is important, hence enabling them to be capable and reliable doctors in the future. Interestingly, more than two-thirds agreed that the anatomy knowledge acquired in their preclinical phase was enough for them to bring forward into the clinical phase.

This was in contrast to a study conducted by Kemeir (2012) in the College of Medicine at King Khalid University, Saudi Arabia, where more than half of the students in their clinical phase stated that the anatomy education which they have received was unrelated to what they learned in clinical settings. 69.4% of the students also expressed their discontent with their anatomy education.

In Gorgich et al. (2017) study to gauge medical students' knowledge on anatomy education importance, there was a significant difference in what students believed were the most effective way of teaching anatomy. Students in the preclinical phase chose lectures given by educationists to be the most effective. However, students in the clinical phase chose

theory taught along with important clinical anatomy to be the most useful. Gorgich et al. also found out that, in terms of why they study anatomy, it was because preclinical students were more interested in doing well for their exams whereas clinical students wanted to refine their clinical skills.

2.8 Conceptual Framework

A comparative study of gender and phase of study for medical students in UPM was made between each of them and a mean score of all six dependent variables as summarised in **Figure 2.1**.

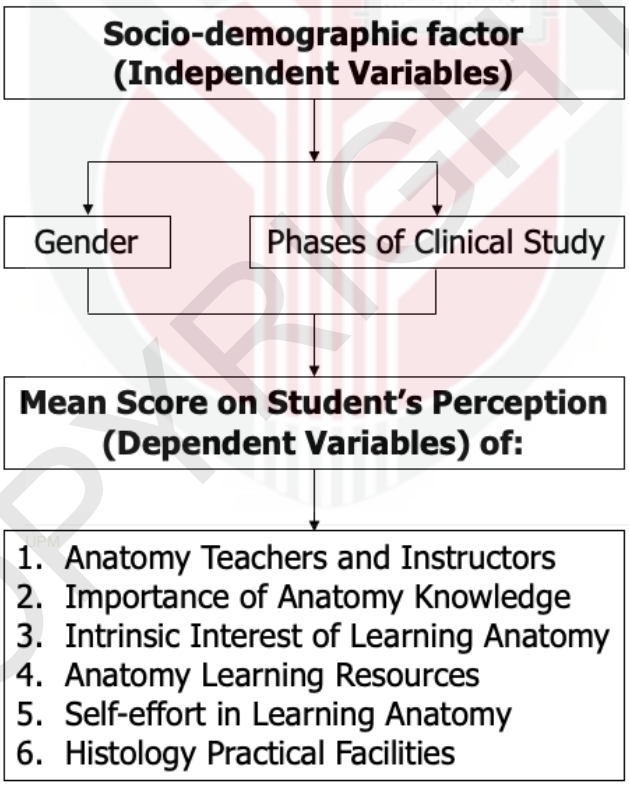

Figure 2.1. A Conceptual Framework of Socio-Demographic Factors on Students' Perception of Anatomy Education Environment in UPM

CHAPTER 3
METHODOLOGY

3.1 Study Location

The research was conducted at the Faculty of Medicine and Health Sciences (FMHS) in Universiti Putra Malaysia (UPM) Serdang, Selangor. The study was addressed at the south of Serdang Hospital and 17th College of Residence is at its west. There was a total of 511 medical students that could have been potentially involved as the study samples. The number of students according to their respective phase of study is shown in Table **3.1**.

Table 3.1: Number of UPM Medical Students in Respective Phase of Study.

Phase of study	Number of students
Preclinical	227
Clinical	284

3.2 Study Design

This was a cross-sectional study. We arranged our sampling population based on the gender and phase of study. As stated in the table above, the Medical programme in UPM Serdang is separated by preclinical and clinical phases.

3.3 Study Population

The study population included all the UPM medical students' of 2019/2020 academic curriculum from both pre-clinical and clinical phases.

3.4 Sampling Population

Stratified random sampling method was used for the sampling population method, it involved the current medical students of FMHS, UPM which includes Year 1, Year 2, Year 3, Year 4 and Year 5.

3.5 Sampling Frame

The sampling frame was a complete medical student of FMHS, UPM list name in the 2019 / 2020 session which fulfilled all the inclusion criteria. The exact number of current medical students in UPM are shown in **Table 3.2**.

Table 3.2: Number of UPM Medical Students in Respective Academic Years.

No.	Year of Study in Medical Degree	Number of students
1.	1	113
2.	2	114
3.	3	100
4.	4	100
5.	5	84

3.6 Sampling Unit

The sampling unit was medical students of FMHS, UPM that fulfilled the inclusion criteria

3.7 Sampling Method

The sampling method used in this research project was stratified random sampling that involves all medical students of FMHS, UPM from Year 1 to Year 5 academic years. Numbers of students for each year was assigned via random number generator. Hence, this ensured that each medical student of FMHS, UPM had an equal probability to be chosen.

3.8 Sampling Size

The following sample size formula (Daniel,1999) was used to calculate the minimum sample size, n needed in this study (**Table 3.3**).

$$n = \frac{z^2 p(1-p)}{d^2}$$

$$n = \frac{1.96^2 x\ 0.65\ (1-0.65)}{0.05^2}$$

= 349.5

The estimated sample size is 349.5 with 95% confidence level. We are considering an adjustment of 10% non-response rate. After adjusting the sample size:

110/100 X 349.5 = 384.5

Final sample size, n: 384 respondents

Table 3.3: Sample Size Formula's Definitions.

n	Required sample size
Z	1.96 for a 95% confidence interval
P	Expected prevalence for medical students of University College Cork which is 0.65 (Sbayeh et al. 2016)
d	0.05 precision

In total, the minimum number of 384 medical students from FMHS, UPM from the sum of Year 1 to Year 5 academic years was needed for this validated study.

3.8.1 Sampling Size Calculation

Table 3.4: Number of Samples needed for the respective year of medical students

	Phase of Clinical Study	Year of Study	Number
Number of Required Medical Students in UPM (Year 1 – Year 5)	**Preclinical phase (171 students)**	**Year 1 (113/511) X 384**	**85**
		Year 2 (114/511) X 384	**86**
	Clinical phase (213 students)	**Year 3 (100/511) X 384**	**75**
		Year 4 (100/511) X 384	**75**
		Year 5 (84/511) X 384	**63**
Total Number of Participants			**384**

3.9 Variables

3.9.1 Dependent variable

Mean score on students' perception of:

1. Anatomy teachers and instructors
2. Importance of anatomy knowledge
3. Intrinsic interest of learning anatomy
4. Anatomy learning resources
5. Self-effort on learning anatomy
6. Histology practical facilities

3.9.2 Independent variable

Socio-demographic factor (Gender and Phase of Clinical Study).

3.9.3 Operational Definitions

The operational definitions of the variables are shown in **Table 3.5.**

Table 3.5: Operational Definition.

Variables		Operational Definition
Socio-demographic factor	Gender	Gender is classified into two categories: ● Male ● Female John et al. (2014)
	Phase of Clinical Study	Phase of clinical study is classified into two categories: ● Clinical phase (students in 3rd, 4th, and 5th year of study) ● Preclinical phase (students in 1st and 2nd year of study) Latiff et al. (2019)
Educational Environment		Educational environment is the surroundings encountered by the students and educators, which plays a crucial role in productive student learning Preethi et al. (2014) Educational environment consists of: ● the atmosphere ● way-of-life or values of the institution

		Roff & McAleer (2001) It also consists of: ● educating methods ● assessment ● physical facilities ● psychological ● monetary experiences of students and other members of an institution. Arzuman et al. (2017)
Students' Perception		Students' perception is a student's personal understanding of given knowledge from their own point of view. National Research Centre (2013)

3.10 Inclusion Criteria

1) Medical students of UPM 2019/2020 academic curriculum.
2) Students aged above 18-year-old.

3.11 Exclusion Criteria

1) Illiterate in English.
2) Unable to establish a good internet connection.

3.12 Study Instrument

In this study, a questionnaire was used.

3.12.1 Adaptation of the questionnaire

The research team used the Anatomy Education Environment Measurement Inventory (AEEMI) which was developed by Hadie et al (2017) using the Delphi technique.

3.12.2 Questionnaire technique

In this study, the AEEMI questionnaire which was developed by Hadie et al. (2017) was used and it was only available in English.

The questionnaire consisted of six factors, wherein each factor has two to seven items, with a total of 25 items in total. The items are regarding students' experience with anatomy education environment in their respective medical institutions.

The six factors that were being assessed:

1) Students' perception of anatomy teachers and instructors.
2) Students' perception of the importance of anatomy knowledge.
3) Students' intrinsic interest in learning anatomy.
4) Students' perception of anatomy learning resources.
5) Students' efforts on learning anatomy.
6) Students' histology practical facilities.

The 25 items (number in bracket represent its respective factor) are:

1. Anatomy teachers are knowledgeable. **(1)**
2. Anatomy teachers are friendly. **(1)**
3. The anatomy topics prepare me for clinical years. **(2)**
4. Learning anatomy prepared me to be a good doctor. **(2)**
5. I am confident to answer anatomy questions well. **(3)**
6. Prosected/ cadaveric specimens are accessible. **(4)**
7. I utilize anatomy museum to learn anatomy. **(5)**
8. Anatomy examinations help me to identify my weaknesses. **(5)**
9. Poor quality of histology slides. **(6)**
10. Anatomy practical sessions are well organized. **(4)**
11. Relevant anatomy topics are reemphasized in clinical years. **(2)**
12. I use anatomy models/specimens to learn anatomy. **(5)**
13. Anatomy teachers are available to help students. **(1)**
14. Anatomy teachers are enthusiastic to teach. **(1)**
15. I can apply my anatomical knowledge in clinical years. **(2)**
16. Learning anatomy is fun. **(3)**
17. Anatomy teachers are good role model for learning anatomy. **(1)**
18. Quality of the microscopes for histology classes is poor. **(6)**
19. Learning facilities are well maintained. **(4)**
20. Anatomy teachers are well prepared. **(1)**

21. The anatomy topics are relevant to future profession. **(2)**
22. My anatomy knowledge helps me to understand other medical subjects. **(2)**
23. Anatomy is an interesting subject. **(3)**
24. Anatomy subject gives me feeling of becoming a doctor. **(2)**
25. Anatomy teachers are approachable. **(1)**

Participants were required to rate each item on a rating scale of 1 to 5 (1= Strongly Disagree; 2= Disagree; 3= Not Sure; 4= Agree; 5= Strongly Agree). A subsequent mean score was calculated for each factor (μ_s= sum of the score for items/ number of items in factor). According to Hadie et al. (2017), a mean score of 1 to 2.99 indicates an "Area of concern", whereas a mean score of 3.99 indicates an "Area of improvement." A mean score of 4 to 5 indicates that it is a "Positive area."

3.13 Validity and reliability

Based on the study carried out by Hadie et al. (2017), the AEEMI was concluded to be a valid tool to measure the Malaysian anatomy education environment due to its psychometric capabilities. Furthermore, the study showed that the AEEMI had a decent content evidence (scale-level content validity index [total]=0.646), an acceptable response process (scale-level face validity index [total] = 0.867) and an average to high internal consistency (Raykov's rho[a] = 0.604-0.876)

3.14 Data Collection

An online survey was distributed randomly via Google Forms to the participants after their consent has been informed as well as their participation willingness. Detailed guidance was provided if necessary. The questionnaire was automatically saved after being filled by the participants electronically.

3.15 Ethical consideration

Written informed consent established from each respondent at the beginning of the study. Permission and approval were obtained from the Ethic Committee for Research Involving Human Subjects Universiti Putra Malaysia or Jawatankuasa Etika Universiti Untuk Penyelidikan Melibatkan Manusia- JKEUPM-2020-236, Universiti Putra Malaysia.

3.16 Data Analysis

The collected data were analysed using IBM Statistical Package for Social Science (SPSS) version 25. Normality test was performed for continuous data. Median and Interquartile range was calculated for not-normally distributed data.

Mann Whitney U test (non-parametric) was used to determine the mean score differences of the 6 factors of AEEMI between gender or between phase of study at the Faculty of Medicine and Health Sciences, UPM Serdang.

CHAPTER 4
RESULT

4.1 Response rate

A total of 356 respondents had completed our questionnaire. The calculated sample size was 384 respondents, as of 8th of September 2020 thus we have only managed to achieve a response rate of 92.71%. One of the limitations we faced was that most of our target respondents; medical students from the first to the fifth year were having assessments and exams during the data collection period. As a result, some were reluctant to take the time to answer our questionnaire.

4.2 Normality test

Normality test was conducted for the mean score on students' perception of the six factors; anatomy teachers and instructors, the importance of anatomy knowledge, intrinsic interest of learning anatomy, anatomy learning resources, self-effort in learning anatomy and histology practical facilities. Kolmogorov-Smirnov test showed that the p-value was ($p<0.001$). Therefore, we rejected the null hypothesis and assumed the distribution for the mean score on students' perception of the six factors was not normally distributed (Confidence Interval 95%).

Normality test for gender and phase of clinical study was not conducted as these variables are not continuous variables.

4.3 Descriptive analysis

4.3.1 Frequency distribution of ratings given for Anatomy Education Environment Measurement Inventory (AEEMI) among medical students.

Table 4.1 shows the distribution of ratings given for each item in the Anatomy Education Environment Measurement Inventory (AEEMI). Participants were required to rate each item on a scale of 1 to 5 (1= Strongly Disagree; 2= Disagree; 3= Not Sure; 4= Agree; 5= Strongly Agree). Based on Item 1 and 2, most of the respondents (82.9% and 74.4% respectively) were strongly agreed that anatomy teachers of Universiti Putra Malaysia (UPM) are knowledgeable and friendly. More than 60% of the respondents also strongly agreed with items 3 and 4, stating that Anatomy prepared them for clinical years and to be a good doctor.

For item 5, 36.8% of respondents answered that they were not sure if they were confident to answer Anatomy questions well, whereas another 17.4% of respondents disagreed or strongly disagreed with the statement in item 5. More than half of the respondents agreed or strongly agreed that the prosected/ cadaveric specimens are accessible and that they utilize the Anatomy Museum to learn Anatomy. Many (Agree=37.9%; Strongly Agree=51.4%) respondents agreed that Anatomy examinations helped them to identify their weaknesses about anatomy knowledge. A significantly high number of students answered not sure (35.1%) for item 9.

Again, majority of the students agreed with item 10 and 11, stating that Anatomy practical sessions are well organized and those relevant anatomy topics are reemphasized in clinical years. 32% of respondents agreed and 28.4% of respondents strongly agreed that they use Anatomy models/specimens to learn Anatomy. Only 4 of the respondents disagreed or strongly disagreed that Anatomy teachers were available to help students and were enthusiastic to teach. Out of the 356 respondents, 303 of the respondents agreed or strongly

agreed that they could apply their Anatomical knowledge in clinical years. About 17% of the respondents were not sure if learning Anatomy was fun. A majority of respondents gave a positive rating to item 17 (Anatomy teachers are good role models for learning anatomy).

As for the statement in item 18, "Quality of the microscopes for histology classes is poor", 34.3% of respondents gave it a rating of 3 (Not sure). Although many respondents agreed that the learning facilities in UPM were well maintained, 12 respondents disagreed or strongly disagreed with the statement. 68% of the respondents strongly agreed that Anatomy teachers of UPM were well prepared. More than 80% of respondents agreed or strongly agreed that the Anatomy topics were relevant to future professions and that their Anatomy knowledge helped them to better understand other medical subjects.

For item 23 (Anatomy is an interesting subject), overall, the respondents gave a positive rating to this item, but 27 of the respondents gave it a negative rating. For item 24, 32.6% and 47.8% of the respondents agreed and strongly agreed, respectively, that the Anatomy subject gave them the feeling of becoming a doctor. Lastly, for item 25 (Anatomy teachers are approachable), more than 90% of the respondents agreed or strongly agreed that Anatomy teachers are approachable.

Table 4.1 Frequency distribution of ratings given for Anatomy Education Environment Measurement Inventory (AEEMI) among medical students.

Item no.	*Item*	*1(Strongly Disagree) n(%)*	*2(Disagree) n(%)*	*3(Not Sure) n(%)*	*4(Agree) n(%)*	*5(Strongly Agree) n(%)*
1	Anatomy teachers are knowledgeable	1(0.3)	0(0)	4(1.1)	56(15.7)	295(82.9)
2	Anatomy teachers are friendly	1(0.3)	0(0)	18(5.1)	72(20.2)	265(74.4)
3	The Anatomy topics prepare me for clinical year	0(0)	6(1.7)	30(8.4)	97(27.2)	223(62.6)
4	Learning Anatomy prepared me to be a good doctor	0(0)	3(0.8)	22(6.2)	92(25.8)	239(67.1)
5	I am confident to answer Anatomy questions well	14(3.9)	48(13.5)	131(36.8)	95(26.7)	68(19.1)
6	Prosected/cadaveric specimens are accessible	3(0.8)	34(9.6)	60(16.9)	125(35.1)	134(37.6)
7	I utilize Anatomy Museum to learn Anatomy	11(3.1)	51(14.3)	85(23.9)	113(31.7)	96(27.0)
8	Anatomy examinations help me to identify my weaknesses about Anatomy knowledge	3(0.8)	6(1.7)	29(8.1)	135(37.9)	183(51.4)
9	Poor quality of histology slides	31(8.7)	85(23.9)	125(35.1)	68(19.1)	47(13.2)
10	Anatomy practical sessions are well organized	3(0.8)	13(3.7)	66(18.5)	133(37.4)	141(39.6)
11	Relevant Anatomy topics are reemphasized in clinical years	0(0)	12(3.4)	83(23.3)	124(34.8)	137(38.5)
12	I use Anatomy models/specimens to learn Anatomy	12(3.4)	54(15.2)	75(21.1)	114(32.0)	101(28.4)
13	Anatomy teachers are available to help students	1(0.3)	3(0.8)	28(7.9)	110(30.9)	214(60.1)
14	Anatomy teachers are enthusiastic to teach	0(0)	4(1.1)	17(4.8)	93(26.1)	242(68.0)
15	I can apply my Anatomical knowledge in clinical years	2(0.6)	7(2.0)	44(12.4)	133(37.4)	170(47.8)
16	Learning Anatomy is fun	15(4.2)	20(5.6)	60(16.9)	108(30.3)	153(43.0)
17	Anatomy teachers are good role model for learning anatomy	1(0.3)	0(0)	30(8.4)	103(28.9)	222(62.4)
18	Quality of the microscopes for histology classes is poor	36(10.1)	68(19.1)	122(34.3)	80(22.5)	50(14.0)
19	Learning facilities are well maintained	3(0.8)	9(2.5)	65(18.3)	148(41.6)	131(36.8)
20	Anatomy teachers are well prepared	2(0.6)	1(0.3)	17(4.8)	94(26.4)	242(68)
21	The Anatomy topics are relevant to future profession	1(0.3)	4(1.1)	29(8.1)	114(32.0)	208(58.4)
22	My Anatomy knowledge helps me to understand other medical subjects	2(0.6)	7(2.0)	28(7.9)	124(34.8)	195(54.8)
23	Anatomy is an interesting subject	15(4.2)	12(3.4)	57(16.0)	102(28.7)	170(47.8)
24	Anatomy subject gives me feeling of becoming a doctor	3(0.8)	15(4.2)	52(14.6)	116(32.6)	170(47.8)
25	Anatomy teachers are approachable	0(0)	4(1.1)	17(4.8)	95(26.7)	240(67.4)

Table 4.2 Median and interquartile range of male and female respondents for Anatomy Education Environment Measurement Inventory (AEEMI).

Item no.	*Item*	*Male* Median (IQR)	*Female* Median (IQR)
1	Anatomy teachers are knowledgeable	5(0)	5(0)
2	Anatomy teachers are friendly	5(1)	5(0)
3	The Anatomy topics prepare me for clinical year	5(1)	5(1)
4	Learning Anatomy prepared me to be a good doctor	5(1)	5(1)
5	I am confident to answer Anatomy questions well	3(1)	3(1)
6	Prosected/cadaveric specimens are accessible	4(2)	4(2)
7	I utilize Anatomy Museum to learn Anatomy	4(2)	4(2)
8	Anatomy examinations help me to identify my weaknesses about Anatomy knowledge	5(1)	5(1)
9	Poor quality of histology slides	3(2)	3(2)
10	Anatomy practical sessions are well organized	4(1)	4(2)
11	Relevant Anatomy topics are reemphasized in clinical years	4(2)	4(2)
12	I use Anatomy models/specimens to learn Anatomy	4(2)	4(2)
13	Anatomy teachers are available to help students	5(1)	5(1)
14	Anatomy teachers are enthusiastic to teach	5(1)	5(1)
15	I can apply my Anatomical knowledge in clinical years	4(1)	4(1)
16	Learning Anatomy is fun	4(2)	4(1)
17	Anatomy teachers are good role model for learning anatomy	5(1)	5(1)
18	Quality of the microscopes for histology classes is poor	3(2)	3(2)
19	Learning facilities are well maintained	4(1)	4(1)
20	Anatomy teachers are well prepared	5(1)	5(1)
21	The Anatomy topics are relevant to future profession	5(1)	5(1)
22	My Anatomy knowledge helps me to understand other medical subjects	5(1)	5(1)
23	Anatomy is an interesting subject	4(2)	4(1)
24	Anatomy subject gives me feeling of becoming a doctor	4(1)	4(1)
25	Anatomy teachers are approachable	5(1)	5(1)

Table 4.2 shows the comparison of median and interquartile range between male and female respondents. For items 1, 2, 3, 4, 8, 13, 14, 17, 20, 21, 22 and 25, both male and female have the same median of 5. As for items 6, 7, 10, 11, 12, 15, 16, 19, 23 and 24, a median of 4 is seen for both male and female respondents. Both genders share the same median of 3 for items 5, 9, and 18. There is no median of 1 and 2 for any of the items. Overall, there is no difference in the median for all items for both genders.

Table 4.3 Median and interquartile range of preclinical and clinical respondents for Anatomy Education Environment Measurement Inventory (AEEMI).

Item no.	*Item*	*Preclinical* Median (IQR)	*Clinical* Median (IQR)
1	Anatomy teachers are knowledgeable	5(0)	5(0)
2	Anatomy teachers are friendly	5(1)	5(0)
3	The Anatomy topics prepare me for clinical year	5(1)	5(1)
4	Learning Anatomy prepared me to be a good doctor	5(1)	5(1)
5	I am confident to answer Anatomy questions well	3(1)	3(1)
6	Prosected/cadaveric specimens are accessible	4(2)	4(2)
7	I utilize Anatomy Museum to learn Anatomy	4(2)	4(2)
8	Anatomy examinations help me to identify my weaknesses about Anatomy knowledge	5(1)	4(1)
9	Poor quality of histology slides	3(2)	3(2)
10	Anatomy practical sessions are well organized	4(2)	4(1)
11	Relevant Anatomy topics are reemphasized in clinical years	4(2)	4(1)
12	I use Anatomy models/specimens to learn Anatomy	4(2)	4(2)
13	Anatomy teachers are available to help students	5(1)	5(1)
14	Anatomy teachers are enthusiastic to teach	5(1)	5(1)
15	I can apply my Anatomical knowledge in clinical years	5(1)	4(1)
16	Learning Anatomy is fun	4(1)	4(2)
17	Anatomy teachers are good role model for learning anatomy	5(1)	5(1)
18	Quality of the microscopes for histology classes is poor	3(2)	3(2)
19	Learning facilities are well maintained	4(1)	4(1)
20	Anatomy teachers are well prepared	5(1)	5(1)
21	The Anatomy topics are relevant to future profession	5(1)	5(1)
22	My Anatomy knowledge helps me to understand other medical subjects	5(1)	5(1)
23	Anatomy is an interesting subject	5(1)	4(2)
24	Anatomy subject gives me feeling of becoming a doctor	5(1)	4(2)
25	Anatomy teachers are approachable	5(1)	5(1)

In table 4.3, we can see that for items 1, 2, 3, 4, 13, 14, 17, 20, 21, 22, and 25, both preclinical and clinical students have a median of 5. Items 6, 7, 10,11, 12, 16, and 19, have a median of 4 for respondents in both phases of clinical study. Only items 5, 9 and 18 have a median score of 3 for both preclinical and clinical students. However, compared to gender, we can see that some items have a different median score for both phases. Items 8 and 15 have a higher median score of 5 for preclinical students compare to clinical students (median of 4). This is also the same for the items “Anatomy is an interesting subject” and “Anatomy subject gives me feeling of becoming a doctor” (items 23 and 24).

4.3.2 Frequency of mean score on students' perception of the six factors

Table 4.4 shows the frequency of mean score on students' perception of the six factors. The mean scores were grouped into three indications. A mean score of 1 to 2.99 indicates an "Area of concern", whereas a mean score of 3.99 indicates an "Area of improvement." A mean score of 4 to 5 indicates that it is a "Positive area."

For Factor 1, the mean score showed that for 90.7% of the respondents, this was a positive area. As for Factor 2, 79.2% of respondents' mean scores showed that this was a positive area as well. Mean scores of 50 respondents showed that students' intrinsic interest in learning anatomy (Factor 3) was an area of concern.

Students' perception of anatomy learning resources (Factor 4) was an area of improvement for 29.2% of the respondents. 10.1% and 32.3% of mean scores from the respondents showed an area of concern and area of improvement, respectively, for Factor 5. Lastly for Factor 6, only 25.8% of the respondents' mean scores showed that it was a positive area.

Table 4.4 Frequency of mean score on students' perception of the six factors (N=356)

Factor no.	Factor	Area of concern (μ_s= 1 to 2.99) n(%)	Area of improvement (μ_s= 3 to 3.99) n(%)	Positive area (μ_s= 4 to 5) n(%)
1	Students' perception of anatomy teachers and instructors	3(0.8)	30(8.4)	323(90.7)
2	Students' perception of the importance of anatomy knowledge	6(1.7)	68(19.1)	282(79.2)
3	Students' intrinsic interest in learning anatomy	50(14.0)	103(28.9)	203(57.0)
4	Students' perception of anatomy learning resources	19(5.3)	104(29.2)	233(65.4)
5	Students' efforts on learning anatomy	36(10.1)	115(32.3)	205(57.6)
6	Students' histology practical facilities.	123(34.6)	141(39.6)	92(25.8)

4.3.3 Socio-demographic characteristics of Respondents

Table 4.5 shows the socio-demographic characteristics of the 356 respondents who participated in this study. Out of the 356 respondents, 117 (32.9%) were male and 239 (67.1%) were female.

As for the phase of clinical study, 49.7% (n=177) of our respondents were in their preclinical phase. Whereas 50.3% (n=179) of our respondents were in their clinical phase.

Table 4.5 Socio-demographic characteristics of Respondents (N=356)

Characteristic	Frequency (n)	Percentage (%)
Gender		
Male	117	32.9
Female	239	67.1
Phase of Clinical Study		
Preclinical phase	177	49.7
Clinical phase	179	50.3

4.4 Comparison between gender and medical students' perception on each of six factors

Mann-Whitney U test was used to analyse between gender and medical student's perception of anatomy education environment in FMHS, UPM.

From **Table 4.6**, there is no significant difference between gender and student's perception of anatomy teachers and instructors (P>0.05). P value is higher than 0.05 thus indicates that the null hypothesis is accepted. There is no gender difference comparison on student's perception of anatomy teachers and instructors.

Next, there is no significant difference between gender and student's perception of anatomy knowledge (P>0.05). This suggests that both genders are aware that anatomy knowledge is important to strive better in the medical field. There is also no significant difference in comparison between both gender and student's intrinsic interest (P>0.05) in

learning anatomy. This indicates that gender did not determine one's interest in a subject specifically in medicine.

Similarly, there is no significant difference between gender and student's perception of anatomy learning resources (P>0.05). Both male and female students utilize and make full use of anatomy learning resources that are provided in the faculty. There is also no significant difference between gender and student's effort on learning anatomy (P>0.05) as every medical student needs to put a tremendous amount of effort into learning anatomy to prepare them for safe clerkship practice during a physical examination and clinical procedures.

There is also no significant difference in comparison between gender and student's histological practice facilities (P>0.05) as all students are given equal opportunities and allocated time to observe histology slides.

Table 4.6 Comparison between gender and medical students on each of six factors (N=356)

Factors	Gender	Mean rank	Median (IQR)	Z	P value
Student's perception of anatomy teachers and instructors	Male Female	173.25 181.07	4.9(0.6) 4.9(0.7)	[a] -0.702	0.483
Student's perception of the importance of anatomy knowledge	Male Female	168.25 183.39	4.4(1.0) 4.6(0.9)	[a] -1.290	0.197
Student's intrinsic interest in learning anatomy	Male Female	165.66 184.79	4.0(1.3) 4.0(1.3)	[a] -1.660	0 .097
Student's perception of anatomy learning resources	Male Female	180.73 177.41	4.0(1.0) 4.0(1.0)	[a] -0.289	0.772
Student's effort on learning anatomy	Male Female	174.35 180.53	4.0(1.33) 4.0(1.33)	[a] -0.538	0.591 .
Student's histological practical facilities	Male Female	175.12 180.16	3.0(2.0) 3.0(1.5)	[a] -0.439	0.660

Note : [a]: Mann-Whitney U Test

4.5 Comparison between phase of clinical study and medical students' perception of the six factors.

To compare the phase of clinical study and medical students' perception of the six factors, we carried out the Mann Whitney U test. **Table 4.7** shows the results of the test.

From the table, we can see that the p-value (P>0.05) shows that there is no significant difference between preclinical and clinical students on their perception of anatomy teachers and instructors. The students' views of their educators are not affected by their phase of clinical study.

Both students from the preclinical and clinical phase have the same perception of the importance of anatomy knowledge. There is no significant difference between the two as (P>0.05).

There is also no significant difference between preclinical and clinical students in their intrinsic interest in learning anatomy (P>0.05). Students in both phases of clinical study in UPM have a similar intrinsic interest to learn anatomy.

The p-value for comparison between phase of clinical study and students' perception of anatomy learning resources showed that there is no significant difference between the two phases. This shows that how the students view their study materials are not affected by their phase of clinical study.

There is no significant difference between preclinical and clinical students' effort on learning anatomy since (P>0.05). This shows that students from both phases of clinical study put in the same amount of effort to study anatomy.

As for students' perception of histological practical facilities, there is also no significant difference between the two phases. The phase does not affect their perception of the facilities in UPM.

Table 4.7 Comparison between phase of clinical study and medical students' perception of the six factors (N=356)

Factors	Phase of Clinical Study	Mean rank	Median (IQR)	Z	P value
Student's perception of anatomy teachers and instructors	Preclinical Clinical	178.11 178.89	4.9(0.6) 4.9(0.7)	[a] -0.075	0.940
Student's perception of the importance of anatomy knowledge	Preclinical Clinical	186.23 170.86	4.6(1.0) 4.4(0.9)	[a] -1.419	0.156
Student's intrinsic interest in learning anatomy	Preclinical Clinical	186.36 170.72	4.0(1.3) 4.0(1.3)	[a] -1.445	0.148
Student's perception of anatomy learning resources	Preclinical Clinical	173.46 183.48	4.0(1.0) 4.0(1.0)	[a] -0.930	0.352
Student's effort on learning anatomy	Preclinical Clinical	170.50 186.41	4.0(1.33) 4.0(1.33)	[a] -1.472	0.141
Student's histological practical facilities	Preclinical Clinical	175.04 181.92	3.0(2.0) 3.0(1.5)	[a] -0.638	0.523

Note : [a]: Mann-Whitney U Test

CHAPTER 5
DISCUSSION

5.1 Distribution of socio-demographic factors of the respondents

5.1.1 Gender

Majority of the respondents were female who accounts for 67.1% (n=239), whereas male was 32.9% (n=117). Females have a higher number of respondents, corresponding with higher female student intake for each batch of medical course in Universiti Putra Malaysia (UPM).

5.1.2 Phase of Clinical Study

Students from the clinical phase who participated as respondents accounts for 50.3% (n=179), while respondents from preclinical phase students account for 49.7% (n=177). Expectedly, the respondents from clinical phase students were higher than preclinical phase students, most probably due to clinical phase students comprise of three batches rather than only two batches for preclinical phase students.

5.2 Comparison between Gender with Anatomy Education Environment in UPM

5.2.1 Gender and Anatomy Teachers and Instructor

P value is higher than 0.05, which means there is no significant difference between gender and student's perception of anatomy teachers and instructors (P>0.05), this indicates that the null hypothesis is accepted. Overall, there is no gender difference in the student's perception of anatomy teachers and instructors. Interestingly, in a gender comparison study of academic achiever versus academic under-achiever conducted by Mayya & Rof (2004), male students perceived their teachers were considerably less angry in the class as compared to the female students' perspective. Here we can appreciate there might

be a bit of difference in male perception towards anatomy teachers, but it is not significant in our study.

5.2.2 Gender and Importance of Anatomy Knowledge

There is no significant difference between gender with a student's perception on anatomy knowledge (P>0.05). This suggests that both genders are aware that anatomy knowledge is important to strive better in the medical field. Cho, M. J., & Hwang, Y. I. (2013), in their study in Seoul National University on students' perceptions of anatomy with respect to time and hands-on cadaver dissection, found that their perceptions regarding the importance of anatomy knowledge demonstrated the greatest importance of anatomy knowledge was to fully appreciate and understand the structure of the human body. Their survey through a questionnaire showed that the students of both genders satisfactorily acquired basic medical terminology (80.0%) and an understanding of the human body structure (79.3%).

5.2.3 Gender and Intrinsic Interest in Learning Anatomy

There is also no significant difference between both genders with the student's intrinsic interest (P>0.05) in learning anatomy. This indicates that gender did not determine one's interest in a subject, specifically in medicine. Furthermore, there was a difference of interquartile range for item "Learning Anatomy is fun" and item "Anatomy is an interesting subject" where both were higher for male (IQR=2) than for a female (IQR=1). This may indicate that male respondents have a higher intrinsic interest in learning anatomy than females. Throughout the research result, we could not compare any difference between intrinsic interest in female and male so we can assume it is an individual-dependent factor and unrelated to gender.

5.2.4 Gender and Anatomy Learning Resources

There is no significant difference between gender with a student's perception of anatomy learning resources (P>0.05). Both male and female students are utilizing and making full use of anatomy learning resources which are provided in the faculty as they provide a variety of anatomy teaching methods such as cadaver-based teaching in anatomy dissection hall, model-oriented at the anatomy museum, simulation software and also lecture session through slideshow presentation in the lecture hall. In contrast, a study on satisfaction of the preclinical students regarding current anatomy curriculum and anatomy teachers of Kust Institute of Medical Sciences (KIMS) showed that facilities provided to students for class presentation and assignments were declared not sufficient by 23.79% of the students by running an assessment of internal evaluation system by students itself. Hence, although the method used to show the satisfactory level of students on anatomy learning resources is different, both genders show the same feedback whether the anatomy learning resources are fulfilling their satisfactory level or not.

5.2.5 Gender and Students' Effort on Learning Anatomy

In this study, there is no significant difference between gender and students' effort on learning anatomy. It shows that both male and female put an equivalent amount of effort in learning anatomy, to thrive far in the medical field. We believe that every medical student acknowledges anatomy as a difficult subject, which needs an immense effort for deep understanding and strong memorization. Clerkship requires medical students to master anatomy well to provide safe practice during the physical examination and clinical procedures. Gender wise comparison showed no significant difference in overall mean scores between male and female on perceptions of learnings and teachings. (Mohsena et al,2016).

This explains there is no correlation existed between gender and the effort's possessed within one's self to acquire continuous knowledge in anatomy study.

5.2.6 Gender and Students' Histological Practical Facilities

There was no significant difference between gender and student's perception in terms of histological practical facilities found ($p>0.05$). However, according to a research by Sinclaire (2013), female students rate a higher percentage on learning via technology compared to ratings by male students that contribute to student satisfaction. Our study did not show any significant difference as this could be due to both male and female students facing the same classroom experience and facilities. The flaws in histological practical facilities were pointed out from our research's result as it has the highest mean scores frequency for areas of improvement. Low-quality histology slides and poor connectivity between teacher's microscope and main monitor probably affected medical student's perception towards anatomy education environment.

5.3 Comparison between Phase of Clinical Study with Anatomy Education Environment in UPM

5.3.1 Phase of Clinical Study and Anatomy Teachers and Instructor

Our study shows that there is no significant difference between the phase of clinical study with the student's perception of anatomy teachers and instructors. Based on a previous study conducted by Latiff A.A, et.al (2019) many of the preclinical students feel that inappropriate teaching methods may lead to the proper performance in anatomy. However, this contradicts with our study which proves the student's perception of their educators is not determined by their phase of study. This is because anatomists in FMHS, UPM is well prepared due to their long teaching hours which polishes their expertise and gives them much

experience in the anatomy field. The most preferred anatomy teaching methods; cadaveric dissection is very well applied by the anatomists to the medical students as they are well trained and undergo plenty of practical hours before. The anatomists are also approachable and friendly hence students from preclinical and clinical are free to meet them to seek knowledge or ask questions which are related to the anatomy subject.

5.3.2 Phase of Clinical Study and Importance of Anatomy Knowledge

Besides that, there is no significant difference between the phase of clinical study with a medical student's perception of the importance of anatomy knowledge. All medical students ranging from Year 1 to Year 5 realise that anatomy is the cornerstone subject in medicine, and it provides a width of knowledge that is essential for various medical careers. However, a research conducted by Nabil et.al, (2014) concludes that senior medical students are more appreciative towards the importance and relevance of anatomy knowledge. This finding is opposite to ours as preclinical and clinical students in our faculty are always taught that knowledge of anatomy is important to be a good physician. Although there is not much exposure of clerkship given towards preclinical students, the concept of it is applied in Early Clinical Experience (ECE) where physical examinations relevant to clinical practice are being conducted. This gives early insights to the students and helps to develop their clinical skills later. This perception remained persistent with the student's participation in Problem Based Learning (PBL) in which the basic anatomy curriculum is being covered according to the systems.

5.3.3 Phase of Clinical Study and Intrinsic Interest in Learning Anatomy

There is no significant difference between the phase of clinical study and students' intrinsic interest in learning anatomy. A study conducted by Zakaria et al. (2018) in UPM concluded that deep approach was the preferred learning method in medical students at our faculty. This approach of learning, where students learn to understand the subject matter, may result in students becoming effective learners. We believe when students have a better and clear understanding of what they learn, it helps to boost a student's self-esteem and grow their interest to learn anatomy. This will drive the internal motivation to learn anatomy despite the vast amount of factual knowledge that needs to be memorised.

5.3.4 Phase of Clinical Study and Anatomy Learning Resources

There is no significant difference between preclinical and clinical students on their perception of anatomy learning resources (P=0.352). As there were not many prior studies that used the AEEMI, we tried looking into studies that used the Dundee Ready Education Environment Measure (DREEM) inventory. Although, this did not focus much on the Anatomy education environment, but rather the overall educational environment in the institution.

A study conducted by Abraham et. al (2008) using the DREEM inventory showed that the mean score between first-year students and students in their clinical phase for the domain Students' Perception of Atmosphere (SPA) was not significantly different either. A probable explanation for this would be that there was no difference in the type of anatomy learning resources used by students from both phases.

5.3.5 Phase of Clinical Study and Students' Effort on Learning Anatomy

As from Table 4.5, again, we can see that there is no significant difference between students in both phases of clinical study with their effort on learning anatomy (P=0.141). Students from both phases put in the same amount of effort to study anatomy. Abraham et. al's study (2008) also showed no significant difference in their mean score for the domain Students' Perception of Learning (SPL). However, if based on individual items, Abraham et. al's study found that for several items in the SPL domain, the mean score was significantly lower in clinical students. One of the items was item 21 (The teaching helps to develop my confidence).

Interestingly, in our own study, a similar item (Item 8: Anatomy examinations help me to identify my weaknesses about Anatomy knowledge) scored a lower median among clinical students (4), compared to preclinical students (5). The clinical students did not find that the examinations and teachings helped them to develop confidence in their self-knowledge as well as clinical students did. Perhaps it's because preclinical students still have the anatomy knowledge fresh in their minds since they are much more focused on theory compared to clinical students. To improve on this score, it may help to have Anatomy refresher classes specifically for students in the clinical phase.

5.3.6 Phase of Clinical Study and Students' Histological Practical Facilities

There is no significant difference between preclinical and clinical students on their opinion of the histology practical facilities in UPM. (P=0.523). However, the median for this domain indicated that it is an "Area of improvement" for students of both phases of clinical study. Biswas et. al (2017) conducted a study regarding students' perception of existing histology teaching methods. In this study, they found that 5.15% of the students reported not being able to achieve better scores due to poor slide quality. In our study, majority of the

students answered “Not sure” for this item 8; Poor quality of histology slides. Due to the pandemic, only online classes were being allowed to be conducted. Therefore, the unsure reason is probably due to the lack of actual practical lessons.

CHAPTER 6

6.1 Conclusion

In conclusion, this study found that there is no difference between UPM's medical students' perception of their anatomy education environment with the gender and phase of clinical study. Overall, according to the AEEMI, the anatomy education environment in UPM is in the 'Positive Area,' especially towards anatomy teachers and instructors, regardless of gender or phase of clinical study.

The histology practical facilities in UPM need to be improved as it is the only domain that the scores fall in the 'Area of improvement'. Maintenance of histology slides and microscopes could help improve the scores.

Although not statistically significant, we found that female students showed a better perception of the importance of Anatomy knowledge compared to male students. This might be because females, in general, are more detail-oriented and have a higher appreciation for intricate features compared to their male counterparts.

6.2 Strength

We managed to achieve a good response rate of 92.71% within a short period of data collection (1 week).

6.3 Limitation

Over the course of completing this study, we faced several limitations. Firstly, as this study was conducted during the COVID-19 pandemic, we had to limit face-to-face contact. Thus, our questionnaire had to be conducted online. As our data collection period was during exam season for most of the medical students in UPM, many were reluctant to answer our

questionnaire for fear of wasting time. It might also be because most did not use their phone as frequently during exams, and missed our message asking them to answer our questionnaire.

Besides that, many students were at home during this period, and they might have been impassive to answer our questionnaire, or maybe they did not have a good internet connection to access it.

6.4 Recommendation

To further expand on this study, we would like to recommend follow-up research to compare the perception of medical students in their first and second year. The reasoning is because the students in the first year have undergone a syllabus change and their curriculum is different compared to their seniors'. Therefore, we believe that there may be interesting findings that can be obtained.

An alternative to improving histology practical facilities in UPM would be to combine virtual microscopy (VM) learning with the traditional conventional microscopy (CM) learning. This is because studies have found that VM is seen to be more effective as compared to CM during histology teaching and learning (Mione at. al, 2013). Therefore, interventional studies can be conducted to gauge if VM is an effective method to be used in FMHS, UPM.

Another recommendation is to conduct a study comparing the Anatomy education environment between universities in Malaysia. Since the medical course in UPM is still considered quite 'young' compared to universities such as Universiti Malaya (UM), Universiti Kebangsaan Malaysia (UKM), and Universiti Sains Malaysia (USM), it would be great if we could use this opportunity to exchange knowledge and experiences to further improve our Anatomy programme.

REFERENCES

Abraham, R., Ramnarayan, K., Vinod, P., Torke, S. (2008). Students' perceptions of learning environment in an Indian medical school. *BMC Medical Education 2008, 8*(20).

Adanır, S.S., Bahşi, I., Orhan, M., Kervancioglu, P. & Cihan, O.F. (2019). A quantitative evaluation of the academicians in anatomy departments of medical schools in Turkey. International Journal of Experimental & Clinical Anatomy, 13(3), 193-199.

Arzuman H., Hasan Maziz M.N., Elsersis M.M., Islam M.N., Sareemini, Daniel, M. & Khan S.A. (2017). Preclinical medical students' perception about their educational environment based on DREEM at a Private University, Malaysia. Bangladesh Journal of Medical Science, 16(4), 496-504.

Benly, P. (2014). Teaching Methodologies on Anatomy- A Review. *Journal of Pharmaceutical Sciences and Research, 6*(6), 242-243.

Biswas, S., Sharma, S., Chakraborty, S. (2017). Students' Perception of Present Teaching Method of Histology-A Study from Eastern Part of India. *Natl J Integr Res Med 2017, 8*(5):61-66

Chan, A. Y. C. C., Cate, O. ten, Custers, E. J. F. M., van Leeuwen, M. S., & Bleys, R. L. A. W. (2019). Approaches of Anatomy Teaching for Seriously Resource-Deprived Countries: A Literature Review. *Education for Health, 32*(2). doi: 10.4103/efh. EfH_272_17

Chimmalgi, M. (2018). Off-line virtual microscopy in teaching histology to the undergraduate medical students: do the benefits correlate with the learning style preferences? *Journal of the Anatomical Society of India, 67*(2018), 186-192.

Cho, M. J., & Hwang, Y. I. (2013). Students' perception of anatomy education at a Korean medical college with respect to time and contents. *Anatomy & cell biology*, *46*(2), 157–162. https://doi.org/10.5115/acb.2013.46.2.157.

Daniel, W.W. (1999). *Biostatistics: A Foundation for Analysis in the Health Sciences* (7th ed.). New York: John Wiley and Sons.

Gorgich, E.A.C., Sarbishegi, M., Barfrosha, S. & Abedi, A. (2017). Medical Students Knowledge About Clinical Importance and Effective Teaching Methods of Anatomy. *Shiraz E-Medical Journal, 18*(12).

Gövsa, F., Karakaş,A.B., Chatzioglou, G.N. & Pınar, Y. (2020). Cause of Non-Attendance in Anatomy Classes of Health Science Students. *Nobel Medicus, 16*(1), 21-30.

Hadie, S.N.H., Hassan, A., Ismail, Z.I.M., Asari, M.A., Khan, A.A., Kasim, F., Yusof, N.A.M., Manan@Sulong, H.A.N., Tg Muda, Tg F.M., Arifin, W.N. & Yusoff, M.S.B. (2017). Anatomy education environment measurement inventory: A valid tool to measure the anatomy learning environment. *Anatomical Sciences Education, 10*(5), 423-432. doi:10.1002/ase.1683

Hadie, S.N.H., Hassan, A., Ismail, Z.I.M., Asari, M.A., Khan, A.A., Kasim, F., Yusof, N.A.M., Manan@Sulong, H.A.N., Tg Muda, Tg F.M., Arifin, W.N. & Yusoff, M.S.B. (2013). The Need to Have a Valid and Reliable Tool to Measure the Anatomy Education Environment. *Education in Medical Journal, 5*(3), e81–e85. doi: 10.5959/eimj. v5i3.148

Hasan, T., Ageely, H. & Bani, I. (2011). Effective anatomy education - A review of medical literature. *Rawal Medical Journal, 36*(3), 225-229.

John, L.J., Ahmed, S., Anjum, F., Kebab, M., Mohammed, N., Darwich, H., Ibraheem, N., Arifulla, M. & Sreedharan, J. (2014). Prevalence of Allergies Among University Students: A study from Ajman United Arab Emirates. *Hindawi Publishing Corporation*, ISRN Allergy, Volume 2014.

Kemeir, M.A. (2012). Attitudes and views of medical students toward anatomy learnt in the preclinical phase at King Khalid University. *Journal of Family and Community Medicine, 19*(3), 190-193.

Latiff, A.A., Kamarzaman, S., Manan, A.A., Rampal, K.G. & Muniandy, B.K. (2019). Students' perception on anatomy education in Cyberjaya University College of Medical Sciences, Malaysia. *Journal of The Anatomical Society of India, 68*(2), 163-173.

Mayya, S.S., & Roff, S. (2004). Students' Perceptions of Educational Environment: A Comparison of Academic Achievers and Under-Achievers at Kasturba Medical College, India. *Education for Health, 17*(3), 280–291. doi: 10.1080/13576280400002445.

Mione, S., Valcke, M., Cornelissen. (2013). Evaluation of Virtual Microscopy in Medical Histology Teaching. *Anatomical Sciences Education,* 6:3017-315

Mohsena, M., Debsarma, S., & Haque, M. (2016). Determining the Quality of Educational Climate in a Private Medical College in Bangladesh via the 'Dundee Ready Education Environment Measure' Instrument. *Journal of Young Pharmacists, 8*(3), 266–274. doi: 10.5530/jyp.2016.3.17.

Nabil, N., Almously, N., Alwathnani, S., Abduldaiem, A., & Alissa, H. (2014). Medical students perception on anatomy knowledge relevance and retention during clerkship. *Journal of Contemporary Medical Education, 2*(3), 147. doi:10.5455/jcme.20140928035119

National Research Centre. (2013). Student Perceptions of School. Retrieved from: https://nrcgt.uconn.edu/wp-content/uploads/sites/953/2015/07/sp_printversion.pdf

Paracha S.A., Khan A.S., Shah Z. & Wahab K. (2011). Satisfaction of the pre-clinical students regarding current anatomy curriculum and anatomy teachers of KUST Institute of Medical Sciences (KIMS), Kohat. *KUST Med J, 3*(2), 45-51.

Preethi, G.P., Vishma, M., Srikanth, Atreya, M.S. & Jnaneshwara, P.S. (2014). Medical Students' Perception of Their Educational Environment. *Journal of Clinical and Diagnostic Research, 8*(1), 103-107.

Prince, K.J.A.H., Scherpbie,r A.J.A.A., Mameren, H.V., Drukker, J. & Vleuten, C.P.M.V.D. (2005). Do students have sufficient knowledge of clinical anatomy? *Medical Education*, *39*(3), 326-332.

Roff, S. & McAleer, S. (2001). What is educational climate? *Medical Teacher, 23*(4), 333-334 Simok, A.A., Hadie@Haji, S.N.H., Abdul Manan@Sulong, H., Yusoff, M.S.B., Mohd Noor, N.F., Asari, M.A. & Kasim, F. (2019). The impact of virtual microscopy on medical students' intrinsic motivation. *Education in Medicine Journal*, *11*(4), 47–59. Retreived from: tps://doi.org/10.21315/eimj2019.11.4.5

Sinclaire, Jollean K. (2013). An empirical investigation of student satisfaction with college courses. *Research in Higher Education Journal. Vol 22*.

Swetha, S., Thenmozi, M.S. (2019) A survey on evaluation of students' perception in anatomy teaching methodologies. *Drug Invention Today*, *13*(1), 63-69.

Turney, B.W. (2007). Anatomy in a modern medical curriculum. *Annals of The Royal College of* Surgeons *of England*, *89*(2), 104-107.

William C. Shiel Jr., (2018) Medical Definition of Anatomy. *Medicine Net.*

ETHICS COMMITTEE FOR RESEARCH INVOLVING HUMAN SUBJECTS
(JKEUPM)
UNIVERSITI PUTRA MALAYSIA

Research title	:	**Medical Students' Perception on Anatomy Education Environment in UPM – A Comparative Study of Gender and Phase of Clinical Study.**
Study Site	:	**Faculty of Medicine and Health Sciences, Universiti Putra Malaysia**
JKEUPM Ref No.	:	**JKEUPM-2020-236**
Researcher	:	**Shyeanne Gunn Shian Yen, Siti Aisyah Mohd Jalani, Muhammad Aliff Aiman Rushlan.**
Supervisor	:	**Dr. Razif Abas @ Buang**

Documents received and reviewed with reference to the above study:

1. Ethics Application Form, Version 1 dated 30/6/2020
2. Respondent Information Sheet & Consent (English), Version 1 dated 30/6/2020
3. Proposal (English), Version 2 dated 11/8/2020
4. Questionnaires/ Interviews (English), Version 1 dated 30/6/2020
5. Curriculum Vitae of:
    a. Dr. Razif Abas @ Buang
    b. Assoc. Prof. Dr. Halimatus Sakdiah Minhat

The University Research Ethics Committee, Universiti Putra Malaysia (JKEUPM) operates in accordance to the ICH-GCP Guidelines.

Decision by JKEUPM:

[X] Approved

[X] **Permission MUST BE OBTAINED from the respective hospitals/ institutions before conducting the research**

[ ] Disapproved

Please note that the approval is **VALID UNTIL 17 AUGUST 2021**

Researchers should comply with the following:

I. Complete a Study Final Report upon study completion (Form 3.2).

II. Ethical approval is required in the case of amendments/ changes to the study documents/ study sites/ study team.

III. Applicable for Clinical Trial Studies and Clinical interventional Studies only: Progress Report has to be submitted to JKEUPM at every 6 months from the date of approval (Form 3.1). Report

occurrences of all Serious Adverse Events (SAEs), Suspected Unexpected Serious Adverse Reaction (SUSARs) and Protocol Deviation/ Violation at all JKEUPM approved sites to JKEUPM. SAEs are to be reported within 15 calendar days from awareness of event by investigator. Initial report of SUSARs are to be reported as soon as possible but not later than 7 calendar days from awareness of event by investigator, followed by a complete report within 8 additional calendar days.

The required forms can be obtained from the Ethics Committee for Research Involving Human Subjects (JKEUPM) website (http://www.tncpi.upm.edu.my/faildokumen).

Date of Approval: 17 August 2020

Members of the JKEUPM who reviewed the documents:

i. Primary Reviewer: Assoc. Prof. Dr. Rosliza Abdul Manaf
ii. Informed Consent Reviewer: Dr. Haslinda Hashim

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PROF. DR. ZAMBERI SEKAWI
Chair
Ethics Committee for Research involving Human Subjects
Universiti Putra Malaysia

JKEUPM is recognised by The Strategic Initiative for Developing Capacity in Ethical Review (SIDCER) in collaboration with the Forum for Ethical Review Committees in Asia and the Western Pacific Region (FERCAP) for its compliance with the Declaration of Helsinki, International Conference on Harmonization (ICH) Guidelines, Good Clinical Practice (GCP) Standards, Council for International Organizations of Medical Sciences (CIOMS) Guidelines, World Health Organization (WHO) Standards and Operational Guidance for Ethics Review of Health-Related Research and Surveying and Evaluating Ethical Review Practices, EC/IRB Standard Operating Procedures (SOPs), and Local Regulations and Standards in Ethical Review.

RESPONDENT'S INFORMATION SHEET AND INFORMED CONSENT FORM

Please read the following information carefully and do not hesitate to discuss any questions you may have with the researcher.

1. STUDY TITLE :

Medical Students' Perception on Anatomy Education Environment in Universiti Putra Malaysia, Serdang - A Comparative Study of Gender and Phase of Clinical Study

2. INTRODUCTION:

This study is an undergraduate research project that will be conducted to all academic years of medical students in UPM Serdang. A sample of 384 respondents will be studied on their perception of the Anatomy education environment in this institution.

This booklet is made to provide a greater understanding of the study to the participants. Please take your time to read this as it is very important to understand the study before giving consent upon participation. If there are any questions regarding this study, please contact any of the researchers as stated in (8). Please sign the Consent Form on the last page once you have read the information sheet and agreed to participate in this study.

Your participation in this study is based on volunteerism. Should you choose not to answer any irrelevant questions or need to withdraw from this study at any given time, you are free to do so.

3. WHAT WILL YOU HAVE TO DO?

You are required to fill in a questionnaire which consists of 2 sections: Section A (Participant Information) and Section B (Anatomy Education Environment Measurement Inventory) if you decide and give your consent to take part in this study. The researchers would like to express their gratitude for your time and effort in answering this questionnaire sincerely.

4. WHO SHOULD NOT PARTICIPATE IN THE STUDY?

Anyone who is not a medical student of Universiti Putra Malaysia cannot participate in this study.

5. WHAT WILL BE THE BENEFITS OF THE STUDY:

(a) TO YOU AS THE SUBJECT?

The researchers hope to gain a better understanding of the medical students' perception of Anatomy education in UPM. From there, they hope to forward this understanding to the Department of Human Anatomy, Faculty of Medicine and Health Sciences, UPM, so that any necessary improvements can be made to the existing Anatomy education curriculum.

(b) TO THE INVESTIGATOR?

The information collected from this research will enable the researchers to gain a better insight into UPM medical students' perception of anatomy education. They will also be able to understand the relationship between medical students' perception and socio-demographic factors such as age and phase of study.

6. WHAT ARE THE POSSIBLE RISKS?

The participants will not face any risks throughout the research. All information relating to the participants will not be revealed to any other parties.

7. WILL THE INFORMATION THAT YOU PROVIDE AND YOUR IDENTITY REMAIN CONFIDENTIAL?

Yes. All information relating to the participants will not be revealed to any other parties. The results of the data obtained will be reported in a aggregated/collective manner thus specific individual information will be not be disclosed.

8. WHO SHOULD YOU CONTACT IF YOU HAVE ADDITIONAL QUESTIONS DURING THE COURSE OF THE RESEARCH?

Dr. Razif Abas @ Buang (Main Supervisor)
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*Please initial here if you have read and understood the contents of this page*_____

9. CONSENT

I …… Identity Card No. …… address…… ……... ……..hereby voluntarily agree to take part in the research stated above *(clinical /drug trial/video recording/ focus group/interview-based/ questionnaire-based).

I have been informed about the nature of the research in terms of methodology, possible adverse
effects and complications (as written in the Respondent's Information Sheet). I understand that I have the right to withdraw from this research at any time without giving any reason whatsoever. I also understand that this study is confidential and all information provided with regard to my identity will remain private and confidential.

I* wish / do not wish to know the results related to my participation in the research

I agree/do not agree that the images/photos/video recordings/voice recordings related to me be used in any form of publication or presentation (if applicable)

* delete where necessary

Signature ……..…… (Respondent)

Date :……..…..

Signature ……..…….
(Witness)

Name :……..…..

I/C No. :……..….

I confirm that I have explained to the respondent the nature and purpose of the above-mentioned research.

Date ……..……

Signature ……..…….
(Researcher)

Medical Students' Perception of Anatomy Education in

Universiti Putra Malaysia, Serdang-

A Comparative Study of Gender and Phase of Clinical Study

Section A: Participants Information

Instructions: Please put a tick (√) in the box of the answer of your choice

Gender:

□ Male □ Female

Year of Study:

□ First Year

□ Second Year

□ Third Year

□ Fourth Year

□ Fifth Year

Section B: Anatomy Education Environment Measurement Inventory (AEEMI)

Instructions:

This inventory assesses the anatomy education environment in your institution. Your judgments should reflect on sessions related to anatomy teaching and learning. All information obtained is for the purpose of analysis and improvement of teaching and learning in anatomy. Please try to be both thoughtful and candid in your responses so as to maximize the value of the feedback. Try to rate each statement honestly and what is really happening. Please tick (√) your response on the column based on the following rating scale:

1 = STRONGLY DISAGREE

2 = DISAGREE

3 = NOT SURE

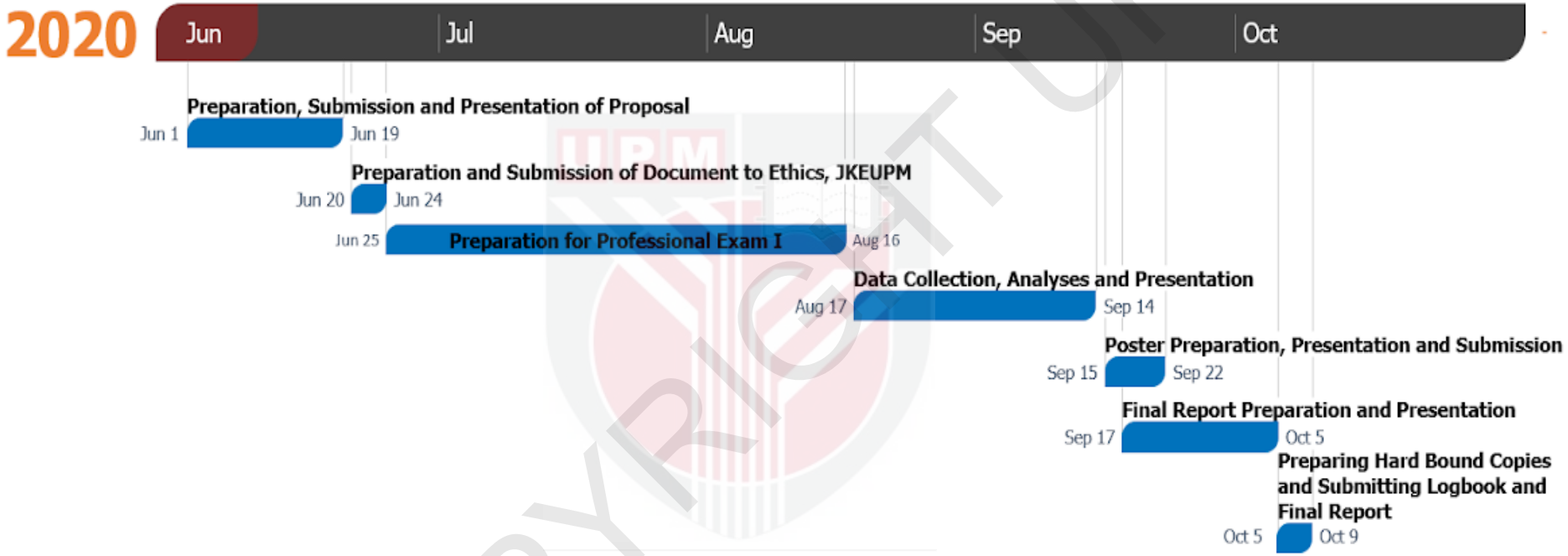
4 = AGREE

5 = STRONGLY AGREE

No.	Item	Rating Scale				
		1	2	3	4	5
1.	Anatomy teachers are knowledgeable.					
2.	Anatomy teachers are friendly.					
3.	The Anatomy topics prepare me for clinical years.					
4.	Learning Anatomy prepared me to be a good doctor.					
5.	I am confident to answer Anatomy questions well.					
6.	Prosected/cadaveric specimens are accessible.					

7.	I utilize Anatomy Museum to learn Anatomy.					
8.	Anatomy examinations help me to identify my weaknesses about Anatomy knowledge.					
9.	Poor quality of histology slides.					
10.	Anatomy practical sessions are well organized.					
11.	Relevant Anatomy topics are reemphasized in clinical years.					
12.	I use Anatomy models/specimens to learn Anatomy.					
13.	Anatomy teachers are available to help students.					
14.	Anatomy teachers are enthusiastic to teach.					
15.	I can apply my Anatomical knowledge in clinical years.					
16.	Learning Anatomy is fun.					
17.	Anatomy teachers are good role model for learning anatomy.					
18.	Quality of the microscopes for histology classes is poor.					
19.	Learning facilities are well maintained.					
20.	Anatomy teachers are well prepared.					
21.	The Anatomy topics are relevant to future profession.					
22.	My Anatomy knowledge helps me to understand other medical subjects.					
23.	Anatomy is an interesting subject.					
24.	Anatomy subject gives me feeling of becoming a doctor.					
25.	Anatomy teachers are approachable.					

Gannt Chart



Organization