A STUDY OF FACTORS AFFECTING USM STUDENTS' PERFORMANCE IN PRIMARY MASTER OF MEDICINE (ANAESTHESIOLOGY) CONJOINT EXAMINATION

AHMAD TAJUDDIN MAT YUSOFF

DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF MEDICINE (ANAESTHESIOLOGY)

UNIVERSITI SAINS MALAYSIA

2020

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2020

ACKNOWLEDGEMENTS

Praise be to ALLAH S. W. T, the Most Compassionate and the Most Merciful, whose blessing has helped me through the entire completion of this study. Special appreciation and gratitude are given to my main supervisor, Associate Professor Dr Wan Nazarudin bin Wan Hassan, for his valuable encouragement, guidance, patience and thoughtful advice in the completion of this dissertation.

I would like to dedicate my sincere thanks to my co-supervisor, Associate Professor Dr Muhamad Saiful Bahri bin Yusoff, Head of Medical Education Department, School of Medical Sciences, Universiti Sains Malaysia for his concern, help, support and suggestions throughout the process of completing this study. My heartiest thanks also go to my second supervisor, Dr Mohd Hasyizan bin Hassan who continuing support has helped me to complete this dissertation.

Last but in no way least, I would like to dedicate this work to my beloved family. Thank you to my loving wife Dr Zaleha Kamaludin for her support and my wonderful children, Aisyah and Harith for being my motivation in completing the study.

Hopefully, this study may benefit all authorities especially USM postgraduate students in Primary M. Med (Anaest) Conjoint Exam.

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LIST OF SYMBOLS, ABBREVIATIONS AND ACRONYMNS

FRCA	Fellowship of the Royal College of Anaesthetists
HREC	Human Research Ethics Committee
IIUM	International Islamic University Malaysia
KKM	Kementerian Kesihatan Malaysia
LNPT	Laporan Penilaian Prestasi Tahunan
M.Med (Anaest)	Master of Medicine (Anaesthesiology)
MCQ	Multiple Choice Question
MMC	Malaysian Medical Council
SAQ	Short Answer Question
SPM	Sijil Pelajaran Malaysia
UKM	University Kebangsaan Malaysia
UM	University Malaya
UPM	University Putra Malaysia
USM	University Sains Malaysia

ABSTRAK

Latar Belakang

Tujuan kajian ini dijalankan adalah untuk menentukan faktor-faktor yang mempengaruhi kejayaan pelajar dalam Peperiksaan Konjoin Primer Sarjana Perubatan (Anestesiologi) dari sudut faktor latar belakang, akademik, persekitaran dan sosia-ekonomi.

Kaedah

Kajian ini melibatkan sebanyak 73 calon yang telah lulus Peperiksaan Konjoin Primer Sarjana Perubatan (Anestesiologi) pada percubaan pertama atau lebih dari satu percubaan. Calon dibahagikan kepada 2 kumpulan. 1) Kumpulan 1 adalah calon yang lulus pada percubaan pertama dan 2) kumpulan 2 adalah mereka yang lulus tapi lebih dari satu percubaan. Calon hendaklah menjawab set soalan selidik yang diberi.

Keputusan

Calon luar kampus yang bekerja dari luar semenanjung Malaysia lebih berpeluang untuk lulus pada percubaan pertama sebanyak 81% (adjusted OR 0.19: 95% CI 0.04 0.99), p=0.048). Begitu juga, calon yang meneruskan pembelajaran secara berkumpulan semasa cuti belajar menambah peluang untuk berjaya pada percubaan pertama sebanyak 41% (adjusted OR 0.59: 95% CI 0.39-0.90), p=0.013). Walaubagaimanapun, calon yang

lama dalam perkhidmatan (adjusted OR 1.62: 95% CI 1.03, 2.54, p=0.036) dan pasangan yang bukan dari profession kesihatan (adjusted OR 6.56: 95% CI 1.57, 27.54, p=0.010) akan mengurangkan peluang untuk lulus pada percubaan pertama.

Kesimpulan

Calon luar kampus yang menjalani latihan di luar semenanjung dan belajar berkumpulan semasa cuti belajar menunjukkan faktor yang penting dalam membantu calon lulus pada percubaan pertama Peperiksaan Konjoin Primer Sarjana Perubatan (Anestesiologi). Manakala, calon yang lama dalam perkhidmatan dan latar belakang perkerjaan pasangan calon merupakan faktor yang mengurangkan peluang untuk lulus pada percubaan pertama.

ABSTRACT

Objectives

The aim of study was to determine the factors affecting USM students' performance in their Primary M. Med (Anaest) Conjoint Examination in terms of academic background, environmental and socio-economic factors.

Methods

This was a cross-sectional, simple sampling study, involving 73 subjects, who passed Postgraduate Primary M. Med (Anaest) Conjoint Exam either at first or subsequent attempts. They were divided into two groups; 1) Group 1: Candidates who passed at first attempt and 2) Group 2: Candidates who passed after subsequent repeat exam. The subjects were required to respond to self-administered questionnaires.

Results

Out-campus candidates who worked outside Peninsular Malaysia had higher chance to pass at first attempt by 81% (adjusted OR 0.19: 95% CI 0.04-0.99), p=0.048). Small discussion group during study leave also increased the chance to pass at first attempt by 41% (adjusted OR 0.59: 95% CI 0.39-0.90), p=0.013). However, longer years in medical services (adjusted OR 1.62: 95% CI 1.03, 2.54, p=0.036) and spouse from non-healthcare profession (adjusted OR 6.56: 95% CI 1.57, 27.54, p=0.010) lowered the chance to pass at first attempt.

Conclusion

Out-campus training outside Peninsular Malaysia and discussion group during study leave were significant factors led to higher chance of first attempt success in the exam. The duration in medical services and background of spouse occupation were the significant factors that lowered the chance to pass at first attempt.

CHAPTER 1: INTRODUCTION

1.1 BACKGROUND

Master of Medicine in Anaesthesiology, or M. Med (Anaest) training programme was first established in Malaysia by University of Malaya (UM), jointly with Universiti Kebangsaan Malaysia (UKM), in 1988 (2). At Universiti Sains Malaysia (USM), the programme was initiated in 1993 (1), but it first started independently. Only later in 2013, USM M. Med (Anaest) programme become conjoined with UM and UKM.

Eligibility criteria entrance into M. Med (Anaest) programme includes a completion of approved residency programme at an accredited medical training centre and demonstration of comparable experience in clinical practice. The minimum USM M. Med (Anaest) entry requirements (3) are as follows:

1. Candidate must possess Medical Degree or equivalent qualification accepted by the University Senate and is registered with the Malaysian Medical Council (MMC). Candidate holding degree from unrecognized institutions are required to sit and pass the Malaysian Medical Qualifying Examination (MQE) prior admission.
2. Candidate must also possess at least 2 years' experience after graduation, either in hospital or institutions certified and accepted by the University Senate.
3. Local candidates are also required to attend a pretest/interview before the final selection.

4. Foreign candidates are also required to go through 3 to 6-month clinical attachment and assessment at the respective department prior admission.
5. Candidate must also in good physical and mental condition.

Qualified candidates will be informed to sit for the Conjoint Entrance Examination, which will be held in the respective universities. The selected candidates will be placed either in-campus or out-campus. Out-campus candidates will be placed until second academic year in tertiary hospitals, which are accredited by USM before joining inside the campus at the beginning of the third year as shown on figure 1.1.

There are two main subjects in the primary exam, which are Pharmacology and Physiology/ Clinical measurement. Each subject consists of theory and viva. The theory part of the examination consists of 80 multiple-choice questions (MCQ) and 6 Short Answer Questions (SAQ). Only candidates who pass in theory can proceed to viva. The candidates will be considered pass the exam if they succeeded both Pharmacology and Physiology/ Clinical measurement subject. Those who fail will repeat only the failed subject as shown on figure 1.2. This type of combined examination system is a high standard and produces properly qualified specialists in anaesthesiology (5).

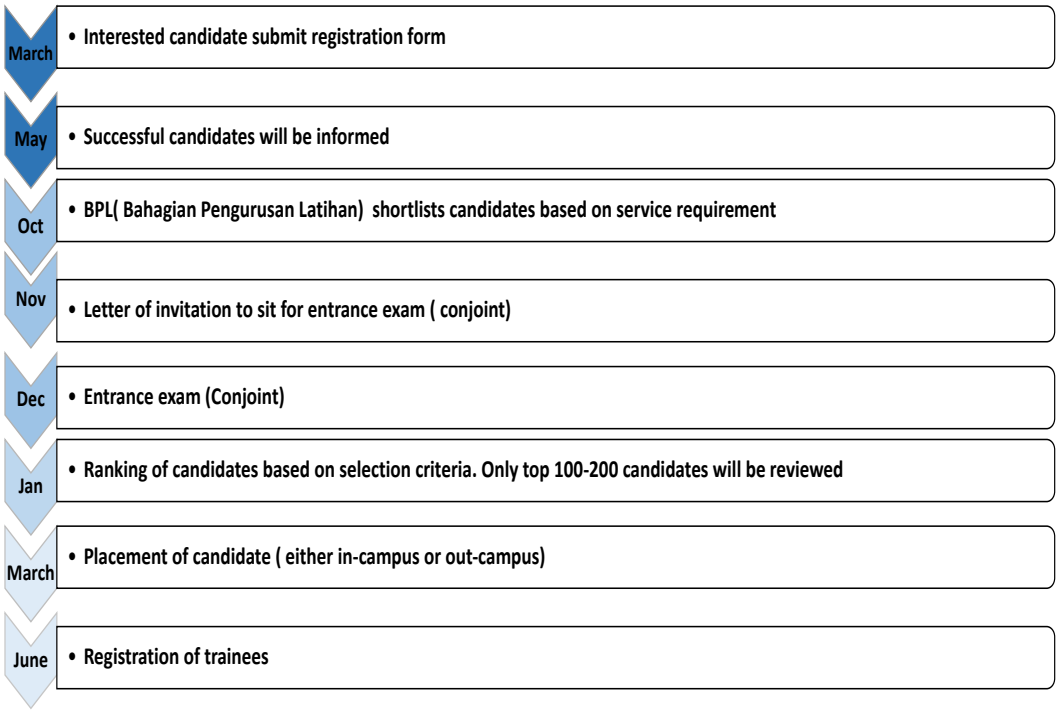

Figure 1.1: Study flow chart for application of M. Med (Anaesthesiology).

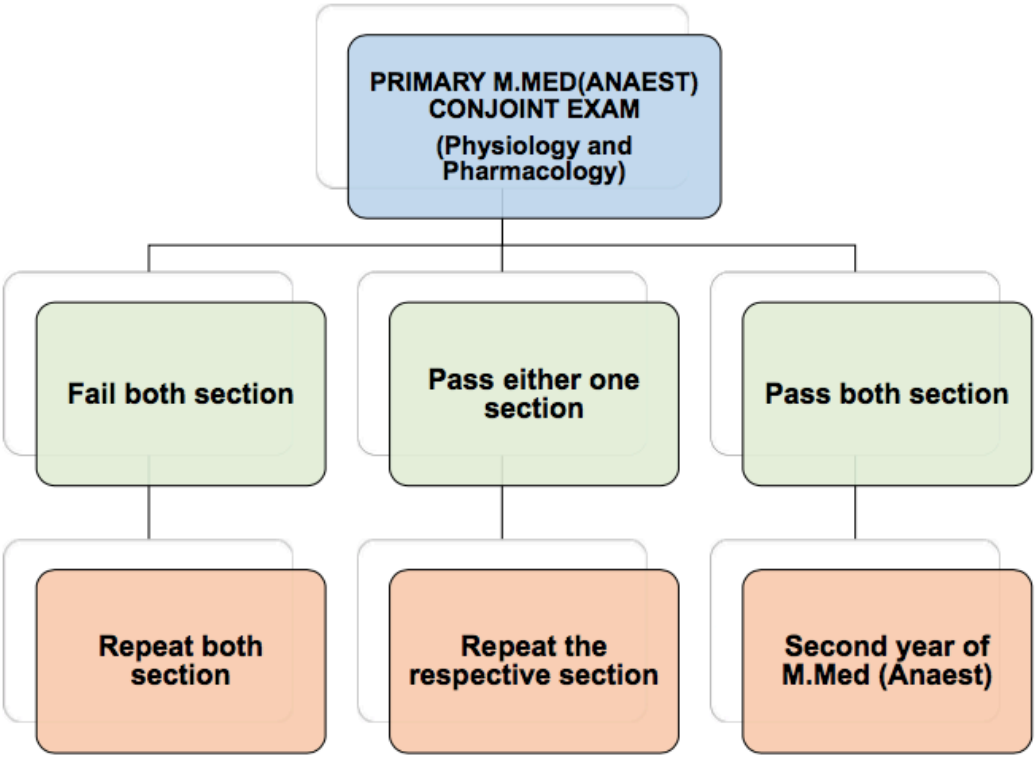

Figure 1.2: Graphic chart of Primary M. Med (Anaesth) Conjoint Exam.

1.2 STUDY RATIONALE

Since the era of conjoint exam for Primary M. Med (Anaest), there are many potential issues that may affect the performance of the students. However, there is no previous systematic research looking into these factors that may determine or influence their performance. This study sought to identify these potential factors in order to improve performance and the exam system in Primary M. Med (Anaest) Conjoint Exam

1.3 LITERATURE REVIEW

Nowadays, anaesthesiology evolves constantly in medical sciences. The subspecialties range from critical care, neuroanaesthesiology, paediatric anaesthesiology, obstetric anaesthesiology, cardiothoracic anaesthesiology and pain service. Selecting a career in anaesthesiology is predisposed by many factors.

The common factors that influenced the choice of anaesthesiology as a career are the opportunity to do procedures and the diversity of clinical spectrum (6). Trainees who take primary exam since conjoint examination face a lot of challenges. Some of the trainees attempted multiple time to pass the exam. A study proves that some candidates continue to improve after attempting the exam multiple times (7).

The factors affecting the students' performance can be divided into academic factors, environmental factors and socio-economic factors. These are explained in further detail below.

Academic Factors

Former academic achievement is acknowledged as the major prognosticator of candidate performance to pass Primary M. Med (Anaest) Conjoint Exam in first attempt. This is supported by the claim that "High United States Medical Licensing Examination (USMLE) scores, class rank in medical school and interview performance were predictive of high examination scores in residency and good clinical" (8).

Environmental Factors

In-campus candidates have a lot of teaching resources and free access to medical journal compared to out-campus candidates. However, quality of educational program is significantly higher for non-university hospitals(9).Somehow, candidates choose the training centre during primary exam based on well-established teaching program (5). This is supported by claim that "Over two-thirds of the students identified pre-set programme, inspiring teaching and peer support as factors enhancing studying" (10).

Social- Economic Factors

The importance of social-economic background for improving performance outcomes changes over time, reliant on the education context and the trainee's developmental stage. Success normally relates positively to student–family, student- colleague and student–lecturer interactions. Gender may be a factor which female graduates are less competitive compared to male graduates (4).

CHAPTER 2: STUDY OBJECTIVES

2.1 GENERAL OBJECTIVES

To evaluate the factors which contribute to academic performance of USM postgraduate candidates for Primary M. Med (Anaest) Conjoint Exam.

2.2 SPECIFIC OBJECTIVES

1. To determine the association between previous academic background and academic performance of USM postgraduate candidates for Primary M. Med (Anaest) Conjoint Exam.

2. To determine the association between environmental factor and academic performance of USM postgraduate candidates for Primary M. Med (Anaest) Conjoint Exam.

3. To determine the association between socio- economic factors and academic performance of USM postgraduate candidates for Primary M. Med (Anaest) Conjoint Exam.

2.3 RESEARCH HYPOTHESES (NULL HYPOTHESES)

1. There is no association between previous academic background and academic performance of USM postgraduate candidates for Primary M. Med (Anaest) Conjoint Exam.

2. There is no association between environmental factors and academic performance of USM postgraduate candidates for Primary (Anaest) Conjoint Exam.

3. There is no association between socio- economic factors and academic performance of USM postgraduate candidates for Primary (Anaest) Conjoint Exam.

CHAPTER 3: STUDY PROTOCOL & ETHICAL APPROVAL

3.1 STUDY PROTOCOL

Research Design

This was a descriptive study utilizing a cross- sectional study design. Commencing end of September 2017.

Study Area and Study Population

The study was conducted at Department of Anaesthesiology and Intensive Care, School of Medical Sciences, USM. Research questionnaires were distributed to post graduate students who passed Primary M. Med (Anaest) Conjoint Exam. Necessary explanations were given prior to administration of the questionnaire. A reasonable amount of time was given for the students to complete the questionnaire. The explanation for the questionnaire and purpose of the study were included.

Subject Criteria

Inclusion criteria

All registered USM postgraduate students who have passed their Primary M. Med (Anaest) Conjoint Exam (2014-2017).

Exclusion criteria

1. Registered as Primary M. Med (Anaest) but did not pass the exam.
2. The students who passed the primary exam in other than by the M. Med programme for example, Fellowship College of Anaesthesiology of Ireland (FCAI).

Operational Terms

Academic background consists of undergraduate education and higher school achievement such as SPM (Sijil Pelajaran Malaysia). While, environment background consists of placement of candidate (out-campus or in campus), educational facility, experience, training facility, group discussion, peer support and supervision.

The Socio-economic factors consist of gender, marriage, number of children, family income, spouse profession and distant from family. Outcome in this study is defined as passing or failure at first attempt of exam.

Sample Size Estimation

The estimated sample size for all the three objectives was determined and calculated for each variable of associated factors for the examination outcome (pass or fail) of USM using Power and Sample Size Calculation Software to compare two independent proportions.

α	=	Type I error probability for a two-sided test. (1.96 for $\alpha = 0.05$ (two-tailed))
Power	=	Power of study (1-β) set at 0.8 (80%)
P_0	=	Proportion of the factors among candidate who failed conjoint examination from literature review
P_1	=	Estimated proportion of the factors among candidate who passed Primary M. Med (Anaest) conjoint examination
m	=	Ratio between candidate who passed exam and who did not

Table 3.1: Summary of sample size calculation for each associated factor

Factor	Author	m	P_0	P_1	n	*n + 10% drop out
Socio-Economic						
-Gender	(4)	**0.6**	**0.44**	**0.74**	**63**	**69**
Academic						
background	(5)	**0.6**	**0.50**	**0.80**	**59**	**65**
-class rank						
Environmental						
background	(9)	**0.4**	**0.36**	**0.66**	**66**	**73**
-Placement of						
candidate	(10)	**0.9**	**0.40**	**0.70**	**51**	**56**
-Peer Support						

*****Drop out of 10% was taken to consider the absence of feedback from candidates. The sample size that is adequate to answer all the objective is therefore **73 subjects**, included of 10% drop-out rate.

Sampling Method and Subject Recruitment

Sampling method is based on time frame and target number of subjects.

Research Tool

The researcher used a questionnaire as the measurement instrument for this study.

The questionnaires were self-administered, and duration taken to answer these questionnaires was about 5 to 10 minutes. The questionnaires contained 35 items, divided into six parts:

Part 1: Mainly on demographic data and social-economic background during registration as Primary M. Med (Anaest) candidates such as age, home state, gender, marital status, number of children, loan, family income and scholarship.

Part 2: Consisted of academic background. For example, type of secondary school, Sijil Perperiksaan Malaysia (SPM) result, undergraduate University and duration to complete undergraduate study

Part 3: Assesses on pre- M. Med training and job characteristic during registered as Primary M. Med (Anaest) such as years of anaesthesia training and medical service before joining M. Med, early training centre before joining M. Med, number of average working hours, number of averages on-call per month and the frequency of working hour during weekend in a month.

Part 4: Scaled from very poor, poor, fair, good and excellent to grade the facilities in Primary M. Med (Anaest) training programme.

Part 5: Consisted information during Primary M. Med (Anaest) exam such as placement of candidate, training of centre, number of attempt/s and result after the overall attempts.

Part 6: Consists of a set of question to assess determinant of students' performance in the Primary Master of Medicine (Anaesthesiology) Conjoint Exam.

Pilot Study

A pilot study was managed on 10 anaesthesiologists who graduated from USM. They were selected because of their experience in Primary M. Med (Anaesth) examination. The pilot study was conducted to establish face validity and reliability of the questionnaires, as well as to ensure that both instruction and item statements were clear.

Study Protocol & Method

About 98 students were coded according to serial number. Only 73 students were randomized and included in this study. Remaining 25 students were not included in this study. The students were required to respond to a self- administered questionnaire.

Participants were voluntary. The risk and benefit were explained to the participants. The questionnaires were distributed to all the students who passed Primary M. Med (Anaest) Conjoint Exam. They were given a one-week duration to complete the questionnaires. The participants answered the questionnaires on their own time and at their own pace. Informed consent was obtained from each participant before data collection was commenced. Participants could withdraw from the study at any time without repercussions.

Data analysis

The statistical Package for Social Science (SPSS) version 25 software was used to perform statistical analysis. Demographic data was described using frequencies, means and standard deviation. Comparison of numerical variables were analysed using independent t-tests and categorical variables were analysed with chi square test / Fisher exact test. The determinant factors for academic performance were analysed with simple and multiple logistic regression test. $P < 0.05$ is consider statistically significant.

3.1: Flow Chart

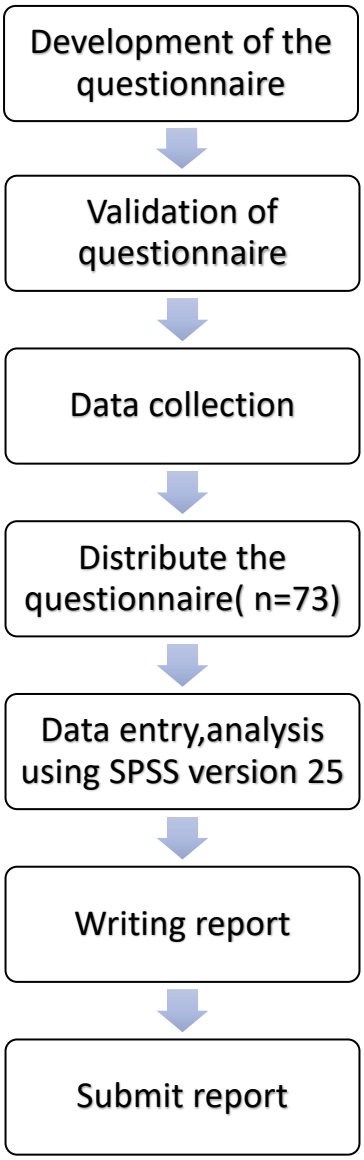

Figure 3.1: Study flowchart

3.2 ETHICAL APPROVAL LETTER

Ethical clearance was obtained from the school and ethical committees prior to the start of the study. Participants' anonymity and confidentiality were preserved and maintained. The researcher explained clearly in the consent form regarding the purpose of this study. The formal signature consent was obtained from each participant who agreed to participate in the study

UNIVERSITI SAINS MALAYSIA
JAWATANKUASA ETIKA PENYELIDIKAN MANUSIA

Jawatankuasa Etika
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Human Research Ethics Committee USM (HREC)

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31st December 2017

017-9671498

Dr. Ahmad Tajuddin Mat Yusoff
Department of Anaesthesiology
School of Medical Sciences
Universiti Sains Malaysia
16150 Kubang Kerian, Kelantan.

JEPeM Code : USM/JEPeM/17090413
Protocol Title : Review on the Determinant Factors of the Outcome of Universiti Sains Malaysia Candidates for Part 1 Master of Medicine (Anaesthesiology) Conjoint Exam.

Dear Dr.,

We wish to inform you that your study protocol has been reviewed and is hereby granted approval for implementation by the Jawatankuasa Etika Penyelidikan Manusia Universiti Sains Malaysia (JEPeM-USM). Your study has been assigned study protocol code **USM/JEPeM/17090413**, which should be used for all communication to the JEPeM-USM related to this study. This ethical clearance is valid from **31st December 2017** until **30th December 2018.**

Study Site: School of Medical Sciences, Universiti Sains Malaysia.

The following researchers also involve in this study:

1. Dr. W Mohd Nazaruddin W Hassan
2. Dr. Mohamad Hasyizan Hassan
3. Assoc. Prof. Dr. Muhamad Saiful Bahri Yusoff

The following documents have been approved for use in the study.

1. Research Proposal

In addition to the abovementioned documents, the following technical document was included in the review on which this approval was based:

1. Participant Information Sheet and Consent Form (English version)
2. Participant Information Sheet and Consent Form (Malay version)
3. Sample of Data Entry Sheet
4. DASS21

Attached document is the list of members of JEPeM-USM present during the full board meeting reviewing your protocol.

While the study is in progress, we request you to submit to us the following documents:

1. Application for renewal of ethical approval 60 days before the expiration date of this approval through submission of **JEPeM-USM FORM 3(B) 2017: Continuing Review Application Form.** Subsequently this need to be done yearly as long as the research goes on.
2. Any changes in the protocol, especially those that may adversely affect the safety of the participants during the conduct of the trial including changes in personnel, must be submitted or reported using **JEPeM-USM FORM 3(A) 2017: Study Protocol Amendment Submission Form.**

CERTIFIED BY: National Pharmaceutical Regulatory Agency (NPRA) | Forum for Ethical Review Committees in Asia & Western Pacific Region

3. Revisions in the informed consent form using the **JEPeM-USM FORM 3(A) 2017: Study Protocol Amendment Submission Form.**
4. Reports of adverse events including from other study sites (national, international) using the **JEPeM-USM FORM 3(G) 2017: Adverse Events Report.**
5. Notice of early termination of the study and reasons for such using **JEPeM-USM FORM 3(E) 2017.**
6. Any event which may have ethical significance.
7. Any information which is needed by the JEPeM-USM to do ongoing review.
8. Notice of time of completion of the study using **JEPeM-USM FORM 3(C) 2017: Final Report Form.**

Please note that forms may be downloaded from the JEPeM-USM website: **www.jepem.kk.usm.my**

Jawatankuasa Etika Penyelidikan (Manusia), JEPeM-USM is in 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.

Thank you.

."ENSURING A SUSTAINABLE TOMORROW"

UNIVERSITI SAINS MALAYSIA

JAWATANKUASA ETIKA PENYELIDIKAN MANUSIA

Jawatankuasa Etika Penyelidikan Manusia USM (JEPeM)
Human Research Ethics Committee USM (HREC)

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Date of meeting : 29th October 2017
Venue : Meeting Room, Division of Research & Innovation, USM Kampus Kesihatan.
Time : 9.00 a.m – 2.00 p.m
Meeting No : 373

Members of Committee of the Jawatankuasa Etika Penyelidikan (Manusia), JEPeM Universiti Sains Malaysia who reviewed the protocol/documents are as follows:

Member (Title and Name)		Occupation (Designation)	Male/ Female (M/F)	Tick (✓) if present when above items, were reviewed
Chairperson: Professor Dr. Hans Amin Van Rostenberghe		Chairperson of Jawatankuasa Etika Penyelidikan (Manusia), JEPeM USM	M	✓ (Chairperson)
Secretary: Mr. Mohd Bazlan Hafidz Mukrim		Science Officer	M	✓
Members :				
1.	Associate Professor Dr. Azlan Husin	Lecturer, School of Medical Sciences	M	✓
2.	Mr. Harry Mulder	Community Representative	M	✓
3.	Associate Professor Dr. Haslina Taib	Lecturer, School of Dental Sciences	F	✓
4.	Tn. Haji Ismail Hassan	Community Representative	M	✓
5.	Associate Professor Dr. Mohtar Ibrahim	Lecturer, School of Medical Sciences	M	✓
6.	Dr. Mujahid Bakar	Lecturer, School of Health Sciences	M	✓
7.	Professor Dr. Nik Hazlina Nik Hussain	Lecturer, School of Medical Sciences	F	✓
8.	Mrs. Norleha Mohd Noor	Executive Secretary, School of Dental Sciences	F	✓
9.	Associate Professor Oleksandr Krasilshchikov	Lecturer, School of Health Sciences	M	✓
10.	Associate Professor Dr. Sarimah Abdullah	Lecturer, School of Medical Sciences	F	✓

Jawatankuasa Etika Penyelidikan (Manusia), JEPeM-USM is in 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.

Chairperson
Jawatankuasa Etika Penyelidikan (Manusia), JEPeM
Universiti Sains Malaysia

CERTIFIED BY:

NPRA MALAYSIA
National Pharmaceutical Regulatory Agency (NPRA)

FERCAP
Forum for Ethical Review Committees in Asia & Western Pacific Region

CHAPTER 4: MANUSCRIPT

4.1 TITLE PAGE

Title:

A Study of Factors Affecting USM Students' Performance in Primary Master of Medicine (Anaesthesiology) Conjoint Examination

Running head:

Determinant Factors for Passing the Primary M. Med (Anaest) Exam at First Attempt

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No conflict of interest between the authors and other research parties should be declared.

4.2 MAIN DOCUMENTS

4.2.1 Title

A Study of Factors Affecting USM Students' Performance in Primary Master of Medicine (Anaesthesiology) Conjoint Examination

4.2.2 Abstract

Objectives

The aim of the study was to determine the factors affecting USM students' performance in their Primary M. Med (Anaest) Conjoint Examination in terms of academic background, environmental and socio-economic factors.

Methods

This was a cross-sectional, simple sampling study, involving 73 subjects, who passed Primary M. Med (Anaest) Conjoint Exam either at first or subsequent attempts. They were divided into two groups; 1) Group 1: Candidates who passed at first attempt and 2) Group 2: Candidates who passed after subsequent repeat exam. The subjects were required to respond to self-administered questionnaires.