

EDUCATION SECTION

MODEL ANSWER FOR CRITICAL REVIEW PAPER: CONJOINT EXAMINATION FOR MASTER OF MEDICINE (PSYCHIATRY) AND MASTER OF PSYCHOLOGICAL MEDICINE, MAY 2009.

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PAPER:

MALAYSIAN POSTGRADUATE TRAINING IN PSYCHIATRY – ARE OUR TRAINEES HAVING CONSISTENT PROBLEM IN BASIC SCIENCE?

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Materials, Methods and Results

This is a descriptive and cross-sectional study which was carried out on data obtained from a group of postgraduate psychiatry students from Universiti Kebangsaan Malaysia (UKM) and Universiti Malaya (UM) who attended a revision course organized by the UKM Department of Psychiatry on January 2005 and Mac/ April 2006.

The candidates attending this revision course are psychiatry trainees from UKM, UM and USM. For January 2005, a set of MCQs (consisting of 45 items, totaling in $45 \times 5 = 225$ statements) was retrieved from a large MCQ mock examination question bank randomly, consisting of well-balanced questions on neuroanatomy, neurophysiology, psychology, statistics and epidemiology, genetics, immunology and neuropathology. For the revision course in 2006, another set of 40 item MCQ (a

total of 200 statements) was again retrieved from a large MCQ mock examination question bank. Each MCQ item has 5 statements (A, B, C, D and E) to be answered true or false. A marking system is used, where a minimum mark of 0 or a maximum mark of 5 is given for each item. If a statement is answered wrongly, a minus mark is given, with a minimum mark of 0 for each item (e.g. if a candidate has 2 correct answers and 3 incorrect answers on 5 statements, he will get a mark of -1 but it would be considered as 0 for that item).

In January 2005, all 11 candidates who attended this MCQ workshop and participated in this study were from UKM. **All 11 candidates attempted all 45 questions given to them (session 2005).** The total scores were calculated based on 11 candidates who made the attempt, e.g. for one item, the maximum score would be $5 \times 11 = 55$.

In March/April 2006, out of 17 candidates (a different batch of candidates from 2005) attended this MCQ workshop and participated in this study, 11 candidates are from UKM, with the remaining from UM. No candidates from USM attended due to short notice. **All 17 candidates attempted all 40 questions given to**

them (session 2006). The total scores were calculated based on 17 candidates who made the attempt, e.g. the maximum score would be $5 \times 17 = 85$. The mock MCQ questions on academic year 2005 and 2006 are almost similar with not more than 20% changes made in the content by the author. The results are tabled in Table 1.

Table 1. The percentage median scores of postgraduate students in year 2005 and 2006.

Domains		Postgraduate Candidate (Percentage median scores)	
		Year 2006 %	Year 2005 %
1	Neuroanatomy*	47	30.9
2	Neurophysiology*	54.1	47.3
3	Neurochemistry	45.3	31.8
4	Neuropathology	33.5	40.9
5	Psychology*	43.5	31.8
6	Aetiology & psychiatric genetics	43.5	40.9
7	Stress & immunology	38.2	37.3
8	Psychopathology & general psychiatry	34.7	50.9
9	Psychopharmacology	52.9	46.4
10	Statistics	34.1	36.4
11	Epidemiology	41.2	47.3
Total average		42.7	40.3

*(Mann Whitney U-Test, * statistically significant, $p < 0.005$)*

ANSWER ALL QUESTIONS (Total 20 marks). Bring along your own calculator.

Q1. You were given the following result of MCQ scoring marks of 2006 postgraduate students:

24,25,29,29,29,30,30,32,34,34,35,35,35,36,36,37,37,38,39,39,40,40,40,41,41,42,42,42,43,43,45,45,45,45,45, 46,47,48,50,64

Find out the mean, median and mode (1.5 marks)

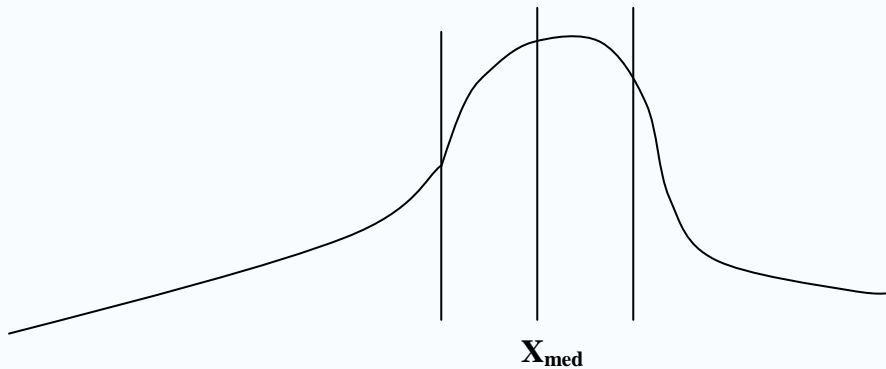
Means (\bar{X}_m) is equal to $1557/40 = 38.9$

Median (\bar{X}_{med}) is equal to $39 + 40$ divided by $2 = 39.5$

Mode (\bar{X}_{mod}) is equal to 45

(i) Draw your distribution curve based on the above mean, median and mode.

(2 marks)



(ii) Do you think that the distribution of the scores: is it positive or negatively skewed? Give your reasons. (2 marks)

It is . because $\bar{X}_m < \bar{X}_{med} < \bar{X}_{mod}$

Q 2. (i) Briefly conclude your findings in table 1. (not more than 50 words) (2 marks)

Based on table 1, postgraduate students in year 2006 was found to have higher (or better) scores in discipline of neuroanatomy, neurophysiology and psychology and it is statistically significant compared to the results of the postgraduate students in year 2005.

(ii) Mann-Whitney-U test was used to assess scoring marks for postgraduate candidate in both years. Briefly outline what kind of test this is? (2 marks)

Mann-Whitney-U test is a non-parametric test which is used when the sample size is small and when it is not normally distributed (skewed distribution), for example using median rather than mean scores.

(iii) Give 2 advantages and 2 disadvantages of this statistical test compared to the student's t-test. (2 marks)

As compared to student's t-test, the Mann-Whitney-U test is simple, does not need to assume a normal distribution, and can be applied in a small sample size. However, its disadvantages include that it is not as strong as the parametric test, and it may increase the type-I error.

Q 3. (i) State the null hypothesis for the above research methodology. (1mark)

$H_0 =$ "There is no difference between the postgraduate students MCQ performance in both years 2005 and 2006."

(ii) List one kind of statistical error that you are going to commit, and explain the meaning of this error (1 mark).

Type-I error: Rejecting the null hypothesis when it should not be rejected (or when it is true). Type-II error: Accepting the null hypothesis when it should not be accepted (or when it is false).

Q4. Postgraduate candidates in year 2006 and 2005 scored median scores of 47% vs. 31% respectively for their neuroanatomy, with $p < 0.05$. What do you understand the meaning of $p < 0.05$ in this context? (2 marks)

$P < 0.05 =$ Postgraduate students in year 2006 scored better or higher (47% vs. 31%) than the students in the previous year, and this was statistically significant –

the probability of committing a type-I error is less than 1 if the statistical test is being repeated 20 times.

Q 5. If the same postgraduate students attending a revision course in neuroanatomy scored 31% in year 2005 and also attended another revision course in 2006 and scored 47%, how many postgraduate students are needed to attend another postgraduate revision course in order to prevent one student from failing neuroanatomy section on MCQ exam? (2 marks)

$$\text{NNT} = 1 / (47\% - 31\%) = 1 / 0.16 = 6.25 \Rightarrow$$

Answer = 7

Q6. Study the following data and statement below:

“A revision course was offered to all postgraduate candidates who sat the March/April 2006 Mock MCQ Exam 3 months later, with a new passing rate of x% median scores. Four postgraduate students are needed to attend the postgraduate revision course in order to prevent one student from failing the MCQ exam.”

Find out the value of x (to be expressed as percentage). (2 marks)

$$\text{NNT} = 4 = 1 / (x\% - 0.43) \Rightarrow 4 = 1 / (x\% - 0.43) ;$$

$$\Rightarrow x - 0.43 = 1/4 \Rightarrow x - 0.43 = 0.25$$

$$\Rightarrow x = 0.68$$

$$\Rightarrow x = 68\%$$

What variable is x% being called in an epidemiological study? (1 mark)

Experimental event rate (EER)

or Control event rate (CER) also can be accepted.

Q6. Outline 1 limitations/weaknesses of this research finding. (1 mark)

[Any of the below answers is acceptable]

(1) This study is only a Mock MCQ Exam and may not reflect the true first part postgraduate MMed examination.

(2) Our MCQ samples were selected and reviewed by only a few psychiatrists and lecturers and these were not reflective of the questions in the final examination itself.

(3) USM candidates were excluded in the 2006 Mock MCQ Exam and this may not be reflective of all the postgraduate psychiatric candidates sitting for their part I examination.

(4) The sample size for this research was small.

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