

Echinacea – Exam style question

Introduction

This activity is similar to Unit 1 exam questions. It tests understanding of the design of a clinical trial in the context of a widely used alternative medicine.

The question is adapted from the Science for Public Understanding SPU 1 exam in 2006

a	i	<ul style="list-style-type: none"> • <u>two groups</u> treatment and control /one group takes Echinacea • control group takes placebo/an explanation of placebo 	for 1 mark each	2
	ii	<ul style="list-style-type: none"> • people assigned to control or treatment group at random • everyone has equal chance of being assigned to either 	for 1 mark each	2
	iii	<ul style="list-style-type: none"> • true <u>value of average</u> likely to lie between 7.3 and 10.9 (still give mark if one arithmetic error) • gives range within which true <u>value of average</u> possibly lies • margin of error in <u>value of average</u> <p>do not give mark if answer implies that this is the total range of results</p>	for 1 mark	1
	iv	<p>No</p> <ul style="list-style-type: none"> • difference between treatment and control groups is within uncertainty range • results not repeatable by different researchers/only one trial showed significant benefit • very small difference between groups • one trial showed placebo better • small sample size <p>max 1 for any yes answer as Q says 'strong evidence' note mark is for explanation, not for 'yes' or 'no'</p>	any 2 for 1 mark each	2
b	i	<p>1</p> <ul style="list-style-type: none"> • possibility of placebo effect • many traditional remedies have been shown to be ineffective/dangerous when tested scientifically <p>2</p> <ul style="list-style-type: none"> • cell culture not same as whole organism • microbes too general/ does it affect this virus? <p>3</p> <ul style="list-style-type: none"> • Placebo effect/ normal healing process • no controls/other variables • sample size • what measure of effectiveness used? <p>this Q is about quality of evidence so max 1 for explanation of effect</p>	any two points from each of two sets for 1 mark each	4

	ii	<ul style="list-style-type: none">• no other treatment for common cold/other remedies have failed• natural products <u>believed</u> safe/ suspicion of modern medicines• faith in remedy/placebo effect /advertising/group influence <p>No marks for 'natural / has no side effects' or for 'alternative remedies cheaper'</p>	any 2 for 1 mark each	2	
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This activity is similar to Unit 1 questions in the exam

Question

Extracts from the Echinacea plant are widely used to 'boost the immune system' and to help recovery from the common cold. These extracts are all commonly known simply as Echinacea.

- (a) Researchers have carried out randomised placebo controlled trials using extracts from the Echinacea plant to treat the common cold.

Figure 1 The results of placebo controlled trials on the use of Echinacea to treat the common cold

Trial	Echinacea		Placebo	
	Number of patients	Average days with symptoms	Number of patients	Average days with symptoms
A	70	9.1 ± 1.8	44	12.9 ± 2.1
B	32	3.4 ± 1.2	32	4.4 ± 1.6
C	69	6.3 ± 0.3	73	5.8 ± 0.3

- (i) What is meant by *placebo controlled trial*?

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(2 marks)

- (ii) What is meant by *randomised* in the description 'randomised placebo controlled trial'?

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(2 marks)

- (iii) What is meant by ± 1.8 in the entry ' 9.1 ± 1.8 average days with symptoms' in trial A?

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(1 mark)

(iv) Do the results shown in Figure 1 provide strong evidence for the effectiveness of Echinacea against the common cold? Explain your answer.

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(2 marks)

(b) The use of Echinacea to fight the common cold is popularly justified on three main grounds. These are given in the statements below.

Statement 1: It has been widely used by American Indian societies for hundreds of years

Statement 2: In cell culture it seems to improve white blood cells' ability to engulf microbes.

Statement 3: Many people say that it has helped them fight off a cold.

(i) Choose **two** of these statements and explain why each does not provide sufficient evidence of effectiveness.

statement chosen...

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statement chosen...

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(4 marks)

(ii) Many alternative remedies such as Echinacea are widely used for the common cold although there is often no scientific evidence that they are effective. Suggest **two** reasons why such alternative remedies continue to be popular.

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(2 marks)

Total marks 13