

## ONC8007: Research Methods II

### Literature assessment project (mock exam)

Please enter your name below

Name: ...A.N. Other.....

The following is based on a recent article in the palliative medicine literature. A brief description of the study is followed by some questions.

The study is concerned with assessing whether or not the use of patient-held records (PHRs) was beneficial for patients with advanced cancer and palliative care needs. Patients were allocated into one of two groups: in one group patients used PHRs and in the other standard methods were employed.

Theses arrangements were used for between 4 and 6 months and at this time structured interviews were administered to assess patient satisfaction with their care arrangements over the preceding months. The main analyses were carried out on two groups, one of size 80 (using PHRs) and one of size 97 (control). However, the numbers responding to particular questions may be smaller than these overall totals.

A slightly modified table based on the results section gives the following.

Question	No. answering 'yes' in PHR group (%)	No. answering 'yes' in controls (%)	P value
Are you very satisfied with information from GP?	60/79 (76)	59/94 (63)	0.06
Are you very satisfied with information provided by main out-patient doctor?	60/78 (77)	62/86 (72)	0.48
Do you agree that hospital staff inform each other very well about your problems?	45/73 (62)	46/67 (69)	???

**Questions (please type your answers in the space provided).**

1.  
What statistical test would have been used to give the P-value in the final column?

The Chi-squared (or  $\chi^2$ ) test would be used. This is because the outcome for each patient in the study is a binary variable, namely whether or not they are satisfied with the information from either GP (row 1) or out-patient doctor (row 2).

**(continued on next page)**

2.

Using Minitab, or otherwise, calculate the missing P-value from the table and type its value below.

.....0.39.....

3.

Give details of the calculations leading to this result or cut and paste the relevant output from Minitab.

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MTB > ChiSquare 'PHR' 'Control'.
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### Chi-Square Test: PHR, Control

Expected counts are printed below observed counts

	PHR	Control	Total
1	45	46	91
	47.45	43.55	
2	28	21	49
	25.55	23.45	
Total	73	67	140

```
Chi-Sq = 0.127 + 0.138 +  
0.235 + 0.256 = 0.755  
DF = 1, P-Value = 0.385
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4.

Interpret the results for each of the three questions listed in the table.

Each of the P-values results from hypothesis tests which test essentially similar *null hypotheses*, namely that the population proportion of patients who are satisfied with the information they receive (rows 1 and 2) or agree that professionals inform each other well (row 3) are the same in the control and PHR groups. The P-values in rows 2 and 3 are, respectively, 0.48 and 0.39. The proportions observed to be satisfied (row 2) in the treatment groups are 77% and 72% and those observed to be in agreement (row 3) in the treatment groups are 62% and 69%. The P-values indicate that if the respective null hypotheses were true, values as discrepant as these could arise by chance with probability 0.48 (for 77% vs. 72%) or 0.39 (62% vs. 69%). As these probabilities are indicate common events the P-values do not provide evidence that the corresponding null hypotheses are false. Nor do they provide evidence that these null hypotheses are true. We simply do not have strong evidence against these null hypotheses.

The P-value in row 1 is 0.06 and this is more equivocal. This states that if the null hypothesis in this case is true, then there is only a 6% chance that the proportions satisfied in the PHR and control groups would be as discrepant as those observed, namely 76% and 63%. As 6% is quite a small probability this

test suggests more strongly that the others that this null hypothesis is false. However, the situation here is not clear: in order for there to be good evidence against the null hypothesis we would be looking for a P-value less than 0.05 and preferably rather smaller than that.

5.

What other statistical quantity could have been included in the table which would have enhanced the information given to the reader? (you are *not* being asked to calculate this quantity for any of the questions) Why would this have been an enhancement?

It would be helpful if the difference in the observed proportions could be accompanied by a 95% confidence interval. This would quantify how different the population proportions might plausibly be. This would give more information than simply that the population proportion might, or might not be different (the situation the P-values alone leave us in)!