Investigators tested an intervention to promote smoking cessation. Among subjects exposed to the intervention 40/120 had quit at 6 months. Among the 80 subjects who did not receive the intervention, 10 had quit at 6 months. What was the “risk ratio” for quitting in the intervention group compared to the placebo group? Was the success rate significantly higher in the intervention group compared to the non-intervention group?

***Observed*** Frequencies

|  |  |  |  |
| --- | --- | --- | --- |
|  | Quit | No Quit | Total |
| Intervention | 40 | 80 | 120 |
| Placebo | 10 | 70 | 80 |
| Total | 50 | 150 | 200 |

Risk Ratio = (40/120)/(10/80) = 2.667
The intervention group had 2.667 times the success at quitting compared to the placebo group.

For the chi-square we need the expected frequencies under the null hypothesis. The overall frequency was 50/200 = 0.25, so under H0: we expect 25% in each category:

* 0.25\*120 = 30
* 0.25\*80   = 20

***Expected*** Frequencies under H0:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Quit | No Quit | Total |
| Intervention | 30 | 90 | 120 |
| Placebo | 20 | 60 | 80 |
| Total | 50 | 150 | 200 |

= 3.33+5.00+1.11+1.67=11.11

df = (2-1)\*(2-1)=1

Therefore, the chi squared statistic is 11.11 with 1 degree of freedom. We can use R to compute the p-value as follows:

> 1-pchisq(11.11,1)

[1] 0.0008586349

RR=(40/120)/(10/80)= 2.7

**Conclusion:** The intervention group was 2.7 times as likely to quit smoking compared to the placebo group during the observation period. This difference was statistically significant (p=0.0009).