

**Workshop II. Understanding and critically appraising asthma education research**

1. Describe in simple terms how statistics such as t-tests and correlations work to indicate statistical significance.
2. Describe how to read and comprehend asthma education research that uses these statistics to make conclusions.
3. Describe how to design and implement asthma education research that uses these statistics.

**I. A Pilot Study Assessing the Impact of a Learner-Centered Adult Asthma Self-Management Program on Psychological Outcomes. Stuart Tousman, Howard Zeitz, and Linda D. Taylor Clinical Nursing Research 2009**

The purpose of the research was to determine if an adult asthma self-management program could significantly improve psychological outcomes for participants. Small groups of adults met for 2 hours for 7 consecutive weeks. Intervention techniques included interactive discussions, problem solving, social support, and a behavior modification procedure. The behavior modification procedure consisted of homework assignments in which participants were asked to self-monitor and record asthma-specific behaviors (peak expiratory flow monitoring, avoidance/removal of asthma triggers, and controller medication adherence) and general lifestyle behaviors (drinking water, washing hands, and exercising). Paired sample *t* tests indicated statistically significant improvements for the outcomes of quality of life, depression, and self-efficacy. Significant increases were found in knowledge and behaviors, such as peak-flow monitoring and frequency of daily exercise. These results provide initial evidence that our program was effective, although the small sample size and lack of control group indicate the need for further research.

**A. Statistical Significance?**

1. A hot story: By the Time I get to Phoenix/Milwaukee. 1 day of 100 degrees versus 30 straight days.
2.  $p < .05$

**B. Types of T-tests**

1. Independent Samples
2. Within-subject design (intervention).

	Mean	N	Std. Deviation
Pair 1 Pre	2.0000	5	.79057
Post	5.0000	5	1.58114

**Paired Samples Test**

	Mean	Std. Error Mean	95% Confidence Interval of the Difference		T	df	Sig. (2-tailed)
			Lower	Upper			
			Pair 1	3.00000			

I am 95% confidence that my program will help between 2 and 4 points. My point estimate would be 2.  $T(2)=8.485, p=.001$  which means my program significantly improves QOL.

**C. A Randomized Controlled Behavioral Trial of a New Adult Asthma Self-Management Program (Journal of The Association of Asthma Educators (2011).**

1. Design
2. Outcomes

II. [Ann Allergy Asthma Immunol.](#) 2010 Jul;105(1):12-9. doi: 10.1016/j.anai.2010.04.009.

Randomized trial of self-management education in asthmatic patients and effects of depressive symptoms. [Mancuso CA](#)<sup>1</sup>, [Sayles W](#), [Allegrante JP](#).

**OBJECTIVES:** To improve asthma knowledge and self-efficacy and to assess effects in patients with depressive symptoms. **METHODS:** In a randomized trial, controls received asthma brochures and social support through frequent follow-up visits. Intervention patients made a contract to adopt a behavior to improve asthma and received a workbook, weekly reinforcements for 12 weeks, and frequent follow-

up visits. Outcomes were Asthma Quality of Life Questionnaire (AQLQ) and 36-Item Short Form Health Survey (SF-36) scores and emergency department (ED) visits and hospitalizations for asthma. RESULTS: Ninety patients were randomized to each group. Mean age was 43 years, 84% were women, and mean study time was 27 months. Intervention patients had more improvement in AQLQ scores at 5 months, but this difference was not sustained. For the entire period, AQLQ scores improved by a clinically important difference from 4.1 to a mean of 5.1 in both groups ( $P < .001$ ) with no difference between groups ( $P = .91$ ). In multivariate analysis, younger age, more education, better enrollment AQLQ score, more asthma self-efficacy and knowledge, and fewer depressive symptoms were associated with more improvement ( $P < .05$  for all). Similar results were found for the SF-36. Thirty-one percent of patients had an ED visit, and 9% were hospitalized, with no differences between groups. In multivariate analysis, female sex, expecting to be cured of asthma, less asthma knowledge, and more depressive symptoms were associated with ED visits. Being in the intervention group attenuated the effects of depressive symptoms for all outcomes.

**A. Data**

SE	QOL
1.00	1.00
1.50	1.20
2.00	1.40
2.50	2.00
3.00	2.40
4.00	2.60
4.50	2.80
5.00	3.00

**Correlations**

		QOL
Selfefficacy	Pearson Correlation	.977**
	Sig. (2-tailed)	.000
	N	8

As SE increases there is a statistically significant increase in QOL  $r(6) = .977, p < .001$ .

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.977 <sup>a</sup>	.954	.946	.17790

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.950	1	3.950	124.810	.000 <sup>b</sup>
	Residual	.190	6	.032		
	Total	4.140	7			

If I know SE I can account for a statistically significant 95% of the variance in QOL  $F(1,6) = 124, p < .001$

**B. Multiple Regression: Multiple Regression: Multiple predictor variables and one dependent variable.**