Can Suggestion Affect Pulmonary Function in Children with Suspected Asthma?

Rémi Thériault
Liana O. Corber
Catherine W. MacLean
Jenilee-Sarah Napoleon
Jay A. Olson
Amir Raz

McGill University

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article

Asthma as a Model for Placebo Effects in Modern Medicine

Emily A. Delpero*; Esin Turkakin*; Amir Raz, PhD*,†

Many a clinical intervention thrives on placebos. Lack of consensus—both definitional and methodological—however, contributes to general confusion and specious conclusions regarding the legitimacy and relevance of placebos in modern medicine. The apparent divergence between objective and subjective treatment outcomes, moreover, renders placebos clinically meaningless. Asthma provides a clinical model for studying placebos because it highlights how psychology works in concert with pharmacology. Here we examine placebos as valuable adjuncts to, rather than replacements for, pharmacological treatments.

Objective Vs Subjective Outcomes

- Placebos, suggestion, and expectation reliably influence people's subjective experience of several clinical conditions (e.g., pain)
- They also influence objective physiological outcomes for some conditions but not others (e.g., Parkinson)
- While suggestion does influence subjective symptoms of asthma, there is mixed evidence that it can affect objective pulmonary function as well
- Yet, this information is important because many physicians forgo from using objective measures of lung function and instead solely rely on subjective symptoms to diagnose asthma

(Delpero, Turkakin, & Raz, 2011)

Patterns of bronchial challenge testing in Canada

Rémi Thériault BA[1], Amir Raz PhD[1,2,3,4]

R Thériault, A Raz. Patterns of bronchial challenge testing in Canada. Can J Respir Ther 2018;54(2):41–47. doi: 10.29390/cjrt-2018-006.

Background: Bronchial challenge testing (BCT) measures airway hyperresponsiveness; asthma guidelines recommend using BCT when symptoms manifest despite normal spirometry. Improper application of these guidelines commonly results in the misdiagnosis of asthma. Yet, statistics concerning BCT remain largely obscure. The current paper addresses this gap and explores how various health variables may elucidate adherence to asthma guidelines and patterns of BCT across Canadian provinces.

Methods: Using the Access to Information Act, medical financial claims for BCT (or equivalent procedures) were requested from each of the Canadian provinces and territories. Based on the available information (from provinces only), correlations between frequency of BCT claims and medical demographics (e.g., prevalence of respirologists, health expenditures) are reported.

Results: Controlling for population or for people with asthma, physicians from Québec claim four times more BCT per year than those in other provinces; physicians from Alberta close to eight-fold fewer. The number of respirologists per capita and BCT per capita correlated moderately, $r(132) = 0.582$, $p < 0.001$, [95% CI 0.421, 0.716]. Excluding "outliers" (i.e., British Columbia, Alberta, and Saskatchewan) greatly strengthened this correlation, $r(87) = 0.930$, $p < 0.001$, [95% CI 0.883, 0.958].

Discussion: These findings demonstrate that provinces vary in their use of BCT. This result seems to stem, at least in part, from differences in the prevalence of respirologists. Interestingly, geographic region appears to wield a strong influence; in the correlation between number of tests and number of respirologists, physicians from Western provinces (i.e., Alberta, Saskatchewan, and British Columbia) administered fewer tests than their Eastern colleagues. Given the association between inadequate application of BCT and misdiagnosis of asthma, physicians should pay special attention to the Canadian guidelines when considering an asthma diagnosis.

Misdiagnosis of Asthma

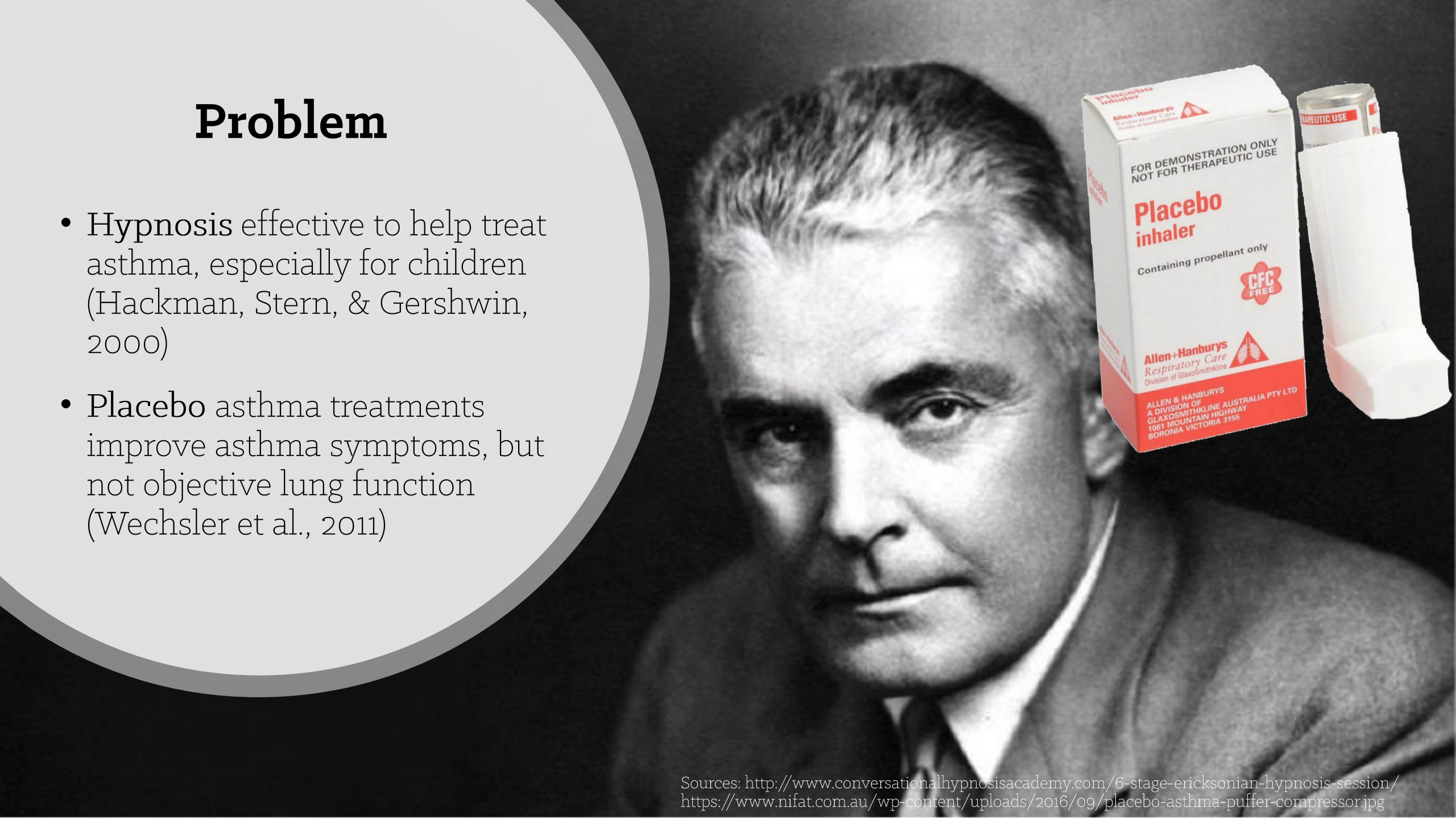
- Large scale study suggests most Canadian provinces underuse bronchial challenge testing for objective confirmation of asthma (Thériault & Raz 2018)
- Only about 50% of patients receive objective pulmonary function testing at all (Aaron et al. 2017; Chapman et al. 2001; Gershon et al. 2012; Lindensmith et al. 2004)
- Misdiagnosis of asthma due to a lack of objective testing could cost Canadians more than $275 million over 50 years (Pakhale et al. 2011)

“Failure to make the diagnosis of asthma objectively is unacceptable… Physicians who do not […] should not be managing asthma”

Editorial of the *Canadian Medical Association Journal*, 2008, p. 1099

Problem

- **Hypnosis** effective to help treat asthma, especially for children (Hackman, Stern, & Gershwin, 2000)
- **Placebo** asthma treatments improve asthma symptoms, but not objective lung function (Wechsler et al., 2011)



Sources: http://www.conversationalhypnosisacademy.com/6-stage-ericksonian-hypnosis-session/
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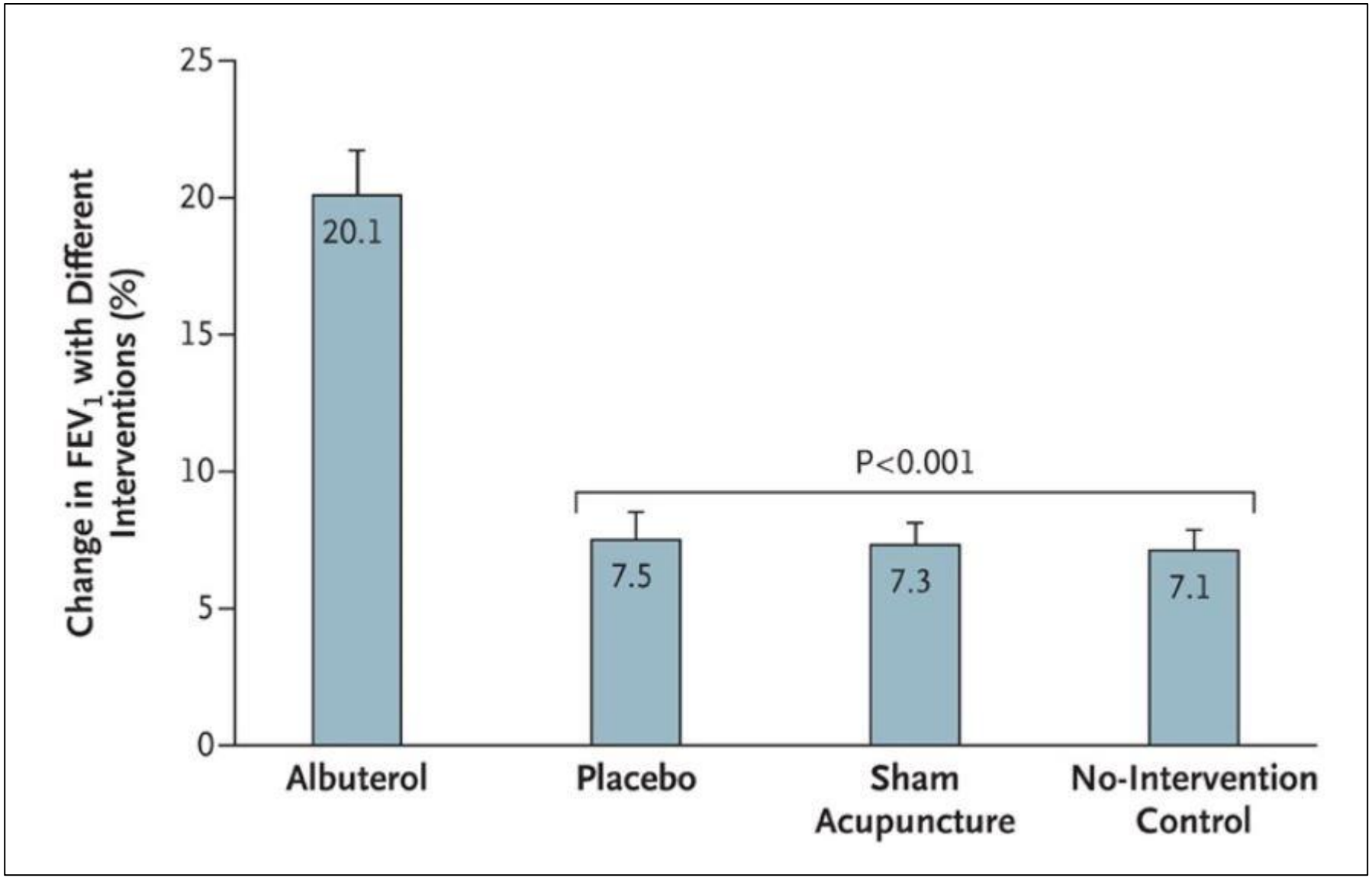


Figure 1 from: Wechsler, M. E., Kelley, J. M., Boyd, I. O., Dutile, S., Marigowda, G., Kirsch, I., ... & Kaptchuk, T. J. (2011). Active albuterol or placebo, sham acupuncture, or no intervention in asthma. *New England Journal of Medicine*, *365*(2), 119-126.

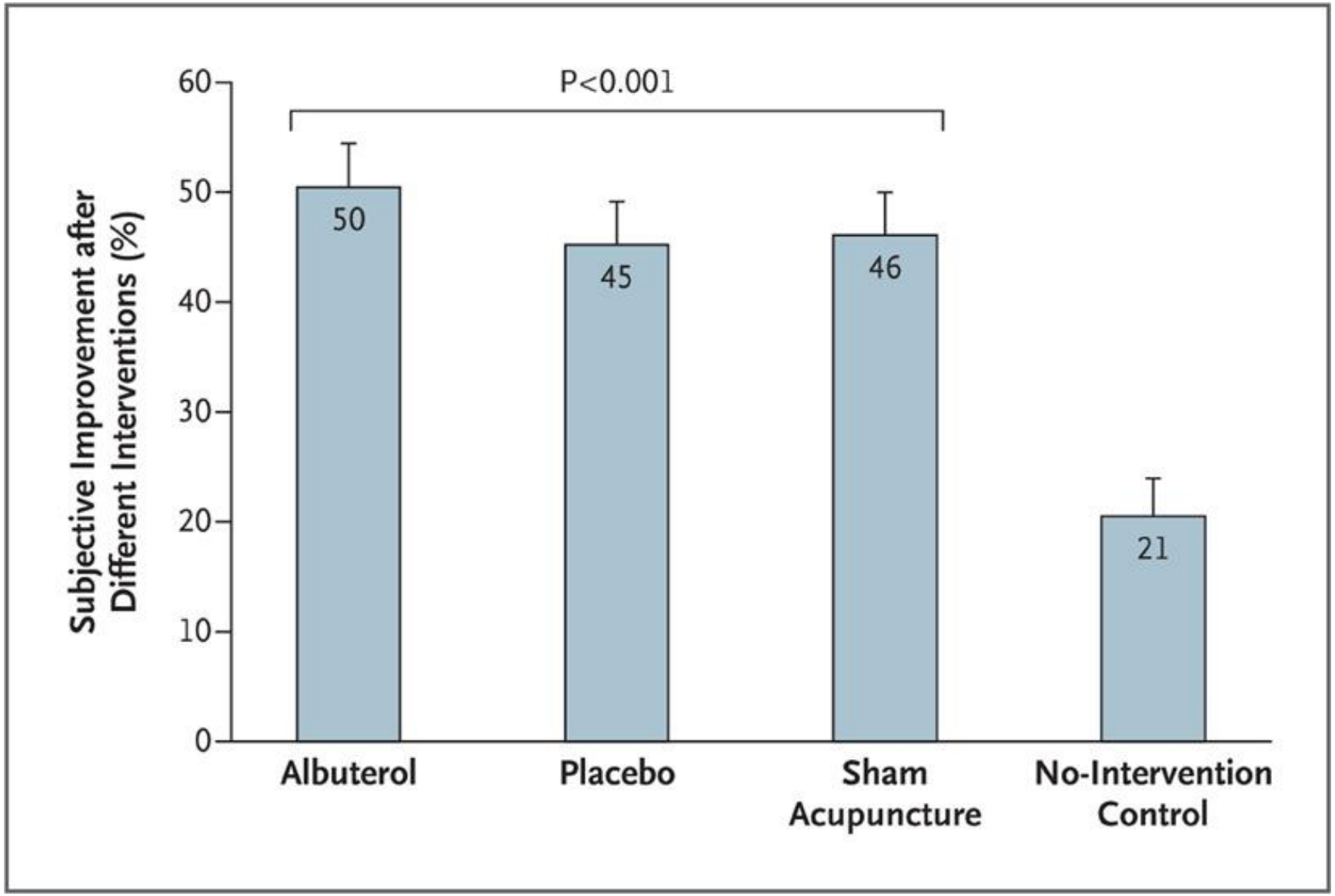


Figure 2 from: Wechsler, M. E., Kelley, J. M., Boyd, I. O., Dutile, S., Marigowda, G., Kirsch, I., ... & Kaptchuk, T. J. (2011). Active albuterol or placebo, sham acupuncture, or no intervention in asthma. *New England Journal of Medicine*, *365*(2), 119-126.

RESEARCH QUESTION

Can suggestions affect subjective AND objective measures of breathing difficulty?

Study 1

- Sample = 36 children recruited at the Montreal Children's Hospital
- Measure lung function via spirometry
  - Forced Expiratory Volume in 1 Second (FEV1)
- Administer lung irritant through methacholine challenge test, used to diagnose asthma

Study 2

- Sample = 22 children recruited at the Montreal Children's Hospital
- Measure lung function via spirometry
  - Forced Expiratory Volume in 1 Second (FEV1)
- Administer lung irritant through methacholine challenge test, used to diagnose asthma
- Self-report questionnaire on breathing difficulty

Methacholine Challenge Test

- First dose = saline solution
- The experimental groups believed the saline to be a strong dose of the irritant drug, methacholine
- Control groups knew the substance was inert, salty water
- After saline, actual methacholine challenge test started with increasing doses of methacholine for both groups—not part of the study

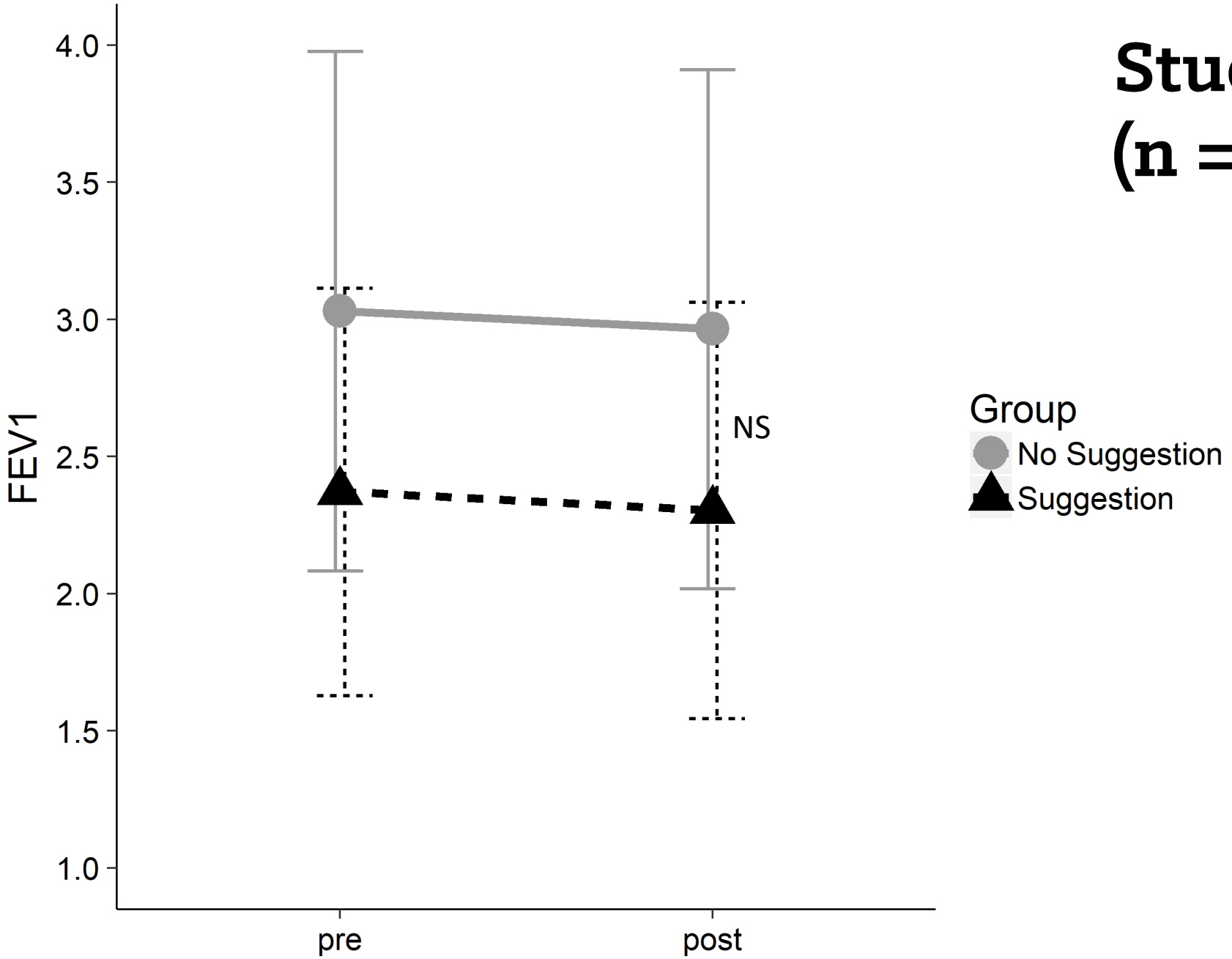
Suggestion…

“When you’re going to breath this medication, it’s going to become very very hard to breath, and you may start wheezing, coughing…”

RESULTS

https://www.yupik.ca/pub/media/catalog/product/cache/afad95d7734d2fa6d0a8ba78597182b7/8/0/80110p_4.jpg

Study 1 (n = 36)


4.0
3.5
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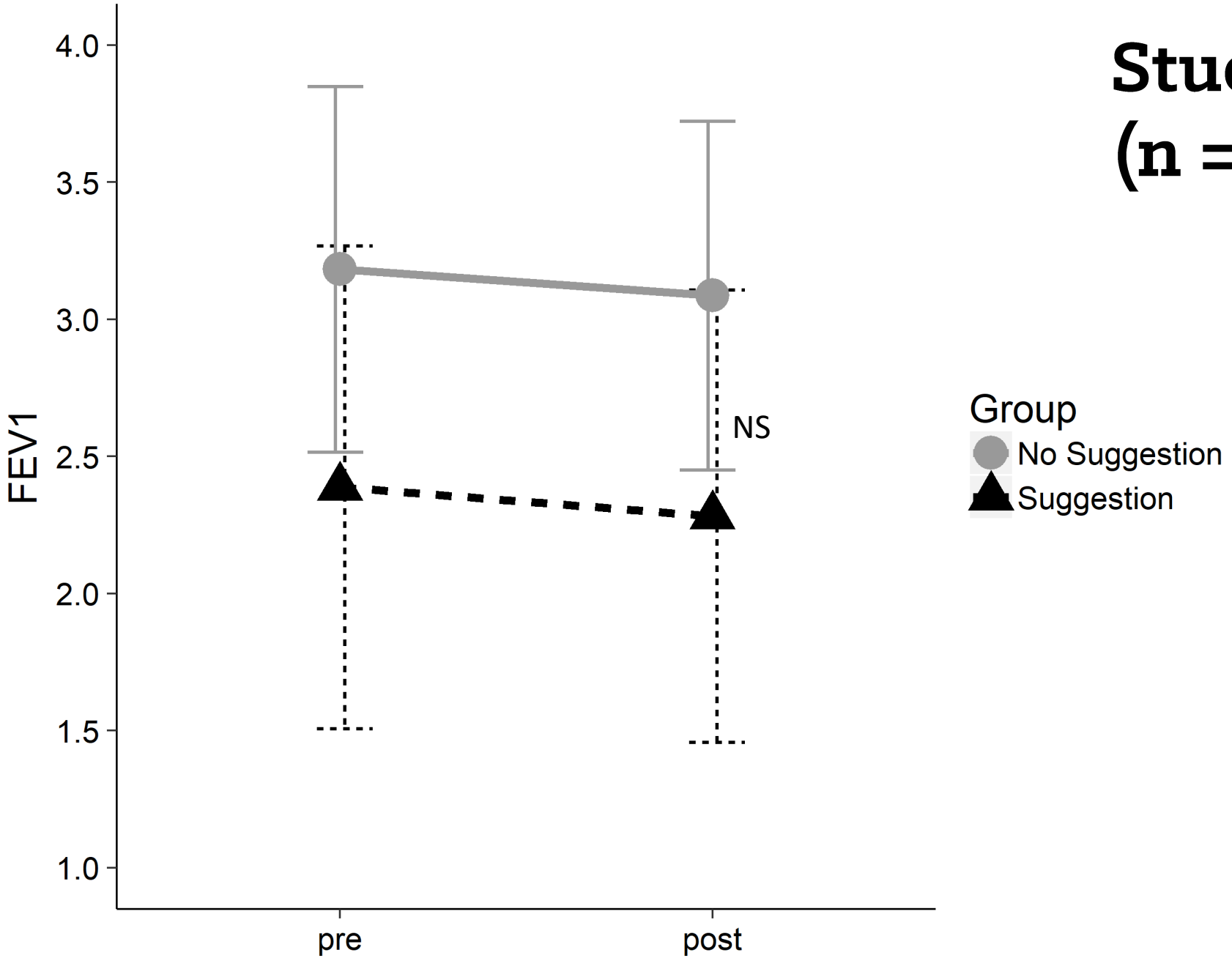
FEV1
NS
pre
post
Group
No Suggestion
Suggestion

Study 2 (n = 22)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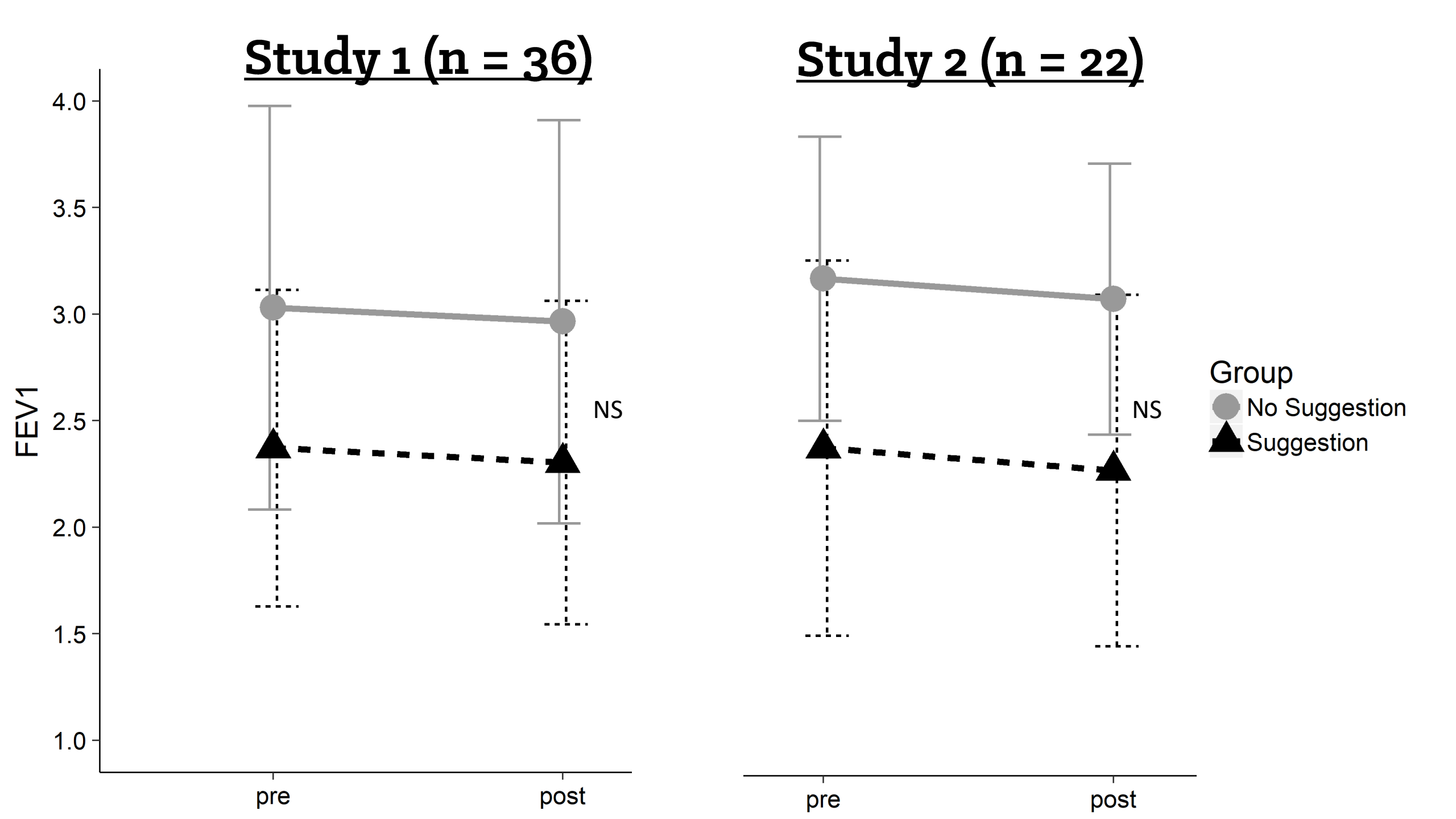
No Suggestion
Suggestion


Study 1 (n = 36)
Study 2 (n = 22)
FEV1
4.0
3.5
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NS
pre
post
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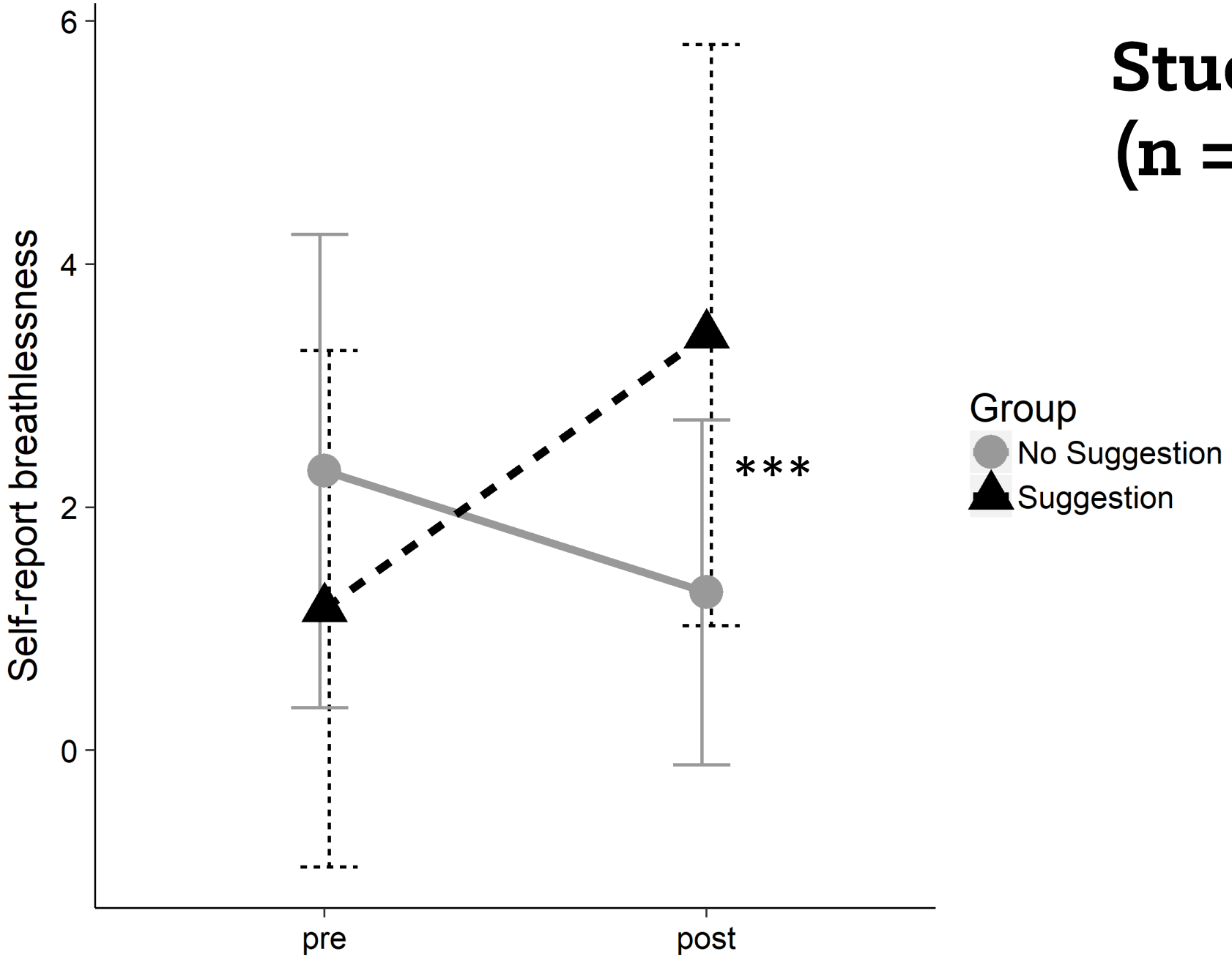
post
Group
No Suggestion
Suggestion

Study 2 (n = 22)


Self-report breathlessness
6
4
2
0
pre
post
***
Group
No Suggestion
Suggestion

DISCUSSION

1. Suggestion readily influences subjective asthma symptoms
2. Suggestion does not readily influence objective pulmonary function
3. Could explain why relying on symptomatology alone leads to higher misdiagnosis rates of asthma (Gershon et al. 2012)
4. Physicians should not rely on symptoms or history alone to make the diagnosis of asthma

CONCLUSION

- Our findings confirm the previously observed discrepancy between subjective experience and objective measures for the case of asthma when expectations contradict reality.

- Physicians should use objective tests when diagnosing asthma, as per national asthma guidelines recommendations around the world