

CRITICAL THINKING EXERCISE 4.1**Stress and the Common Cold**

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CONCEPT

Stress is associated with illness. In this research study, Cohen et al. (1993) looked at whether experiencing high levels of stress increases the likelihood that a person will get a cold after being exposed to a cold virus. The purpose for this activity is to help students accomplish the following:

- APA National Standards (Health standard area): 1.3 Explain physiological and psychological consequences of stress for health and wellness.
- Evaluate and understand the independent, dependent variables of the study, critique the study, and determine whether the hypothesis was supported.

MATERIALS

- *Stress and the Common Cold Worksheet*

INSTRUCTIONS

This activity takes 20-30 minutes to complete.

- Have students read the summary of the research study titled *Stress and the Common Cold* (Cohen et al., 1993).
- Students will answer and discuss the questions following the summary.

STRESS AND THE COMMON COLD WORKSHEET

Negative Life Events, Perceived Stress, Negative Affect, and Susceptibility to the Common Cold

Authors: Cohen, S., Tyrrell, D. A. J., & Smith, A. P. (1993)

Brief Article Summary: Our immune systems are designed to protect us when we come into contact with viruses. Ideally, our immune systems would always protect us so well that we would not know we were exposed to a virus. Unfortunately, there are times when we are exposed to a virus, like a cold or flu virus, and we get sick. The question is - what determines whether we get sick or do not get sick after exposure to a virus? Many have suggested that stress plays a role.

Cohen et al. (1993) wanted to know if people who report high levels of stress are more likely to get sick after exposure to a cold virus than people who report low levels of stress. To answer their question, they designed a *viral-challenge* study, a type of study in which participants report their stress levels, are then exposed to a cold or influenza virus, and are followed to see who gets sick. They predicted people high in psychological stress would be more likely to get sick after exposure to upper respiratory virus than people low in psychological stress.

The researchers recruited 420 healthy volunteers (154 men and 266 women) in Salisbury, England. Participants were 18 to 54 years old with an average age of 33.6 (10.6 standard deviation). Approximately half had completed secondary education, 22% had not, and 27% attended at least one year of University. Participants were given a medical examination including blood tests to determine immune activity and cotinine levels (cotinine indicates exposure to nicotine) and completed measures to determine the number of negative major stressful events, perceptions of the ability to cope with current life demands, and current negative affect (emotions). Then, participants received a nasal spray with one of five respiratory viruses at the level typical of person-to-person transmission or no virus (saline). They were quarantined (alone or with one or two others) in apartments for nine days (two days before the viral challenge and seven days after). Each day, participants were examined for respiratory symptoms by a medical professional, body temperature was recorded, nasal wash samples were collected, and the number of used tissues were counted. A blood sample was taken 28 days after the viral challenge. Participants were determined to have a clinical cold if they were infected (the virus was isolated in samples) and diagnosed as having a cold by the medical professional.

None of the saline control participants met the criteria for having a clinical cold and, thus, were not included in the analyses. Looking specifically at participants who were exposed to a virus and then quarantined alone, the researchers found that those with a higher stress levels, perceived stress, and negative affect were more likely to meet the criteria for clinical illness than participants with a lower stress index, perceived stress, and negative affect.

Please answer the following questions after reading the research summary:

What type of research is being conducted and how do you know?

What was the hypothesis?

The summary did not include information about how participants were selected. What suggestions do you have for how participants could/should be selected for this study?

What was the independent variable?

What was the dependent variable?

What was the control group?

What was the experimental group? Were there multiple conditions?

Was the hypothesis confirmed?

Can these results be generalized to a larger population? How do you know?

What are some criticisms of the study?

ANSWER KEY**What type of research is being conducted and how do you know?**

One part of the study is an experiment. I know this because the researchers manipulated which participants received one of the virus nasal sprays and which received the saline nasal spray.

Another part of the study reflects a quasi-experimental design. I know this because groups (high/low stress index; high/low perceived stress; high/low negative affect) are formed by measurement (answers to the stress and affect measures) rather than manipulation (i.e., the researchers did not assign people to high/low stress or to high/low negative affect).

What was the hypothesis?

The researchers predicted people high in psychological stress would be more likely to get sick after exposure to upper respiratory virus than people low in psychological stress.

The summary did not include information about how participants were selected. What suggestions do you have for how participants could/should be selected for this study?

Many answers are acceptable here as long as students discuss random sampling.

What was the independent variable?

Nasal spray ingredients—one of the five viruses or saline (although the results did not compare participants who received the saline to those who received a virus).

Participants were grouped based on whether they were high or low on three different variables. What were those variables?

1. Negative major stressful events
2. Perception of the ability to cope with demands
3. Negative affect (emotions)

What was the dependent variable?

Clinical cold

What was the control group?

The group that received the nasal spray with saline.

What was the experimental group? Were there multiple conditions?

The group that received nasal spray with a virus in it.

Was the hypothesis confirmed?

Yes. A higher percentage of participants with high levels of stress, high perceived stress, and high negative affect developed clinical colds than participants with low levels of each measure.

Can these results be generalized to a larger population? How do you know?

The generalizability of these results to a larger population is questionable because the sample was recruited using convenience sampling rather than random sampling.

What are some criticisms of the study?

Some participants were quarantined alone and others were quarantined with one or two other participants. Participants quarantined together might have infected one another, making it difficult to rule out the impact of exposure to multiple viruses.

Source:

Cohen, S., Tyrrell, D. A. J., & Smith, A. P. (1993). Negative life events, perceived stress, negative affect, and susceptibility to the common cold. *Journal of Personality and Social Psychology*, 64(1), 131-140. <https://doi.org/10.1056/NEJM199108293250903>