Depression: What Do We Do To Treat It?

Source: Hollon, S.D., Thase, M.E., and Markowitz, J.C. (2002). Treatment and prevention of depression. *Psychological Science in the Public Interest*, 3, 39-77.

Goals:

Teach the method of proof by disproof.

Teach the significance of the information gained from a controlled experiment.

Teach the importance of recognizing potentially biased sources.

Teach the importance of random assignment.

Basic Idea:

What is depression? What are the different methods of treating it? How are specific methods of treatment selected for specific individuals? These questions are explored as we look at current research on this all-too-common problem.

Gain Attention/Interest:

Vignette

Karen is walking down the hallway and sees one of her friends, Beth, looking sad, and asks her what's wrong. Beth replies by telling Karen that she's a little depressed because she got in a fight with her mom that morning, but that "it's not a big deal." But Karen is still worried because Beth has been acting this way quite a bit recently, and her fights with her Mom are becoming more frequent. Beth always seems a little bit down.

Something like this may have happened to you or someone you know.

Depression is more common than you might think. In fact, it's the most common mood disorder in the U.S. Depression can range from a mild disruption of mood to a life-threatening, extremely serious condition.

Think & Write #1

What are your thoughts about depression? Is it a major problem? Is it an issue that only some people have to worry about?

CORNELL

www.circ.cornell.edu

NSF

Ask: What is Science?

1 Ask: What is Science?

What exactly is depression? What can we do to treat it? A nonscientist might simply be worried about helping Beth feel better by focusing solely on her relationship with her Mom. But what about the phenomenon of depression more generally? Not everyone feels depressed because of a fight with a parent. Scientists look at the general phenomenon of depression and try to figure out what can be done to help people suffering from it.

Science is not just old people in long white coats mixing potions. Much of what scientists study happens in the real world and is based on problems that real people have. For example, scientists might ask: Do young people get depressed more often than old people? Males more than females? Poor more than rich?

Say you think you know the answers to all these questions. If you don't have any support for your answers, why should someone else believe you? You need evidence for your claim. It is the job of scientists to answer these questions in a way that will convince even the most cynical of critics. To do this, scientists use a method of **proof by disproof**.

Example: Proof By Disproof

Imagine a scientist makes the claim that wealthy children don't get depressed. To support this claim, a scientist tries to disprove it by looking for examples of wealthy children who are depressed. If the scientist finds no wealthy children who are depressed, then the scientist has support for the claim. However, if depressed wealthy children are found, the scientist has proved the claim false.

Using this process, scientists try to prove themselves wrong. If they cannot prove themselves wrong, they accept their explanation for the time being. Scientists try to disprove their own answers. Although this may seem to work backwards, if scientists cannot disprove as idea, then they have found support for it.

Define the Problem: See Many Sides

First, let's define depression. A clear definition is an important aspect of science because it communicates exactly what scientists are studying.

What does depression mean to you? (Solicit responses.)

2

Define the Problem: See Many Sides.

One person might compare being depressed to "being sad." Another might think depression is "being sad for a long time." However, these definitions aren't clear and specific enough; scientists require specific, clear definitions so that everyone understands what is being discussed. Depression is difficult to define because it has many different characteristics. Additionally, the concept of depression means different things to different people.

Here are characteristics of the definition of depression that scientists use:

- having negative feelings
- a long-term loss of interest in doing things that used to be enjoyed
- pessimism (focus on the negative side of things)
- negative beliefs about self (e.g., "I'm no good at anything")
- being less productive (i.e., not doing well in school)
- difficulty sleeping
- loss of appetite
- withdrawing socially

This list is not all-inclusive or universal. A person does not need to show all of these signs to be feeling depressed. Also, just because a person is feeling or doing some of these things does not mean that she is depressed.

The complexity of depression doesn't end once we define it. Another tough question regarding depression concerns the best way to treat it. Obviously, there are a lot of different ways to look at this problem, and different people will have different thoughts. Imagine if the depressed person was one of your friends or a family member, or even yourself. You wouldn't want to have a mediocre, or average, method of treatment; you would want the very best method to make yourself feel better.

Activity

Divide the class into small groups to brainstorm different possible methods of treatment for depression. What could they or others do to help? Not all the ideas have to be perfect, just have them generate as many ideas as possible, no matter how ineffective some of them may seem. Quality is important, but in this activity quantity is the primary goal. Emphasize speed of thinking— try to have each group think of at least 5 different ideas. After giving them time to brainstorm, write each unique idea on the board and discuss the potential for implementation and helping depressed individuals. Have students remain in their groups for a later brainstorm activity.

Alternative Activity

Have students split into pairs or small groups and give the following descriptions to each group. Based solely on this information, ask would they treat the individuals the same way, or differently? Why?

Sam	*Alyson*
41 years old	*23 years old*
construction worker	*college student*
feels sad a lot	*feels sad a lot*
unhappy with life	*lonely*
unconfident	*doesn't sleep well*
many health problems	*basically healthy*

What groups of people are usually involved in the treatment of depression? How would these groups think about the topic? Solicit responses.

Doctors. Doctors want to be able to help their patients. They have often been trained to try drug treatments to help depression.

Insurance companies. Insurance companies won't cover a treatment for depression that consists of "eating pizza twice a week". They will only pay for treatments that have been scientifically found to be effective. These treatments generally involve therapy with a psychologist or psychiatrist, or medication (drugs).

Drug Companies. Companies that spend billions of dollars developing medications want people to use their drug so they can make a profit.

What about drug researchers? Do you think they would advocate the same type of treatment as the family members of a depressed person? What would differ about these two groups' respective motivation to help? (Solicit responses.)

Frequently, people who work in the drug industry have the potential to make a profit if they sell their drug. The more they sell, the more money they make. Family members of a depressed person may want whatever will best help the person who is depressed. The drug researcher's opinion may be influenced by profit potential.

BIASED SOURCE

Scientists avoid getting their information from biased sources. Groups that have the potential for making a profit depending on how the research turns out have a built-in bias. This is why scientists do their own research or get information from other scientists.

Distinguish Fact From Opinion: Learn What Constitutes Scientific Evidence

The two most common methods used to treat depression are medication and therapy. But which is better and exactly how do we figure out which is better?

Even though there are many ways to treat depression, for the sake of this discussion, let's consider medication and therapy as treatment methods for depression. (Perhaps also include some of the more popular class ideas to see how they match up.) Which helps more? To decide, scientists make hypotheses, or guesses, and gather evidence to find out whether or not their prediction was correct.

3

Fact Versus Opinion: What Constitutes Evidence?

What is evidence?

Vignette

I have a pill that will make anyone who takes it run faster than people who don't take it. I know this to be true because I gave each member of the high school track team one of my pills and they ran faster than a second group of people from Shady Oak retirement community who did not take the pill. How many of my pills do you want to buy?

Does the above example represent valid evidence?

Members of each group (track team member, residents of retirement community) did not have an equal chance of being in each group. In science, each person having an equal chance of being in either group (getting the pill or not getting the pill) is called **random assignment**. These groups are sometimes called "conditions" by scientists. Assuming members of the track team ran faster because they took a pill is not high quality evidence. It is expected that they run faster even without having taken the pill because they are younger and in shape. This is an example of how information can be misleading depending on how it is presented.

Scientists require rigorous evidence to influence their thoughts. Just because information sounds scientific does not mean that it is.

Example: Presenting Misleading Information

The advertisement, "Four out of five dentists recommend using Minty toothpaste" may seem pretty convincing that you should use Minty toothpaste. However, what happens when you see, "Four out of five dentists recommend using Freshen toothpaste"? Both can easily be correct because maybe the truth is that four out of five dentists recommend toothpastes with tartar control, and since both have a tartar control ingredient, both brands can claim that four out of five dentists recommend their product.

Activity

Have students think of examples of real products that make claims similar to the above toothpaste example and have the class analyze them. Not all claims have to be verbal, for example, a claim could be made visually.

Think & Write #2

Have students develop a better method for using the track team and people from a retirement home to test whether or not a pill makes people run faster.

Example: Controlled Experiment

Randomly select half the track team and half the retirement community members and give them the pill. The other half of each group gets no pill. Then compare running times. If those who took the pills ran faster than their peers did, then this would constitute evidence that the pill helps people run faster. You could also measure running times before and after taking the pill (have them run 100 yards on Monday, then take the pill on Tuesday and have them run 100 yards again).

Weigh Evidence and Make Decisions

Now let's apply this to how scientists define and treat depression. Recently, a group of scientists reviewed many of the research studies that investigate treating depression to try to answer our question. They looked only at studies that followed a strict scientific research design. They found that there are many types of effective treatment, though it is important to note that NONE are effective for every person in every situation. No single method succeeds in helping everyone who tries it. Depending on the individual person and the type of her/his depression, different treatments may be more or less effective. The two best methods were medication or therapy.

4

Weigh Evidence and Make Decisions.

Medication:

- Extensive research supports its effectiveness.
- As long as the medication is taken, it remains helpful.
- People sometimes stop using the medication when feeling better. This can halt benefits.
- Many medications have troublesome side effects.

Therapy:

- There are many kinds of therapy, some have been tested for their effectiveness, some aren't widely available.
- Many kinds of therapy have been found to be as effective as medication.
- Need access to a competent therapist (which can be difficult for many).

Using the best types of therapy, about 50% of the patients show signs of improvement. Using other methods leads to even less successful results. To test the effectiveness of medications, scientists have some people take a pill that does not contain actual medication; they just want to test to see if people get better if they think they are taking something that is helping them. This is frequently just a sugar pill and it is called a **placebo**. Surprisingly, 30% of depressed people who took a placebo showed signs of improvement. What could this mean?
Solicit responses. Discuss how simply thinking they are taking something that will help them can actually help people feel better.

It has also been found that combining therapy with medication can be even more effective than using just one or the other. However, how the two can best be combined is not yet known.

Think & Write #3

Now that you've heard how scientists define and treat depression, what do you think? Compare your thoughts now to your thoughts from Think & Write 1.

Move From Science to Society

5

Move From Science To Society.

If you see a friend who is depressed, what will you do? First, it's important to know that being depressed can mean a variety of things and just because a person is sad (or down) does not mean he is depressed. Also, even if a person who is depressed is getting help, it does not mean that she will be "cured". Next time you see an advertisement for something that guarantees improvement for everyone, what will you think?

Knowing the most effective methods of treatment for depression can help people (friends, family members, self). Knowing the facts about depression is also important for people in a lot of different careers.

Insurance Company Employee. Insurance companies must decide whether or not a treatment will be covered by insurance. Insurance companies employ a variety of employees that help determine these decisions.

Therapist/Counselor. Therapists help patients who can be depressed. Therapists attend four-year colleges and then attend graduate or medical school.

Drug Researcher. People who conduct drug research make new medications that attempt to better serve those who need them. Drug researchers typically attend four-year colleges and then graduate or medical school.

School Psychologist/Guidance Counselor. School psychologists and guidance counselors work with students who may be depressed and could be a gateway to helping students get professional help. School psychologists attend four-year colleges and often some graduate school.

Pharmacist. Pharmacists sell and distribute medications. Pharmacists attend four-year colleges and pharmacy schools.

Revisit, Review, Reflect, and Re-evaluate

With treatments succeeding in only about half of all depression cases, it is clear that there is still significant work to be done. Scientists continue to reflect on depression and revisit and review previous work to help improve future work with depression. New medications are constantly being tested with hope that they will better assist people suffering from depression. Additionally, scientists are persistently re-evaluating past answers and seeking new, more effective methods of therapy. Scientists do not simply attack a problem, find the best answer, then move on; they persistently return to the same problem in search of even better potential answers.

6

Revisit, Review, Reflect, and Re-evaluate.

Think & Write #4

Have students write their thoughts about the direction they think scientists should take in the future. Should scientists focus on ways to improve treatment?

Discussion Questions

1. We discussed how scientists have found that the best treatments for depression have a 50% success rate. Is a 50% success rate good or bad?
   Some differing points of view: A sports team that wins 50% of its games probably isn't considered "great", but a treatment that helps 500 of 1,000 participants is much better than no treatment at all.

2. Should more effort be put toward prevention of depression? What are the costs and benefits focusing on treatment or prevention of depression?

Homework Questions

1. Without giving them any of the information you learned in this lesson, ask three people what they think about how to treat depression. Then see how their thoughts are influenced once you tell them what you have learned.

2. Defining terms is an important part of science. Think of two problems that people your age might have (e.g., being too busy, feeling peer pressure). Make a list of components that compose these problems and develop a scientific definition for them.

Quiz Questions

Version A

1. Imagine that there are two different toothpaste companies, Minty and Freshen. Which of the following is the most reasonable explanation of how can 4 out of 5 dentists recommend two different brands?

    a. Each company only chose 5 dentists, and in the first case 4 of them happened to recommend Freshen, and in the second instance 4 of them happened to recommend Minty.

    b. One of the companies is lying.

    c. Both could be correct because maybe the truth is that 4 out of 5 dentists recommend toothpastes with tartar control and both Minty and Freshen toothpastes have that ingredient.

    d. None of the above.

2. Below is a design to test whether or not taking a pill makes people run faster. What is the mistake that would keep scientists from being able to make a scientific conclusion?

    Give each member of the high school track team a pill and see if they run faster than a second group of people from Shady Oak retirement community who did not take the pill.

Quiz Questions

Version B

1. Below is a design to test whether or not taking a pill makes people run faster. Rewrite it without the mistake that keeps scientists from being able to make a scientific conclusion.

> Give each member of the high school track team a pill and see if they run faster than a second group of people from Shady Oak retirement community who did not take the pill.

2. Using the best types of therapy, about 50% of patients show signs of improvement from depression. Is a 50% success rate good or bad? Explain in a few sentences.

3. Imagine that there are two different toothpaste companies, Minty and Freshen. How is it possible for these two different toothpaste companies to advertise that four out of five dentists recommend using their toothpaste?

Quiz Questions

Version C

1. In some communities, fluoride is added to tap water in order to promote good dental health. If extensive research supports the effectiveness of medication to treat depression, should it be given to entire groups of people at risk, such as adolescents or the elderly?

2. Re-write the following experiment so that it has three different kinds of mistakes in it. For example, one mistake would be having people run 100 yards on Monday and 200 yards on Tuesday. Underline each of the three mistakes and explain why they are mistakes.

> Randomly select half the track team and half the retirement community members and give them the pill. If those who took the pills ran faster than their peers, then this would constitute evidence that the pill helps people run fasters. You could also measure running times before and after taking the pill (have them run 100 yards on Monday, then take the pill on Tuesday and have them run 100 yards again).

3. Using the best types of therapy, about 50% of patients show signs of improvement from depression. Is a 50% success rate good or bad? Explain in a few sentences.