

HEALTH LITERACY: A TWO-WAY STREET

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AGE: 11



ROHAN

AGE: 15



SAHANA

AGE: 11

Health information spreads quickly these days, but not all of it is true. That is why it is important to build your health literacy—your ability to find and understand evidence-based health information. When you learn the basics of health topics, it is easier to tell fact from fiction. Understanding science also helps you trust experts like health professionals and scientists. You can boost your health literacy by staying informed, learning how science works, and double-checking new information with knowledgeable and trusted sources. Health experts have responsibilities, too. They should try to explain things clearly using simple words, make themselves available to answer questions, and share their work openly. The more the public understands science, the more they will trust good health advice. If you can learn from reliable sources and make smart choices to the best of your ability, you can help to keep yourself and your community healthy. Working together to increase health literacy can improve lives. Keep reading, asking questions, and learning—a healthy future starts with you!

UNDERSTANDING CAN BOOST TRUST

Imagine you see a new post from your favorite social media influencer saying that spinach is unhealthy. Wow—maybe you now have an excuse not to eat it the next time it shows up on your dinner plate! But you also know that the influencer is not a scientist or health professional, and he did not say *why* spinach is bad... so can you trust what he said? After all, you have always heard that spinach is good for you. The next day in school, you ask your science teacher if she has heard this new spinach rumor. She explains that spinach contains a substance called oxalic acid. In very large amounts, this substance can prevent the body from absorbing minerals properly—however, you would have to eat over two *pounds* of spinach *every day* for that to happen! So, she says, enjoying spinach in normal amounts is perfectly healthy and provides important nutrients, like iron.

Even if you *would* like to avoid eating your spinach, who are you more likely to believe: your science teacher or the influencer? If you chose your teacher, your choice probably came down to two main factors: knowledge and trust. Your teacher gave you important knowledge about spinach—she took the time to explain the details so that you understood where the influencer’s claim came from. You also recognize that, unlike the influencer, your teacher has a background in science and knows what she is talking about. You trust her and remember that she has given you correct information in the past.

As you can see, having knowledge about a health-related topic and trusting health information (and health experts) go together. Building knowledge and trust is a two-way street: we have a role to play by learning all we can, but scientists and health professionals such as nurses, doctors, dentists, dieticians, and others have responsibilities, too. In the rest of this article, we will describe why it is important to trust science and how our knowledge of health-related topics can boost our trust in expert advice, helping us to make the best possible health decisions. We will explain how you can improve your health literacy, and the important things that scientists and health professionals can do to help people build this knowledge and trust.

WHY IS IT IMPORTANT TO TRUST SCIENCE?

Why is it so important to trust science in the first place? Maybe that is easiest to understand by looking at an example of what can happen when people do *not* have this trust.

During the early stages of the COVID-19 pandemic, there was a huge amount of information about the disease. You may have seen news stories and social media posts, or heard things your classmates said, or things adults were talking about. Some of the information was helpful

INFODEMIC

When false information and rumors spread very quickly online and in the news, making it hard to know what is true. It is like a disease outbreak of bad information.

VACCINE HESITANCY

When people do not trust what health experts say about vaccines, so they are unsure or hesitant about getting the shot. This can put themselves and others at risk of getting sick.

HERD IMMUNITY

When enough people in a community are vaccinated that a disease cannot easily spread. Even people who cannot get vaccinated are protected because there are no infected people to transmit the illness.

but some of it was incorrect or was even dangerous. The information came so quickly that it came to be called an **infodemic** [1]. Just like a pandemic, in which a disease spreads very quickly, an infodemic is when information and rumors spread so fast that it is hard to know what is true. Some of the false information scared people, such as rumors claiming that the vaccines did not work, were unsafe, or even that they contained microchips that could track people. Scary rumors that spread during the infodemic contributed to **vaccine hesitancy**, which is when people do not trust what health experts tell them about a vaccine, so they are unsure (or “hesitant”) about getting the shot. Vaccine hesitancy is not limited to the COVID-19 pandemic—some people choose not to get vaccines that could protect them against other dangerous diseases, too [2].

Lack of understanding or trust in science can also show up in other health behaviors. For instance, during the COVID-19 pandemic, some people did not believe it was important to wear masks or follow social distancing guidelines. Beyond COVID-19, people who do not trust the guidance provided by health experts might choose to participate in unhealthy or risky behaviors like smoking or unprotected sex, or they may refuse to get checkups, cancer screenings, or other types of medical care, even if that care is readily available. Overall, public trust in science is critical for keeping people healthy.

HEALTHY PEOPLE MAKE HEALTHY COMMUNITIES

Not all people have the option to make choices about things that affect their health, like what they eat or whether they get vaccinated. Many people live in areas with limited access to healthcare or may not be able to afford healthy food, for example. But even people who *do* have those options might not make the healthiest choices. You might be thinking, “So what? If some people do not want to get vaccinated or wear masks, or if they choose to smoke, that is their decision!”. However, some people feel that certain health-related decisions go beyond personal choice because we have a responsibility toward others in society. For example, when most people in a population can and do get vaccinated, something called **herd immunity** can happen [3]. This means that enough people are protected from catching or spreading the sickness that it cannot grow out of control. Herd immunity keeps vulnerable people safe, like the elderly or those who are too sick or too young to be vaccinated. Vaccination and other precautions like masking and social distancing can help get a pandemic like COVID-19 under control. One human disease, smallpox, has even been completely eliminated because enough people got vaccinated [4].

When many people in a community are sick, the whole society can suffer. People might be too sick to go to work, and businesses could struggle if there are not enough healthy workers or customers.

HEALTH LITERACY

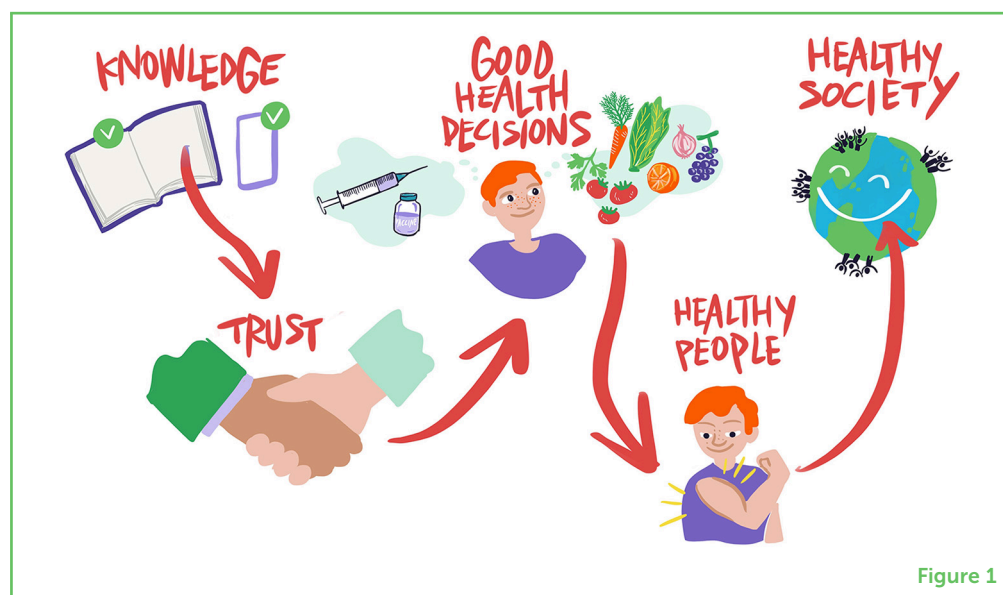
The ability to find, understand, and use information to make good choices about your health. When you are health literate, it is easier to know fact from fiction when it comes to health info.

Figure 1

Health literacy is important because it can help to keep the whole world as healthy as possible. The more we understand about health-related topics, the more we can trust the health advice that experts give us. When healthy options are available, trust can lead to good health decisions, such as getting vaccinated, going for regular checkups, and eating healthy foods. Healthy choices make healthy bodies—and when there are many healthy people around, it is easier for entire societies to be healthy, happy, and productive. Figure created by carlottacat.com.

Hospitals can become overwhelmed trying to care for too many patients at once, as happened early in the COVID-19 pandemic. Kids might miss more school days and could fall behind in their education. And the economy might suffer too, as healthcare costs rise, and people spend less money at local stores and restaurants because they do not feel well. In some cases, the impacts can really add up, making day-to-day life harder for everyone.

So, the more we understand about science, the more likely we are to trust the good advice that health experts give us. When we have healthy options available to us, a better understanding could lead to better personal health decisions—which could combine to keep whole societies healthy and functioning well (Figure 1). The ability to find, understand, and use scientific and health-related information to make informed decisions about health is called **health literacy**. There are two sides to increasing health literacy: there are things the public can do, and things that scientists and health professionals can do. Both sides have important roles to play in this critical goal (Figure 2).



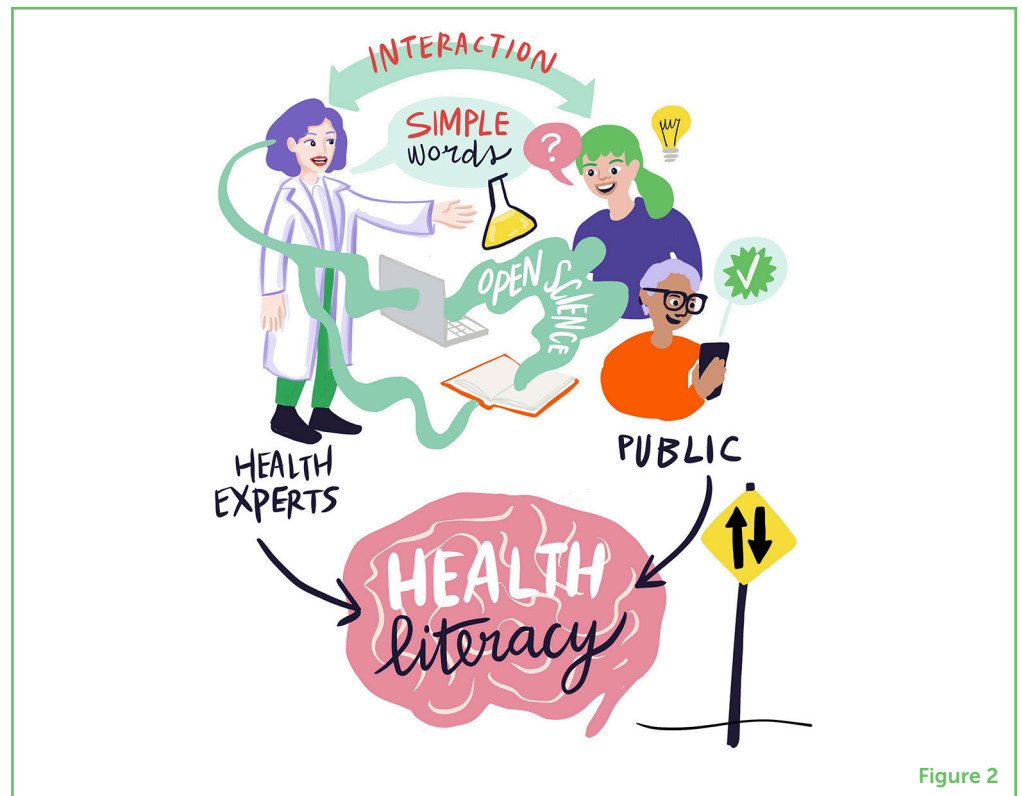
WHAT CAN PEOPLE DO TO BOOST HEALTH LITERACY?

People can work on their health literacy at any age, but starting young is especially helpful. To become health literate, we must use whatever resources we have available to learn at least the basics of health-related topics. While some kids might find science topics intimidating, there are lots of easy ways to boost health literacy. Here are just a few:

- **Stay informed.** Exploring reliable websites, podcasts, books, and magazines written by scientists, doctors, or other health experts is a great way to learn about health and science. Some great

Figure 2

Increasing health literacy, which can improve trust in science, is a two-way street. Both health experts and the public have responsibilities. Kids, you can boost your health literacy by staying informed: learn as much as possible about both health-related topics and about the way science works. Also, be sure to verify information. Health experts, be sure to communicate clearly, using simple words and images to make topics easy to understand and interesting. Make yourselves available to the public so people can get to know you and ask questions. Practice open science so that your work will seem less mysterious. Figure created by carlottacat.com.

**Figure 2**

resources include [Your Life, Your Health](#), [MedlinePlus/MedlinePlus en Español](#), [MedlinePlus tutorials](#), [BAM! Body and Mind](#), [HHMI Biointeractive](#), [Crash Course Biology/Crash Course Biología](#), [The Walking Classroom](#), the [Diverse Voices in Health and Medicine Collections toolkit](#), the [National Library of Medicine Bookshelf](#), and [Frontiers for Young Minds](#). You can also ask your parents, teachers, and health professionals any health questions you might have. Adults can often help you to better understand health and science topics, so you can make sure you are doing the right things to stay healthy.

- **Understand how science works.** Health literacy also involves understanding how science works. Science is an ongoing process of learning and discovery, and sometimes it is a little messy. What scientists “know” about a topic can change as they gather more evidence and do more research. Think back to the early months of the COVID-19 pandemic. At first, scientists were still figuring out how the virus spreads and how to best protect people. As they learned more, suggestions about things like wearing masks changed. This frustrated some people who thought scientists did not know what they were talking about, but that is just how science works—as scientists make new discoveries, they update their recommendations. When guidelines or ideas change, it does not mean the experts are wrong or cannot be trusted. It means our understanding is improving thanks to new research.
- **Check your information.** Being health literate means keeping an open but critical mind as the evidence develops. When you

hear or see new health-related information, be curious and investigate to make sure it is true. Ask an expert (like your science teacher) or try to verify the information using more than one trustworthy source, like well-respected health websites from hospitals, research institutes, and government agencies, or science and health articles from major journals or newspapers.

HOW CAN SCIENTISTS AND HEALTH PROFESSIONALS BOOST HEALTH LITERACY?

In our earlier example, remember how your science teacher took the time to explain the science behind the spinach rumor? In the same way, scientists and health professionals have a key role to play in making sure as many people as possible can understand health-related topics. Here are some things these experts can do to help gain the public's trust and increase health literacy:

- **Build communication skills.** Many scientific concepts are complex, so health experts must often use precise, technical terms that may sound really complicated. But this does not mean these topics are impossible for non-experts to understand. Health experts should learn how to explain health and science topics simply, using easy words. Experts can create fun science videos, books, comics, websites, or apps, including colorful illustrations or animations, that make learning about health and science fun and exciting. The more “public friendly” health and science information is, the more people will learn about the topics.
- **Be available and down to earth.** Sometimes, experts like scientists and health professionals can seem a little intimidating to the rest of us because they have so much specialized knowledge. But they are people just like us! To help us get to know and trust them, scientists and health professionals can visit schools and libraries to talk with kids about important health topics and answer kids' questions in person. They can also organize fun events where kids and their parents can do cool science experiments or learn about staying healthy through games and activities. When people feel they can trust health experts, they are more willing to follow expert advice for staying healthy.
- **Support and practice open science.** By making their data and experimental methods available to the public and publishing their work in journals where anyone can read it for free, health experts can help people to understand health-related topics *and* the way science works. **Open science** gives people a “window” into the scientific process, allowing them to see how ideas can change based on evidence, which can make science seem less mysterious and increase people's trust. In this way, open science can help to fight misinformation so that it is easier for

OPEN SCIENCE

When scientists share their data and methods freely, so anyone can understand how they do research. This openness helps people learn about and participate in science and builds trust.

people to make informed decisions about their health. For more information on open science, see [this article](#) in this Collection.

KNOWLEDGE IS POWER

Many factors can influence people's trust in science, including awareness, religion, political beliefs, education, and personality traits, but knowledge is one very important aspect. Health literacy is critical for the health of both people and whole societies. When people understand health-related topics, they can make smarter choices based on the options available to them—choices that can help to keep themselves and their communities safe and functioning.

But knowledge is power only if it comes from reliable sources. Kids, make sure to keep learning about science and health from experts you trust. Ask questions, dig deeper, and verify information. Do not be afraid to admit when you simply do not know something—being curious is great! And remember to help boost the health literacy of your friends and family by sharing the interesting things that you learn. Health experts, keep communicating openly. Simplify complex topics and make learning interactive. The more the public knows about your work, the more they will understand and trust you.

We all have a role to play in boosting health literacy. When people are empowered with knowledge, it improves lives, strengthens communities, and benefits society. So, keep reading, asking, sharing, and learning. Together, we can build a future of trust, understanding, and health for all!

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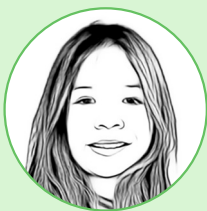
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YOUNG REVIEWERS



LAUREN, AGE: 11

I am 11 years old and really like science, especially physics and biology. My hobbies include track and field, writing, reading, and chess. I also enjoy programming, geography, and exploring new places. I live with my parents, my little sister, and my two cats.



ROHAN, AGE: 15

Rohan is a high school student with a passion for medical innovation. When not learning about medical technology he can be found listening to a diverse musical catalog or attempting free-throws on the basketball court. He is excited to serve as a young reviewer and help promote scientific education for the next generation of leaders.



SAHANA, AGE: 11

I like science, especially chemistry. Now that I am in 6th grade, I also like biology. I love going off track while doing experiments and reading about what happened. I sometimes experiment on my dog.

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Susan Debad has been the main editor for FYM since 2015, making all our science clear and interesting—so that nobody feels it is “boring” or “too hard.” She has a Ph.D. in viral immunology (how the immune system protects us against viruses). Susan lives outside Washington, DC, and has a teenage son, two birds, and four dogs. She fosters beagles and helps them to get adopted, which means that sometimes she has more than four dogs! In her spare time, she enjoys reading, crossword puzzles, and being outdoors. *susan@sjdconsultingllc.com



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