RESEARCH INSIGHTS

Can a Smartphone App Teach Users about Air Pollution and Help Them Avoid It?

Training university students on the use of a smartphone app that displays real-time information on air quality increased their acquisition of information about air quality, knowledge about avoidance behavior, and actual avoidance behavior.

The training also increased participants' concern about other environmental issues.

Participant characteristics moderated the effects of the training; for example, the training was generally less effective among jobholders.

CONTEXT

Ambient air pollution is a leading cause of death in developing countries. In theory, disseminating real-time air pollution information via "personal" information and communication technologies (ICTs) such as smartphone apps and text messages could boost avoidance behavior like wearing face masks and closing windows. Yet evidence on the effectiveness of such ICTs is limited.

Key Concept

AVOIDANCE BEHAVIORS

Actions like wearing a face mask or closing windows that reduce the negative health effects of exposure to pollution.

PROJECT

We conducted a randomized controlled trial, randomly assigning a sample of 578 students in Bogotá to either a control group or a treatment group that received an information session—on air pollution, avoidance behaviors, and the air quality app—along with an invitation to participate in a six-week interactive email campaign designed to habituate them to using the app. A baseline survey, which was administered in person in March 2020 just before the information session, and an endline survey, which was administered remotely three months later, collected information on sociodemographic characteristics and a range of behavioral and attitudinal outcomes.

RESULTS

We find that training in the use of the air quality app boosted participants' acquisition of information about air quality, knowledge about avoidance behavior, actual avoidance behavior and concern about other environmental issues. With regard to the acquisition of information about air quality, the training increased by 84 percentage points the probability of having the air quality app installed on a device and by 29 percentage points the probability of using the app to search for air quality information.

As for knowledge about avoidance behavior, the training increased by 3 percentage points the probability of knowing that changing some aspect of one's behavior can reduce the adverse health effects of air pollution and it increased by 9 to 31 percentage points the probability of knowing about specific avoidance behaviors.

Regarding actual avoidance behavior, the training increased by 9 percentage points the probability of having changed any behavior in the past two weeks as a result of poor air quality. It increased by 5 percentage points the probability of having worn a mask with a filter in response to poor air quality and by 7 percentage points the probability of having closed windows.

The treatment also enhanced participants' concern about other environmental issues. It increased their level of concern about hazardous waste by 0.19 Likert points [0–4 scale], boosted their concern about water pollution by 0.14 Likert points [0–4 scale] and cut by 8 percentage points the probability that they believed that pollution was a necessary trade-off for fostering economic growth.

Finally, we find that the effects of the training were moderated by participant characteristics. In particular, we find that among students who were also jobholders, it was less effective in increasing use of the air quality app, actual avoidance behavior, and air quality warnings.

POLICY IMPLICATIONS

Our findings have several policy implications. First, they add to the growing evidence that ICTs providing real-time information on air quality can help reduce exposure to pollution. More specifically, they suggest that training in the use of smartphone apps may be an effective means of reducing exposure in developing countries, where air pollution has the most severe effects on human health and where prospects for reducing emissions in the short to medium term are arguably most limited. Second, they provide some evidence that training in the use of air quality ICTs can have spillover effects on people's attitudes about other types of pollution and environmental quality in general.

Key Concept

AIR QUALITY SMARTPHONE APP

A smartphone application that display real-time information on air quality at a specified location.

Key Concept

RANDOMIZED CONTROLLED TRIAL

An experimental evaluation of an intervention in which the sample receiving the intervention is selected at random from an eligible population.

Figure 1. Treatment Effects on Avoidance Behavior Knowledge and Actual Avoidance Behavior

Knowledge
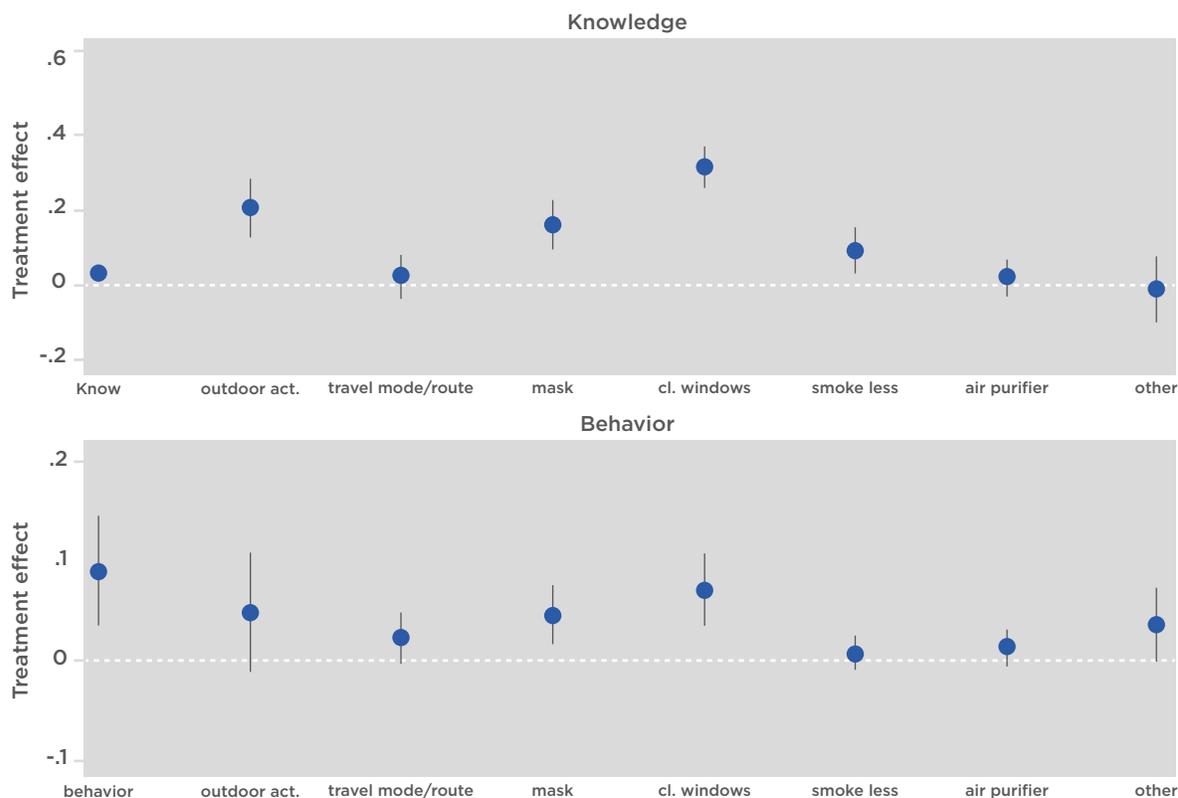
Behavior

Note: Training in use of air quality smartphone app boosts knowledge about avoidance behaviors (top panel) and actual avoidance behaviors (bottom panel); the first effect on top left is the probability of knowing that changing one's behavior can reduce adverse health effects of air pollution and remaining effects are knowing that changing specific behaviors can do that; the first effect on bottom left is probability of having engaged in any avoidance behavior in past two weeks and other effects are the probability of having engaged in specific behaviors; dots are effect estimates and whiskers are 90 percent confidence intervals.

📘 **FULL STUDY**

[Blackman, Allen, and Bridget Hoffmann. "Breathe Easy, There's an App for That: Using Information and Communication Technology to Avoid Air Pollution in Bogotá."](#)

DEPARTMENT OF RESEARCH AND CHIEF ECONOMIST

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