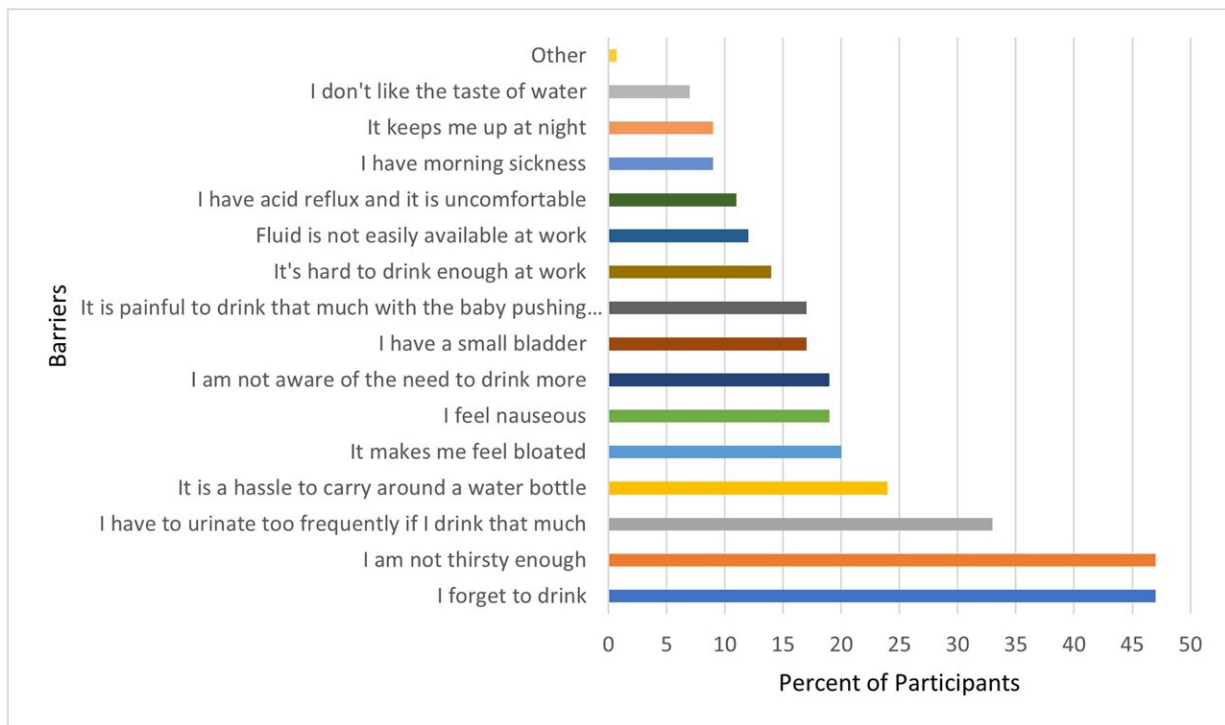


Pregnant women may not be drinking enough water, researchers report

August 13 2024, by Aaron Wagner



Barriers to meeting fluid intake guidelines (N = 137). Credit: *PLOS Digital Health* (2024). DOI: 10.1371/journal.pdig.0000499

Maternal under-hydration during pregnancy is associated with a range of negative birth outcomes, including low levels of adequate amniotic fluid and plasma, disrupted fetal brain development and risk of low birth weight, according to guidelines from the American Pregnancy

Association and The American College of Obstetricians and Gynecologists.

An interdisciplinary research team from the Penn State College of Health and Human Development recently found that, despite the risk, many [pregnant women](#) in the United States do not know how much water they should consume and were not tracking their water intake.

The study also indicated, however, that women were willing to follow guidelines and use [digital technology](#) that could help them track their hydration status and meet water consumption goals.

Pregnant women should be consuming between 1.9 and three liters of water every day, according to national guidelines. The recommendations for individual women vary based on the women's weights, how far they are into their pregnancies, their physical activity levels and even the climates where they live.

Danielle Symons Downs, professor of kinesiology and of obstetrics and gynecology, and Abigail Pauley, a postdoctoral fellow in Downs' research group, led a survey of 137 pregnant women in the United States.

Results of their study—recently [published](#) in *PLOS Digital Health*—demonstrated that nearly two-thirds of women were not meeting and/or unaware of hydration recommendations. Around the same percentage of women said they were interested in using [digital tools](#) to increase their fluid intake.

"Pregnant women do not need to panic about hydration, but it is important to consume enough fluids," said Downs, associate director of the Penn State Social Science Research Institute.

"Hydration is important to the health of both the mother and fetus—especially as the pregnancy progresses into the second and third trimester when women need more water to form amniotic fluid, carry nutrients, and enhance digestion. Our prior work has also shown that hydration levels can impact fetal birth weight."

Study participants were recruited on social media from around the United States. Participating pregnant women completed a one-time, 45-minute survey about their water intake and related water-intake behaviors. Results showed that 63% of the women were not aware of hydration guidelines and 67% were not meeting the recommendations.

When asked about why they might not be drinking enough water, the most common responses included lack of thirst, forgetting to drink water and not wanting to increase the frequency of urination.

"Overall, these results point to a gap in the messaging we provide to pregnant women and in the awareness of expecting mothers," Pauley said. "Fortunately, our other results showed that there might be a low-cost and low-burden way to address the problem for many women."

Women in the study were open to using digital technology to improve their water intake, according to the researchers. Sixty-nine percent said they were willing to try using a digital tool, and 67% said a smart [water bottle](#)—a water bottle that measures the volume of water consumed during a day and reports that data to a smartphone app for tracking—could help them meet fluid intake guidelines.

"Our collaborator, David Conroy, conducted a study that successfully used smart water bottles to encourage fluid intake among people with [kidney stones](#), which led us to consider this approach with pregnant women," Downs said. "The results of both that study and this research suggest that smart water bottles may be an effective tool for promoting

[water intake](#) among pregnant women."

Pauley said she was also optimistic.

"People love the Stanley Cup craze," Pauley said. "A smart water bottle could be viewed as new and fun to use to increase fluid intake. The pregnant women in our study were very receptive to the idea."

Despite the knowledge that maternal under-hydration can negatively affect fetal growth, little data has been collected to date on the specific risks to pregnant women if they do not meet hydration guidelines. The current research is part of Downs' larger Healthy Mom Zone study, which is developing a personalized, digital intervention that adapts to each pregnant woman's needs.

Downs said that the Healthy Mom Zone team intends to measure how much impact hydration levels have on maternal and fetal health as part of a future study.

"The United States has the highest birth morbidity and mortality rates of any high-income nation in the world," Downs said. "We are building the tools that will help us better understand why that is true and offer strategies to address key gaps in order to improve birth outcomes for women and infants."

More information: Abigail M. Pauley et al, Every sip counts: Understanding hydration behaviors and user-acceptability of digital tools to promote adequate intake during early and late pregnancy, *PLOS Digital Health* (2024). [DOI: 10.1371/journal.pdig.0000499](https://doi.org/10.1371/journal.pdig.0000499)

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