Conversational AI technology improves sexual and reproductive health education, study finds

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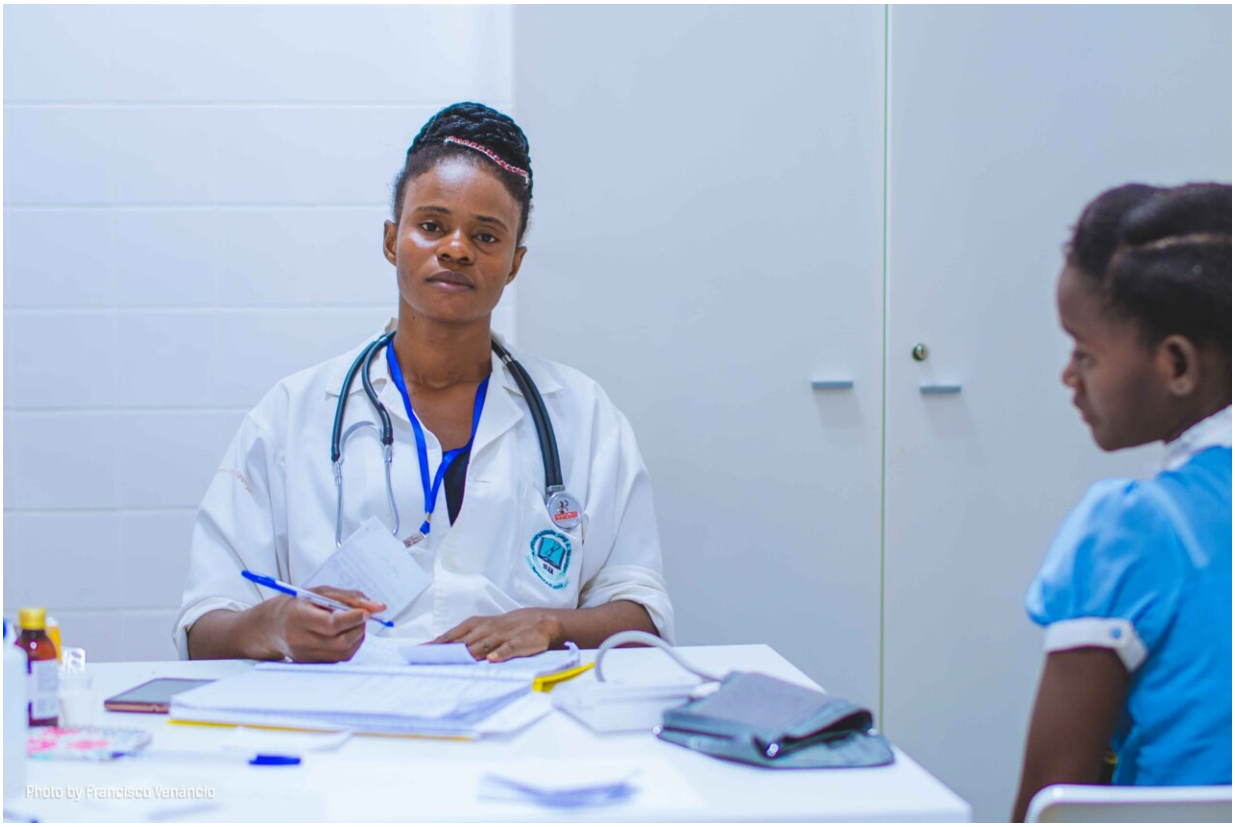

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Young women worldwide face problems like unwanted pregnancy and sexually transmitted infections. The 1.8 billion adolescents and young

people (age 15-24) of both sexes worldwide account for 42% of new HIV infections.

Providing sexual and reproductive health education to young women is a priority in Sub-Saharan Africa, where 80% of young people globally living with HIV reside. Lesotho, a poor mountainous country in southern Africa, has the second-highest HIV prevalence in the world at nearly 23% of the population. The country is challenged by critically low numbers of health care personnel and a terrain that makes face-to-face interactions difficult.

In a study published in *BMC Global and Public Health*, researchers from the Boston University Chobanian & Avedisian School of Medicine, collaborating with Northeastern University, University of Massachusetts Chan Medical School, University of Oklahoma and South Africa's Sefako Makgatho Health Sciences University, have used conversational AI technology to successfully disseminate sexual and reproductive health information.

"Our results support the use of e-health solutions to address the challenges of providing high quality, evidence-based health education to young women in low-income countries where this education is needed most," said study lead and first author Elizabeth Nkabane Nkholongo, Ph.D., and the executive director of the Lesotho Boston Health Alliance (LeBoHA), a partnership between BU's medical school and the Lesotho Ministry of Health.

"In Lesotho, it could even lead to e-health 'leap-frogging' face-to-face health education," added Nkholongo.

People are familiar with the technology known as chatbots, but AI-empowered embodied conversational agents (ECA) go further in engaging the user with software technology that creates a screen persona

that can mimic interactions with real people by conversing in the natural language of the target audience along with familiar gestures and other body expressions.

In the Lesotho study, researchers adapted an ECA model known as "Gabby" that had been used successfully to disseminate sexual and reproductive health information to African American women in the U.S. The Lesotho model employed the hairstyle, complexion, facial expressions and mannerisms recognizable to young Lesotho women and built the persona of Nthabi, a professional nurse midwife.

In this case, the choice of ECA technology was possible due to the rapid diffusion in Lesotho of mobile technologies like smart phones and tablets. Researchers constructed a Nthabi app that could be downloaded to mobile devices without relying on the country's spotty Wi-Fi coverage.

To analyze Nthabi's effectiveness, researchers recruited 172 young women with a mean age of 22.5 years to use the app. They measured participant knowledge before and after their discussions with Nthabi on family planning, folic acid use (a B vitamin important in preventing birth defects of the brain and spinal cord) and healthy eating. The number of correct pre- and post-test responses were then compared.

"Young women enrolled in this study demonstrated a significant increase in knowledge about family planning methods and preconception of folic acid use after interacting with the Nthabi," the report concluded. For example, the total percentage of correct answers to questions on the use of folic acid rose from 45.3% in testing before the use of Nthabi and 71.6% in post-use testing.

According to the researchers, Nthabi might help overcome the barriers inherent in traditional face-to-face education, especially in areas like

Lesotho that have fewer health care workers and tough geographic challenges, but also to counter the stigma surrounding discussion of sexual reproductive health issues.

"The potential of utilizing Nthabi as a population health education tool is a game-changer as the world works towards achieving Universal Health Coverage," said LeBoHA President Brian Jack, MD, and BU professor of family medicine.

More information: Elizabeth Nkabane-Nkholongo et al, Change in sexual and reproductive health knowledge among young women using the conversational agent "Nthabi" in Lesotho: a clinical trial, *BMC Global and Public Health* (2024). DOI: 10.1186/s44263-024-00091-0

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