

# Telehealth User Experience of Female College Students

## ABSTRACT

Telehealth uses technology to give users easier access to healthcare, public health, and health education. We conducted an interview study with 18 college students to better understand how people use smart application technology and how the technology can improve an individual's health. Students were asked to test out a telehealth application, Maven Clinic, and give their feedback. Most of the student participants expressed their concerns about privacy after using the virtual tool to discuss their healthcare. We also asked about their previous telehealth experiences where a fair number of students had used one previously while the other participants did not. Their reasons for not using healthcare applications included: time, dedication and the user input requirements. Overall, the general consensus has they had a good experience with the Maven application. Participants were able to give a service comparison between in-person healthcare appointments and online telehealth services. For most, they would recommend it to other students and colleagues. Participants provided feedback and recommendations on how to tackle privacy and security concerns and how to better improve telehealth applications.

### Author Keywords

telehealth; female, college,; college, students; telecommunications; telemedicine; mHealth.

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H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous

## INTRODUCTION

Technology has been playing an evolving role in provision of remote health services and is an active area of research in the fields of information technology and human-computer interaction among others. Telehealth is an innovative way to monitor and examine one's health by connecting with a medical professional remotely. It's an unconventional way to manage healthcare, as traditional methods have mainly been face to face.

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Telehealth is certainly not new: it has been unseeingly in use since the 19th century (3). Early on, physicians learned that a phone call could reduce and replace unnecessary patient visits (3). Then, during the mid-20th century, NASA became acquainted with using technology to help remotely monitor the physiological functions of their astronauts (3). Today, amidst the prevalence of smart phones, there are many recognizable health applications (apps) that the average person can use but it is still far from being a mainstream technology.

In order to understand how young adults, feel about telehealth, an interview study was conducted with 18 female college students ages 18 to 26. Participants in this study downloaded and used the telehealth application, Maven Clinic. During the interviews and in the subsequent analysis, the authors were able to see clear ideas of how telehealth can play a role in college students' lives.

Our findings indicated that college students are open to using telehealth applications to monitor and manage their health. Surprisingly, they are more likely to feel more comfortable with an online healthcare provider than in person. For college students, the convenience of time and location is considerably appealing and would have them refer other students to this service. In the subsequent sections, we describe participants' opinions about their general health, health applications, and their overall experience using Maven Clinic.

## WHAT IS TELEHEALTH?

Telehealth is a means and method that aims to improve health care access, public health, and health education through the use of technology, especially telecommunications (2). It uses these servers to provide virtual medical advice, health information, and education services. It can provide health in a variety of different ways; answering questions, prescribing medication, and following up post operation for individuals. It also allows for more access to healthcare at times that may be more convenient for both the provider and the patients. The app is virtually available to anyone with internet and a tablet, computer, or smartphone.

We chose to use Maven Clinic, an online clinic dedicated to connecting women users with different health care providers and specialists at a variety of times. (9)

## **COLLEGE STUDENTS**

College students are considered one of the busiest but relatively healthiest populations (8, 10). They lead lives with minimum hospital stays and physician visits all the while being under school and social stresses. These students are more likely to procrastinate a doctor's visit, eat unhealthily, exercise less and face a demanding workload (5, 8).

Students tend to get non-emergent sicknesses that cause them to miss classes. Of these students, 22% end up dropping a class, stop working on a major project or cause them to receive a lower grade (8). It doesn't help that students living away from home don't have easy access to their healthcare providers. In instances like these, many students respond by going to costly urgent care clinics or making an emergency room visit when their student health services are closed for the day (10).

It has become common for people to use the internet to seek out healthcare information. About 50% of all adults use the internet to search about healthcare information (13). Of this, young adults, aged 18 to 29, make up about 66% of this population (13). This makes them the highest group percentage to search online for health information.

Telehealth services can be used as an adjunct to student health services. Its flexibility with time allows students not to have to worry about missing class (10). Students can receive professional medical advice and personal consultation at an affordable price outside of the normal student health service hours (8). The use of telehealth services gives convenience with no less privacy and no less quality of service while saving time and money. Telehealth has the ability to provide students with systems that work efficiently and conveniently.

Telehealth marketers are specifically interested in college students because of their relatively healthy population and technological savviness (4, 10). Today, college-adults are on their smartphones and tablets for over 4 hours per day (11). One of the many benefits they can receive from this technology-infused generation is to track and monitor one's health.

Based on the interviews, we were able to get real-life college students to give feedback on their personal experience with a telehealth application specifically tailored to women.

## **WOMEN IN HEALTHCARE**

The authors chose to interview female college students' experiences because of an understated health gap. Most research studies have a significantly higher percentage of men participants than women participants (6). These studies are used to make guidelines for women even though they were not the focus group (6). Thus, to ensure proper target recommendations we used women as our focus group.

According to an interview with Katherine Ryder, Maven Clinic's founder, women are the backbones of healthcare decisions in the United States. Women have about an 80% control of the decisions made in the healthcare (12). Maven Clinic's purpose is to support and help these women navigate this elaborate healthcare system (12). The use of technology to video conference healthcare professionals in an accessible way for women is very empowering.

## **METHOD**

We conducted an interview study with 18 female college students from New Jersey Institute of Technology after IRB approval. Initial participants were recruited through emails to two populations. The first population was Albert Dorman Honors College students, who have above average academic records and service commitments. The second population was to female students on campus through the Murray Center for Women in Technology, a center that supports female students. We also utilized snowball sampling, whereby participants were asked to share the email with other female college students.

Participants who were interested in a 30-minute interview were sent an access code for a 25-dollar credit to use on the Maven Clinic application and website. They were required to perform one video conference session of their choice. Once completed, an interview was carried out.

Table 1 describes the demographics of the participants including their school year, major, and categories they chose their health care provider from. Our participants all identified as female and were current college students. They were predominantly white and Asian, though there were a variety of ethnicities. Participants were college students mainly majoring in biology or engineering. These participants mostly used their video conference for nutrition and general health with a few participants using it for mental health.

Participant No.	Age	School Year	Major	Ethnicity or Race	Categories
1	20	Junior	Biology	White	Nutrition
2	18	Freshman	Business	Asian (Indian)	Nutrition
3	18	Freshman	BME	Asian	Nutrition
4	20	Senior	Biology	Indian	Mental Health
5	21	Senior	CE	Chinese American	Nutrition
6	25	Transfer // Undergrad	CS	Other	General Health
7	20	Junior	BME	Asian	Nutrition
8	20	Senior	Biology	White	Mental Health
9	21	Senior	Law // Humanities	Filipino American	General Health
10	21	Senior	CE	White	Nutrition
11	19	Second Year // Senior	BME + EE	Asian	General Health // Birth Control
12	19	Sophomore	CE	Middle Eastern	General Health
13	21	Senior	Biology	Caucasian	Nutrition
14	19	Sophomore	Biology	Middle Eastern	Mental Health
15	21	Senior	Biology	Middle Eastern	General Health // Dermatology
16	26	Graduate Student	IS	Asian	Nutrition
17	21	Junior	CE	Indian	Nutrition
18	22	5 <sup>th</sup> Year // Senior	Biology	American	General Health

**Table 1. Participant demographics**

*Note:* BME= Biomedical engineering, CE= Chemical engineering, CS= Computer science, EE= Electrical engineering, IS= Information systems

After participants confirmed their session using the Maven Clinic app, an interview session was scheduled. The interview consisted of five sections to better know the participant and understand their user experience. The interviews were audio- recorded, transcribed and checked for accuracy. A textual analysis was conducted using a data matrix in Excel. This process enabled us to identify themes based on similar responses and also note negative and unique cases (7).

The analysis was a recurrent process wherein the authors went through each transcription and examined each set of questions to identify themes in the answers. Each question that had a multitude of answers was coded to examine the different participant's answers. These were made into categories onto the data matrix that allowed for representation and a better understanding of recurring themes. In developing the narrative, all participants were

checked to identify anyone who was a negative case. In all themes, we matched student quotes within a theme.

## RESULTS

Each interview conducted included a few warm-up questions to better prepare participants for the interview. This set of questions was known as “getting to know you and general technology use”. It consisted of asking each participant about their typical day. Most students identified a typical day as a school day that included homework and studying. Others included their job and if they exercised in a typical day. It was recorded that all 18 participants had some form of insurance whether it be school-based, personal insurance, or on their parent(s)' insurance plan. All had a smartphone and access to the internet through a computer, laptop, or tablet.

## GENERAL HEALTH ATTITUDE

The second set of questions were done with the goal to better understand the participant's health perspective. For instance, the first question was “What do you do to keep healthy?”. The general trend of answers showed that students took similar measure to keep healthy. The student participants watched what they ate especially in the student cafeteria. They choose to exercise around campus whether that considered actively going to the gym or choosing stairs over the elevator. Most participants also mentioned they tried to get enough hours of sleep every night.

The second question was asked as a follow up to understand their health priority. Participants' priorities differed on this matter. On one hand, some participants placed their health over their studies while on the other hand, some participants placed their studies over their mental health. Despite this, most still considered their health a top priority, if not first, then second, or third in their respective lives.

When asked how they were monitoring their health, almost all participants said they just based it on how they were feeling. They mentally compared an off-day's activity to a typical day's activity and energy level. Most of the participants did not have a smart tool, such as smartwatch, that calculated their activity levels. One student, participant 10, had a Fitbit, that has been motivating her to watch her health. Others infrequently check their smart phone's installed Health application that monitored steps taken and other inputted information such as water intake, calorie intake, and hours of sleep. Another student, participant 7, used the app MyFitnessPal to calculate her nutrient and calorie intake.

We also asked how many times students went to the school's student health services. This question received a mixed amount of answers. Students who did visit their student health services expressed discontent with the

waiting period to see a health care provider or the available times to see a health care provider. The students who did use the school's health care provider were both residents on campus and commuters to school. As a follow-up, we found out that on average the participants saw their health care provider around twice a year.

### Privacy Aspect

A main research question of this study was to know participants' opinions and understanding about privacy with their health. In Bull 2016, the study aimed to find and understand student perceptions of telehealth systems. One of their concerns was about privacy with their health care (1). After analyzing this question there were four different answers that emerged. It should be noted that participant 10 did not answer the privacy question within this set.

The most common response by the participants was privacy is a trust and ethical issue. As many as half, expressed that without trust, there was no comfort and thus one could not have a conversation with their doctor. Participant 7 even mentioned that a health care provider should take their HIPAA regulations seriously. Another participant explained privacy in healthcare:

*"You need to trust your provider or you won't be able to talk to them. Also, to get reassurance that their information will be kept safe. Their job should help them to get a patient's trust." (P9)*

The next theme was the concern of the people present in a room. Participants considered the presence of either a medical technician, or a nurse, or even a family member as something that constitutes an invasion of privacy. One participant explained it as an unconscious decision:

*"I don't consciously put in my mind that I need to go out of my way to make things private but I do meet with my doctor one on one." (P8)*

While another participant expressed it's more complicated than the presence of people in the room:

*"Obviously, no one else can be in the room. But it depends if it's a doctor I know and been to constantly then I'll share more private information with since I'm more comfortable. There's room to go into detail and somethings feel embarrassing or shy to ask." (P14)*

Other participants mentioned that privacy related to their health meant it was no one else's concern. To a few participants, they stated that if one wants to share their medical health information with others then that is their personal business. It was the general consensus of this subgroup that health care providers should not inform others of a patient's medical condition. Participant 7 mentioned that a health care provider should get explicit permission to share a patient's information with others. Another one of the students explains their concern:

*"It really depends, not everybody needs to know what's going on. If you want to tell somebody that's your opinion but other people can't. It's not their job or their business to spread the word around". (P2)*

There were also a few students who mentioned they were indifferent about privacy concerns. For these participants, they acknowledged that privacy is a concern depending on the situational factor. For instance, participant 5 stated that if more information was needed to speed up a process then she would have no concern informing the healthcare provider.

### PERCEPTION ABOUT HEALTH APPS

In this section, we will discuss participants' understanding and perception surrounding telehealth. For almost all the participants, their first time seeing the word "telehealth" was in the email recruitment. During the interview, we asked them a few questions to understand their knowledge of telehealth applications. The general response to what a health app consisted of was that it is a smart application that can help a user track weight, food intake, nutrition facts, answer health questions, and give workouts or advice. One of the students described an ideal health smart app:

*"Ideally, if I'm looking for a health app and it's run by health care professionals and its information is reliable. I would use it to look up symptoms and look up what a medication does. I would also like to use it to communicate with my healthcare provider." (P8)*

There was a fair number of participants who did use a health app and those who did not use a health app. Those who were considered to have used a health smart application included menstruation trackers, nutrition, and water intake trackers, weight trackers, and exercising applications like Fitbit or MyFitnessPal. Participant 2, used a step tracker to help her monitor her activity level to see if she needed to change her lifestyle. This application changed her opinion of telehealth applications because she noted that her step count was fairly reliable and accurate. However, despite her successful experience she mentions:

*"I don't really use it often anymore but I do use it once in a while since I got so busy with college." (P2)*

Generally, the students said someone wouldn't use these applications if they did not have the time. For some who didn't use health smart application or stopped using these apps considered it too time-consuming. Others did not remember, they had such an application and said there needed to be more prominent notifications and alerts to use the app.

Participant 2 was not the only participant who considered keeping up with an application needed some commitment to keep up with the application:

*“Pretty frequently in the beginning but then I forgot to keep up with it, so now when I remember.” (P1)*

Others considered that it required way too much user input and information to make it a personal experience. A participant explained it as:

*“I feel like it doesn’t cater to your personal issues. It’s difficult and rather just meet with my healthcare provider.” (P8)*

This along with a fee for an application may have played a role in why participants did not use a health smart application and why they considered others would not use one either.

### **MAVEN USER EXPERIENCE (UX)**

Overall, the general user experience with the Maven Clinic Application was a positive experience. Despite many not being familiar with telehealth before this research study, it was considered an overall successful experience. There was a consensus that they did not know such applications existed and articulated it was “awesome” as said by multiple participants. For the most part, many acknowledged it was easily accessible because it was time friendly and easy to use. The application was viewed as a good tool to use when wanting to talk about something that might make one uncomfortable as it “sets the mood” according to participant 5.

A concern among students using telehealth applications is the impersonal and coldness of technological devices (1). In this study, the participants said this useful application helped answer their health questions or gave them personal advice on how to lead a healthier lifestyle. For the participants, the ability to see their healthcare provider’s credentials helped them feel confident with the information they were receiving. According to participant 8, the providers give personal answers that can be searched on the internet. To her, this was a big deal as it had a “personal touch” to it and was “tailored to [her] lifestyle”.

According to participants, their favorite feature about the application was the real-time and live video chatting sessions. Other participants mention there are other websites online that have online messaging features but isn’t as well-received as the face-to-face video feature. Participant 8 assumed it would be a completely different experience if this application was just a messaging option. It also helped that these video sessions had a wide range of accessible times that made it “flexible” to use.

The user interface was friendly enough to choose from different health care providers. These providers ranged from different specialists that attracted different discussable topics. Another favorite feature was the health binder; a questionnaire similar to what a nurse would ask for an in-person appointment.

The application itself did not require a lot of work or effort to have a proper session. It was easy to set up an account and appointment. To participants, the ability to access the application in their location of choice is very attractive and reachable. A student shares her favorite features as:

*“The simple layout. How easy it was navigating and to set up an appointment. They gave you a time thing to open the appointment and the fact there was a time limit was also good because you get straight to the point.” (P14)*

### **UX: Telehealth Use**

Participants noted that they would rather use a telehealth application for things such as mental health, nutrition, coaching and general medical questions that needed to be answered. Generally, if something did not require a physical appointment then they would rather use a telehealth application service. A majority of the participants said a telehealth application would be most useful for something “minor”. This “minor” medical issue can be something that didn’t require a prescription or didn’t involve broken bones according to multiple participants. Participant 11 mentioned telehealth applications would serve good use for follow up appointments while participant 7 said general check-ups were better in person. Participant 14 said she would not use a telehealth application for her medical concerns and health care.

One of the students who has had a relatively difficult experience with her health care providers over a thyroid condition would use the application. She explains how the accessibility would be very attractive:

*“I really liked it. Like for my thyroid, she [in-person healthcare provider] looked at my levels and talked to me for five minutes and set me on my way. If I could do this [Maven App] for that it would’ve saved me so much time because I had to drive all the way home and wait in the waiting room for thirty minutes for a five-minute session. I would use the telehealth.” (P10)*

Another student discusses how mental health taboos make this application very favorable to use. Other participants agree with the notion that a mental health session on the application is a private matter that would not get as easily disclosed to others as would a physical in-person appointment. The student mentions how a comfortable environment plays an important role:

*“Mental health I would say that’s not something easy to talk about in an office. Because for some people they could be talking about serious things like depression or anxiety or eating disorders and stuff that I would say would be better if it’s in your own home. Because then you can like feel more comfortable in your own clothes and in your personal space. The person listening will*

*try their best to understand you versus if you were in an office, stiffening up.” (P5)*

### **UX: Privacy Aspect**

The author asked about each participant’s concern about privacy using the application and in their experience. A majority of the participants expressed that the privacy aspect using this application depended on the presence of people in the room and their location setting. For instance, a participant explained her experience and her afterthought about the privacy as:

*“I thought it was fairly private. I felt like I was in control of my privacy because I could do my appointment where I wanted too.” (P7)*

While participant 5, mentioned that privacy was more complex in that it needed getting to know the health care provider’s profile first. She explains it as:

*“I think it also depends on the person you’re talking to. The good thing about this app is that you can look at their backgrounds and then how long they’ve been in the profession and what they look. Sometimes they post their personal pictures up there and I can see all that information which is great because you know when I make an appointment with the doctor. I usually don’t know anything about them. Then I see them in person... but it’s good to know who they are beforehand.” (P5)*

While participant 10 and participant 14 expressed the privacy concern experienced with a telehealth application would be similar to that in an in-person appointment with a healthcare provider. However, participant 14 did mention a hacking concern in that someone can view your health information and past chats with a provider. In Bull 2016’s research study, it’s mentioned that security is also a concern along with privacy for students. Participant 6, stated this concern can be counteracted by using a VPN.

### **UX: Service Comparison**

For a handful of the participants, they said as their experience with telehealth was conducted in a similar manner as an in-person appointment. For a few participants, they stated that their telehealth experience was better than an in-person appointment. Participant 3 stated the “no wait time” was advantageous as participant 10 felt it was timelier. A few participants expressed they would experience more privacy and comfort in an office setting.

It should be noted that participant 9 did not give a response and participant 7 was the only participant who had a negative overall experience. She expressed her appointment was too relaxed and unprofessional. While participant 11 mentioned her session was too short to get everything across so she had to be less in depth to get the full benefit of her appointment. Participant 13 said telehealth applications

provided a less quality service since there is no physical contact and “can’t really examine you”.

Another participant expressed the environment with telehealth is too casual, but can you can get used to it with time:

*“An in-person appointment is a lot more formal and this is pretty laid back since you’re literally sitting in your house. I felt the need to dress it up. If I continued using Maven and talking to this health professional maybe we’ll get more comfortable with each other and be totally natural. I felt the need to make it seem like I’m there in person and dress in normal clothes”. (P14)*

### **UX: Feedback**

After interviewing patients’ experience with the application, perception about privacy, and understanding of telehealth, we wanted to know how they viewed the information they were receiving as it was provided through virtual means. Almost all of the participants had no concerns about getting information through an online application as they already search up their health questions online. However, they were pleased with this method of getting answers as the credentials allowed them to have “trust” with their providers’ answers.

We also wanted to know if the accessibility feature would change the frequency one would get in contact with a healthcare provider. There were two participants who would not frequently use telehealth while another participant said it depends on the results of an appointment. This was participant 16 who met with a dietician and would like to see if the health provider’s advice had noticeable results.

Others mentioned they would likely use this application as much as they would see a health care provider in a year, about two times on average. While some said if they had a medical question and would need an answer right way would then use a telehealth application such as Maven Clinic. For these participants, they expressed the time convenience within the application was appealing. They also mentioned it would be more beneficial than relying on a general internet answer as this would be more personal.

Most of the participants liked their experience with Maven Clinic’s application. They said it had good design and was easy to use. Their recommendation was to include an insurance option as a way to afford the services. One of participants mentioned it would be helpful to look back at their session with their provider as a recorded session. Others recommended they can have broad topics within a category they can choose from. This would help them choose a provider who meets their specific needs. It makes it more convenient for the user instead of having to search for each provider’s credentials and experiences. A student expounds on this sub-categorical cloud:

*“I was looking for a specific service. I didn’t know what I wanted but when I clicked on general health there were a million doctors and each has a million specific specialties and I would really just like subcategories. Some tool to help you find what you’re looking for.” (P6)*

Another recommendation by participants was to have a way to synchronize the application with one’s body, such as including a way to put vitals. Another participant stated her appointment was too much of a consultation first. She recommends:

*“Possibly include a way to make a plan with them if you want to do something specific then you could have it requested before the appointment” (P3)*

## DISCUSSION

Overall most of the participants in the study better understand telehealth now. Their good experience with the application made them think better of it. Participant 15 no longer thinks the word telehealth is as intimidating and was pleased with how professional the experience was. While participant 5 thinks in the future there will be increased use of telehealth as it’s convenient and suitable to use when limited on time. Others stated this application experience opened them up to experience other healthcare apps. Participant 8, especially felt it was a reliable service that she could trust.

All the participants said they would recommend telehealth services to someone. They believe from their experience that someone who is short on time or isn’t time-flexible can really benefit from such an application. As students, they would recommend it to their classmates who don’t have time to see a health care provider and allow their health to deteriorate. Participant 9 said she would recommend it as a “first step for your health”.

When asked how they would explain telehealth, participant 16 said she would expound on her own personal experience while participant 17 calls it a “virtual hospital”. Essentially, most said it would be simplified as a beneficial way to get medical or health care when time and comfort was an issue. According to some of the participants, they mentioned they could discuss more issues online because they’re more comfortable in their own setting.

## CONCLUSION

Overall, the student participants expressed they would like to see telehealth services incorporated into their school’s health services. Telehealth applications are very appealing to college-aged students. The college-aged students are a relatively healthy population with limited time availability. They may also be living away from home. The participants in this study demonstrated their attraction to a smartphone

application that would help connect them with healthcare providers and manage their health.

This user experience test showed the accessibility and convenience were attractive features for college-aged students. There is still much that needs to be learned and researched in telehealth. Future studies can work on examining other age or gender populations, testing out applications for longer periods of time, and comparing user experiences with in-person healthcare provider. Telehealth has the ability to provide students with systems that work efficiently and conveniently to allow easier access to healthcare.

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