

## Strengthening the Role of the Audiologist in the Digital Age

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This is part one of a four-part article series.

More than half of the world's population (3.8 billion people) is connected to the internet via a smart mobile device,<sup>1</sup> opening the door to eHealth, which allows health care practitioners to establish new service delivery methods that maximize access to care, improve impact and efficiency, and reduce health care costs.<sup>2</sup> Audiology is often associated with the use of multiple technologies to assist patients on their journeys. However, while audiologists share positive attitudes toward eHealth audiology, only 25 percent of them have used it in clinical settings, and many have concerns about the impact of automated testing on future job security.<sup>3-5</sup> With the COVID-19 pandemic reshaping professional and social landscapes, it has highlighted the critical role of connected technologies during these unprecedented times. In one way, the pandemic has accelerated eHealth trends that were already starting to shape the future of health care and audiology.

### MOBILE TECHNOLOGY & eHEALTH

The global increase in mobile penetration rates highlights the increase of internet accessibility, and consequently the increase of online services accessibility through which health care providers can connect with patients at the appropriate time.<sup>6</sup> In the United States alone, 91 percent of U.S. adults aged 65 years and older owned a mobile device, of which 53 percent were smart devices.<sup>7</sup> As the use of technology by aging patients changes, so will the future of the audiology profession.<sup>8</sup> As a profession, audiology must adopt new technology-based practices in daily routines to remain relevant amid a global health crisis.

eHealth offers potential avenues for audiologists to strengthen their role in the economy during and post-COVID-19. It plays a critical role in mitigating the risk of close contact with patients to continue treatment, as alternative service delivery models are being proposed for hearing health care due to the pandemic.<sup>9</sup> These changes in an audiological practice, necessitated by the current situation, will usher in a new delivery method for audiology care, making eHealth audiology not only about convenience and accessibility but also about mitigating risks and keeping patients safe.

### RESEARCH HIGHLIGHTS

In a recent research project, our team aimed to develop an eHealth audiology hybrid model employing a combination of online and face-to-face audiological care. We incorporated asynchronous eHealth modalities into preparing patients for minimized face-to-face

consultations by ensuring continuous support along the patient journey using online modalities that enhance traditional service delivery.

Furthermore, we aimed to develop an eHealth audiology ecosystem that can be used to follow the patient journey—from the initial investigation of a patient’s hearing challenges to seeking audiology advice, and to becoming a successful communicator.<sup>10</sup> This research journey into eHealth audiology was ambitious, especially when we realized that most previous studies were proof of concept for sections of the patient journey whilst this project, encompassed the entire journey from detection, assessment, fitting, and rehabilitation using a hybrid eHealth approach. Previous studies were also abandoned after completion, and very few studies lead to sustainable adoption into clinical practice.

At the conception of the research project in 2017, we identified many unknowns:

- Would potential patients reach out to us through an online-only presence?
- Would they willingly leave their details for us to contact them after an online screening?
- How would they perceive us “online” if there was no initial face-to-face engagement?
- How would audiologists react to this model?
- What are the ethical and legal rules we must abide by within this new digital world?

To conduct our research, a nonprofit entity, Hearing Research Clinic, was established in June 2017 in Durban, South Africa.<sup>10</sup> Since prior patient database or referral sources were not in place, we worked with a local IT company to develop a user-friendly and consumer-oriented website that would be easy for elderly clients to navigate. An online hearing screening<sup>11</sup> that made use of a validated triple-digit-in-noise test<sup>12,13</sup> was embedded in the clinic's website and advertised using targeted digital marketing. The clinic conducted an online hearing screening along with a face-to-face diagnostic hearing evaluation, including hearing aid provision for adults, followed by online rehabilitation. The completed online hearing screening indicated either a passing result or a need for referral. The clinic audiologist contacted test-takers who provided their consent to contact to assess their readiness to seek hearing health care<sup>14-17</sup> before proceeding with a face-to-face appointment for diagnostic testing. Readiness management was conducted online via audio/video calls, emails, or instant messaging.

The online tools provided a range of data, including time, location, device type to log on, and patients’ data with consent. Online marketing tools successfully attracted potential patients, indicating that online hearing health seekers were curious to establish their hearing status.

In the first 12 weeks, our website had 2, 693 visitors, of which 2,667 were unique and 1,852 were from within the target area. In this period, 462 website visitors completed the online hearing test,<sup>10</sup> of which 51 submitted their details for further care. Five patients proceeded to a face-to-face diagnostic test over three months.

The majority of the online hearing health seekers were over 55 years old (Table 1).<sup>10</sup> Most (83%) of them accessed the website using their smartphones, of which 74 percent were Android-based.<sup>10</sup>

**Table 1:** Online hearing screening test completed per days in a week according to age group (n=462)

| DAY OF THE WEEK | AGE CATEGORY |       |       |       |       |     | TOTAL TESTS |
|-----------------|--------------|-------|-------|-------|-------|-----|-------------|
|                 | 18-24        | 25-34 | 35-44 | 45-54 | 55-64 | 65+ |             |
| MONDAY          | 1            | 3     | 13    | 13    | 15    | 16  | 61          |
| TUESDAY         | 1            | 2     | 6     | 10    | 10    | 14  | 43          |
| WEDNESDAY       |              | 1     | 8     | 23    | 18    | 18  | 68          |
| THURSDAY        |              | 1     | 4     | 17    | 18    | 14  | 54          |
| FRIDAY          | 1            | 5     | 17    | 18    | 28    | 31  | 100         |
| SATURDAY        | 3            | 6     | 6     | 13    | 17    | 22  | 67          |
| SUNDAY          |              |       | 6     | 13    | 30    | 20  | 69          |

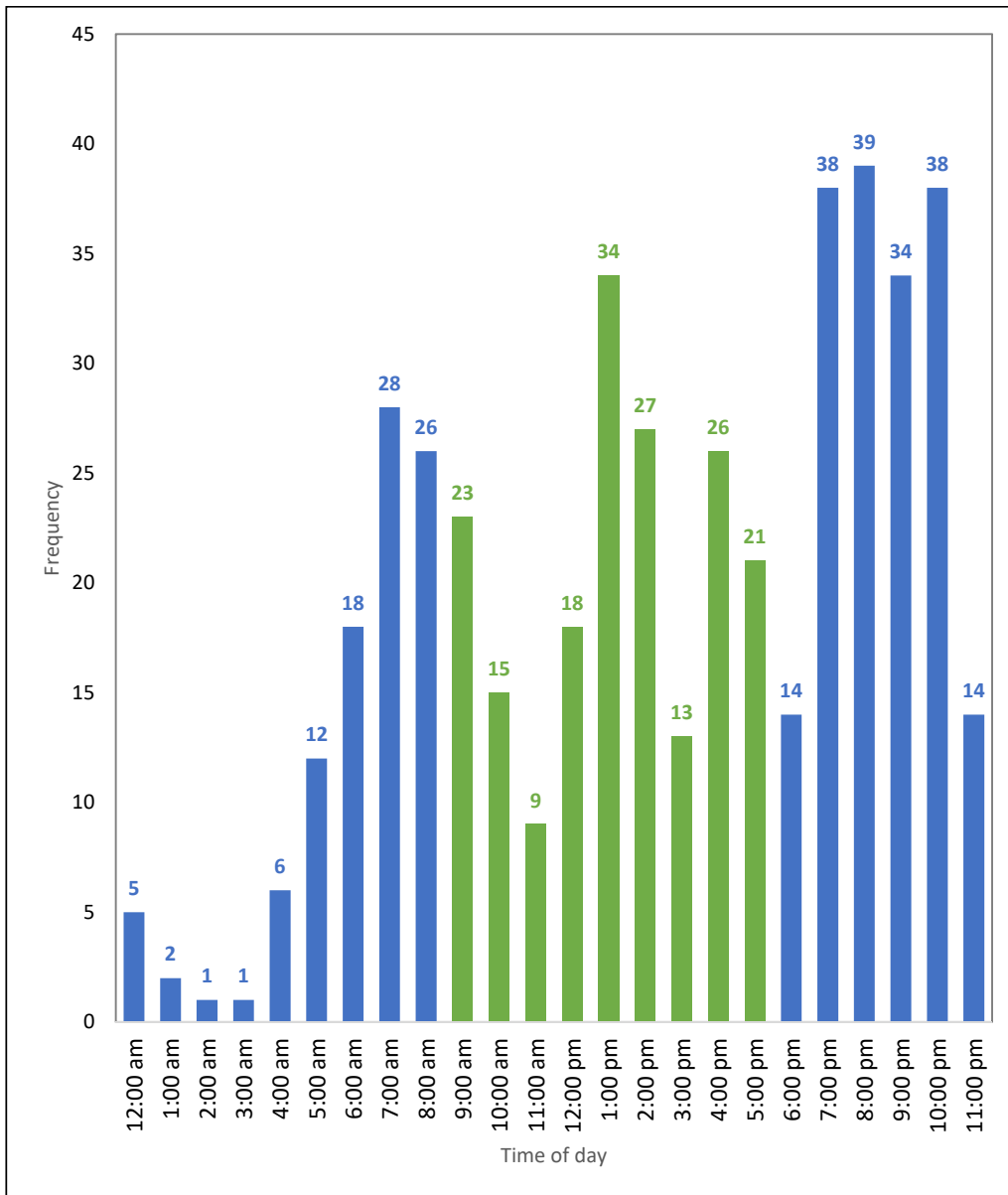
In total, 60 percent of tests were completed outside a traditional workday (i.e., before 9:00 am and after 5:00 pm; Fig. 1). Most tests were completed in the mornings and evenings, with the highest number of tests completed at 7:00 am, 1:00 pm, and between 7:00 pm and 10:00 pm. Most tests were completed on a Friday (Table 1), and many tests were also completed on a Wednesday, Saturday, and Sunday,<sup>10</sup> indicating the potential of offering self-administered asynchronous services outside of the traditional workdays.

Our study confirms that a hybrid model can support people seeking hearing health care online. This model better prepares patients before they make in-clinic visits and allows for additional in-clinic times to be used to address more complex hearing issues. With a responsive clinic website, audiologists can strategically provide services outside a traditional workday, essentially staying open 24/7.<sup>10</sup> As technology and accessibility improve, new patient pathways must also evolve to meet the needs of patients seeking hearing health care in different formats, mediums, and methods.

Over the next three articles in this series, we will discuss: (1) design and considerations for an audiology clinic website and the tools for a hybrid model; (2) a five-step hybrid hearing health care model for high patient satisfaction; and (3) key implications of digital proficiency and online hearing health care seeking.

With increased connectivity, particularly amid a global pandemic, eHealth audiology offers a potential solution to meet demands in hearing health care. At the outset of our research, the thought of a worldwide pandemic was not on our minds at all. However, current lockdowns and physical distancing measures strengthen the relevance of our research findings. An eHealth audiology care model that reduces direct patient contact is imperative for audiologists to continue providing services, particularly to older adults who have a higher risk for developing hearing loss and are the most vulnerable during the pandemic.

Now that the COVID-19 pandemic has forced us to investigate new ways of providing services to patients, there is simply no going back to normal as we knew it. Hearing care professionals must embrace the changes and plan for a new future by shaping it with technologies within a patient-centered approach.



**Figure 1:** Online hearing screening test completed per hours in a day (n=462)

*Acknowledgments: The authors wish to thank Thomas Behrens (Oticon A/S) and Lezanie Tietze (Oticon South Africa) for the fruitful discussions with regards to developing a hybrid hearing health care model. The William Demant Foundation supported the establishment of the Hearing Research Clinic NPC and the research project through a grant. Dr. Swanepoel, the second author, has a relationship with the hearX Group (Pty) Ltd that includes equity, consulting, and potential royalties.*

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