Portfolio Assignment: Identifying a Digital and Virtual Health Solution for Specialized Graduate Certificate in Health Informatics Concentration: Digital Health

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Article #1: "Teaching home tonometry using a remote video link"

The author's goal/hypothesis was that 12 glaucoma patients could be taught in 30-minute telehealth sessions how to use the iCare HOME tonometer. All participants were sent home with the device and written instructions. Remote teaching was provided for 30 minutes. After a teaching session, each patient was asked to record home intraocular pressure 8 times over 2 days and respond to 5 questions about the teaching and ease of use. Results showed that 10 patients completed training and could perform home IOP measures, and 2 patients could not. Majority of the patients preferred being taught via telehealth as it saved time and cost to travel to the clinic. Two of the 12 patients spoke English as a second language and valued the telehealth instruction because they were not able to translate the written instructions. The authors concluded that patients can successfully be taught how to use the iCare HOME tonometer via telehealth which saves time and money for clinic visits. In addition, data obtained from home monitoring can be uploaded to a mobile device and/or cloud platform for immediate provider review to provide feedback and medication adjustments as needed making glaucoma treatments more precise. Lastly, patients who speak English as a second language which is often a health inequity, greatly benefit if they do not understand written instructions. The authors noted if a patient did not have internet/mobile phone access for telehealth visits it hinders the entire process.

Article #2: "Assessment of the iCare HOME2, a New IOP Self-Measurement Tonometer"

The rationale for this paper was to study the iCare HOME2, the newest version of the iCare HOME tonometer. The original iCare HOME tonometer did not provide feedback if the patient's eye was correctly aligned and thus the resulting IOP measures would either be completely

wrong, or the tonometer would not record any measures at all. In addition, there was no way to review the IOP results without access to a computer. The new iCare HOME2 provides feedback via a green light notifying the user that their eye is correctly positioned, and the results are available in real-time via an app on the user's smart phone. The hypothesis was that these improvements would make the device easier to use for self/home IOP monitoring and produce comparable results to the gold standard "GAT" (Goldmann) tonometer. Methods included a retrospective study of glaucoma patients who had a complete eye exam by an Ophthalmology provider with comparison IOP measures using the standard "GAT" and the new iCare HOME2. The order of devices used on each patient was randomized to avoid any bias. The readings from both Tonometer's were masked to the examiner to prevent biased IOP measures. Results were analyzed from 135 eyes in 70 patients. With higher IOPs the iCare HOME2 had higher readings, but with lower IOPs the GAT had higher readings. The authors noted the previous version of the iCare HOME would often underestimate the IOP as compared to the GAT and usually 20% of patients were consistently not able to obtain an IOP reading because there was no feedback system to notify the user of poor eye position and the lack of real-time results were not possible unless a user had immediate access to a computer to upload the results. However, this study was the first to evaluate the new iCare HOME2 and demonstrate that with the introduction of user feedback (green light for good eye position, red for bad eye position) and the mobile app for immediate real-time IOP readings, the results are more accurate than the older iCare HOME and comparable to the gold standard GAT method. A major limitation of the study was that patients were assessed in a controlled environment Ophthalmology clinic by a provider rather than on their own at home, and these were patients that were highly likely to have glaucoma as

they were directly referred to their clinic rather than walk-ins. However, the results are very promising that the newer version of the iCare HOME2 solves the problems it intended: providing user feedback on eye position to obtain better readings and displaying immediate real-time results to the user via a mobile application rather than waiting to upload them to a computer later.

References

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