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Using the Virtual Reality World of Second Life to Promote Patient Engagement

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Abstract

Patients have typically been passive participants in their own healthcare. However, with a change in philosophy towards outcomes driven care, it has become necessary to make sure that patients mutually set their healthcare goals with their providers Both eHealth and mobile health applications have required patient participation in ways never before valued. The virtual reality world of Second Life offers one eHealth solution that requires computer literate patients to participate via avatars in synchronous healthcare visits and support groups, as well as explore online resources asynchronously. This paper describes the development of a Second Life environment that served as a platform for nurse practitioner driven care supplemented by a patient portal as well as the institutional electronic health record. In addition, the use of Second Life is described as an active exercise to expose students in a Consumer Health course to support groups and resources available to actively engage patients.

Keywords

Patient participation; telemedicine; continuity of patient care; virtual systems; consumer participation

1. Introduction

Patient engagement is a necessary component in today's healthcare where patient centered care is the expectation. In an era of shortened length of stay, and an emphasis on evidence and outcomes, the participation of patients in the provision of their own care has become essential. Spruce argues that the inclusion of patients and their families in the planning and execution of their care is one way to help contribute to increased patient safety [1]. Furthermore, if there are issues of miscommunication, clinicians have the opportunity to engage patients in the conversation and invite them into the process improvement cycle.

The virtual reality world of Second Life (SL, secondlife.com) provides an environment that allows users from around the world to "log on" to this web-based platform. Second Life is a 3D virtual world, created by its residents. The world is driven by the interactions of real-world individuals and their avatars. Thus, for every avatar one encounters in SL, there is a

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live person somewhere in the world who is dictating that avatar's actions, emotions, words, dress, etc. SL provides the place for interactions with people, businesses, and organizations in a 3D environment that requires only an Internet connection and working computer rather than extensive travel arrangements. This environment thus has the capability of expanding global telehealth possibilities.

2. Background

The Second Life environment was built as part of prior funded grants from the U.S. Department of Health and Human Services Administration (Grants #D80HP11271 and #U1KHP1296). The purposes of these grants were to provide nursing faculty the opportunity to manage clinical simulations while advancing in their own competency and proficiency levels of simulation management while in the Second Life virtual world. Synchronous sessions were provided by master teachers, after an orientation to SL had been completed by the users. These grant activities have been reported in prior international informatics conferences [2,3].

Second Life is organized in such a way that developers lease island space, but have to develop the buildings and/or content to be placed on their islands. The developed space noted above consisted of a conference center, an outpatient facility (replicated from the Vanderbilt Eskind Diabetes Center), an acute care facility (replicated from the Vanderbilt Acute Care Tower), a nursing home environment, and several homes. The island was named "NurSim4U."

Most faculty required orientation activities to the SL platform. One of the negative implications of using the SL platform is that most users start their experience on "Orientation Island." Many times there are other avatars on the Orientation Island who are predators and are there only to harass new users either verbally or through the use of nudity or sexual innuendos. It was possible to bypass this island by providing participants with the specific island location for the intended education session via a SLURL (Second Life Universal Resource Locator). In doing so, however, participants did not learn how to manipulate their avatars. As a result, orientation activities specific to this project were required. Video sessions and one-on-one orientation sessions ensured that all participants reached pre-determined competency levels in SL. An orientation course was developed that was elevated from the island itself so that no additional geographic space would be required. Figures 1 and 2 illustrate both the conference center (initial entrance to the NurSim4U island) and the orientation course.

The developed property on the leased island in Second Life can be considered as a backdrop for a play. Nothing is taking place there until avatars appear and interact, whether spontaneously or in a scripted fashion. For grant activities, there were scripted simulations that took place after the users were oriented.

It was soon determined that this developed environment could be used for a multitude of purposes. One was for the provision of patient care in the outpatient environment. Another was for the involvement of informatics students.

3. Patient Engagement Examples

Results of extending nurse practitioner care using the virtual reality world of Second Life was presented during NI 2012 [4]. However, the aspect of patient engagement was not fully explored during that presentation. In addition, the interaction in Second Life opened up the possibilities of how Second Life could be used for consumer health. As a result, one of the faculty members on the original grant, Dr. Trangenstein, incorporated aspects of Second Life involvement in order to demonstrate its potential engagement use with patients.

3.1 Nurse Practitioner Example

Long term management of adult patients with diabetes requires maintenance of glycemic control. One of the barriers to acceptable control is access to healthcare providers. While much has been written about the educational applications in SL, few attempts have been made to deliver actual patient care. Watson et. al. present a framework that demonstrates how applications within SL can be constructed to meet the needs of patients with diabetes, allowing them to attend group visits, learn more about lifestyle changes, and foster a sense of support and emotional well-being [5]. Furthermore, they describe the importance of dealing with concerns related to privacy and liability as pre-requisites before engaging patients and providers into using this new approach.

When this pilot project took place with nurse practitioners and patients, the best way to ensure privacy was to replicate the patient care room, have the NP press the privacy button, and then suspend the room around 200 meters above the ground. This was well out of audio eavesdropping range from the ground, as well as far enough away from the orientation course so that users there could not hear the private conversation. Once the visit was completed, the privacy "off" button teleported the patient and clinician back down to the original building in order to complete any post visit activities and exit the facility. Admittance to the island was restricted by accounts to care givers, identified patients, and technical support personnel. The general public were not able to access the island.

Patients were authenticated by logging into their patient portal and registering using a virtual screen in the SL lobby of the Eskind Diabetes Center. Patients were then met by his/her healthcare provider and were accompanied back to her office. The main purpose of the visit was for mutual goal setting to improve glycemic control. A questionnaire was completed by the patient prior to the visit, so this data could be used during the conversation. For example, one patient wanted to work on improving her exercise routine and diet; another was concerned about the high cost of medications; while another just wanted to decrease his A1c. Using this self-assessment questionnaire provided structure to the visit in such a way that the nurse practitioners were able to capitalize on that time to meet the needs of the patient. Figure 3 illustrates the office environment, which included an ocean view not typically seen by the participants.

3.2 Consumer Healthcare Informatics Example

The Vanderbilt University School of Nursing (VUSN) has an informatics specialty that is part of the Master’s in Nursing Science program. One of the unique features of this program

since its inception is the inclusion of a two credit hour course in Consumer Healthcare Informatics. Taught by the Specialty Director, Dr. Patricia Trangenstein, this course is also a popular choice for the Doctorate in Nursing Practice (DNP) students to take as an elective, regardless of their focus area.

One aspect of the course is to expose the students to technology applications that empower and inform consumers. After orienting the students to SL (using the Orientation Course described above), one of the assignments required students to explore a number of patient engagement possibilities in SL. Those virtual activities were followed by an actual synchronous class session held in SL. The sites listed below represent a range of immersion from merely providing education via text bulletin boards to experiencing the sights and sounds of a combat event in a village. Students were directed to choose the following islands in SL:

- Avatar Fitness Club (Research indicated that exercising your avatar regularly may help you to improve your own physical fitness. Join the club and try the cycles, treadmills, yoga, climbing wall, swimming pool, aerobics, lounge with ping pong.)
- National Health Service (The UK's publicly-funded healthcare system, known as the National Health Service, also has a home in SL. This region offers visitors a tour that represents the future of medical care throughout the nation.)
- Virtual PTSD Experience (This is an immersive, interactive learning experience designed to educate visitors about combat-related post-traumatic stress disorder (PTSD).)
- Reality Check Café (This 3D learning environment illustrates the relationship between calorie intake and physical activity, and the importance of making smart choices while dining out.)
- Tox Town at Virtual NLM (environmental health information from the National Library of Medicine)
- Virtual Hallucinations (UC Davis sponsored schizophrenia education experience that allows users to see what those with paranoid schizophrenia might see in order to better understand the symptoms of this disease.)

4. Discussion and Conclusions

Feedback results from both examples provide evidence that the SL environment can be an alternative to face-to-face patient engagement activities. Both the patients and the nurse practitioners involved in the care scenario thought that this was a viable alternative to driving in for appointments, and appreciated the pre-visit questionnaire that helped to focus in on their healthcare needs for the visit. They did, however, acknowledge that this type of visit required technology literacy to be possible, and thought the orientation activities were excellent. While the second example included students, they provided positive course evaluation statements in support of being able to experience patient focused SL activities that expanded their ideas about how to better engage patients. Both examples describe the

potential of the virtual reality world of SL in providing viable alternatives to our patients to become better involved in their own care regimens.

References

1. Spruce L. Back to basics: patient and family engagement. AORN J. 2015; 102(1):34–37. [PubMed: 26119607]
2. Weiner, E., McNew, R., Trangenstein, P., Gordon, J. Using the virtual reality world of Second Life to teach nursing faculty simulation management. In: Safran, C.Marin, H., Reti, S., editors. Proceedings from MEDINFO 2010: Partnerships for Effective eHeatlh Solutions, 13th World Congress on Medical and Health Informatics. 2010. p. 615-619.
3. Weiner E, Abshire D, Beals C, Benson C, Catlett C, Gordon J, McNew R, Miller S, Prevost S, Tipton G, Trangenstein P. Faculty simulation management using Second Life. Proceedings of NI2012: 11th International Congress on Nursing Informatics, Montreal. 2012:768.
4. Weiner E, Elasy T, Lorenzi N, McNew R, Shackleford L, Wolff K, Martin S, Benson C. Extending nurse practitioner care using the virtual reality world of Second Life. Proceedings of NI2012: 11th International Congress on Nursing Informatics, Montreal. 2012:437–441.
5. Watson AJ, Grant RW, Bellow H, Hoch DB. Brave new worlds: How virtual environments can augment traditional care in the management of diabetes. J Diabetes Sci Technol. 2008; 2(4):697–702. [PubMed: 19885247]

Figure 1.
Conference Center.

Figure 2.
Orientation Course

Figure 3.
Office Environment for Clinical Visit.