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VIDEO-CHAT -MEDIATED VISITS IN A PERSONAL CARE HOME

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INTRODUCTION

Many of Canada's increasing aging population experience physical and cognitive impairments that necessitate moving to a residential care facility (also called nursing home, personal care home, or long-term care home). CIHI reports that 28.9% of these residents have depression, or indicate symptoms of it [1]. Depression has multiple causes, but one known contributor is social isolation: 22-42% of care home residents reported feeling severe loneliness [2], [3]. This is corroborated by the CIHI data, which indicated that 43.8% of studied residents had little or no social interaction.

Video-chat sessions have been found to be valuable supplements to in-person visits [4], [5]. They also provide a sense of security for the resident's guardian(s), (i.e. family and friends who are responsible for their care) who may not be able to visit residents as often as they would like. However, adults with impairments such as dementia cannot operate the equipment required for video-chat sessions. Relying on PCH staff to facilitate chat sessions for large numbers of residents is impractical considering their already high workloads. Thus, an appropriate video-chat technology should be able to automatically establish connections for users, and not require any maintenance beyond the initial setup. In this work, we investigated the usage and efficacy of a video-chat solution for two residents of a local Personal Care Home (PCH).

METHODS

We originally intended to use an integrated video-chat solution called the Biscotti for this project, but technical limitations discovered late in testing forced us to use a different video-chat service. We selected a solution called Linphone that runs on an inexpensive Windows laptop. Guardians used a smartphone application called Bria and a free account created using the service SIP2SIP.info. To begin the video-chat, the guardian telephoned the nursing station to inform PCH staff that they wished to video-chat, and the PCH staff ensured that the participant was in his/her room ready to video-chat. Then, the guardian used the Bria app to call the laptop running Linphone, which automatically answered and began transmitting/receiving. Since this process was automatic, it required only minimal interaction from PCH staff.

The effectiveness of the video-chat system was investigated using 5 metrics:

1. In-person visit questionnaires
2. Daily mood reports (collected at bedtime)
3. Psychological assessments taken before and after implementing the video-chat system
4. Usage frequency
5. Subjective feedback

This research was conducted with approval from the University of Manitoba Biomedical Research Ethics Board, and all participants signed an informed consent form (or gave verbal assent and had the consent form signed on their behalf by an appropriate guardian).

The study was split into two phases so that we could observe changes in the participants' mood/depression/loneliness levels with respect to their mood/depression/loneliness levels when they only received in-person visits.

Phase 1

During the first phase, we collected data about standard visitation practices. Each visitor was asked to note the participant's mood (using a 5-point Likert scale), talkativeness (i.e. less than 20% of the visit, between 20 to 40% of the visit, about 50% of the visit, more than 60% of the visit), and whether the participant recognized the visitor(s). We also collected the start-time and duration of the visit. This first phase lasted approximately one month, and was timed to end near mid-December (to avoid the Christmas season, when family are more likely to visit and skew mood values). Additionally, PCH staff scored the participant's mood using a 5-point Likert scale when putting them to bed. This ensured that we would have frequent mood reports, even if the participant did not receive any visitors.

Phase 2

The second phase began in the second week of the new year. In Phase 2, laptops running the Linphone software were made available to participants in their rooms. In-person visit data continued to be collected during this phase. In addition, the video-chat software logged the following metadata:

- Frequency of use
- Start/end time of each use
- Name/ID of external 'Visitor'

Additionally, we collected subjective feedback from participants and guardians.

Psychological Assessments

We used 3 instruments to assess participants' psychological health:

- Montreal Cognitive Assessment (MoCA) [6]
- Geriatric Depression Scale (GDS) [7]
- De Jong Gierveld Loneliness Scale (LS) [8]

These assessments were performed by the research assistant at 3 points during the study: once before beginning Phase 1, once upon completion of Phase 1, and once upon completion of Phase 2.

RESULTS

Of the 4 participants recruited for this study from a local PCH, 2 withdrew. One of them passed away shortly before beginning Phase 2, and the other withdrew due to feelings of anxiety and stress. Overall, we qualitatively observed that the participants and guardians who remained in the study enjoyed using the video-chat system.

Table 1 shows the scores for the neurocognitive tests we performed. For the GDS and LS, decreasing scores correspond with improvement, and for the MoCA, increasing scores correspond to improvement. The scores in the GDS/LS columns represent the number of responses indicating depression/loneliness, while the number in brackets indicates the total number of responses.

Table 1: Neurocognitive Scores. (*) indicates number of answered questions. The total number of possible questions is in the top row.

	GDS (/15)	LS (/6)	MoCA (/30)
Participant E			
Baseline	2 (*3)	0 (*2)	3 (*9)
After Phase 1	4 (*5)	2 (*5)	3 (*9)
After Phase 2	3 (*6)	4 (*5)	4 (*13)
Participant R			
Baseline	9 (*13)	3 (*6)	3 (*30)
After Phase 1	3 (*10)	0 (*5)	0 (*5)
After Phase 2	3 (*9)	2 (*5)	4 (*17)

In-Person Visits

The visit data for Participant E and Participant R are shown in Table 2 and Table 3 respectively. Participant E had a hired companion that would visit every weekday for

Table 2: Participant E Family/Companion Visits

Time	Average Talkativeness (/4)		Average Visit Time (Minutes)		Number of Visits		Average Mood	
	Fam.	Comp.	Fam.	Comp.	Fam.	Comp.	Fam.	Comp.
End of Phase 1	3.10	3.18	77.67	240.00	10	22	3.10	3.82
End of Phase 2	2.25	3.65	114.29	240.00	7	31	4.14	4.65

approximately 4 hours. The visits from Participant E’s guardian(s) are noted in the “Fam” columns, and the visits from the companion are noted in the “Comp” columns. Since Participant R received only 2 visits from his companion (2 hours each in duration), the companion and guardian visits are combined in Table 3. Both participants received fewer in-person visits during the second phase than the first phase, and we did not observe any noticeable change (decline) in overall mood scores over the course of the study.

Table 3: Participant R Visits

Time	Talk- ativeness	Visit Time	Visits	Mood Score
End of Phase 1	2.00	112.22	9	3.89
End of Phase 2	1.29	105.00	7	4.57

Video-Chat Visits

During Phase 2, guardians had video-chat-mediated visits with their respective participant approximately once per week, and visits lasted 4.47 minutes on average. When testing the system at the PCH, we noted that each participant enjoyed seeing their guardian’s face on the screen and speaking with them. Guardians reported that the participants often seemed distant when using the video-chat equipment and did not really seem to be very engaged by it, however Participant E’s companion noted that she became animated when her guardian’s face appeared on the laptop, and that she enjoyed waving to him and seeing him wave back.

Participant R’s guardian reported that on two occasions, she had attempted to use the video-chat system but the PCH staff claimed to be

unable to operate it, and opted to put the participant on the phone instead. The guardian said that she had a positive conversation that ended with the participant saying the call had “made [his] day.” The participant seemed to have benefitted similarly from a telephone conversation as from a video-chat session.

DISCUSSION

We had initially explored the usage of the Biscotti video-chat platform [9] in participants’ rooms. Biscotti allows users to video-chat by means of their television (See Figure 1), and can automatically answer video calls from pre-approved users, and therefore does not require any user interaction. The Biscotti device can also automatically activate the television when answering a call. These usability enhancements make the Biscotti an attractive solution for PCHs, since they require no interaction from PCH staff or residents. However, we found the Biscotti system to be incompatible with the existing firewall configurations at the PCH, and thus were forced to use the less user-friendly Linphone solution instead.



Figure 1: Biscotti Setup [9]

We did not observe any significant change in the psychological scores after completing Phase 2. One interesting point to note is that Participant R’s GDS score improved considerably

between the baseline assessment and the Phase 1 assessment. This is likely because Participant R was uncharacteristically grouchy that day, which could have skewed the assessment results.

The large amount of variance in the LS and GDS scores shown in Table 1 is largely due to poor participant compliance. In particular, Participant R became quite frustrated with the assessments, and he would only cooperate with the research assistant if a family member was present. Participant E had difficulty speaking, which also made these assessments difficult to administer.

We observed that both participants received fewer in-person visits during Phase 2. However, the frequency of video-chat visits in combination with in-person visits appears to have been sufficient to maintain participants' moods, and prevent feelings of depression and loneliness (at least within the short-term period investigated by this study). Since a visitor does not need to journey all the way to the PCH for a visit, they do not feel compelled to have a long visit, and simply saying "Hello!" is enough contact for the resident. Of course, there is the risk that guardians will stop visiting in-person altogether when they rely too much on video-chat visits. This does not appear to have manifested itself in our 1-month pilot study, however it could manifest itself in a longer-term study.

Over the course of the study period, 1 of the 4 original participants withdrew due to feelings of anxiety. However, the guardian informed us that while some of these feelings stemmed from our study, the participant had been experiencing anxiety even before hearing about the study. This participant had developed a feeling of being watched, even during Phase 1 when no device had been installed. Anxiety is a common psychological symptom in people with dementia [10], and may occur in up to 72% of people with Vascular Dementia [11], and video-chats with relatives may help alleviate these effects for other residents (if not this particular participant).

CONCLUSION

We conducted a user trial pilot study, where 2 residents at a local Personal Care Home used a video-chat system to remotely communicate with family members. Although the system was not used as much as we expected, family members were enthusiastic about it. While objective psychological assessment scores did not change much in the 2 participants of the study, subjective reports indicated that residents enjoyed the video-chats. A true, quantitative assessment of the benefits of this technology should be run in a much larger population.

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