Virtual coach for continuity of care

ISRCTN85439821

Summary of Results

Summary of quantitative results

Primary outcomes

Acceptability and Usability Questionnaire (SUS)

The experimental group to which participants belonged significantly influenced usability (SUS) scores. Specifically, participants who used the technology in the comfort of their own homes (G3) recorded higher SUS scores compared to other groups.

Overall, the SUS scores indicate that the acceptability and usability levels are satisfactory across the three experimental groups. In particular, the G3 (dwelling setting) is the group that perceived higher levels of acceptability and usability according to the SUS scores.

Comparing with other variables, in group 1 and group 2, the results (Anova type II) were not significant.

Particularly in group 3 (dwelling setting), the age significantly affected usability (SUS). In particular, younger participants had higher usability scores than older participants.

User Experience Questionnaire – short version (UEQ-S)

The user experience questionnaire (UEQ) is a widely used questionnaire to measure the subjective impression of users towards the user experience of products. The selected short version of the UEQ (UEQ-S) with just 8 items, is optimized for the purpose of the pilot 6 application scenarios. The questionnaire consists of pairs of contrasting attributes that may apply to the product. The circles between the attributes represent gradations between the opposites, that go from 1 to 7.

There are no significant changes in UEQ-S score when comparing the intervention groups. In general, the UEQ-S score indicates that the patients value the system in a mean of 4.80, from 1 to 7 (from badly to highly accepted, respectively).

Particularly, comparing with the descriptive variables, group 1 and group 2 (both from the clinical setting) show no significant results.

In line with the SUS, in group 3 (dwelling setting), the age significantly affected user's experience (UEQ-S). In particular, the user experience is greater for younger participants.

Post-Study System Usability Questionnaire (PSSUQ)

In general, observing the PSSUQ scores, the overall perceived usefulness was positive, counting with a score (from 1 to 7, from badly to highly accepted) of M=5.33.

There are no significant changes in PSSQ score when comparing the intervention groups.

Particularly, comparing with the descriptive variables, the PSSUQ scores of the experimental group 1 and group 2 (both from the clinical setting) show no significant results.

In line with the SUS and the PSSUQ, in group 3 (dwelling setting), the age significantly affected user's perceived usefulness (PSSUQ). In particular, the user experience is greater for younger participants.

Secondary outcomes

Mini Mental State Examination (MMSE)

The intervention group significantly influenced the change in the MMSE scale (p=0.042), with the largest changes detected in the dwelling setting group.

Geriatric Depression Scale (GDS)

According to the model used, the changes in the GDS scale after the intervention are not significant, neither in the control group nor in the experimental group 1 and 2 (both from the clinical setting).

In the G3 (dwelling setting), the MMSE total score significantly affected the change in the geriatric depression scale (GDS). Specifically, patients with lower MMSE total score showed a shift towards higher GDS values after the intervention, whereas as the MMSE scale increases, the change is smaller (GDS scale after the intervention is similar to baseline). Note that in the GDS scale, the higher the score, the more severe the depression (suggestion). In the MMSE, higher score suggests higher results in the cognitive functions.

Quality of Life Index (EQ-5D-3L)

The EQ-5D-3L descriptive system comprises the following five dimensions: mobility, self-care, usual activities, pain/discomfort and anxiety/depression.

None of the variables analysed significantly affected the change in the quality of life scale.

Compared with the control group, participants of the G2 (group intervention) presented a more pronounce change in quality-of-life scale (EQ-5D-3L) in the post evaluation. No significant changes were recorded in the other two groups (G1 and G3).

According to the model, the changes in the EQ-5D-3L scale after the intervention are not significant, neither in the control group nor in the experimental group 1 (individual intervention in clinical setting) and group 3 (dwelling setting).

Summary of qualitative results

After a soft qualitative analysis of the focus groups were and additional feedback from patients in the post-tests evaluations, the results show similar feedback between the groups. The evaluation that stood out was the one from the informal caregivers, considerably less positive, comparing to the one with the healthcare professionals and patients. The summary of the feedback provided is described herein.

Feedback from healthcare professionals (formal caregivers)

Virtual Assistant as a contribution to improve the autonomy or quality of life of your patients:

In summary, professionals consider that the system could be a support to improve patients' autonomy and the quality of life, taking into account that the cost-benefit is higher in this format. On the other hand, in the robot's UI, two professionals' advert to the emotionally vulnerable older adults that could get attached to the robot, which could represent a dangerous situation.

Easiness to use and profiles:

The professionals perceived that the system would be easy to use in cases of healthy people or people with mild cognitive impairment. Moderate to severe cognitive impairment is discouraged for the future use of the tool.

Features that were most valued:
Gradior tool, Pepper human features - "Pepper is funny, innovative" for now, the fact that the system can be used in the older adults' dwelling and that in the presentation of results, the healthcare professional can see data all resumed in one place [web management].

Suggestions for future changes:

- Some aesthetics features could do some improvement – "make it more colourful".

- Feedback from the system (closer to interaction) would be better – "voice recognition like an Alexa".
- The robot's tablet is outdated.
- The advertisements that are used in the system should be removed in an exploitation future.
- The robot's tablet is too small for older adults.
- In case of the Q&A timing: "'More time between questions to process the information' 'A pause button'".
- The UI voice could use improvement - "It should vocalise more'".
- The robot Pepper's sensors could have better quality: "Better sensors because when you gesture it moves your hands and can give to people".
- More variety of content in the future.

Feedback from families (informal caregivers)

Virtual Assistant as a contribution to improve the autonomy or quality of life of your patients:

The caregivers suggest that with some conditions in mind, this could be a positive solution. Between these, the participants highlight the cost-effective (compared to having a support person in their dwelling), the ability to use the tablet and autonomy of the person in general.

Easiness to use and profiles:

Participants considered that the system would most likely be difficult to use for most people. It is recommended to have a person to "to help you to get it up and running'".

Features that were most valued: Gradior tool.

Suggestions for future changes:

- UX features could be improved – "To make it simpler: switching it on, how to access it, interacting with it"
- The voice of the UI is not clear
- The screen's UI is too small
- In respect to the content that is in video format, participants don't see the benefit (compared to going to YouTube channel)
- To add "voice recognition", to reply to requests
- "It would be more useful to have something that can help you with your medication or that can help you if you fall ill or something happens to you, something that really gives you assistance in the home."

Feedback from patients

Within the group sessions, workshops' facilitators perceived a notable engagement with the system. Patients expressed that they were pleased with the robot's friendly aspect.

When asked about the qualitative feedback after the quantitative tests, most patients confirmed that they were pleased when interacting with the robot, although two aspects were highlighted as negative features to a smaller group of participants: the robots voice that was too fast and that sometimes made the sentences unclear, and the visual content that was hard to see in the tablet's size.

Final note

For further details about the research results and conclusions, please contact:
info@hosmartai.eu

References

Chatzikou, M., Marques, D. F., Almeida, R., Losada, R.,, Latsou, D. (2024). Cost-Consequences Analysis (CCA) of the HosmartAI Virtual Coach for Continuity of Care Among Older Adults. [Poster presentation] ISPOR, Barcelona, Spain.