O109 Comparing robot, avatar, and voice assistance in PROMIS administration – A cross-randomized controlled trial

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Objective: Patient-reported outcomes measures (PROMs) are increasingly used to monitor quality of care, but completing these questionnaires can be burdensome—especially for patients with reading or motor impairments (e.g. after a stroke) or concentration difficulties (e.g. when suffering from depression). However, their underrepresentation in PRO data bears risk of nonresponse-bias. Therefore, a multimodal assistance system was developed and evaluated within a participatory-interdisciplinary research network. The system reads instructions and questions aloud, paraphrases in simplified language, and accepts voice or touch responses.

Methods: In a cross-RCT, outpatients in psychosomatic and neurological rehabilitation were randomly assigned to one of three assistance systems: a robot (Furhat Robotics, embodied robotic head with lip-sync, idle movements, and eye contact), a digital avatar (on-screen agent on separate tablet with lip-sync and idle movement), or voice-only (audio output via questionnaire tablet without visual agent). Nine PROMIS domains (physical function, fatigue, sleep disturbance, pain interference, cognitive function abilities, anxiety, depression, self-efficacy in managing emotions, and ability to participate in social roles and activities) were assessed by 72 items. Participants completed 4 items per domain via standard tablet and 4 via their assigned assistant, in random order. Differences between assisted and standard assessment on a group level using a linear mixed model and Bland-Altman plots for agreement were investigated.

Results: Ninety-eight patients were randomized; 3 were excluded post-randomization due to technical issues. The remaining 95 were analyzed (33 robot, 30 avatar, 32 voice-only). Sixty-five were psychosomatic patients (67.7% female, mean age=47.0 years, range=22–65; most common diagnoses: depression, anxiety) and 30 were neurological patients (36.7% female, mean age=52.3 years, range=22–74; most common diagnosis: post-stroke). Across all domains, mean scores did not differ significantly between assisted and standard assessment, with a mean difference <1 PROMIS T-Score. We found neither significant nor relevant differences between assistance modes.

Conclusions: Our results indicate that robot-, avatar-, and voice-administered PROMs yield comparable results to standard tablet-based assessments. These findings suggest that assistive technologies may offer a feasible way to improve accessibility without affecting data integrity. Future studies will build on current findings by addressing specific patient barriers and exploring broader applicability and transfer.