INNOVATIVE TECHNOLOGICAL APPROACHES AND THEIR USEFULNESS IN THE ACUTE SETTING: EXPERIENCE FROM THE TRIESTE STROKE UNIT

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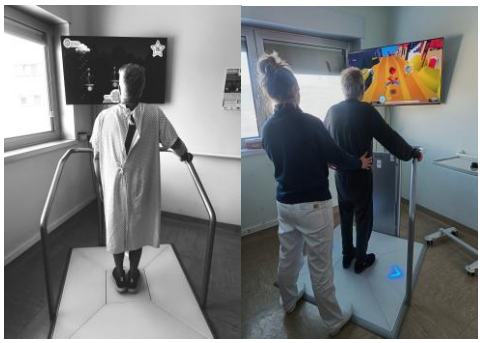
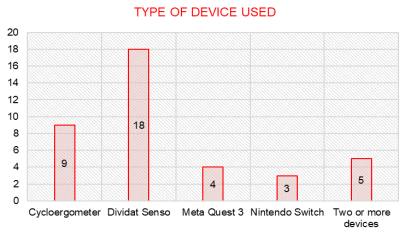
Background and aims

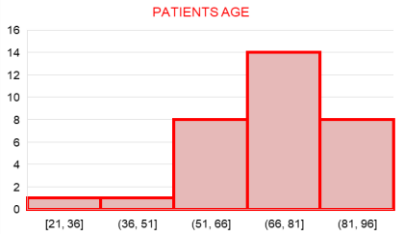
Therapeutic approaches utilizing innovative technologies are increasingly gaining traction in neurorehabilitation1. However, evidence regarding their use during the acute phase of stroke remains limited. This study aims to evaluate the utility and application of innovative technological devices for early rehabilitation in a single Italian Stroke Unit.

Materials and methods

The study was conducted between January 2025 and May 2025 in Trieste, within the framework of Interreg Italia-Slovenija Xbrain.net project. During hospitalization in Stroke Units, at Trieste University hospital, patients were exposed to one or more of four different rehabilitation devices. Ischemic and emorragic stroke patients with motor impairment requiring physical therapy were included. Exclusion criteria were: diagnosis of comprehension or global aphasia, important cognitive impairment, severe hemodynamic instability or full motor recovery after drug treatment. Patients used one or more of the following devices: Nintendo Switch®, Meta Quest 3®, Dividat Senso® and bed Motomed®. Outcomes were assessed using clinical (NIHSS) and functional (mRS, Barthel Index) scales at discharge.







Results

73 patients were admitted to the Stroke Unit from January 2025 to May 2025, 32 (23 males) used one or more innovative technological devices. The median length of hospital stay was 11 (8-15) days. Among of 32 patients, 18 used Dividat Senso®, 9 used bed Motomed®, 4 used Meta Quest 3® and 3 used Nintendo Switch®. Five patients were used two or more devices during their hospitalization. The median patients age was 74 years. 30 patients had an ischaemic stroke (IS); of these, 11 underwent reperfusion treatment. The median NIHSS at admission was 4 (3-6), and at discharge the median was 1 (0-3). Finally, the median mRS at discharge was 2 (1-2).

Conclusions

32 (43.8%) patients admitted to a Stroke Unit could be potential candidates for rehabilitation using innovative technological devices, despite the inherent challenges of the acute care setting. In this project, Dividat Senso and the bed-based Motomed appeared to be the most usable devices in early rehabilitation. Further studies are needed to identify the most appropriate devices in terms of usability, safety, and effectiveness for promoting early neurological improvement in the acute setting.

References

1. Marín-Medina DS, Arenas-Vargas PA, Arias-Botero JC, Gómez-Vásquez M, Jaramillo-López MF, Gaspar-Toro JM. New approaches to recovery after stroke. Neurol Sci. 2024 Jan;45(1):55-63. doi: 10.1007/s10072-023-07012-3. Epub 2023 Sep 11. PMID: 37697027; PMCID: PMC10761524