

# Which factors affect patients' acceptability of BCIs for functional rehabilitation after stroke? A questionnaire study among 140 patients and a comparison with the general public

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Although motor imagery-based BCIs have been demonstrated to be relevant for improving motor recovery after stroke [1], they remain barely used in rehabilitation services. We hypothesise that acceptability (assessed in terms of perceived usefulness (PU), ease of use (PEOU) and behavioural intention (BI) [2,3]) could serve as a lever for fostering the adoption of BCIs through the improvement of their efficacy. More precisely, we suggest that improving BCIs acceptability could alleviate post-stroke patients' anxiety [4], stimulate their engagement in the BCI process, and thereby, favour skill acquisition (self-regulation abilities)[5], which will have positive effects on motor recovery.

We created a model of acceptability of BCIs for functional rehabilitation after stroke, and designed an associated questionnaire that we used to empirically assess the weight each factor of the model had on acceptability. We obtained 140 responses from post-stroke patients, and compared them with data collected in the general public (N=753)[6] by using T-tests,  $\chi^2$  tests and regressions.

Results showed that patients and general public have high acceptability levels (BI: 8.48/10 and 8.23/10, respectively; PU: 8.34/10 and 8.28/10, respectively), but PEOU was significantly lower in patients (6.43/10 and 7.17/10). For both, PU, scientific relevance and ease of learning were the most influential acceptability factors. Nonetheless, the perceived benefits on risk balance is more positive for the patients than it is for the general public; patients also consider that their close relatives will be more in favour of BCI rehabilitation; in addition, patients want human guidance when using a BCI, whereas the general public prefer a computerised help system.

Globally, results highlight the importance of better informing on the scientific evidence related to BCIs and of personalising rehabilitation procedures to facilitate learning. One next step will consist in applying this approach with clinicians.

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