

## Physical Activity Based on Daily Step-Count in Inpatient Setting in Stroke and Traumatic Brain Injury Patients in Subacute Stage Follow Up: A Cross-Sectional Observational Study

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**Abstract :** Background: Brain injury is one of the main causes of permanent physical disability, and improving walking ability is one of the most important goals for patients. After inpatient rehabilitation, most do not receive long-term rehabilitation services. Physical activity is important for the health prevention of the musculoskeletal system, circulatory system and the psyche. Objective: This follow-up study measured physical activity in subacute patients after traumatic brain injury and stroke. The difference in the number of steps in the inpatient setting was compared to the number of steps 1 year after the event in the outpatient setting. Methods: This follow-up study is a cross-sectional observational study with 29 participants. The measurement of daily step count over a seven-day period one year after the event was evaluated with the StepWatch™ ankle sensor. The number of steps taken one year after the event in the outpatient setting was compared with the number of steps taken during the inpatient stay and evaluated if they reached the recommended target value. Correlations between steps-count and exit domain, FAC level, walking speed, light touch, joint position sense, cognition, and fear of falling were calculated. Results: The median (IQR) daily step count of all patients was 2512 (568.5, 4070.5). During follow-up, the number of steps improved to 3656(1710,5900). The average difference was 1159(-2825, 6840) steps per day. Participants who were unable to walk independently (FAC 1) improved from 336(5-705) to 1808(92, 5354) steps per day. Participants able to walk with assistance (FAC 2-3) walked 700(31-3080) and at follow-up 3528(243,6871). Independent walkers (FAC 4-5) walked 4093(2327-5868) and achieved 3878(777,7418) daily steps at follow-up. This value is significantly below the recommended guideline. Step-count at follow-up showed moderate to high and statistically significant correlations: positive for FAC score, positive for FIM total score, positive for walking speed, and negative for fear of falling. Conclusions: Only 17% of all participants achieved the recommended daily step count one year after the event. We need better inpatient and outpatient strategies to improve physical activity. In everyday clinical practice, pedometers and diaries with objectives should be used. A concrete weekly schedule should be drawn up together with the patient, relatives, or nursing staff after discharge. This should include daily self-training, which was instructed during the inpatient stay. A good connection to social life (professional connection or a daily task/activity) can be an important part of improving daily activity. Further research should evaluate strategies to increase daily step counts in inpatient settings as well as in outpatient settings.

**Keywords :** neurorehabilitation, stroke, traumatic brain injury, steps, stepcount

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