

## National Consortium for Ph.D in Nursing

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**Title:** A study to assess the effectiveness of Graded Motor Imagery (GMI) on upper limb motor function, visuo-spatial neglect, depression, body image and quality of life of patients with subacute stroke residing in selected community health setting of Calicut District, Kerala”

**Introduction:** Stroke is one of the leading causes of disability globally, causing decreases in motor, sensory, behavioral, emotional and cognitive functions, and affecting independence and quality of life for survivors. Several nonpharmacological interventions have been found to improve functional outcomes after stroke

**Objectives:** This Randomised Controlled Trial evaluates the effectiveness of Graded Motor Imagery (GMI) on upper limb motor function, visuo-spatial neglect, depression, body image and quality of life among stroke survivors, from a selected rural community health setting in Kozhikode, Kerala.

**Methods:** Demographic and clinical proforma, Fugl-Meyer Motor Assessment for Upper extremity (FMA-UE), Star Cancellation Test, Patient Health Questionnaire (PHQ-9), Body Cathexis scale and SF-36 were used to collect the data. The participants were pre-screened for eligibility based on the inclusion criteria, then randomly allocated into an intervention group or a Treatment as Usual (TAU) group using block randomisation. 151 participants were enrolled, with 76 in the intervention group and 75 in the TAU group. In addition to conventional treatment, home-based GMI was taught to the participants in the intervention group, who were directed to practice each stage of the GMI, which included two weeks each of implicit motor imagery, explicit motor imagery and mirror therapy. Each session was done for about 30 minutes/day, five days per week for six weeks. Follow-up assessment was done at 6, 12 and 24 weeks after the intervention. Normality of data was tested using the Shapiro-Wilk test, while RM ANOVA and Friedman’s test were used to analyse the effectiveness of the intervention.

**Results:** Analysis was done using an Intention to Treat approach. The attrition rate was 6.62%. The sample comprised of 151 sub-acute stroke patients aged between 28 and 80, with a mean age of 64.58±10.33. 81 (53.6%) subjects were male, 86 (57%) were educated above primary level, 83 (55%) were unemployed, and 82 (54.3%) were below the poverty line. The mean duration of stroke was 6.84 months, ranging from 1 to 12 months. Most (115, 76.2%) subjects had ischemic stroke with right-sided arm paresis and left-sided brain lesion. Disability severity was split evenly across each third of the sample. Hypertension was the most common comorbidity among 141 (93.4%) subjects, followed by dyslipidemia 64 (42.4%). Upper limb motor function, assessed at baseline using the FMA-UE, revealed that only one participant in

the intervention group had full upper extremity capacity. This increased to nine participants at six weeks, eight at 12 weeks and 11 at 24 weeks. Among the TAU group, fewer participants attained full extremity capacity. At baseline, two had full upper extremity capacity, increasing to five at six weeks, four at 12 weeks and five at 24 weeks. The average percentage change in the individual FMA-UE scores in the intervention group was 20.44%, much higher than in the TAU group of 5.58%. Friedman's test showed a significant improvement in upper limb motor function in the intervention group ( $\chi^2=101.11$ ,  $p<0.001$ ), compared with the TAU group ( $\chi^2=24.38$ ,  $p<0.001$ ).

Initially, 11 participants in the intervention group and 25 in TAU group had visuospatial neglect. There was a marked decline in the number of participants with neglect in intervention group, from 11 to three post-intervention. The number of participants with neglect in TAU group remained the same at six weeks. Friedman's test showed that GMI had a significant effect on visuo-spatial neglect scores for subacute patients in the intervention group ( $\chi^2=153.96$ ,  $p<0.001$ ). There was a considerable improvement in depression scores among the intervention group. The number of participants falling into the minimal depression category improved considerably from 19 at baseline to 30 at six weeks, 33 at 12 weeks, and 40 at 24 weeks. In comparison, the TAU group rose gradually from 11 at baseline, 12 at six weeks, 16 at 12 weeks, and 22 at 24 weeks. There was a marked reduction in moderately severe depression among the intervention group in the post-intervention xv period, with numbers falling from five at baseline to two at six weeks, one at 12 weeks and none at 24 weeks, compared to the TAU group, which had 13 at baseline, ten at six weeks, eight at 12 weeks and five at 24 weeks. Mild depression decreased overtime. The decrease in depression scores was greater in the intervention group compared to the TAU group ( $p<0.001$ ). The study indicated a complementary effect of GMI combined with conventional treatment in significantly reducing depression among stroke survivors. RM ANOVA divulged no significant within-group effect ( $F=2.504$ ,  $p=0.11$ ) or between-group effect ( $F=1.34$ ,  $p=0.25$ ) on participants' body image. Thus, it was inferred that GMI as an additional intervention did not significantly change self-perceived body image among stroke survivors. The average percentage change in the individual physical component Quality of Life (QoL) scores was +4.64 in the intervention group and -7.43 in the TAU group. Friedman's test revealed that GMI had a significant effect on the physical component (QoL) summary scores of subacute patients in the intervention group ( $p<0.001$ ). Thus, it was inferred that GMI, in addition to conventional management, was effective in significantly improving the physical component of QoL of patients with subacute stroke. RM ANOVA showed no significant improvement in the mental component of QoL scores within groups ( $F=1.16$ ,  $p=0.32$ ) and between groups ( $F=0.03$ ,  $p=0.86$ ). GMI as an additional intervention did not significantly change the mental component of QoL scores for stroke survivors. No significant correlation was found between upper limb motor function and visuospatial neglect, depression, body image and quality of life scores for patients with subacute stroke. There was a significant association seen between upper limb motor function and type of stroke ( $p<0.001$ ), but no significant association was found with the other selected demographic and clinical variables.

## **Conclusion**

The researcher concluded that GMI is effective in improving upper limb motor function, visuospatial neglect and depression among subacute stroke survivors. Hence, rehabilitation programs of stroke survivors can incorporate GMI as one of the techniques to improve these conditions among stroke survivors. Furthermore, GMI training could be made more available to the community through supervised nurse-led early transfer home programs, to reduce disability limitations and to promote improved quality of life among stroke survivors.