

## ABSTRACT

**Purpose:** The aim of the study was to evaluate the effects of NAGs for pain, pain in available end range, various ranges of motion, certain activities of daily living (ADL) and anxiety associated with cervical spine pain and stiffness.

**Relevance:** The studies on NAGs and its functional outcomes have not been reported in literature. Several questions regarding NAGs remain unanswered especially about its efficacy in pain and stiffness affecting ADL. However, a number of therapists throughout the world use this technique as an integral component of their practice. A limited number of papers including case studies and case series have documented a rapid reduction in pain and stiffness of other parts of the spine and the peripheral joints using Mulligan Concept. In the era of evidence based practice, there is urgent need to cross validate the claims made by the proponents of this technique. This study is an attempt to establish a scientific evidence to use NAGs for the benefit of the patients and future research.

**Participants:** One hundred subjects (N=100) of age group 30 to 60 years, attending OPD of orthopedic department, suffering from cervical pain and stiffness, without radicular pain, diagnosed as having cervical Spondylosis. Those who met the predefined criteria were included in the sample with written informed consent. The sampling was incidental; subjects were randomly assigned to the four groups (n=25).

**Methods:** Ethical approval was sought and obtained. It is a repeated measure design, with double blind controlled trials. Visual Analogue scale (VAS) score, Range of Motion (ROM), Neck Disability Index (NDI), and State-trait anxiety inventory (STAI) were the dependent measures. McGill Pain Questionnaire (MPQ) was used for the assessment and screening of the subjects for the study and to develop demographic data. All groups received hot packs for 12 minutes along with set of active exercises from day one to day twelve. In experimental group one, NAGs as mobilisation technique was added for all the 12 days while in experimental group two, it was withdrawn on day seven. In experimental group three, NAGs was added from day seven onwards. In the control group placebo effect was introduced for all the 12

days. All patients were assessed before and after the treatment on day one, two, six, seven, ten, and twelve. After six weeks was the follow up.

**Analyses:** Analysis of covariance (ANCOVA) with post-hoc t-test with adjusted means and graphical presentations.

**Results:** A significant ( $p < .01$ ) difference in pain, ROM, neck disability index score was noticed in the experimental groups immediately after NAGs and was maintained on the day of observation in the sixth week. No significant difference seen in anxiety level.

**Conclusions:** The results indicate that the NAGs is a useful manual therapy technique for producing quicker and long lasting effects in reducing pain and restoring ROM with functional activities in patients suffering from pain and stiffness of cervical spine. Further, it is observed that reduction in pain and improvement in range of motion improves the functional ability.

**Implications:** This study provides supportive evidence for the efficacy of NAGs in reducing pain, improving ROM and ADL affected due to painful stiff cervical spine. It further provides a base for future study to further explore the reasons for the differences observed between the groups.

**Keywords:** Mulligan Concept, NAGs, VAS, Range of Motion, Activities of Daily Living, Neck Disability Index, Anxiety, and Cervical Spine.

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**Ethics Committee:** Guru Nanak Dev University Ethics Committee