



Effectiveness of Alter G gait training to improve balance, lower limb strength and reducing falls among patients in AMK-THKH inpatient rehabilitation.

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INTRODUCTION

Patients admitted to AMKH inpatient rehabilitation are often subjected to gait training to achieve most significant improvement in terms of functional mobility before a successful integration into community. Walking ability is also perceived as an effective goal for patients, caregivers, family members as well as therapists.

Walking capacity is often limited by patient and environmental factors such as fear of falling, fatigue, obesity, morbid status, deconditioning, musculoskeletal compromise, limited space and floor structure. These factors can be challenging to both the therapists and patients when designing a walking intervention. Tech- assisted care optimizes the environment suitable for patients undergoing gait rehabilitation. Alter G (anti-gravity treadmill) is a training equipment using Differential Air Pressure (DAP) technology that assists with reducing body weight support and gravitational force over the lower limb joints. Patients are highly motivated to participate in Alter G gait training that provides fall free and pain free environment. Patients are able to walk safely and effortlessly on Alter G Treadmill with the unique support system within an enclosed space. The aim of this project is to explore the effectiveness of Alter G gait training on patient's lower limb strength and balance thereby reducing the risk of falls among patients discharging from AMKH-THKH rehabilitation.

METHODOLOGIES

The study recruited 30 patients over 6 months, in the aged 60-83 years. Participants were selected according to inclusion and exclusion criteria (Table 1) to enroll in Alter G training program. Each participants received eight sessions of Alter G training over two to three weeks for 20 to 30 minutes of training with body weight support of 50% to 80%. Patients also received standard physiotherapy session on non Alter G training days. Pre-test and Post-test analysis of the outcome measures, TUG (Time Up Go), BBS (Berg Balance Scale), 5x STS (Sit to Stand) were conducted and the results were compared for evaluation .

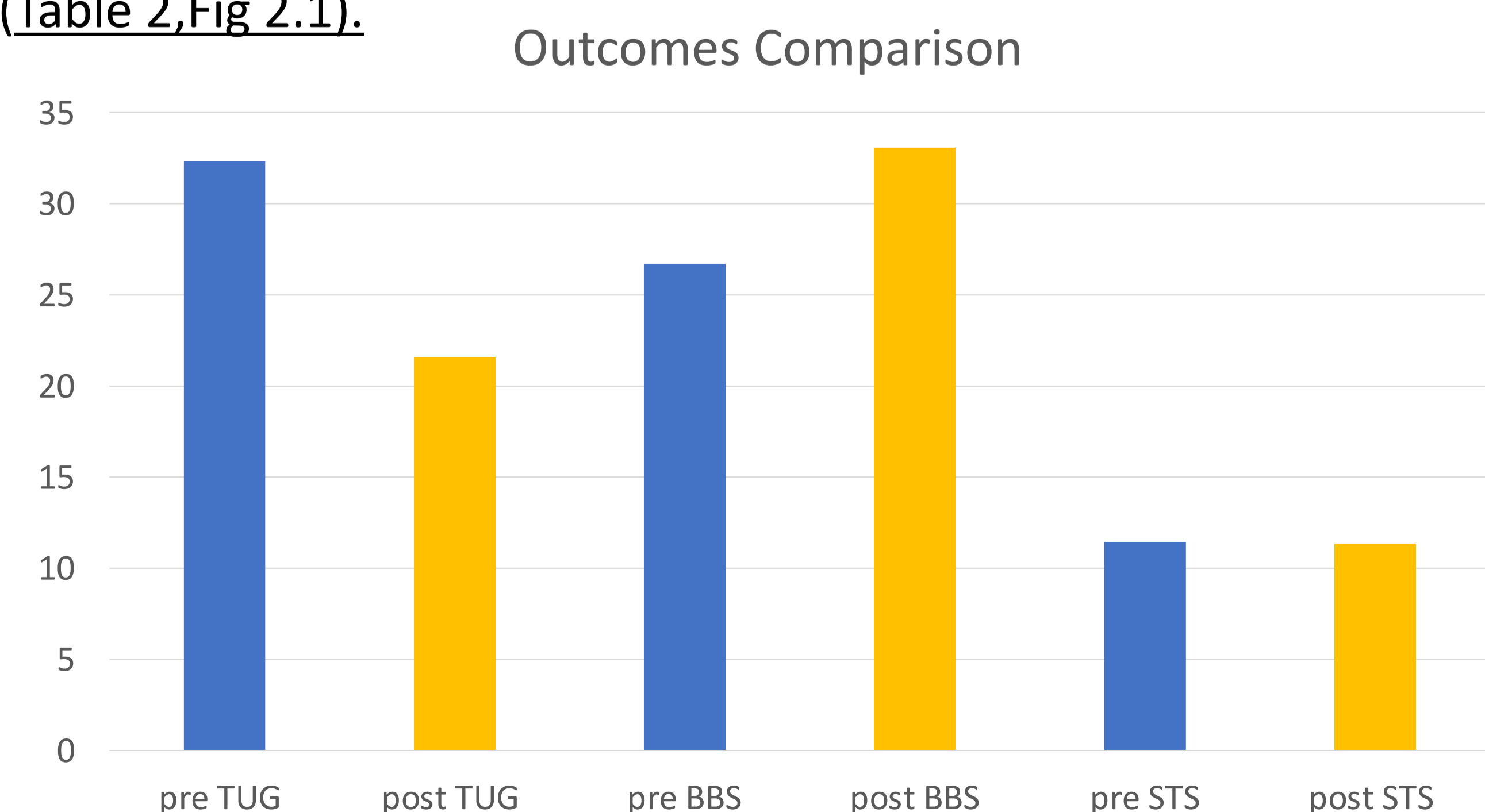
(Table 1)

Inclusion Criteria	Exclusion Criteria
<ul style="list-style-type: none"> • Patient requires minimum to moderate assistance for walking with or without aid • Patient who refuses or limit walking due to joint pain, fatigue, reduced motivation, fear of falling • Patient with weight bearing precautions • Ability to give personal consent, understand instructions and learn through practice 	<ul style="list-style-type: none"> • Unable to follow one step command • Postural hypotension • Patient with pacemaker • Patient who has Deep Vein Thrombosis • Patient requires manual facilitation of lower limbs for walking • Patient with behavioral disorders

RESULTS

Patients were noted to have improvements in balance (BBS) and TUG outcomes from pre- to post-Alter G training. However, no changes were noted in STS scores (Table 2, Fig 2.1) likely due to body weight support provided that assisted with unloading the lower limbs.

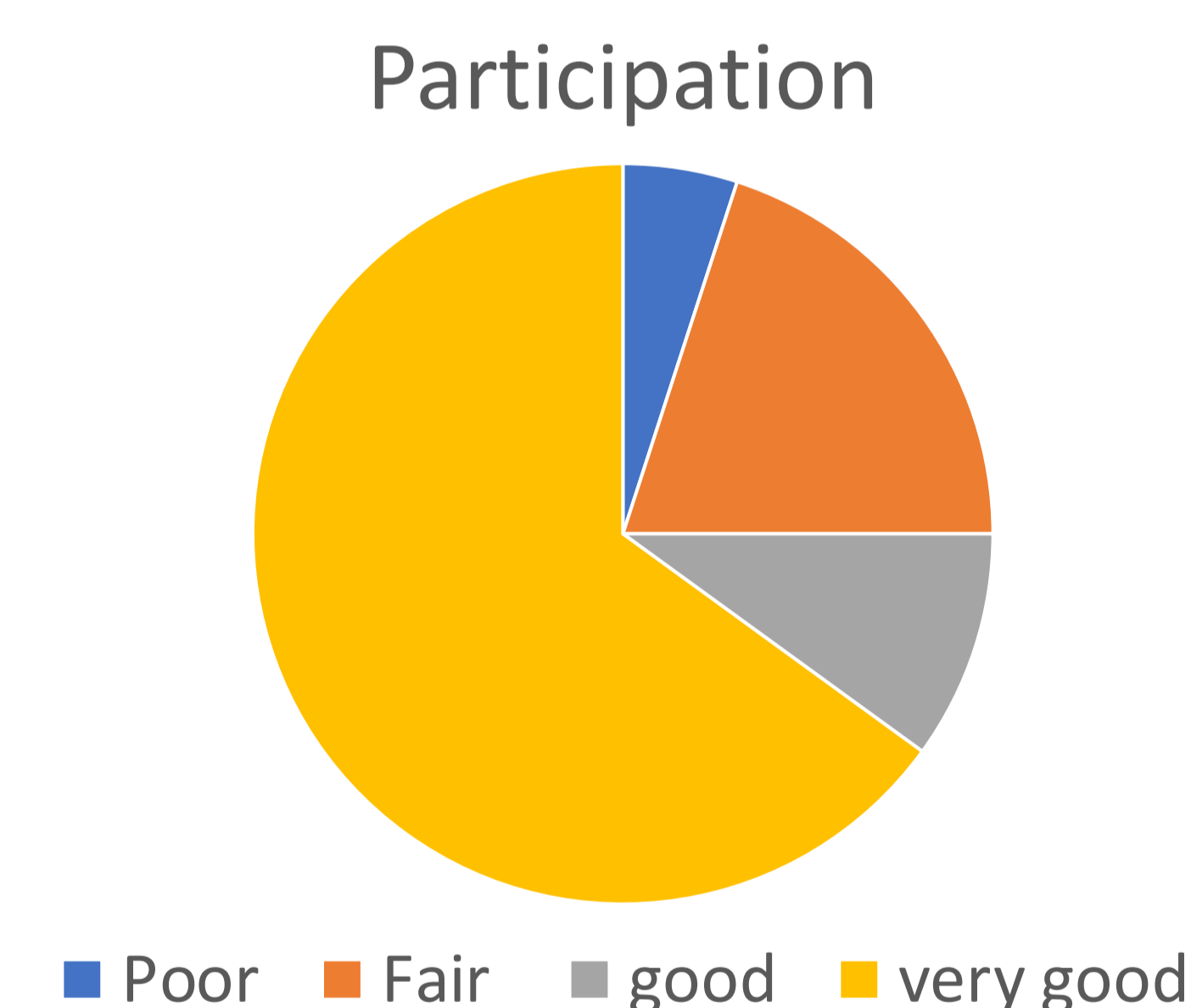
(Table 2, Fig 2.1).



RESULTS

Alter G enables individuals to walk at a lower body weight. It helps to restore normal walking while supporting the healing tissue. The stress on joints is lesser due to body weight support as it provides fall free and pain free environment. Although explanations and demonstrations were provided to patients prior to the initial session, four of them were able to attend only one or two sessions due to fear, not keen to participate, transferred out to acute hospital and one request for early discharge. 73% of Alter G users were meaningfully engaged and completed eight Alter G sessions.(Table2, Fig2.2). Participants in the program were noted to have improved walking pattern and reduced risk of falling. Patients who received Alter G training sessions were highly motivated and had active participation during inpatient stay.

Table 2, Fig 2.2



CONCLUSION

Alter G gait training is found to be effective in improving the TUG and BBS scores which has indirectly influenced on lowering the risk of falls in recruited patients. However , there were no changes noted in the STS scores likely because lower limb muscles were not subjected to resistance training during Alter G training that eliminates gravitational force over lower limbs. Gait speed was not the focus as participants were mainly encouraged to walk longer duration with a comfortable speed. The body weight support assists participants to maintain physiological gait pattern throughout the program while providing a supported safe environment without any adverse effects on joints.Alter G training can be explored together with progressive resisted exercises for lower limbs in future studies. Alter G Treadmill training can to be utilized in physiotherapy intervention for our older and vulnerable patients during locomotor training to influence on positive outcomes for functional ambulation as well as falls reduction.