

Community-based Dementia Service Stations-The Effectiveness of Hand Exercise and Muscle Strength by Making Grip Ball with Five-Senses Satisfaction for Dementia Patients

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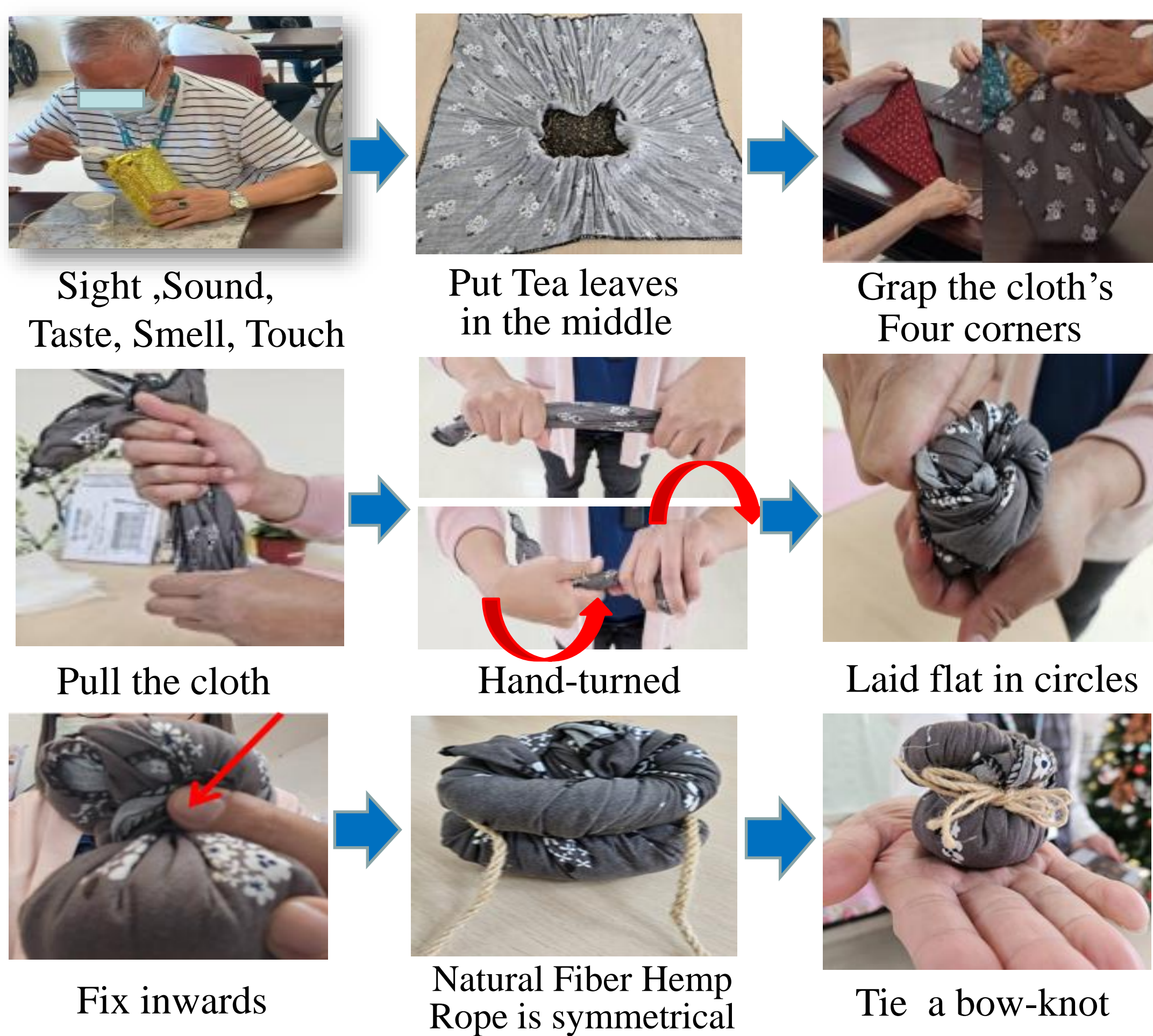
Background and objective

Emerging research highlights a significant connection between grip strength and memory function, with studies indicating that a decrease of 5 kilograms in grip strength correlates with an 18% increase in the risk of severe memory impairment. In response to this, we present the Five Senses Satisfying Grip Ball (FSSGB), designed to enhance grip strength while providing a multi-sensory experience that stimulates cognitive function. The FSSGB is crafted from natural tea leaves and pure cotton, offering a comfortable and effective grip. Its design encourages various fine motor movements, including opening, pinching, and gripping, which are essential for activities of daily living (ADL).

Prepare



Five Senses Satisfying Grip Ball (FSSGB) steps



Methods



➤ Individual and muscle training(FSSGB making process):

- The process of the Five Senses Satisfying Grip Ball (FSSGB):** Designed to enhance fine motor skills through specific actions like pulling, turning, and pinching.
- Vision-Recognizing Tea Leaves:** Participants observe the vibrant colors and textures of the natural tea leaves, fostering visual recognition and appreciation of materials.
- Hearing-Crisp Sounds:** The distinct sound of dried tea leaves being handled enhances auditory awareness, making the training process more engaging.
- Taste-Brewing Method:** Participants can brew the tea to experience its flavor, linking taste with the process and creating a more immersive sensory experience.
- Olfactory-Tea Aroma:** The rich aroma of the tea leaves stimulates the sense of smell, contributing to relaxation and enhancing the overall sensory experience.
- Tactile-Touching the Leaves:** Handling the dried tea leaves and feeling their texture promotes tactile stimulation, essential for fine motor skill development.

➤ Group Grip Training :

Using the FSSGB, elastic ball, elastic band, emphasizing key hand posture “tension”, “pinch”, “grip”, bimanual, with individual and bimanual hand training.

➤ Individual and group hand force training:

Both were one hour in every week, for 12 consecutive weeks individual and group hand force training, both were one hour in every week, for 12 consecutive weeks.

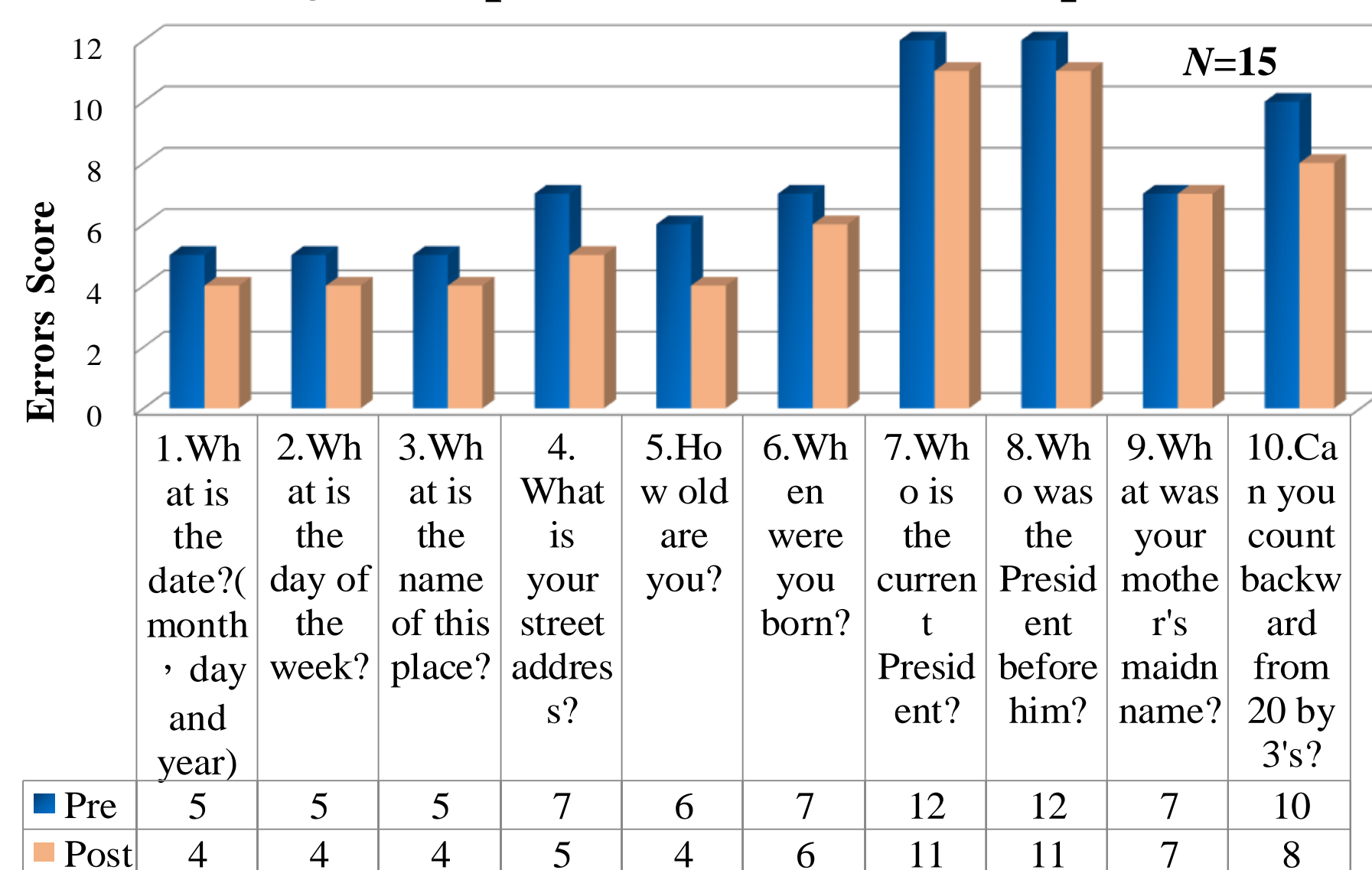
Results

➤ JAMAR® hand grip strength test (N=15)

Female (yrs)	Right (kg)		Left (kg)		Male (yrs)	Right (kg)		Left (kg)	
	pre	post	pre	post		pre	post	pre	post
58	16	16	10	10	65	20	20	18	18
77	16	17	14	18	74	24	28	27	30
80	2	2	4	4	75	6	4	8	9
81	12	14	14	17	76	12	12	16	16
81	12	12	12	12	77	18	18	14	14
87	10	8	12	12	80	16	16	18	18
89	4	4	4	6	85	10	10	18	18
90	0.5	0.5	1	1					

- Males (7 participants):** 0.29 (from 15.14 to 15.43kg) and 0.57 (from 17 to 17.57kg) for dominant and non-dominant hand, and 0.43 (from 16.07 to 16.5) for bilateral hands, which with a rate of progress of $(0.43/16.07) \times 100\% = 2.27\%$.
- Females (8 participants):** 0.13 (from 9.06 to 9.19kg) and 1.22 (from 8.88 to 10kg) for dominant and non-dominant hand, and 0.63 (from 8.97 to 9.6) for bilateral hands, which with a rate of progress of $(0.63/8.97) \times 100\% = 7.02\%$.
- Overall (All Participants):** 0.21 (from 12.1 to 12.31kg) and 0.85 (from 12.94 to 13.79kg) for dominant and non-dominant hand, and 0.53 (from 12.52 to 13.05) for bilateral hands, which with a rate of progress of $(0.53/12.52) \times 100\% = 4.23\%$.

➤ SPMSQ(short portable mental status questionnaire)



SPMSQ Errors average score :

The average error score of the SPMSQ decreased by 0.8 points, from 5.06 to 4.26, representing a decline rate of 15.81%.

Relevance to HPH

Research shows that when individuals make their own FSSGB, it fosters creativity and personal expression, which can boost engagement and motivation. This hands-on approach also improves hand strength, coordination, and overall motor skills. Additionally, using the FSSGB engages multiple senses, enhancing cognitive function and potentially delaying cognitive impairments. Integrating the FSSGB may be beneficial in delaying disabilities and dementia.

Future Suggestions:

Partnerships with Therapists: Incorporating the FSSGB into rehabilitation programs.

Regular Community Events: Organizing FSSGB-based events like competitions to sustain interest and engagement.