

PROPRIOCEPTIVE AND TACTILE KIT TO ENHANCE HAND FUNCTIONS AND MEMORY IN OLDER ADULTS

REHABILITATION SCIENCES- OCCUPATIONAL THERAPY

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Abstract: It is a well-known fact that a person's senses deteriorate with the aging process. As individual proceeds towards aging, it is seen that mass changes occur throughout the body, externally as well as internally. The major areas affected during this process are tactile, proprioceptive senses and memory. As an individual uses his hand for the most of the daily work, in this article/ project, it is discussed how hand, being a major body part is affected in elderly adult's activities of daily living are affected in consideration with tactile and proprioceptive senses along with the memory. The aim of this project was to develop a kit, in order to help elderly people, retain their tactile and proprioceptive senses along with their memory. The project will help the department to intervene in the OT process by initiating and improving proprioceptive and tactile sensory memory on hand of older people by reeducating the senses and enhancing hand functions. The kit consists of four patterns, to be practiced with five different materials, and consists of three stages for the improvement of memory. In this kit, the materials used were the things with which a common person is familiar with and has been using over his age. The patterns used in the kit are the basic patterns by which an individual starts to learn in primary schooling in his childhood and time of initial learning. The technique used is Montessori techniques. Montessori method is to create persons who are as independent as possible, able to make choices, while being treated with respect and dignity. This kit was made to facilitate and enhance the proprioceptive and tactile sense in the hand of the older adults, emphasizing on the sensory memory. While many studies were evidencing the sensory decline in the human body as it ages, and there are evident changes in memory and cognitive aspects of brain as the person gets older, the need was felt to make this kit, in co-relation of the above two mentioned senses along with the sensory memory to work on hand functions, which diminish with the age. The person is guided to tap, trace, and sprinkle the placards with different provided materials in the kit according to the stage of the problem. This kit was mindfully designed keeping in mind the sensory and memory enhancing methods on hand functions which were easily available at home and to which the person is familiar too. It is intended to help the geriatric population in improving their proprioceptive and tactile sensory memory and thus improving their hand functions using a simple technique.

Keywords: Tactile sense, Proprioceptive sense, Hand functions, Memory, older adults

INTRODUCTION:

Aging is typically defined as the build-up of varied destructive changes occurring in cells and tissues advancing age that's responsible for the increased risk of disease and death¹. It is a steady decline within the age-specific health factors of an organism because of internal physiological deterioration².

As individual proceeds towards aging, it's seen that mass changes occur throughout the body, causing a decline in health, memory and thus the body state of an individual's being, resulting in visible and invisible changes. With the deteriorating age the brain tends to shrink resulting in cognition changes and therefore the most generally seen cognitive change related to ageing is that of memory³⁻⁴. Older people can expect some decline in their senses, and because it proceeds, and should find it harder to socialize and participate in activities⁵. Decline in senses like proprioception and tactile leads to various difficulties in doing activities of tailing living. Difficulties are often related to decline in functional performance through decrease in bodily process, cognitive skills, and motor skills.

Decline in functional performance negatively impact the power of older adults to perform activities of daily living (ADL) Tasks like brushing, cleaning, eating, toileting, dressing are called ADL activities⁶, and as hand is the mostly used organ in ADL, it is one of the most affected organ in older adults which is hampered when it comes to the proprioceptive and tactile senses.

This project emphasizes on the reeducation of hand functions with tactile and proprioceptive senses along with the rejuvenation of the memory with the help of Montessori activities and tracing patterns.



The project consists of 3 levels where the first level contains 4 patterns and 6 different materials going from gross (hardest and thickest) to fine (softest and thinnest).

In the first level the person is asked to trace the pasted materials with bare hands. The materials are pasted in the sequence of kabuli chana, corn kernels, rice, semolina and wool yarn. Each material is pasted on all the 4 patterns. All the 4 patterns are paste on an acrylic sheet with a white background for a better view.

In level 2, the person is provided with the materials in a container, and is asked to sprinkle and place the provided materials in the printed pattern provided, but on 2 different colored backgrounds (blue and yellow) for make the stage a bit difficult than the previous one, helping to improve the persons concentration and eye hand coordination. In this level theraputty is added along with the materials in order to strengthen the hand muscles.



In level 3, the the person is only provided with all the 6 materials and 2 colored backgrounds, without the printed patterns. This is the toughest and the final level where the person's concentration, memory and eye hand coordination are tested.

PROCEDURE:

STEP 1: Paste all the 5 materials (kabuli chana, corn kernels, rice, semolina, and wool yarn) on the acrylic sheets on the printed pattern with white back grounds

STEP 2: Print the patterns on colored backgrounds (blue and yellow)

STEP 3: Combine everything into a clip file in order to make it a compact file.

CONCLUSION:

This kit was mindfully designed keeping in mind the sensory and memory enhancing methods on hand functions which were easily available at home and to which the person is familiar too. It is intended to help the geriatric population in improving their proprioceptive and tactile sensory memory and thus improving their hand functions using a simple technique.

DISCUSSION:

As the process of aging progresses it becomes increasingly difficult to perform common tasks involving precision dexterity, two hand coordination, like thread needles, open buttons on clothing, or finger-grip tasks as in holding pen or cutlery. Studies show that aging has marked degenerative effects on hand function and age-related declines in hand and fingers strength and ability to control submaximal pinch posture, manual speed.

Simple hand grip task like opening of bottle also required certain amount of strength.

As the age increases and reaches close to 70 years the prehensile pattern become more apparent and results in decreases of hand strength, performance time, and range of motion.

As earlier mentioned, aging induces major reorganization and remodeling at all levels of brain structure and function which results in sensorimotor and cognitive functions decline progressively.

For the sense of touch, many studies evident that the tactile acuity deteriorates contribute to peripheral decrement in tactile sensibility leading to slowness in processing afferent information associated with hand movement.

Human beings at every age have a tendency to learn with touch and other senses including visual sense, whereas nerve damage and repair are simultaneous process that goes hand in hand

Neuroplasticity or brain plasticity (in common terms), is said to be the capability of the nervous system to adjust its activity in response to intrinsic or extrinsic stimulation by reconstruction of its structure, functions, and/or contacts.

A bottom-line property of neurons is their capability to customize the strength and effectiveness of synaptic transmission through a diversified number of activity-dependent mechanisms, commonly attributed as synaptic plasticity

Since the brain is constantly growing and developing, it has unique opportunities to learn while it is plastic and sensitive, with the ability to absorb new information with different types of sensory inputs including tactile, visual and proprioceptive senses.

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