

*Review Article***Multipurpose Cognitive Rehabilitation Kit****Rohit Kumar¹, Neha Jain² & S K Meena³***Mahatma Gandhi Occupational Therapy College,**Mahatma Gandhi University of Medical Sciences & Technology, Jaipur***Abstract**

The process of understanding is termed as 'Cognition'. It can be illustrated as the capacity of an individual to abstract and retain relevant information from the environment and apply or respond as per that information in its surrounding environment. Cognitive impairment can reduce productivity and performance of an individual in routine activities or they may also fail to cope up with adverse situations in life.

Cognition is a mental process of grasping knowledge from the environment, comprehending it and responding to it in an appropriate way. Thinking, knowing, remembering, judging, problem-solving, perceiving, reasoning are some of the cognitive processes. Cognition is about learning something new, processing, memorizing and taking actions towards it. Cognitive impairment is a significant cause of disability. Rehabilitation of cognitive impairment is a systematic therapy based on a patient's brain-behavioural disability. This therapy includes reinforcement of previously learned patterns; establishing new patterns of behaviour through external compensatory mechanisms like environmental support. Although modification of cognitive function impairment is very difficult but through cognitive rehabilitation it can be achieved to a certain extent.

Keywords

Cognition, Attention, Therapeutic activities, Cognitive disability

Introduction

Cognitive rehabilitation aims at improving impaired cognitive functions, like memory, reasoning, concentration, problem-solving etc. Cognitive rehabilitation supports individuals regaining the ability to perform everyday tasks and to improve their overall quality of life ^[1]. Cognitive rehabilitation typically involves an individualized treatment plan that is individualized to the patient's condition. Treatment may include activities designed to improve attention and concentration, memory training exercises, problem-solving tasks, and strategies to help with organization and planning.

Improvement can be seen in many areas of cognition after rehabilitation. These may be -

1. Attention,
2. Concentration,
3. Perception,
4. Memory,
5. Comprehension,
6. Communication,
7. Reasoning,
8. Problem solving,
9. Judgment,
10. Initiation and many more functions.

Interventions are planned for the improvement of patient's emotional and psychosocial functions as these are related directly to the acquired neurocognitive dysfunction, they are not the service's sole focus.

Cognitive rehabilitation is a broad term used to describe a set of techniques and interventions designed to help individuals recover or improve their cognitive abilities after experiencing some form of brain injury or neurological condition such as Alzheimer's, dementia, Parkinson's, genetic conditions, brain abnormality etc . The goal of cognitive rehabilitation is to help individuals regain or develop the skills necessary for independent living.

In the process of preventing further damage, physical exercise may be a promising tool. Cardio-respiratory fitness can be improved by aerobics. With this physical exercises have been proved beneficial in improvement physical capacity in elderly^[2].

A cognitive rehabilitation kit typically includes a collection of tools and exercises designed to improve cognitive function in condition of brain injuries. These kits may include activities focused on memory, attention, problem-solving, executive function, and other areas of cognitive processing.

Some common tools found in a cognitive rehabilitation kit might include memory aids like calendars and reminder systems, brain games and puzzles, skills training exercises that focus on specific cognitive abilities, and computer-based programs that provide structured exercises for improving cognitive function.

The specific contents of a cognitive rehabilitation kit depends on the patient's situation, therefore a therapist or healthcare professional needs to individualize the rehabilitation process.

Cognitive rehabilitation kits can be used to treat a wide range of conditions that affect cognitive function. For example, they can be helpful in neurodegenerative diseases or brain injuries.

Research has shown that cognitive rehabilitation can be effective in improving cognitive function in these populations by targeting specific cognitive deficits. However, the effectiveness of any given cognitive rehabilitation kit depends on the severity and nature of the cognitive impairment, the individual's motivation and engagement with the activities included in the kit, and the availability of support from healthcare professionals or caregivers.

Impaired adaptive behaviour and mental health is also seen in Autism spectrum disorder (ASD) that also needs rehabilitation therapy^[3].

During life span, goal-directed behaviours are directly controlled by higher level cognitive functions. It supports the process of learning, memorizing, decision making and a lot more capabilities that enable a person to grasp knowledge and implement it in interaction with the environment^[4].

While cognitive rehabilitation kits can be a useful tool for improving cognitive function, they should not be viewed as a substitute for medical treatment or therapy. It's important that healthcare professionals should closely monitor patients with cognitive impairment to rule out underlying cause of their cognitive deficits and develop a comprehensive treatment plan that may include both cognitive rehabilitation exercises and other interventions like medication and therapy.

Cognitive rehabilitation is designed to help people recover from cognitive deficits caused by injury or illness. A cognitive rehabilitation kit may include a variety of tools and activities that can assist with this process.

Some potential components of a cognitive rehabilitation kit might include:

1. Memory aids: These can include calendars, task lists, and reminder systems to help individuals keep track of important information.
2. Brain games: These are activities that challenge the brain in various ways, such as puzzles, word games, and memory exercises.
3. Cognitive therapy exercises: Patients cognitive capacity has been shown to be improved in terms of concentration, analytical thinking and implementing action after cognitive exercises.

4. Communication aids: These can include communication boards, picture cards, and other tools to assist individuals with language difficulties.
5. Assistive technology: This includes devices such as voice recognition software, adaptive keyboards, and other tools to help individuals with physical limitations access technology and communicate more effectively.

Cognitive rehabilitation kits are sets of tools and exercises designed to help people recover from cognitive impairments or deficits caused by various situations like injury and diseases. These kits typically include activities that target specific cognitive capabilities. There are many different types of cognitive rehabilitation kits available, and the specific contents and activities included in each one can vary widely depending on the intended audience and the purpose of the kit. Some kits are designed for use by healthcare professionals in clinical settings, while others are intended for use by individuals recovering from cognitive impairments at home.

Research Methodology

Observation studies were collected from various data bases and included in the present review. These studies were scrutinized for clarity and content before inclusion.

Criteria for the sample collection

Inclusion Criteria

- Both male and female
- All ages
- Adequate vision
- Learning disability

Exclusion Criteria

- Active substance abuse

- Low vision
- Severe cognitive impairment

Electronic Database Searching

The data base searched like PubMed, online journal, access open, Google scholar

Data Extraction and Quality Assessment

PRISMA flow diagram was used to select the eligibility criteria of the selected articles. Evaluation of the studies was done on the basis of relevance, appropriateness and clarity [12].

The extracted data included following details from each study -

Participants, publication year, methodology, intervention and inference.

Analysis

Steps in the analysis -

Step 1: Extracted data was tabulated in columns of author name, study design technique, publication year, sampling, method, sample size, intervention and results.

Step 2: Categorising the findings: Findings were categorised into various categories on the basis of their effect on improvement in gross motor skills, i.e. Gross motor skills development Mat game for kids.

Results

The reviewed study included 250 potentially relevant articles out of which 200 studies were included as duplicate, 25 articles were excluded as they did not meet inclusion criteria. 15 articles did not mention the category of the participants and 10 studies were included for the review.

Characteristics of the Articles

Out of the 10 studies included in the review, all the reviews were qualitative study.

Majority of the study were conducted in the hospital settings. These studies were published between 2000 to 2023.

S. No.	Author	Year of publication	Research design	No of participants	Sample characteristics	Theme	Subtheme
1.	Leila Shahmoradi et.al	2022	Systemic review	226	persons with ASD	This systematic review revealed the importance of using different virtual reality-based approaches to improve the cognitive indexes of people with ASD.	Cognitive rehabilitation in people with autism spectrum disorder: a systematic review of emerging virtual reality-based approaches
2.	Vahid Nejati et.al	2020	Journal	30 children	ADHD	In the present study, a cognitive training program is used for the improvement of cognitive impairment and amelioration of behavioral symptoms in children with ADHD. The result showed improvement in attention and working memory as the trained domains in the program.	Cognitive rehabilitation in children with attention deficit-hyperactivity disorder: Transferability to untrained cognitive domains and behavior
3.	José Ramón YELA et.al	2020	Journal	33	who attended a mutual-aid group at an important regional association of pathological gamblers	These results are consistent with previous research assessing the effectiveness of mindfulness interventions aiming to reduce substance-related craving	Effectiveness of a mindfulness-based Cognitive therapy group intervention in reducing gambling-related craving.

4.	Naomi Josman et.al	2018	Review	50 publications	Children and adolescence	Accurate assessment and relevant intervention goals can lead to developing unique occupation-based intervention protocols for different populations among children and adolescents.	Conceptualisation and use of executive functions in paediatrics: A scoping review of occupational therapy literature
5.	Emily Gardiner et.al	2018	Research Article	59 children and adolescent	ASD	The results of the current investigation illuminate the possibility that targeting particular EFs among children with and without ASD may not only have direct benefit for behavior regulation and metacognitive abilities, but also extend to other areas of life, including adaptive behavior and concomitant internalizing symptomatology, potentially protecting long-term functioning and well-being.	Everyday Executive Function Predicts Adaptive and Internalizing Behavior among Children with and without Autism Spectrum Disorder
6.	Hae Yean Park et.al	2015	Randomised control trial	60 study	TBI	Occupation-based cognitive rehabilitation has been confirmed to be effective on enhancing performances in mental functions, ADL, and values, beliefs and spirituality as the results showed a small effect size with no publication bias.	The Effect of Occupation-based Cognitive Rehabilitation for Traumatic Brain Injury: A Meta-analysis of Randomized Controlled Trials
7.	Jean Tirole et.al	2016	NA	2 groups	People with and without cognitive impairment	Because of their importance for economics, cognitive games need to be better understood and there are multiple alleys for future research.	Cognitive Games and Cognitive Traps

8.	Littbrand H et.al	2011	Systemic review	10 study	Alzheimer's disease	Among older people with Alzheimer disease in residential care facilities, combined functional weight-bearing exercise seems applicable for use regarding attendance and adverse events, and there is some evidence that exercise improves walking performance and reduces the decline in activities of daily living.	Applicability and Effects of Physical Exercise on Physical and Cognitive Functions and Activities of Daily Living Among People With Dementia
9.	Susan R. McGurk ET.AL	2000	Correlational	208	Schizophrenia	This study demonstrated that cognitive functioning is the strongest correlate of functional status in geriatric poor-outcome schizophrenic patients, regardless of negative symptom severity	Relationship of Cognitive Functioning, Adaptive Life Skills, and Negative Symptom Severity in Poor-Outcome Geriatric Schizophrenia Patients
10	Cicerone et.al	2000	Systemic review	171 study	TBI and Stroke	Overall, support exists for the effectiveness of several forms of cognitive rehabilitation for persons with stroke and TBI.	Evidence-Based Cognitive Rehabilitation: Recommendations for Clinical Practice

Conclusion

After studying various articles related to cognitive impairments. Besides fewer studies conducted on the effect of therapeutic games on cognition, a game was created for improvement of cognitive functions in persons with cognitive impairment through which it was concluded that the games help in improving cognitive skills. Therapeutic games are designed to improve cognitive function and address mental health concerns through engaging gameplay. These games use evidence-based strategies to promote positive

cognitive changes, including improved attention, memory, problem-solving and social skills. Therapeutic games can be used in a variety of settings, including therapy sessions, schools, and at home. They can help individuals with conditions such as anxiety, depression, ADHD and autism spectrum disorders. Cognitive rehabilitation kits can be an effective tool for individuals with cognitive impairments resulting from brain injury or neurological conditions. These kits often include a range of activities that are designed to improve various cognitive functions like concentration, remembering things, analytical thinking and decision-making.

Specialization is required for practising cognitive rehabilitation but in rural areas, there is a lack of access to cognitive rehabilitation so this kit will be beneficial for the people as there is no specialization required to use it simply following the instruction will result effectively.

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