Creative Therapeutic Interventions for Clinicians to Promote Physical Activity in Older Adults with a Brain Injury: A Viewpoint

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INTRODUCTION

- 47% of individuals experience chronic disability well into their later years. Early implementation of appropriate treatment strategies becomes crucial in promoting physical activity and addressing related cognitive and behavioral function.
- Normal aging brain changes:
  - Decreased synaptic density
  - Decreased nerve conduction velocity, resulting in delayed processing and cognitive decline
  - Aging microglia can produce toxic substances
  - Size of brain decreases after 50 years with early volume loss in grey matter and white matter
- Aging brain with TBI:
  - Less age related neuronal loss needed to exceed threshold adequate for manifestation of a deficit
  - Worsened cognitive, behavioral, and physical state as compared to a normal aging brain

CLINICAL SIGNIFICANCE

- Limited knowledge exists on alternative treatment approaches to manage clients aging with a TBI
- Benefits of exercise on brain activity in TBI:
  - Physical exercise can maintain and improve pathophysiological changes from TBI
  - Encourage cognitive recovery by up-regulating neuroplasticity-related growth factors
  - Reduce neuronal degeneration, inhibit neuronal apoptosis and reduce lesion size
  - Up-regulation improves: Working, spatial, and delayed memory
  - Cognition
  - Auditory and visual learning
  - Processing speed
- This treatment approach highlights creative strategies which may be incorporated into rehabilitation programs to promote physical activity after TBI

CREATIVE INTERVENTIONS

VIRTUAL REALITY
- Virtual reality is (VR) is used to improve standing balance through motivational and adaptive exercises, resulting as a safe alternative to traditional treatment to improve static balance

GROUP FITNESS
- Group fitness benefits in older adults include:
  - Improved social networks
  - Decreased depressive symptoms
  - Increased exercise intensity
  - Greater satisfaction
  - Self-recognition
  - Sense of achievement

MUSIC THERAPY
- Listening to music can:
  - Improve communication in individuals with aphasia
  - Improve engagement and participation
  - Reduce depression and confusion
  - Improve mood with rhythmic movements to music or active music making

CANINE ASSISTED THERAPY
- Canine assisted therapy aides in the management of pain and stress, as well as an improvement in verbal and non-verbal communication, mood, motivation, and emotion, resulting in enhanced therapeutic involvement

YOGA
- Physical benefits of yoga include improvements in:
  - Flexibility and ROM
  - Posture and balance
  - Strength and stability
  - Motor control and coordination
  - Cardiovascular endurance

CONCLUSIONS

- Research and clinical experience reveal that aging affects survivors of TBI differently than their healthy counterparts. These clients benefit greatly from creative treatment strategies to prevent boredom, frustration, decreased motivation and subsequently result in positive physical, cognitive, behavioral, and social outcomes.
- Future research is indicated to:
  - Evaluate these interventions with larger scale studies and the use of standardized assessment measures
  - Assess the impact of these creative interventions more specifically on physical activity in the aging population and their carryover to everyday function
  - Explore a greater variety of interventions
- Results of future research would potentially lead to the development of guidelines on effective utilization of these activities to promote physical activity in aging individuals with a history of TBI.

REFERENCES