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December 7th, 2015
Policy Statement Project

The Benefits of Intervention for all Older Adults

Introduction:

Mild cognitive impairment (MCI) is a prodromal stage between expected/ age-related cognitive decline in older adults over the age of 65 and severe cognitive decline (Gagnon, 2011). Severe cognitive decline may be diagnosed as a variety of different neurodegenerative diseases such as dementia or Alzheimer`s. During this stage of cognitive decline, an older adult may experience cognitive impairment in memory and memory related tasks. MCI is common within older adults with a prevalence rate of 3% - 29% in the general population, which may be considered low possibly due to the lack of standardization in the diagnosis for MCI (2006, cited in Weybright, Dattilo, & Rusch, 2010). Over a period of 2 - 3 years, 20% - 50% of these older adults transcend into a more serious stage of MCI (e.g., dementia or Alzheimer`s) (Belleville, Gilbert, Fontaine, Gagnon, Ménard, Gauthier, 2006). These degenerative diseases are the result of the lack of activity in parts of the brain that are linked to cognitive skills/ activity and lack of physical activity (Tesky, Thiel, Banzer, & Pantel, 2011). Attention should brought to these older adults who fall into the in-between stages of cognitive decline and are at risk of developing serious brain degenerative diseases.

While age-related cognitive decline is common in older adults, there are many factors that may contribute in the development of more serious stages of MCI. For example, the decline of cognitively stimulating activity, such as leisurely activities (e.g. playing chess, reading, socializing, visiting a museum, playing music, etc.), may affect the strength of an individual`s cognition (Tesky, Thiel, Banzer, & Pantel, 2011). Also changes in lifestyle, such as diet,

nutrition and exercise, may affect the strength of an individual`s cognition (Tesky, Thiel, Banzer, & Pantel, 2011). Many older adults that dwell in community-facilities may not have the opportunity to have new sets of stimuli to enhance or enrich their cognitive development. In other words, the environment itself may not give a strong support for older adults in terms of cognitive stimulation. Staying within this sedentary lifestyle without cognitive challenge has been linked to cognitive decline as well as depression, which are both symptoms that may lead to severe cases of MCI (Mueller, Raymond, & Yochim, 2013).

While clinical trials have taken place to find a pharmaceutical solution, none have been successful in finding a way to prevent severe cognitive decline or manage older adults who suffer from the symptoms of MCI (Belleville, Gilbert, Fontaine, Gagnon, Ménard, Gauthier, 2006). Previous studies have shown the benefits of intervention, which is a new possible solution to MCI. These interventions help promote constant cognitive and physical activity for older adults and aims to prevent/ further prevent damage from severe degenerative diseases. All interventions inform and educate their participants about the dangers of severe cognitive decline. Interventions also have the capability to help maintain the cognitive abilities of those who suffer from MCI. In other words, these interventions focus on impaired cognitive functioning and processing and strengthen the remaining capabilities of individuals (Belleville, Gilbert, Fontaine, Gagnon, Ménard, Gauthier, 2006). This is done through training and maintaining a person`s cognitive skills (e.g. through repetition, concentration or problem solving), as well as making changes in a person`s life style. These interventions have the potential to aid the lives of healthy older adults and adults who suffer from MCI, which may transcend into serious brain degenerative diseases (Fairchild, Friedman, Rosen, & Yesavage, 2013).

Physical Interventions:

Previous studies have shown the potential benefits of physical interventions for older adults. While there are a vast number of different interventions that have been studied and applied, most seemed to involve the general uses of physical fitness (e.g. gymnastics, yoga, walking, sports, jogging, walking or productive/ intellectual activity like, gardening, playing music, etc.) and lifestyle change (diet and environment). Some studies that focus on the effects intervention do not typically have participants act in the intervention alone. In other words, when participants are put in these intervention studies, they undergo other sources of treatment in order to seek the best improvement in maintaining and strengthening cognitive ability. For example Tesky, Thiel, Banzer, & Pantel (2011) ran a study that focuses on an intervention called AKTIVA, which focuses on physical fitness through leisure activities.

AKTIVA (Aktive Kognitive Stimulation - Vorbeugung imk Alter) is considered one of the first intervention program that aims to achieve active cognitive stimulation in older adults and prevention of further cognitive damage through the uses of cognitively stimulating leisure activities. The range of activities that are considered leisure activities have the ability to enhance general cognitive and social functioning and strengthen an individual`s cognitive abilities, which may prevent participants further transcending into the severe stages of MCI. Reasons that have been linked to physical activity and how an older adult`s cognitive reserve (i.e. maintaining strength in cognitive ability) may benefit from fitness points to the possible increase cerebral blood flow (Hultsch, Hertzog, Small, & Dixon, 1999). Also, older adults who suffer from MCI that engage in such leisure activities are 44% less likely than those who are physically inactive to develop further cognitive impairments (2001, cited in Weybright, Dattilo, & Rusch, 2010). In this particular study, participants were placed into two separate groups of leisure activities; one

group participated in reading, playing games, and listening to music, while the other group participated in walking exercises, yoga exercises and gymnastics exercises as well as the leisure activities in group one, while keeping a healthy diet. Participants who kept a healthy diet typically went through nutrition counseling, where individuals were taught the benefits of eating specific foods, such as fish vegetables, legumes, fruit, cereal, unsaturated fatty acids, low consumption of dairy.

The intervention itself hosted 8 weekly sessions and two booster sessions after a 4 month break. A pre-intervention and post intervention psychometric tests were given to participants to measure the effects of the intervention. It was found that the intervention only was only able to benefit younger-older participants (50+) and had no significant effect for older adults (65+) in either intervention groups. In other words, there was no evidence of this particular intervention truly influencing the cognitive abilities of older adults and only managed to benefit the strengthening or maintenance an individual`s cognitive reserve if they were around the age of 50. However, another study done by Weybright, Dattilo, & Rusch (2010) focused on fitness as well, but paired it with the benefits of socializing, rather than nutrition and managed to yield improvement in cognitive abilities and general quality of life.

The intervention group created by Weybright, Dattilo, & Rusch (2010) focused on the benefits of a social environment and cognitive challenge, while participating in physical fitness. The integration of both cognitive and physical activity was done by using the Nintendo Wii. By implementing the usage of technology in the intervention, participants had felt positive affect in their overall quality of life. This is also an important factor in terms of maintaining cognitive health. Experiencing a low quality of life is associated with cognitive decline in older adults, as

well as neuropsychiatric disorders (e.g. depression). 50% of individuals with MCI, that are affected by neuropsychiatric disorders, suffer impairments in daily living activities and are more prone to rapid cognitive decline (2002, cited in Weybright, Dattilo, & Rusch, 2010). Also, previous studies have shown the increase in cognitive impairment when an individual`s social network is limited, especially in cases where individuals are living alone and lack any contact between close friends or relatives (2000, cited in Weybright, Dattilo, & Rusch, 2010). Older adults who dwell in community-facilities that aren`t able to achieve social bonds often are twice as likely to experience cognitive decline as those with five or more social ties. Playing games using the Nintendo Wii had the ability to promote cognitive challenge, physical fitness, and gave individuals an opportunity to be social amongst the community that they resided in.

In the study done by Weybright, Dattilo, & Rusch (2010), two older adults (ages 86 and 93) participated in playing Nintendo Wii games such as Wii Sport games (specifically bowling, due to it`s engagement in cognitive maintenance). The game itself exercised cognitive abilities such as attending to tasks, following directions, and using hand/ eye coordination and also physical capabilities such as balance and fine motor skills. Participants were asked to take part in the Nintendo Wii intervention for about 15 minutes a day, four times a week; the intervention itself was hosted for 16 weeks and observations were made every three weeks. It was found that both participants had benefited from the intervention and showed increased attention through fitness, cognitive ability, and showed positive affect. The Nintendo Wii in the rehabilitation setting had addressed issues and shown improvement in balance, gait, range of motion, visual-perceptual processing, postural control, and fine motor control, by using the integration of physical and cognitive intervention (2008, 2009 cited in Weybright, Dattilo, & Rusch, 2010).

Cognitive Interventions:

Previous studies have shown the benefits of cognitive intervention for older adults. Older adults who suffer from or are at risk of developing severe cognitive impairment are typically able to complete activities of daily living with little difficulty; however these individuals also struggle with objective memory deficits for their age including memory loss, language disturbances and attention challenges (2008, cited in Weybright, Dattilo, & Rusch, 2010). These older adults with cognitive impairments typically lack active participation during their free time, possibly due to their environment or sedentary lifestyle, often have challenges related to attending to task (2008, cited in Weybright, Dattilo, & Rusch, 2010). These challenges often are related to attention deficits, which can be one of the first problems other than memory to affect those with MCI. Such attention deficits can include impairments in visual attention, attention control, attention shift, reaction time and disengaging attention (2007, 2006, 2003, cited in Weybright, Dattilo, & Rusch, 2010). Structured cognitive training for older adults has also been shown to enhance and maintain cognitive abilities. Such training focuses on concentration, attention, or memory as well as the ability to solve problems that follow a pattern or learning strategies (Hultsch, Hertzog, Small, & Dixon, 1999). An example of such intervention has been done by Belleville, Gilbert, Fontaine, Gagnon, Ménard, & Gauthier (2006).

In this study done by Belleville, Gilbert, Fontaine, Gagnon, Ménard, & Gauthier (2006), participants underwent 8 weekly sessions of intervention— each session was approximately 120 minutes. Each set of sessions had different types of mnemonic training that participants were asked to learn from expected to exercise and reflect upon within their homework journals, which they were given during the beginning of their intervention. For example, Sessions 2 and 3 were focuses on computer-assisted attentional training, which exercised divided attention, as well as

speed of attention through arithmetic skills and visual detection skills. Session 4 through 7 were devoted to episodic memory through the teaching of different methods to improve memory performance. Teaching methods that were used consisted of interactive imagery, method of loci, face-name association and organization of text information. These teaching methods were aimed to improve visual imagery abilities, generate and memorize bits of information within the environment of the older adults, and comprehending/ organizing informational texts. Experienced clinical neuropsychologists would teach participants during daily meetings, which were held in a classroom like setting. In this study it was found that the multifactorial training had significantly improved the cognitive abilities of MCI patients within the study and had the ability to increase their ability to preserve and strengthen their cognitive reserve. While some studies focus on mnemonic learning, others focus on improving memory through spaced retrieval training.

The study done by Hawley & Cherry (2008), was devoted to spaced retrieval intervention, which focuses on the retention and recall of memory over specific durations of time through exposure. Spaced retrieval has the potential to enhance the quality of life for participants through the benefits of self-efficiency. In other words, older adults who had improved their memory abilities through various levels of exposure generally feel more positive about their cognitive capabilities than those who don`t remember. The intervention itself has the potential to also increase the ability for older adults to work through impairments and maintain everyday functioning (2007, cited in Haweley & Cherry, 2008). There are two experiments within this particular intervention that were studied.

In the first part of the intervention study, 12 individual sessions were held over a 4 week long period, where participants would train for about an hour three days a week. Spaced retention training in this particular study typically consisted constant exposure to an assortment of stimuli. For example, participants were shown an array of photographs and were told the name of each person within the photograph (typically it would be photos of their family members). After the training session had been complete, participants were asked to pick out pictures within an array of photos of specific members that were just taught. Later during the intervention, participants were asked to do a live person transfer task, where the participant would identify the actual person within the room after finishing their repetition training. The second part of the intervention focused more on the quality of life that each participant had experienced when realizing that they had retained information from their daily training. It was found that spaced retention intervention had not only improved the cognitive abilities of older adults, but also improved the quality of life that they had experienced during and after the intervention training process. In other words these memory remediation activities, which were easy to implement with minimal effort, had become an activity program that helped facilitate and produces gains in both quality of life and cognitive maintenance/ strengthening.

Conclusion:

Severe cognitive decline, outside of age-related cognitive decline, has the potential to result in brain structure, functioning, and volume, which have the potential to impact cognitive functioning and may lead to serious neurodegenerative diseases such as dementia or Alzheimer`s (2008, cited in Weybright, Dattilo, & Rusch, 2010). An estimate of 70% of nursing home residents suffer from MCI, while close to 47% of nursing home residents been diagnosis with dementia or Alzheimer`s (2007, cited in Hawley & Cherry, 2008). Interventions have the

capability of enhancing an individual`s cognitive reserve, which is the overall resilience the brain has to neurological damage as well as the brain`s capability to overcome damage that is already done through cognitive activity, intelligence, educational achievements, degree of literacy, leisure activities and social integration (Tesky, Thiel, Banzer, & Pantel, 2011). The potential benefits of intervention is the introduction of cognitively stimulating activities and strategies to help the brain keep off "auto-pilot" as well as improving the quality of life and self-efficiency of participants. Also the possible benefits of changing the lifestyle of participants, may also yield improvement in participant`s cognitive maintenance and strengthening. While there are many potential benefits to the different types of cognitive and physical interventions, there are also limitations.

An example of a limitation that comes with the uses of these interventions lies in the fact that there is no evidence showing that these trainings have a general effect on everyday cognitive abilities. Also interventions provide no evidence that they have the capability of delaying or slowing the progression of severe cognitive decline, which leads to neurodegenerative diseases (2009, cited in Tesky, Thiel, Banzer, & Pantel, 2011). Also interventions that are typically is paired with pharmaceuticals, or other sources of support may be unreliable, since they don`t always produce the same results and are also a hazard to validity. For example, Although pharmaceuticals alone have not shown any progress or prevention for MCI patients, when paired with intervention, in some cases, have shown improvement in maintaining and strengthening cognitive ability. While some studies have shown this improvement, others have denied the benefits of intervention. Studies that have shown the weaknesses of intervention have discussed errors that might be due to internal validity. For example, studies that have shown the benefits of

intervention paired with the use of pharmaceuticals have no control group to prove that the intervention alone created improvement in participants. Also, some interventions may not work for everybody. Some studies show that there is no relationship between physical and cognitive increase through intervention and the overall cognition of an individual (Hultsch, Hertzog, Small, & Dixon, 1999); however, this may all be due to individual differences. Another limitation that should be noted is the fact that intervention may not yield improvement if participants are not in constant exposure to the intervention. In other words, interventions only last a certain amount of time and without constant exposure to the teachings within the intervention, the abilities of participants may deteriorate over time (Fairchild, Friedman, Rosen, & Yesavage, 2013). Finally, patients who suffer from more severe MCI may be more difficult to work with and may scatter the results of the participants that did improve from physical or cognitive intervention. These differences may cause floor and ceiling effects (Fairchild, Friedman, Rosen, & Yesavage, 2013).

Solutions/ Policy Statement:

There are a variety of ways to implement the possible improvements that come with intervention into a real life setting. For example, adjustments to community centers and nursing homes by making the environment more interactive, more social, and giving individuals the ability to exercise their cognition through physical fitness and cognitively stimulating activities may improve their cognitive reserves. These environments should be geared towards making adjustments in the lifestyles of older adults and removing them from any sedentary environment. The integration that has been exhibited within the literature not only seems easy to manage, but also has low cost with high improvement; there should be no reason as to why these environments cannot evolve. More research with different types of interventions is definitely

needed. It`s extremely difficult since everyone has different struggles with MCI, which possibly makes finding a standard for interventions more difficult; however, future research should focus on more structured intervention that takes into account more participants that have a variety of different levels of MCI.

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