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RESEARCH ARTICLE

EFFECT OF TIME BASED SELECTIVE DOMAIN OF SELF REHABILITATION ON HEALTH RELATED QUALITY OF LIFE IN PARKINSON'S DISEASE

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ABSTRACT

Aim of the study: The aim of the study is to compare the effect of time based selective domain of self-management rehabilitation on health related quality of life in Parkinson's disease

Need for the study: There is no cure for Parkinson's disease. Medical management is directed at slowing of disease progression and symptomatic treatment.

Individuals who develop Parkinson's disease are confronted not only with the physical and psychological issues that impact quality of life. The medical community is increasingly recognizing health related quality of life as a major criterion in evaluation of health interventions, particularly as it relates to Parkinson's disease, in the content of both motor and non motor symptoms. Research has pointed out that maintaining positive attitude optimism and happiness can lead to longer lives, less disability and increased quality of life. Rehabilitation has an important role in reducing functional limitations while promoting activity participation and independence. In addition complication of Parkinson's disease can be reduced or prevented while quality of life is promoted.

The ideal rehabilitation program considers the patients disease history, course and symptoms, together with impairments, functional limitations and disability. Of equal importance are the patient's abilities, priorities and resources including family, home and community resources.

Study Design: Experimental

Study Type: Comparative

Sample Size: 18subjects were taken for the study and divided into three groups Namely Group A, Group B, Group C, Group A: control Group (5), Group B: experimental Group 1 (6), Group C: experimental Group 2 (7)

Sampling Method: Convenient sampling

Study Duration: 6weeks

Results: According to table 1 & table 2, difference between three groups in terms of Parkinson disease questionnaire – 39. Group 1 was given medications, group 2 was given medications and 18 hours rehabilitation and group 3 was given medications and 27 hours rehabilitation. The mean difference between group 1 & 2 is -2.5987745 and mean difference between group 1 & 3 is 12.8867157. The p value is < .066. The mean difference between group 1 & 3 is greatest than group 1 & 2. The mean difference between group 2 & 1 is 2.5987745 and mean difference between group 2 & 3 is 15. 4854902. The p value is < .019. The mean difference between group 2 &3 is greatest than group 2&1. The mean difference between group 3&1 is -12.8867157 and mean difference between group 3&2 is -15.484902. The p value is < .019, the mean difference group 3&2 is greatest than group 3&1. Hence the mean difference between the group 3&2 is greater than group 1&2 and group 1&3.

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INTRODUCTION

Parkinson's disease or paralysis agitans was first described as the shaking palsy by James Parkinson in 1817. Etiology is unknown or idiopathic. (Susan b o'sullivan, 5th edition) Parkinson's disease is a well-known disorder which occurs as a result of basal ganglia dysfunction. It is due to a steady loss of the neutral transmitter dopamine together with a reduction in the number of dopamine receptors in the basal ganglia. The signs and symptoms of Parkinson's disease and the motor disorders associated with basal ganglia dysfunction are (Kim Jones and Karen Barker, 1st edition).

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Deep within the white matter of each cerebral hemispheres lie a group of nuclei which are collectively named the basal ganglia or basal nuclei. Individually they comprise the sub thalamic nucleus, the substantia nigra, the caudate nucleus and the lentiform nucleus which has two parts, the globus pallidus and the putamen. The caudate nucleus and the lentiform nucleus together known are known as the corpus striatum. (Albin, 2012; William Dauer and Serge Przedborisk, 2010; Nadir, 2010) The basal ganglia play an important role in the planning and programming of movement by selecting inhibiting specific motor synergies. It also plays roles in some cognitive processes including awareness of body orientation in space ability to adopt behavior as task requirements change and motivation. (Albin, 2012; William Dauer and Serge Przedborisk, 2010; Nadir, 2010) Parkinson's disease is

associated with degeneration of dopaminergic neurons that produce dopamine and loss of nigral cells and melanin containing neurons and other neuro transmitters like serotonin, norepinephrine etc. loss of dopamine results in an overactive indirect pathway that is tough to underlie akinesia and rigidity. The other disorders characterized by excessive or abnormal movements. These are thought to result from underactive direct pathway while dyskinesia, dystonia or athetosis are thought to result from an over direct pathway. Tremor is viewed as a release phenomenon, representative of loss of inhibitory influences within basal ganglia. (William Dauer and Serge Przedborisk, 2012; Nadir, 2012) It affects more than 2% of population. Average age of Parkinson's disease onset is approximately 50 to 60 years. (Nadir, 2012) Impairments in cognitive functions can be mild to severe approximately 20 to 40 % of the patients (Harvey *et al*., 2010). Disruptions in daily function roles and activities and depression is common in individuals with Parkinson's disease. (Docherry *et al*., 2011) Patients with Parkinson's disease will have neurobehavioral disturbances. It is estimated according to the stage and severity of the disease using a staging scale. The most widely used is HOEHN & YAHR classification of disability scale. It provides a useful measure for charting the progression of the disease. Stage1 is used to indicate minimal disease involvement whereas stage 5 indicative of severe deterioration in which the patient is confined to bed or wheel chair. (Susan b o'sullivan, 5th edition; Stephen and Gancher, 2012) Impairments in cognitive functions can be mild to severe with Parkinson's disease patients. The cognitive function like memory, orientation, conceptual reasoning, problem solving and judgment should be examined. A brief screen of cognitive function can be obtained using mini-mental status exam (MMSE). (Hoop *et al*., 2009)

Emotional & behavioral changes are associated with Parkinson's patients. It is important to ask to the patient about the presence of depressive symptoms such as sadness, apathy, passivity, insomnia, anorexia, weight loss, inactivity and dependency, inability to concentrate and impaired memory. Geriatric depression scale is useful instrument to know about the emotional and behavioral changes associated with the patients. (Amy faraburgh *et al*., 2011; Mc donald *et al*., 2006) Health related quality of life (Health Related Quality Of Life) is one's perceived health and wellbeing in personally valued domains of daily life. 1.2 Parkinson's disease symptoms compromise health related quality of lifeby making it difficult to participate in valued activities and roles of home and community of life. (Tickle dengen *et al*., 2010) Interventions are Restorative (aimed at improving impairments, functional limitations and disabilities), Preventative (aimed at minimizing potential complications and indirect impairments), and Compensatory (aimed at modifying the task, activity or environment to improve function). (Susan b o'sullivan 5th edition) Previous studies found rehabilitation to improve performance in mobility and self-care activities in 25% individuals with Parkinson's disease compared to control conditions (Crizzle and newhose, 2006; Ellis *et al*., 2005). Recent studies have strengthened the evidence that rehabilitation benefits health related quality of life. (Bahram yousefi *et al*., 2009; Schenman *et al*., 2012) The health related quality of lifein Parkinson's disease is assessed with the tool Parkinson disease questionnaire - 39 questionnaire. It focuses on the subjective report of impact of Parkinson's disease on daily life and addresses eighthealth related quality of lifedimensions (Mobility, Activities of daily living, Emotional, Wellbeing, Stigma, Social support, Cognition, Communication & Bodily discomfort). (Hagell and Nygren, 2007; Peto *et al*., 2007)

Aim of the study

The aim of the study is to compare the effect of time based selective domain of self-management rehabilitation on health related quality of life in Parkinson's disease.

Need for the study

There is no cure for Parkinson's disease. Medical management is directed at slowing of disease progression and symptomatic treatment. Individuals who develop Parkinson's disease are confronted not only with the physical and psychological issues that impact quality of life. The medical community is increasingly recognizing health related quality of life as a major criterion in evaluation of health interventions, particularly as it relates to Parkinson's disease, in the content of both motor and non motor symptoms. Research has pointed out that maintaining positive attitude optimism and happiness can lead to longer lives, less disability and increased quality of life. Rehabilitation has an important role in reducing functional limitations while promoting activity participation and independence. In addition complication of Parkinson's disease can be reduced or prevented while quality of life is promoted. The ideal rehabilitation program considers the patients disease history, course and symptoms, together with impairments, functional limitations and disability. Of equal importance are the patient's abilities, priorities and resources including family, home and community resources.

Hypothesis

Null Hypothesis: There is no significant improvement in the health related quality of life self - management rehabilitation in patients with Parkinson's disease.
Alternative Hypothesis: There is significant improvement in health related quality of life with self-management rehabilitation in patients with Parkinson's disease.

Review of Literature

- M.P Arun, S. Baharth, pramood kumar (2012) suggested that depression plays roles in disability and quality of life in Parkinson patients. (Arun *et al*., 2012)
- Schenkman M, Hall DA, (2012) suggested that exercises for Parkinson patient in early or mid-stage are beneficial and improved quality of life (Schenman *et al*., 2012).
- Ziropadja LJ, Stefanova E, Petrovic M (2012) suggested that Apathy and depression are among the most common and behavioral disorders associated with Parkinson's disease. (Ziropadja *et al*., 2012)
- Speelman AD, Warrenburg BP *et al*, (2011) suggested that physical activity is beneficial in Parkinson disease and improves quality of life.
- Cruise KE, Bucks RS *et al*, (2011) suggested that exercises benefit the Parkinson's patients in cognition and quality of life.
- Docherry JR, Kansal (2011) *et al*, says that depression is common in Parkinson disease due to disturbed or impaired quality of life. (Docherry *et al*., 2011)
- Caglar AT, Gurses HN, Mutluay FK, Kiziltan G. (2010) says that a home based rehabilitation programmes for

patients with Parkinson disease helped to improve motor performance who did not take advantage of a regular, professionally designed exercise programmed. (Caglar *et al*., 2008)

- Tickle – Degnen, Ellis T *et al*, (2010) suggested that self-management rehabilitation improves health related quality of life in Parkinson patient. (Tickle dengen *et al*., 2010)
- Hoops S, Nazem, Siderowrf AD, Duda JE, Xie SX (2009) suggested that Mini mental status scale examination has good validity in evaluating for Parkinson's disease. (Hoop *et al*., 2009)
- Peter Hagell AND Maria H. Nilsson (2009) suggested that Parkinson disease questionnaire -39 is valid as unidirectional construct. (Peter Hagell and Maria H. Nilson, 2009)
- Madeleine E. Hackey, Gammon M. (2009) says alternate form of exercises improves health related quality of life. (Madeleine E. Hackey and gammon M.Earhart, 2009)
- Faculty of physical education, razi university authors (2009) suggested that exercise therapy improves activities of daily living in Parkinson's patients.
- Beth e. Fisher, Allan d. *et al*, (2008) suggested that the effect of exercise training improves motor and corticomotor excitability in persons with early Parkinson's disease. (Beth e. Fisher *et al*., 2008)
- Hagell P, Nygren C (2007) suggested that Parkinson disease questionnaire - 39questionnaires has good acceptability and reliability in Parkinson disease. (Hagell and Nygren, 2007)
- Martinez P, Serrano M *et al*, (2007) suggested that Parkinson disease questionnaire - 39 has good reliability and validity in assessing health related quality of life in Parkinson disease.
- Crizzle Am, Newhouse IJ (2006) suggested that physical exercises improve activities of daily living in Parkinson patient. (Crizzle and Newhose, 2006)
- Mc donald wm, holtzheimer pe. Haber M, Vitek JL, (2006) suggested that geriatric depression scale is very useful for screening for depression in Parkinson's disease. (Mc Donald *et al*., 2006)
- Ellis T, De Geoede CJ *et al*, (2005) suggested 6 weeks physical therapy exercises program improves health related quality of life in Parkinson patients. (Ellis *et al*., 2005)
- Feldman Rg, Wolters EC (2005) suggested that physical therapy is efficient in improving health related quality of life in Parkinson's disease. (Ellis *et al*., 2005)
- De Boer, Wijcker W *et al*, (2002) suggested that Parkinson disease questionnaire - 39 is quick, valid & reliable in assessing the health related quality of life in Parkinson disease.
- Cees J.T, De Geoede *et al*, (2001) says that Parkinson patients are benefited with the physical therapy treatment combined with their standard medications. (Cees *et al*., 2001)
- Karen H Karlsen *et al*, (2000) stated that Parkinson's disease has a substantial impact on health related quality of life. (Karen H Karlsen *et al*., 1999)
- Peto V, Jenkinson C, Fitzpatrick R (2000) suggested that Parkinson disease questionnaire - 39 has good development and validation measure is functioning and well-being for individuals with Parkinson disease. (Peto *et al*.)
- Bushnell Dm, Martin ML (1999) suggested that us version of Parkinson disease questionnaire - 39 demonstrated acceptable and proved reproducible with Parkinson disease.
- Donald M.Bushell and Monna.L (1999) suggested that Parkinson disease questionnaire - 39 has good reliability and validity in assessing health related quality of life in Parkinson disease. (Donald M. Bushnell and Mona l. Martin, 1998)
- Schenkman M, Custon Tm, *et al*, (1998) demonstrated that improvements in axial mobility and physical performance can be achieved for people with early and mid-stage Parkinson's disease with exercises. (Schenkman *et al*., 1998)
- Crisipin Jenkinson, Ray Fitzpatrick (1997) suggested that Parkinson's disease questionnaire - 39 has a good reliable and validity score to assess the health related quality of life in Parkinson's disease. (Crrispin Jenkinson *et al*., 1997)

MATERIALS AND MEHTODS

Study design: Experimental

Study type: Comparative

Sample size: 18subjects were taken for the study and divided into three groups

Namely Group A, Group B, Group C
Group A: control Group (5)
Group B: experimental Group 1 (6)
Group C: experimental Group 2 (7)

Sampling method: Convenient sampling

Study duration: 6weeks

Study settings

1. Dr. A.V. Srinivasan, Old no 113, Near mandaveli bus stand, Chennai.
2. SSS neurotherapy center, 119 Majestic colonies, Vadapalani, Chennai.
3. Shanmugam multi special clinic, No 102, Raman Street, Kodambakkam, Chennai.

Inclusion criteria:

- Diagnosis of idiopathic Parkinson's disease.
- Modified Hohen & Yahr stage
- Age > 50
- Mini mental status exam score < 26
- Geriatric depression scale < 20
- Ability to understand & communicate
- Stable dose of Parkinson's disease medicine for at least 2 weeks prior to entering the
- Interest in participating and ability to give consent.

Exclusion criteria:

- Patient who received surgical intervention such as deep brain stimulation.
- No hearing and visual impairments.
- Any associated neurological, cardiovascular, or musculoskeletal conditions.
- No other form of rehabilitation therapy received within 2 months before participation in study.

Materials used for study:

- Sand bags (1Kg)
- Water bottle (1litre)
- Hand spring
- Hand Exercise Ball

Figure 1. Outcome measures

Parkinson disease questionnaire – 39 (PDQ -39)

Procedure:

The subjects referred by the Dr. A.V.Srinivasan neuro clinic, SSS Neurotherapy center, Shanmugam Multi-Specialty clinic were assessed with a detailed history and evaluation. The samples who were satisfied under the inclusion criteria were included in the study. 18 subjects are allocated into 3 groups for the study after meeting the criteria and inform consents were obtained before starting the intervention. Group A 5 subjects (control group) Group B (18 hours rehabilitation) 6 subjects & Group C (27 hours rehabilitation) 7 subjects. Before starting with intervention subjects were assessed for their Health Related Quality Of Life prior to their study by Parkinson disease questionnaire – 39. Group A were given only medications. Group B were given medication and 18 hours rehabilitation i.e. 41/2 hours per week i.e. 1.5hours per day in alternative days. Group C were given medication and 28 hours rehabilitation i.e. 7 hours per week i.e. 1 hour daily.

The self-rehabilitation program includes:

- Deep breathing exercises
- Self-stretches for all muscles
- Facial exercises
- Free exercises
- Strengthening exercises
- Sit to stand

The exercises are thought to patient how to perform and those patients were performed all exercises in the guidance of the therapist supervision. Each set of exercises are repeated 8 to 12 times. Group A has no intervention but on regular medication. Group B consist of 1.5 hours of interventions per day and continues alternative day and on regular medications. Group C consist of 1hour of interventions daily and with regular medications. Often there is increase in rigidity and stiffness of the body with Parkinson's disease so warm up to the body is important. It is started with gentle breathing exercises and stretching exercises to the muscles. Breathing exercises can be done in lying or sitting position. In sitting the patient was instructed to sit straight and in full relaxed position. The patient was asked to place one hand on belly and other hand on the chest and was asked to exhale through the nose and contract abdominal muscles. While inhaling through the nose the patient was asked to let the belly rise first. This procedure was repeated for 10 times.

Neck Stretches

After breathing exercises the stretching exercises are continued. The patient was made to sit in a stool or chair, hold to right, dropping the right ear to the right shoulder. Do not turn your head or chin, look straight forward to stretch the side of the neck, vice versa and hold the stretch for 5 to 10 sec and repeat it. Head rotation to relax the side flexors of neck, the patient was asked to sit on chair and keeping chin parallel to floor, turn head to right to look over the right shoulder and vice versa for same duration. Chin tucks exercises for neck flexors and extensors, the patient was asked to sit in a chair and maintain the neck in neutral position and was asked to draw chin back hold it and release it.

Spinal Stretches

The patient was asked to sit in a chair, and was asked to fold his/her hands and gently turn to right looking over his/her right shoulder and hold it and come back gently and vice versa. They were asked to push the abdomen forward and the shoulders back to create an arch in the lower back, followed by shoulders round forward shoulder position, pulling the abdominal muscles in and letting the lower back round out. Chest opener exercises were helpful in stretching the chest muscles. The patient was asked to clasp both hands behind his/her neckand was instructed not to pull head forward, bringing both the elbows to front as close as together as they can and open the shoulders up, bring the elbows back as far as possible, was asked to hold it and repeat it again.

Arm Stretches

The patient was askedto sit on stool or chair and was asked to him/his clasps his/her hands behind the back and hold it for few sec and relax. The patients were asked to raise their shoulders and bend elbow fully and lift it over head and hold the hand with opposite hand for few sec and vice versa. The patients were asked to clasp their hands behind their back and were asked to draw their shoulder blades together and lift their hands away from their body as far as they can; they were suggested not to lean forward. The patients were asked to put their one hand on stool or chair and transmit weight over the hand and maintain it vice versa.

Leg Stretches

The patient was asked to stand on the toes and heel for ankle stretches, they were asked to sit in long sitting position and were asked to touch the toes with hand for thigh stretches.

Facial Exercises

The patients were instructed to practice in front of the mirror and were asked to repeat this sequence for 4- 5 times.

- Pucker the lips in a kissing motion.

- Keep the lips closed and teeth together smile as much as possible without opening lips.
- Keep the lips closed, curl the lips.
- Pretend to have just been exposed to horrible smell.
- Frown the head as much as possible.
- Show surprise look by raising eyebrows.
- Perform chewing action with lips closed.
- Hold the air in cheeks like blowing a balloon
- Close the eyes tightly and open and do continuous blinking of the eyes.
- Open the mouth as wide as possible and push the jaw up, down and sideways.

Free and Strengthening Exercises

Patients were instructed to do free active range of motion exercises for both upper and lower extremities. The strengthening activities for upper limbs were encouraged with weights combined with free exercises, one litre water bottle and one kg sand bags were used as weights. They were encouraged to the pull the spring and open & close fingers with rubber bands or smiley balls. The strengthening activities for the lower limbs weredone by free exercises and oneKg sand bags were used. For ankle strengthening heel raises and toes raises with support were encouraged. For strengthening of hip and gluteal muscles sit to stand was encouraged with the support, if they balance well, supports were removed. After the study duration patients were assessed for their health related quality of life by Parkinson disease questionnaire – 39.

Self-stretch of arm strengthening activity of upper limb

Figure 2. Sit to stand with support

Data analysis

Table 1. Comparison of time based self management-rehabilitation in terms of Parkinson disease questionnaire – 39 in Parkinson diseased patients

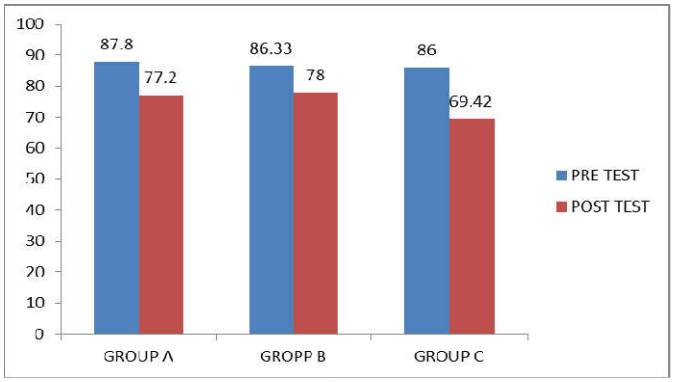
	Sum of Squares	Degree of freedom	Mean Square	F	Sig.
Between the Groups	893.699	2	446.850	5.540	.016
Within the Groups	1209.941	15	80.663	-	-
Total	2103.640	17	-	-	-

The p value is <0.05
So there is difference between the three groups in terms of Parkinson disease questionnaire - 39.

Table 2. Comparison of time based self-management-rehabilitation in terms of Parkinson disease questionnaire – 39 in Parkinson diseased patients

Group (I) Group (J)	Mean difference (I-J)	Std.error	Sig	95% confidence interval	
				Lower bound	Upper bond
12	-2.5987745	5.4384132	.883	-16.724891	11.527342
3	12.8867157	5.2588779	.066	-.773063	26.546495
21	2.5987745	5.4384132	.883	-11.527342	16.724891
3	15.4854902*	4.9967028	.019	2.506703	28.464277
31	-12.8867157	5.2588779	.066	-26.546495	.773063
2	-15.484902*	4.9967028	.019	-28.464277	-2.506703

The mean difference is significant 0.05 levels.
The mean difference between group 3 and 2 is greatest when compared to group 3and 1, group 1 and 2.
So there is a difference between the three groups in terms of Parkinson disease questionnaire - 39.



Graph. Comparison of mean values of in three groups in terms of Parkinson disease questionnaire – 39

RESULTS

According to table 1 & table 2, difference between three groups in terms of Parkinson disease questionnaire – 39. Group 1 was given medications, group 2 was given medications and 18 hours rehabilitation and group 3 was given medications and 27 hours rehabilitation. The mean difference between group 1 & 2 is -2.5987745 and mean difference between group 1 & 3 is 12.8867157. The p value is < .066. The mean difference between group 1 & 3 is greatest than group 1 & 2. The mean difference between group 2 & 1 is 2.5987745 and mean difference between group 2 & 3 is 15. 4854902. The p value is < .019. The mean difference between group 2 &3 is greatest than group 2&1. The mean difference between group 3&1 is -12.8867157 and mean difference between group 3&2 is -15.484902. The p value is < .019, the mean difference group 3&2 is greatest than group 3&1. Hence the mean difference between the group 3&2 is greater than group 1&2 and group 1&3.

DISCUSSION

This study was done to find out the effectiveness of 27 hours rehabilitation over 18 hours rehabilitation and medical therapy. The results shows that 18 hours rehabilitation and medical therapy showed little influence in Health Related Quality Of Life in Parkinson diseased patients as assessed by Parkinson diseased questionnaire - 39. These results show that regular practice of self rehabilitation can positively impact health related quality of life in Parkinson patients. The mean difference between patients trained with 27 hours rehabilitation (Group - c) and group – A is greater than group C & group B and group B & A for Parkinson disease questionnaire – 39. People with Parkinson disease responded to 6 weeks program self-management rehabilitation with health related quality of life benefits beyond best medical therapy. This effect translates into clinically greater than for medications alone. A therapy team can predict that it will have to treat approximately 2 to 6 patients with Parkinson disease before achieving clinically relevant improvement in health related quality of life of at least 1 patient greater improvement rates continued for rehabilitative relative to no follow up. (Tickle dengen *et al*., 2010) Programs must be designed and tested to determine how best to reinforce self- management gains and sustain health related quality of life of patients and family care givers as disease progresses. The similarities in specific strength in an investigation suggested that the preservation of muscle strength with aging has greater dependence on the maintenance of muscle mass, whereas the impairments in muscle power among elders with mobility limitations may develop independently of muscle atrophy with advancing age. Rehabilitation more effectively improved mobility outcomes of participants who are at baseline had more concerns about their mobility and activities of daily living (Kieran F. Reid and Roger A. Fielding, 2012). One study says that descriptive patterns in the PDQ-39 domain scores imply that individuals receiving physical intervention in the home and community sessions (27 hours) received more benefit in physical areas of function, whereas those who spent additional hours in talking with one another about their ''normal'' lives in the social session (18 hours) received more benefit in psychosocial areas of function. (Linda tickle-degnen *et al*., 2010) The subjects who received 27 hours rehabilitation in this study improved in the Physical areas of function domain in the PDQ-39 than those who received 18 hours of rehabilitation thereby causing a significant improvement in the mobility of the patients. Increased mobility helps in maintaining the muscle properties of these elderly individuals thereby improving their health related quality of life.

Donald M bushnell & Mona L. Martin concluded that the US version of the PDQ – 39nQuestionnaire demonstrated that acceptable internal consistency (α= 0.51 to 0.96) and proved to be reproducible (0.86 to 0.96). (Donald M. Bushnell and Mona L. Martin, 1998)

Rodrigues De Paula, TEI Xeira *et al*, suggested that impact of exercise or physical therapy improves the physical, emotional and social aspects of quality of life in individuals with Parkinson patients. (Rodrigues *et al*., 2006)

Conclusion

This study using 27 hours rehabilitation and 18 hours rehabilitation in Parkinson disease showed that both were significant in improving health related quality of life. This study shows that group C (27 hours rehabilitation) showed better improvement when compared to group B (18 hours rehabilitation) & group A (medications). People with Parkinson disease typically are referred to rehabilitation when their physical functioning has severely declined or when there is an acute change in status. It is not standard practice for rehabilitation to occur at earlier to middle stages of this chronic disease when there are gradual declines in health related quality of life and daily function. A theory and evidence base self- management approaches recognizes that individual patients needs preferences and action directed goals toward goals and f unction's are fundamental to successful rehabilitation outcomes in community living adults. This study finding suggests that self – management rehabilitation be considered in early to middle stages of Parkinson disease to improve and sustain health related quality of life.

Limitations

- Small sample size
- Less duration
- All measurements for a given subject in the study were measured by the same individual.
- Difficulty in getting patients.
- Emotional changes with the patient
- No follow up

Recommendations

- Future studies should have a larger sample size.
- Future studies are recommended to have a longer duration with follow up.
- For motivating the patients add music therapy.
- Follow up for the study to see the results persist or not.

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