The Effectiveness of MRP_2023

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RESEARCH ARTICLE

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THE EFFECTIVENESS OF MOTOR RELEARNING PROGRAMMER (MRP) ON IMPROVING MOTOR FUNCTION AMONG POST STROKE PATIENTS: LITERATURE REVIEW

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Abstract:

Decreased motor function is one of the problems that often arises in stroke patients. One of the nursing interventions to overcome the decline in motor function in strokepatients is to provide a motor relearning program (MRP) intervention. The objective of this study was **to** determine the length, duration, and frequency of giving a MRP and the effectiveness of MRPon motor function in stroke patients. This study was conducted by means of a literature review. Eight pieces of literature were identified from three databases (Google Scholar, Pubmed and Science Direct) in the 2000-2020 range. The research design studiedwas true and quasi-experimental with stroke patient's population who received MRP**.** There were eight articles that met the inclusion criteria with different durations and frequencies of motor relearning programs. The provision of MRP interventions in post-stroke patients is effective in improving motor function. There are varying durations and frequencies of giving MRP. Each article mentions that MRP is effective restoring motor function, although with different times, durations and frequencies. Several articles also combined this intervention with other therapies such as bobath therapy and electrical stimulation, the results showed better. The provision of MRP interventions in post-stroke patients is effective improving motor function.

Keywords: motor relearning program, stroke

Introduction

Riskesdas in 2007 showed data of 8.3 per Stroke or often also called "brain attack" is a disease caused by a disturbance in the functionof the nervous system that occurs due to a lackor disruption of the supply of oxygen and nutrients to the brain due to blocked or ruptured blood vessels.[1]

Lavenia (2018) states that 80% of stroke patients experience neuromotor deficits thatgive symptoms of one-sided paralysis, with varying degrees of weakness, from weak to severe.[2] failure of the coordination system and changes in walking patterns and balance disorders. The problems caused by stroke sufferers are very complex for human life. Oneof the decreased functions experienced by stroke sufferers is motor function when there is weakness or paralysis of the arms or legs in onepart of the body.[3,4]

The physiotherapeutic approach to strokefunctions in restoring movement and roles withmotor training.[5] One of them is that the provision of MRP is not only relatively cheap and easy, but this exercise also links the active participation of patients because MRP links re-education of functional activities which arevery useful for sufferers in improving theirquality of life. The nurse will focus and explain the exercises that will be carried out by stroke sufferers.[6]

Lavenia (2018) revealed that MRP affects changes in walking patterns in post-stroke patients by being treated for 6 weeks with a frequency of 2 times a week.[2] Irawan (2014)also revealed that MRP was effective in improving the patient's walking pattern by being given treatment 3 times a week for 60 minutes for 4 weeks.[6] As well as in a study (Gajana 2013) revealed that MRP was more effective than Bobat in the rehabilitation of acute stroke patients in the first six weeks of training in the sixth week.[7]

Based on the data above, there are different treatments in giving MRP therapy to patients, causing researchers to want to find out which ones are effective for post-stroke patients and how effective MRP exercises are in restoring motor control in post-stroke patients. Therefore, researchers are interested inconducting a literature review so thatinformation related to MRP interventions for post-stroke patients can be more clearly relatedto the frequency, duration, and duration ofMRP administration and how effective MRP isin improving motor control in post-stroke patients.

Research methods

Research literature review with the use of experimental article design. Secondary data isused with national and international publications. The journal search databases used are Pubmed, Science Direct, and Google Scholar. The keywords used were Stroke OR "Cerebrovascular Accident" OR "Cerebrovascular Disease" OR "Cerebrovascular Accident" and MRP OR "Motoric Relearning Program". The inclusioncriteria for articles are articles with a population of stroke patients experiencing motor function disorders, comparison articles are other interventions or control groups, and the outcome measured is motor function published in the 2000-2020 range, using Indonesian and English.

Articles that meet the criteria are assessed using JBI's Critical Appraisal Tools and the results are 8 articles for analysis. The literature search framework in this literature review can be seen in Figure 1.

Results

The Following chart describes the steps of researchers in finding, selecting, and analyzingarticles in research.

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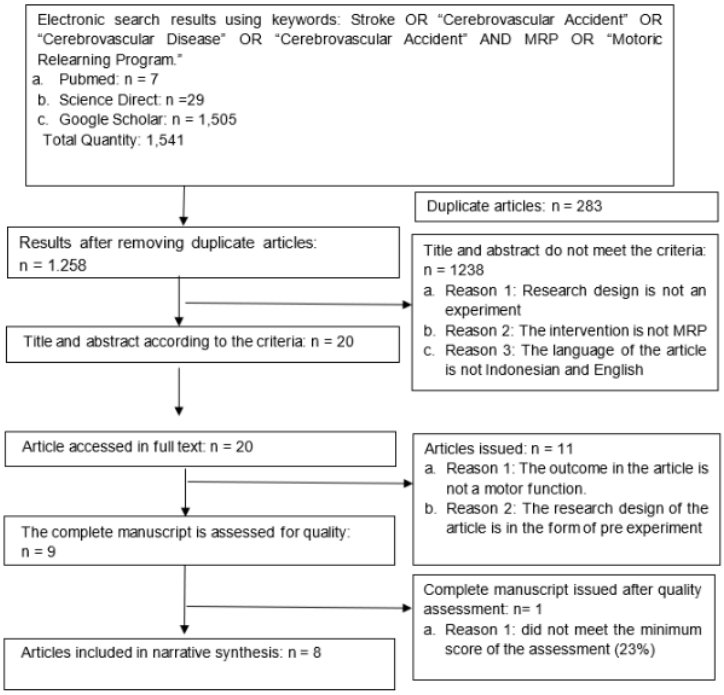

Figure 1. Article networking flow diagram

Based on the quality assessment that has been carried out, 8 articles related to the topic of motor relearning program interventions in the treatment of stroke patients have been obtained.

Table 1. Extraction of Data Related to Therapeutic Effectiveness

No	Researcher Name	Research Title	Year	Research design	Intervention	Comparative Intervention	Instrument	Results
1	Shafqatullah Jan, Aatik Arsh, Haider Darain and Shehla Gul	A randomized control trial comparing the effects of motor relearning program and mirror therapy for improving upper limb motor functions in stroke patients	2019	RCT	MRP (n=33)	Mirror Therapy (Mirror Therapy) (n=33)	Motor Assessment Scale (Motoric Rating Scale)	In both groups there was a significant difference between the mean pre-treatment and post-treatment scores of the three variables ($p<0.05$, respectively). The mean value of the three variables increased significantly in the treatment group compared to the control group.
2	Amjad Annethattil, Joseph Sebastian, and Jibi Paul	Combined effect of bobath Technique and motor relearning program (MRP) over its individual effects to improve upper limb function in stroke patients	2017	RCT	MRP (n=10)	a. Bobath therapy (n=10) b. Combination of MRP and bobath therapy (n=10)	Modified Ashworth Scale (MAS) / the ashworth scale modified, STREAM scale, and Fugl Meyer . scale	Giving MRP intervention can reduce spasticity significantly and can increase functional activity but there is no change in voluntary control. Giving bobath therapy intervention can significantly reduce spasticity, can improve voluntary control and can increase functional activity. Likewise with the intervention of a combination of MRP and bobath which is also effective in reducing spasticity, can increase voluntary control and can increase functional activity. This combination intervention group also showed better results in the voluntary control than the other 2 groups.
3	Sana Batool, Nabila Soomro, Fareeha Amjad, and Rabia Fauz	To compare the effectiveness of constraint induced movement therapy versus motor relearning program to improve motor function of hemiplegic upper extremity after stroke	2015	RCT	MRP (n=21)	CIMT / constraint induced movement therapy (n=21)	Motor Assessment Scale (Motoric Rating Scale)	Intragroup analysis showed statistically significant results (p-value<0.05) on all MAS instrument items in both groups. However, the advanced hand activity item in the MRP group showed insignificant results (p-value = 0.059).
4	Shanta Pandian, Kamal Narayan	Comparison of brunnstrom movement	2011	RCT	MRP (n=21)	Brunnstrom hand manipulation/	Brunnstrom recovery stage of	Both therapies were effective in hand rehabilitation where the outcome was

No	Researcher Name	Research Title	Year	Research design	Intervention	Comparative Intervention	Instrument	Results
	Arya and Rajkumar Davidson	therapy and motor relearning program in rehabilitation of post-stroke hemiparetic hand: a randomized trial				brunnstrom's hand manipulation (n=15)	the hand (BRS-H) / brunnstrom hand recovery stage and Fugl Meyer assessment	(BRS-H; p= 0.003 to 0.004, FMA-WH; p < 0.001). However, the results were statistically significant for group A given the BHM intervention for FMA-WH (p, 0.004) and FMA item VIII (hand motor recovery) (p, 0.033).
5	Dora YL Chan, Chetwyn CH Chan, and Derrick KS Au	Motor relearning program for stroke patients: a randomized controlled trial	2006	RCT	MRP (n=33)	Conventional Therapy (n=33)	The Berg Balance Scale/ berg balance scale, the timed up and go test, and The Functional Independence Measure (FIM)	There was a general increase in scores on all outcome measures at the second, fourth, and sixth weeks in both the intervention group receiving MRP and the control group receiving only conventional therapy. Patients who were given the MRP intervention showed significantly better performance on all tests except the Timed Up and Go test when compared to the control group
6	Birgitta Langhammer and Johan K Stanghelle	Bobath or motor relearning programme? a comparison of two different approaches of physiotherapy in stroke rehabilitation: a randomized controlled study	2000	RCT	MRP (n=33)	Bobath therapy (n=28)	Motor Assessment Scale (Motoric Rating Scale)	There was no significant difference in MAS between the two groups in the acute stage. Both groups improved on MAS scores from the first to the third test. However, the MRP intervention group showed a better improvement compared to the control group given the bobath intervention on the MAS score part 2.
7	Nisfil Mufidah, Rahmad Wahyudi, and M. Hasinuddin	The differences between motor relearning program and bobath method on standing balance in stroke patients	2020	Quasy Experiment	MRP (n=12)	Bobath therapy (n=12)	Berg Balance Scale (BBS) / Berg balance scale	On the results of the Paired t-test, the MRP group was obtained, namely p = 0.010 and the Bobath method, namely p = 0.000.
8	Ikram Ullah, Aatik Arsh, Aneela Zahir and Shafqatullah Jan	Motor relearning program along with electrical stimulation for improving upper limb function in stroke patients: A quasi experimental study	2020	Quasy Experiment	Combination of MRP and electrical stimulation (n=12)	No control group	Motor Assessment Scale (Motoric Rating Scale)	There was a significant difference (P<0.05) between the score of upper arm function before and after treatment, hand movements and advanced hand activities.

Discussion

1. MRP Length, Duration and Frequency

All articles mention the duration and frequency of giving MRP interventions, namely researchfrom Ikram et al (2020), Nisfil et al (2020), Shafqatullah et al (2019), Amjad et al (2017), Sana et al (2015), Shanta et al (2011), Dora et al (2006), and Birgitta (2000).[11,12]

In the articles Shafqatullah et al (2019), Sana et al (2015), and Dora et al (2006) mention thelong duration of the MRP intervention, which is 2 hours. In the article Shanta et al (2011) mentions the duration of the intervention is 1 hour. In the articles Amjad et al (2017) and Ikram et al (2020) mention the duration of the intervention for 45 minutes. Meanwhile, Nisfilet al (2020) and Brigitta et al (2000) stated thatthe duration of the intervention was 40minutes. In addition to the overall duration of the article also mentions the frequency given tothe patient.[13,14]

In the article, Shafqatullah et al (2019) and Dora et al (2006) mention that the frequency given is 3 times a week which is carried out for6 weeks or 18 times of action. In the article Nisfil et al (2020) and Shanta et al (2011) mention that the frequency given is 3 times a week which is carried out for one month or 4 weeks or 12 times of action. In the article Sana et al (2015) mentions that the frequency givenis 6 times a week which is carried out for one 3 weeks or 18 times of action. In the article Ikram et al (2020), Amjad et al (2017), and Birgitta (2000) mentions the frequency given is 5 times a week where in the article Amjad etal (2017) it is carried out for one month or 4 weeks or 20 weeks action times.[15,16]

From the data above, it is found that there is no specific or specific time, duration, and frequency in giving the MRP intervention, because in the first stage of the MRP program it will be seen which components are missing from the patient's motor function, after that the physiotherapist will plan the appropriate therapy.[17,18] according to the patient's needs. before determining the length of the patient's action, it will be identified what motorskills are missing from the patient. The duration of this action is also influenced by thehigh motivation of the patient to recover and the cooperation of the therapist and the patient's family in supporting this therapy program.[19,20]

2. MRP Effectiveness on Motor Function

The 6 of 8 articles focused on measuring motor function in the extremities, namely research articles from Shafqatullah et al (2019), Amjadet al (2017), Sana et al (2015), Shanta et al (2011), Brigitha et al (2000) and Ikram et al (2020). While the remaining 2 articles focus on measuring balance in post-stroke patients, namely research from Dora et al (2006) and Nisfil et al (2020).[1]

The ability of motor function is the ability related to the control of limbs or extremities to perform tasks. Exercise for motor function skills requires accuracy in the correct movement technique.[1] All articles that focus on measuring motor function in the extremitiesmention that the administration of MRP interventions is effective in improving motor function in the extremities. In the study, Shafqatullah et al (2019) stated that there were significant results between pre-treatment and post-treatment on upper arm function, hand function, and advanced hand activities. In the study of Amjad et al (2017), it was stated that the MRP intervention could significantly reduce spasticity and increase functional activity, but there was no change in voluntary control. In the control group, respondents were given MRP therapy combined with bobath therapy where the results were effective inreducing spasticity, increasing voluntarycontrol and increasing functional activity. This combination

intervention group also showed better results in the voluntary control group than the group that was only given the MRP intervention.[11] In the study of Sana et al (2015) stated that at the end of the third week, the average score increased significantly across all items in the MRP group, namely items of upper arm function, hand function, and advanced hand activities.[12] However, the advanced hand activity items showed insignificant results. In the research of Shanta et al (2011) it was stated that there was an increase in all measurement results, it can be concluded that the MRP intervention is effective in hand rehabilitation.[17] In the study of Brigitha et al (2000) it was stated thatby giving the MRP intervention there was a significant increase in the MAS score from thefirst test to the third test.[15] In the study of Ikram et al (2020) there was a significant improvement between upper arm function scores, hand movements, and continued hand activity before and after treatment.[18]

From the data above, it is known that the MRP intervention is effective in improving motor function in stroke patients. This is becauseMRP exercise is an exercise that is given in theform of transfer and ambulation skills that willprovide an understanding of normal human motion (kinematic and kinetic) to provide a stimulus in the form of facilitation and reeducation of the motor control center towards the memory and cognitive center.[21,22] According to (Handoko, 2016) if the exercise is repeated for some time, it will provide motion experience and become automatic motion.[23]

All articles that focus on measuring the balance of post-stroke patients are effective in improving the balance of post-stroke patients. In the study of Dora et al (2006) it was stated that patients who were given MRP showed better functional recovery than patients who were only given conventional therapy in terms of balance function, especially at the 2nd, 4th and 6th weeks. Meanwhile, in the Nisfil et al (2020) study, it was stated that the MRP intervention was effective in improving standing balance in post-stroke patients.[16]

3. Key Findings and Research Gaps

Researchers found findings in the eight research articles, namely the variation in the duration and frequency of giving the intervention. The durationsfound were 40 minutes, 45 minutes, 1 hour and 2 hours. Meanwhile, the frequency found is 3 times a week for 4 weeks, 3 times a week for 6 weeks, 6times a week for 3 weeks, 5 times a week for 4 weeks and 5 times a week for 6 weeks. This MRP intervention is effective in improving motorfunction in post-stroke patients.

The gap in this study is that there is 1 article that does not mention how many times the frequency ofthe MRP intervention is given, so that nurses who want to provide this intervention will be confused in determining how many times the frequency is even though the results of the study say it is effective.

4. Limitations, Weaknesses, and Obstaclesof Research

The diversity of studies found makes it difficult for researchers to synthesize. The use of the term motor relearning program for keywords used in general may notattract other research articles. In the article screening, there are also many articles that cannot be opened. In addition, there is 1 article that does not mention how many times the frequency is used in the research so that the assessment to answer the research objectives inthis literature review is not optimal.

Conclusion

The results of the review of the eight research articles have different durations and frequencies of motor relearning

programs. Theduration given varies from 40 minutes, 45 minutes, 1 hour and 2 hours. The frequency ofgiving this motor relearning program also varies from 3 times a week for 4 weeks, 3 timesa week for 6 weeks, 6 times a week for 3 weeks, 5 times a week for 4 weeks and 5 timesa week for 6 weeks. There are several articles that combine MRP intervention with other therapies such as bobath therapy and electrical stimulation, the results show better improvement compared to only providing MRP intervention alone. Giving MRP intervention in post-stroke patients is effectivein improving motor function.

Clinical nurses must know how the application of motor relearning program interventions in post-stroke patients and their families can playa role in the patient's motor recovery in the fourth stage, namely when transferring real activity exercises according to education from physiotherapy. With the MRP intervention, it is hoped that there will be an improvement in motor function in these post-stroke patients. This MRP intervention is also useful as a reference for teaching materials to nursing students so that it can add insight to students regarding MRP interventions that can be applied to post-stroke patients.

Conflict of interest

There is no conflict of interest in this study.

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