

Measuring Physiotherapy Performance in Knee Osteoarthritis (Koa) Patients During Movement Control Order (Mco): A Retrospective Study

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Abstract

Knee osteoarthritis (KOA) is a prevalent joint condition in the older person that causes pain, loss of function, disability, and reduce in quality of life. During the pandemic covid -19, older person of patients was categorised as the highest risk and was restricted to go for rehabilitation session due to the implementation of Movement Control Orders (MCO). Although the home exercise program has been designed, the is a concern for low adherence among patients to the program. Therefore, this study is to measure the physiotherapy performance in older persons with KOA during Movement Control Order (MCO). Upon receiving ethical approval, data collected was pain perception, physical mobility and a list of interventions from previous subjects' records in Hospital Alor Gajah from March 2020 to March 2022. The is a significant improvement in both pain perception using the Numerical Rating Scale (NRS) pre-intervention (M= 4.73, SD= 2.05), post-intervention (M= 3.35, SD=2.08), t (157) = -17.19, p<0.00; and physical mobility tests using the Timed-Up Go (TUG) pre-intervention (M= 12.38, SD= 2.84), post-intervention (M= 11.62, SD=2.38), t (157) = -6, p<0.001. In conclusion, a home exercise program designed by physiotherapists is effective for KOA patients during the MCO period.

Keywords: Knee Osteoarthritis, Older Person, Physical Performance, Numeric Rating Scale, Timed Up Go.



Introduction

Knee osteoarthritis (KOA) is a prevalent joint condition among older person that causes pain, loss of function, and disability, as well as a reduction in quality of life, affecting roughly one-third of adults over the age of 60 (Chen et al., 2019). As an osteoarthritis condition worsens and can eventually make a person disabled. The severity of the clinical symptoms that occur may differ for everyone. However, patients will feel the condition getting worse, more frequent, and more debilitating over time. The rate of progression is also different for everyone. Common clinical symptoms include knee pain that begins gradually and worsens with activity, knee stiffness and swelling, pain after sitting or resting for long periods, and pain that worsens over time (Hsu, 2021).

In developed countries, osteoarthritis (OA) is the most disabling disease. Globally, approximately 9.6% of men and 18% of women age above 60 years of age have pain with OA. the report 8% of osteoarthritis patients were limited in movement, 25% of that population were restricted to main daily activities (Ana & Joanne, 2019). One of the risk factors OA was environmental factors. The person who is living uplands area may increase the risk factor for the condition. Other several factors include body weight, age, female, sex, occupational activity and injury, congenital abnormalities and joint shape, meniscal tears lower limb joints alignment and genetic predisposition (Moghimi et al., 2019).

Patients with KOA commonly will be referred to physiotherapy to promote the rehabilitation process including the intervention of modalities such as transcutaneous electrical neuromuscular facilitation (TENS) to relieve the pain, exercise, and manual therapy (Walsh et al., 2017). Søren and Ewa (2019) stated that preference for exercise therapy as a first-line treatment for non-surgical intervention for KOA conditions within individual pain tolerance (Søren and Ewa, 2019).

During the COVID-19 pandemic, healthcare systems were impacted, and therapists need to plan for the optimization of rehabilitation services (Mandeep et al. 2020; World Health Organization, 2020) due to the implementation of Movement Control Orders (MCO (Shah et al. 2020). Although the home exercise program has been designed, the is a concern for low adherence among patients to the program (Castro Da Rocha et al., 2020). Therefore, this study aims to measure pain perception and physical mobility in pre and post-intervention among older persons with knee osteoarthritis during Movement Control Order (MCO).



Methodology

Design and setting

It is a retrospective study design where the information was collected from past clinical documentation regarding KOA among older persons including pre and post-mobility measurement, pain perception, and physiotherapy interventions. The data will be retrieved from the Physiotherapy Record Unit in Hospital Alor Gajah, Melaka.

Demographic information and clinical assessments

Demographic information such as age, gender, ethnicity, and medical history was collected from the database. In addition, clinical assessment in measuring physiotherapy performance in the pain perception using Numerical Rating Scale (NRS) and physical mobility using Timed-up and Go (TUG). According to Alghadir et al. (2018), NRS was shown to be valid and reliable to assess pain level among KOA. The higher the NRS score, shows higher the intensity of pain in KOA persons (Yi et al., 2020). TUG is indicated to have high reliability and validity to classify older person with and without a history of falls (McLay et al., 2020). Furthermore, TUG has also been used to determine physical mobility and balance among older person (Ortega-Pérez de Villar et al., 2018).

Inclusion and exclusion criteria

Data will be retrieved from the Physiotherapy Record Unit in Hospital Alor Gajah; Melaka was based on the inclusion and exclusion criteria indicated in flow chart 1. The inclusion criteria: diagnosis with knee osteoarthritis, aged 60 years old and above, received physiotherapy intervention between March 2020 to March 2021. The exclusion criteria: patient multiple diagnoses, knee osteoarthritis cases before and after MCO period and does not receive physiotherapy intervention.

Intervention

The types of interventions that have been applied to the selected patients based on inclusion and exclusion criteria were retrieved from the database. The physiotherapy interventions that had been identified were the usage of electrical modalities and conventional and functional exercise. The outcome of the interventions will be reported using the selected clinical assessment.

Data collection

Upon identification of the gap in the literature review, a paper based on a retrospective data collection form was created to help the researcher to organize the retrieved information from the database. Data were collected upon receiving ethical approval from Medical Research Ethics Committee (MREC). In addition, permission was also obtained from the Director of Hospital Alor Gajah and the Head of the Physiotherapy Unit regarding the patient data recruitment and collection for the study. The recruitment process begins with searching patients aged 60 years old and above through the monthly census book from March 2020 to March 2022 as indicated in Figure 1. The researcher will have early identification of selected participants based on the current census book. Future screening of the information based on the inclusion and exclusion



criteria to ensure the eligibility of data retrieved from the database to be in line with study objectives.

Statistical Analysis

Following that, all the data collected from the participants were analyzed using Statistical Package for the Social Sciences (SPSS®) version 27. Sociodemographic information and clinical assessment were analysed using descriptive by reporting the mean and standard deviation for continuous variables, and frequencies for categorical variables. The report on the evaluation of physiotherapy performance pre- and post-intervention was analysed using paired T-Test.

Results

A total of 157 participants were selected based on the recruitment criteria. The mean age of participants is 68 years old with a deviation of 5.9 years. Most of the participants were female about 61% and male about 39% of the total participant. Ethnicity was divided into four main groups which were Malay, Chinese, Indian and other races. Malay makes up the majority of the participant about 83%, Chinese 10% and Indian about 6% as indicated in Table 1. Reporting on the types of physiotherapy interventions that were divided into two main groups. Most of the participants around 81% had been prescribed exercise as the only method of intervention and the remaining 19% of participants had a combination of both electrical modalities and exercise as shown in Table 1.

There was significant improvement in overall participant pain perception using Numerical Rating Scale (NRS) during MCO period, pre-intervention (M= 4.73, SD= 2.05), post-intervention (M= 3.35, SD=2.08), t (157) = -17.19, p<0.001. Similar significant result with the specific group of interventions (modalities and exercise), pre-intervention (M= 5.03, SD= 2.34), post-intervention (M= 3.43, SD=2.33), t (29) = -7.74, p<0.001; and (exercise only) M= 4.66, SD= 1.97), post-intervention (M= 3.33, SD=2.03), t (127) = -15.39, p<0.001 as indicate in Table 2.

The result for physical mobility using Timed-up and Go (TUG) indicate significant improvement in timing for completing the task for the overall participant and specific group of interventions. For total overall participant result in TUG, pre-intervention (M= 12.38, SD= 2.84), post-intervention (M= 11.62, SD=2.38), t (157) = -6, p<0.001. Intervention group (modalities and exercise), pre-intervention (M= 12.93, SD= 3.36), post-intervention (M= 12.07, SD=2.86), t (29) = -3.21, p<0.001; and (exercise only) (M= 12.25, SD= 2.71), post-intervention (M= 11.52, SD=2.25), t (127) = -5.15, p<0.001 as shown in Table 3.



Discussion

The purpose of this study was to measure the physiotherapy performance in older persons with KOA during Movement Control Order (MCO). This study was conducted at the Physiotherapy Unit in Hospital Alor Gajah, Melaka. The prevalence of the older person population in Alor Gajah is reported to be at 9.3% which is the highest in Melaka (Jabatan Perangkaan Malaysia, 2020). The mean age of 68 years old that come to the physiotherapy department for KOA treatment during MCO time. The previous study does indicate that KOA was a frequent and communal condition among older people (Valdes et al., 2018). This study also indicates female gender and Malay ethnicity as the largest majority of more than 80% received treatment for KOA condition. It is similar to past studies that indicate ethnicity and gender as risk factors for having KOA (Mat et al., 2018; Vitaloni et al., 2019).

The result in pain perception using the Numerical Rating Scale (NRS) reported significant improvement in overall participants and group of interventions. The result in combination combined intervention (modalities and exercise) showed a higher amount of improvement in the reduction of pain as compared to a single intervention (exercise only). As supported in past studies the usage of electrical modalities such as electrical stimulation, thermal therapy, cryotherapy, infrared radiation therapy, and ultrasound therapy does help in reducing pain and combination with exercises will encourage mobility (Usman et al., 2019). Another study on the usage of electrical modalities on KOA conditions indicates thermal therapy is more effective than old therapy in reducing pain perception (Zafar et al., 2020).

Timed Up Go test (TUG) was used to identify participants' physical mobility. This result indicates a significant improvement in overall participants and both groups of interventions. The combined intervention (modalities and exercise) showed a higher amount of improvement as compared to a single intervention (exercise only) in the TUG test. However, previous indicates that there is no difference in effectiveness in managing KOA with combined intervention or single exercise intervention (Gomes et al., 2020). Nonetheless, there is strong evidence that indicates exercise and physical activity are effective in addressing KOA (Allen et al., 2019).

To date, there are no specific exercise recommendations for Hong Kong Lower Limbs Osteoarthritis (OA) guidelines (Kan et al., 2019). Nevertheless, routine physical activity such as stretching has shown to be beneficial in KOA conditions (Jyoti, Shabnam & Vikram 2019). In addition, prescribing functional exercise that simulates activities like everyday movement increase patient adherence to a rehabilitation program (Fragala et al., 2019). Functional activity has also been shown to help improve physical mobility, and balance and reduce pain perception in KOA conditions (Singh, 2016).



Conclusion

In conclusion, a home exercise program prescribed during the MCO period between March 2020 to March 2022 for managing KOA conditions in the physiotherapy department has shown to be effective. Adherence to the home exercise program and therapy sessions is important for a successful rehabilitation program. Furthermore, combined intervention by using both electrical modalities and exercise has been shown to give a better outcome in improving pain perception and physical mobility in managing KOA conditions.

Figures and Tables



Inclusion criteria: Diagnosis with knee osteoarthritis, aged 60 years old and above, received physiotherapy intervention between March 2020 to March 2021.

Exclusion criteria: Patient multiple diagnoses, knee osteoarthritis cases before and after MCO period and does not receive physiotherapy intervention.





Figure 1. Flow Chart for Data Collection

Variables	Mean or % (n=157)	Standard Deviation
Age	68.17	5.9
Gender		
Male	39.2	
Female	60.8	
Race		
Malay	82.9	
Chinese	10.1	
Indian	6.3	
Others	0.6	
Type of Interventions		
Modalities & Exercises	19	
Exercises	81	

Table 1. Sociodemographic Information

Table 2. Pre and Post Intervention for Numerical Rating Scale (NRS)

Variable	Pre-Int.	Post-Int.	Mean score	t statistic	p-value
	Mean (SD)	Mean (SD)	different (CI)	(df)	
Overall	4.73(2.05)	3.35(2.08)	-1.39(-1.55, -1.23)	-17.19 (157)	0.001*
Combined	5.03(2.34)	3.43(2.33)	-1.6(-2.02, -1.18)	-7.74(29)	0.001*
Intervention					
Single	4.66(1.97)	3.33(2.02)	-1.34(-1.51, -1.16)	-15.39(127)	0.001*
Intervention					

Note. *Indicates p < 0.05, SD= standard deviation

CI: Confidence Interval, df= degree of freedom

Table 3. Pre and Post Intervention for Timed Up Go (TUG)

Variable	Pre-Int.	Post-Int.	Mean score	t statistic (df)	p-value
	Mean (SD)	Mean (SD)	different (CI)		
Overall	12.38(2.84)	11.62(2.38)	-0.76(-1, -0.5)	-6(157)	0.001*
Combined	12.93(3.36)	12.07(2.86)	-0.87(-1.42, -0.31)	-3.21(29)	0.003*
Intervention					
Single	12.25(2.71)	11.52(2.25)	-0.73(-1.02, -0.45)	-5.15(127)	0.001*
Intervention					

Note. *Indicates p < 0.05, SD= standard deviation

CI: Confidence Interval, df= degree of freedom



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