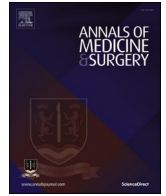




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Cohort Study

Analysis of the Covid-19 pandemic impact on osteoarthritis patient visits at physiotherapy clinics in Indonesia – A retrospective cohort study

Djohan Aras^{a,*}, Aco Tang^b, Hasnia Ahmad^b

^a Department of Physiotherapy, Nursing Faculty, Hasanuddin University, Indonesia

^b Department of Physiotherapy, Health Polytechnic of Makassar, Indonesia

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ABSTRACT

Objectives: This study aimed to determine the impact of visits by knee OA patients to physiotherapy clinics in Indonesia during the Covid-19 pandemic.

Method: This retrospective cohort study collected data from knee OA patients seeking treatment at a physiotherapy clinic in Makassar, Indonesia, from January to December 2021. The number of patient visits per month was compared using descriptive statistics. The treatment outcomes were measured in Visual Analogue Scale (VAS) and Western Ontario and McMaster Universities Osteoarthritis (WOMAC) Index and analyzed using inferential statistics.

Result: During the Covid-19 pandemic, there was a decrease in knee OA patient visits to physiotherapy clinics. Knee OA patient visits increased after the vaccination program was implemented, especially for patients who had been vaccinated with the full dose.

Conclusion: The frequency of knee OA patient visits to physiotherapy clinics decreased during the Covid-19 pandemic. It impacted the outcome of treatment received by the patients. However, patient visits increased after the vaccination program was implemented.

1. Introduction

Osteoarthritis (OA) is one of the most common joint diseases that cause musculoskeletal complaints, especially in older people [1]. Although osteoarthritis can happen in any joints, knee osteoarthritis remains one of the most common musculoskeletal disorders causing pain and functional impairment [2]. The goals of OA treatments include efforts to improve pain and functional ability [3]. Multimodality treatment options include medication, physiotherapy, and surgery [4]. In Indonesia, data on OA are not explicitly reported but belong to a group of joint diseases where OA is the most dominant joint disease [5]. Nationally, the prevalence of joint disease in Indonesia reached 7,30% in 2018, where osteoarthritis is the most dominant joint disease. In Makassar, the prevalence of joint disease reached 6,04%, and in South Sulawesi, it reached 6,39% [6]. Based on South Sulawesi's 2019, Risesdas data, the highest prevalence of joint disease was in the 65-74-year age group (17,1%), female (7,43%), never attended school (11,37%), did not work (8,57%) and live in urban areas (6,56%).

One of the American College of Rheumatology recommendations is physiotherapy combined with various therapeutic modalities [7].

Strengthening exercises, as well as a perturbation, balance, and aquatic treatment, can reduce discomfort and increase functional capacity, according to a review by Brakke et al. (2012) [8]. Deyle et al. (2020) reported that physiotherapy (including manual therapy and active exercise) increased Western Ontario and McMaster Universities Osteoarthritis (WOMAC OA) Index after one year compared to glucocorticoid injection in a cohort study of chronic knee OA patients [9].

Indonesia announced its first confirmed cases of Covid-19 on the March 2, 2020 [10] and marked the first wave of Covid-19 pandemic in Indonesia. The Covid-19 cases continue to rise steadily until July 2021, reaching their peak due to the delta variant. During the period, the Indonesian government activated the restriction to prevent the spread of Covid-19. The restriction was also applied to healthcare services, especially for non-emergency conditions. It impacted the frequency of visits by patients to healthcare facilities. The Indonesian government applied rules for restricting public mobility by arranging travel and requiring PCR and antigen tests, including when going to a health facility, patients are required to show negative antigen test results. This limitation of visits occurred not only from the patient's side but also from the side of the health facility itself. With the recommendation to limit the number

* Corresponding author. Faculty of Nursing Building, Hasanuddin University, Jl. Perintis Kemerdekaan, Km. 10, Tamalanrea, Makassar, 90245, Indonesia.
E-mail address: djohanaras.da@gmail.com (D. Aras).

of patients in one room to allow social distancing, patient visits to health facilities need to be arranged so that the number of patients who come for treatment at one time can be limited. This limitation should be assumed to impact patients' quality of health services. The limited service for OA patients is stricter than other patients because most OA patients are older people, who are the most vulnerable group to Covid-19.

The Covid-19 vaccination program in Indonesia starts on the 3rd Sunday of February 2021 for the older people group and public servants [11]. This vaccination program protected health workers, and older people were protected from Covid-19 infection with this vaccination program. It allows an increase in the frequency of patient visits, especially those aged 60 years and over who have received the vaccination program. Likewise, health workers who have received the Covid-19 vaccination may be more confident in providing health services to OA patients. We hypothesize that there may be a change in the frequency of visits by OA patients after the Covid19 vaccination program is implemented. It is undoubtedly expected to affect patients' quality of health services.

With the implementation of restrictions due to the Covid-19 pandemic, health services, including physiotherapy, may be limited. Office closures, reductions in non-emergency care (e.g., cancellation of elective procedures), increased use of telemedicine, and increased distrust of healthcare facilities are all responses to the pandemic. The epidemic has resulted in the need for necessary care and economic instability for patients and the health system, as access to healthcare has been significantly restricted. Factors associated with this pandemic may also affect the frequency with which patients visit physiotherapy clinics and their treatment-seeking behaviors.

During the pandemic, access to physiotherapy may be even more limited for certain OA patients, particularly older people and impoverished populations. This study aimed to determine the frequency of physiotherapy visits among patients diagnosed with knee OA between January and December 2021. We hypothesize that the Covid-19 pandemic has a significant impact on the physiotherapy outcomes achieved by OA patients due to the infrequent visits.

2. Methods

This study has been reported in line with the STROCCS criteria [12].

2.1. Patients and study design

This study is a retrospective cohort study involving data on male and female patients aged 18 years and over with a diagnosis of knee OA on one side, who were treated at a physiotherapy clinic in Makassar City, Indonesia, from January to December 2021. Patients with bilateral knee OA were excluded. This study is a retrospective study sourced from medical records of a physiotherapy clinic in Makassar, Indonesia.

2.2. Intervention and outcome

The intervention given to the patient is physiotherapy exercise which aims to reduce pain, increase joint strength, reduce muscle contractures, and improve functional ability. The components of the intervention were 1) soft tissue release (friction) to reduce pain, 2) elongated traction to increase joint ROM, 3) articular pump to reduce motion pain and increase ROM, 4) stretching exercises to reduce muscle contractures and increase ROM, 5) force passive movement to increase ROM, 6) strengthening exercise to strengthen muscles and 7) functional exercises to improve the patient's functional ability. The treatment outcomes were measured in Visual Analogue Scale (VAS) and Western Ontario and McMaster Universities Osteoarthritis (WOMAC) Index.

2.3. Data analysis

All patient information has been de-identified. A two-tailed alpha of 0.05 was used for statistical analysis. We used descriptive statistics in Microsoft Excel to report the analysis results, and inferential statistics were used in SPSS for Mac version 25.

2.4. Ethical approval

This study protocol was reviewed and accepted by the Health Research Ethics Commission of the Makassar Health Polytechnic (Approval # 0650/KEPK-PTKMS/XII/2021). This study is considered an exemption because it does not involve interaction with human subjects and does not require informed consent because the data used are de-identified.

3. Results

3.1. Characteristic of participants

In general, the characteristics of knee OA patients who visited the physiotherapy clinic in 2021 are shown in Table 1. Based on the characteristics of osteoarthritis patients who visited the physiotherapy clinic, the majority were male, under 60 years old, with right-sided OA, severe pain, and had severe limitations.

3.2. Trend of visits of knee OA patients per month

Fig. 1 illustrates the month-by-month comparison of knee OA patients in 2021. According to Table 2, 90 patients visited the physiotherapy clinic in the first quarter of 2021, 40 patients visited in the second quarter of 2021, 152 patients visited in the third quarter of 2021, and 208 patients in the fourth quarter of 2021. Our analysis revealed a significant month-to-month variation, with significantly more patients in the third quarter and IV. Intriguingly, these numbers increased after the restrictions were eased, and the vaccination program was accelerated in April 2021, particularly among older adults.

We identified 155 OA patients with 490 visits during 2021. Initially, we compared the number of patients before vaccination and the first vaccination with complete vaccination. Our analysis found that the number of patients after the complete vaccination program was higher than before the vaccination and dose I vaccination. The first quarter of 2021 was used for month-to-month statistical analysis before the vaccination program. Overall, our findings suggest that knee OA patients overall improved in the second, third, and fourth quarters compared to the first quarter.

3.3. Outcome difference between unvaccinated and fully vaccinated patients

Table 2 shows that the outcome of treatments in pain and activity

Table 1
Characteristics of participants.

Characteristics of Participants	n	Percentage
Gender		
Male	115	74.2
Female	40	25.8
Total	155	100.0
Age group		
<60 Years	100	64.5
>60 Years	55	35.5
Total	155	100.0
OA side		
Left	64	41.3
Right	91	58.7
Total	155	100.0

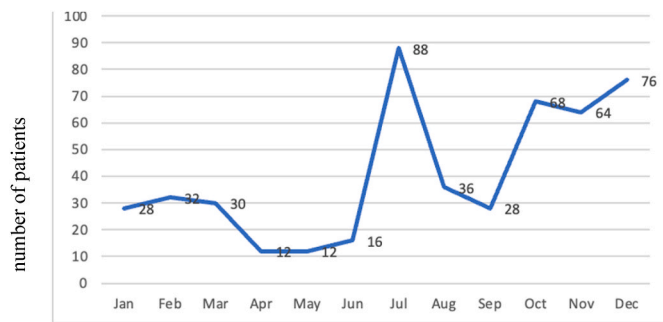


Fig. 1. Trend of visits by knee OA patients per month.

Table 2
Outcome difference between unvaccinated and fully vaccinated patients.

Variables	Vaccination Status	N	Mean Rank	Sum of Ranks	P
VAS pretest-posttest	Unvaccinated	65	42.81	2782.0	<0.001
	Fully vaccinated	90	103.42	9307.5	
WOMAC pretest-post-test	Unvaccinated	65	34.53	2244.5	<0.001
	Fully vaccinated	90	109.39	9845.5	

limitation is significantly different between unvaccinated and fully vaccinated patients.

4. Discussion

This study shows the decrease in OA patient visits to a physiotherapy clinic from January to December 2021. During the first quarter of 2021, when the number of Covid-19 cases was still relatively small, the decline in the number of cases was not too significant. There was a drastic decrease in patient visits in the second quarter, along with an increase in the Covid-19 new cases and deaths. During this period, the government’s new vaccination program began, specifically aimed at health workers and older people as a group prone to experiencing severe symptoms if exposed to Covid-19. It impacts osteoarthritis patients, which are experienced mainly by older people. There was an increase in patient visits in the third quarter, although the Covid-19 case was at its peak. There was a decrease in cases after that, especially in July 2021. The increase in the number of visits is also supported by the vaccination program, where in the third quarter, many older people have received complete vaccinations, so they are more confident to visit the clinic. Along with the decreasing number of Covid-19 cases and the increasing number of vaccinated people, patient visits may gradually increase in the fourth quarter of 2021.

Most OA patients who visit the physiotherapy clinic are under 60 years old. It shows that the incidence of OA at a younger age has increased. The group of patients under 60 years of age received a vaccination program in April 2021, so the patient visit rate in July showed an upward trend. It shows that the patient’s confidence level increases after getting a complete vaccination.

The frequency of the intervention given determines the intervention given in the physiotherapy clinic. More frequent frequencies may have less impact than higher frequencies. It can be seen when compared between the first semester and the second semester of 2021, where in the first semester, the frequency of patient visits is lower than in the second semester. The results of changes in VAS and WOMAC scores tend to increase more in the second semester than in the first semester.

In aggregate, our data indicate a statistically significant increase in visits to physiotherapy clinics by knee OA patients in April compared to previous months. In March and July 2021, we identified two distinct declines in the visiting trend.

While patient access to healthcare resources was likely limited

during the COVID-19 pandemic, several potentially significant factors may have contributed to the observed decrease in physiotherapy visits. To begin, we must consider the possibility that the overall number of patients seeking OA treatment at our facility may decline during this time period. During the pandemic, many patients may lose access to transportation, while others may avoid the risks associated with traveling to appointments. Similarly, healthcare providers may delay visits for specialized services such as physiotherapy during this period due to anticipated delays and difficulty obtaining care. These possibilities can be investigated further, emphasizing the needs of older adults and underserved populations.

Additionally, our study identifies additional factors that need to be addressed. While many patients go without health care during the COVID-19 pandemic, this is especially concerning for ethnic minority groups and residents of socioeconomically disadvantaged neighborhoods. These individuals are not only at an increased risk of severe illness and death from COVID-19. It is critical to determine whether the decrease in physiotherapy visits increases health disparities. Additionally, it may be beneficial to determine whether differences in health insurance types (private, government, or no insurance) correlate with specific patterns of physiotherapy visits for patients with OA during this period.

Similarly, while our data indicate a decrease in overall physiotherapy visits, it is instructive to compare these findings to the overall number of patient visits to primary care centers during this period. It may assist us in determining whether the decrease in physiotherapy visits is due to a reduction in the overall number of patient visits or a reduction in specific patient visits.

The results showed that telehealth in physiotherapy to knee OA patients positively affected and satisfied both patients and physiotherapists [13].

The results showed that OA patients tended to feel the impact of social restrictions on their social life during a pandemic. As a group vulnerable to Covid-19 infection, OA patients feel anxious about being in their family environment, especially when they continue working outside the home during the pandemic. In addition, OA patients experience restrictions in visiting hospitals or other health facilities. They are not taught the importance of physical activity and physiotherapy, so they tend not to do physical activity and physiotherapy [14].

5. Limitation of study

Among the study’s limitations is that our findings are based on a single-center retrospective study with small sample size. As previously stated, we recognize that various factors, including those not directly related to the COVID-19 pandemic, may be contributing to the decline in physiotherapy visits. Our data are based on group rates and do not include data from individual patients.

6. Conclusion

Collectively, our data show a significant decrease in OA patient visits to the physiotherapy clinic in the first quarter of 2021 and an increase as the vaccination program runs and Covid-19 cases decline. It deserves continuous attention from physiotherapy services in Indonesia. One suggestion is to adapt the physiotherapy program to patients online to encourage continued participation in physiotherapy services. According to Miller et al. [15], virtual physiotherapy services are feasible and acceptable, with 94% of patients satisfied with this modality. Exploration of the feasibility of implementing these options on a large scale could assist in limiting delays and addressing ongoing shortages in patient care during the pandemic.

Ethical approval

This study protocol was reviewed and accepted by the Health

Research Ethics Commission of the Makassar Health Polytechnic (Approval # 0650/KEPK-PTKMS/XII/2021). This study is considered an exemption because it does not involve interaction with human subjects and does not require informed consent because the data used are de-identified.

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Author contribution

All authors contributed to the design, data collection, analysis, and manuscript preparation.

Registration of research studies

1. Name of the registry: Research Registry
2. Unique identifying number or registration ID: researchregistry7706
3. Hyperlink to specific registration: <https://www.researchregistry.com/browse-the-registry#home/registrationdetails/62216b8284a7df001e8dc66e/>

Guarantor

Dr. Djohan Aras.

Consent

This study does not require informed consent because the data used are de-identified.

Provenance and peer review

Not commissioned, externally peer reviewed.

Declaration of competing interest

All authors declare no competing interest in this study.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.amsu.2022.104826>.

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