

Return to Work in Welder Underwent Total Knee Arthroplasty

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Abstract

Background: Osteoarthritis is the most common musculoskeletal disorders found and after reached severe stage, total knee arthroplasty (TKA) should be considered. Welders are group of workers whose work dominated by kneeling or squatting position in long period and sometimes carrying heavy weights. Return to work (RTW) process in welder underwent TKA was varied by duration and activity limited post operation.

Aim: to know whether welder underwent TKA could return to his original work.

Methods: Searching literature for the evidence-based has been conducted with a clinical question through "PICO" method. Then we continued the searching using electronic databases: "PubMed", "Cochrane Library", "EMBASE", and "Scopus". The keyword is "osteoarthritis", "total knee arthroplasty", and "return to work" with all the synonyms combined with Boolean Operator. The inclusion criteria were blue collar worker or welder population, underwent TKA at most for one year, and full text article. While we excluded study in white collar worker or office worker population, partial knee arthroplasty procedure, and population age >65 years old.

Results: From the three literatures obtained, we could learn about RTW duration in workers underwent TKA and what activities were limited after operation, and what the workers expectation after the procedure.

Conclusion: Welder underwent TKA could return to work at least three months after the procedure was done, but modification in the workplace still need to be done.

Keywords: osteoarthritis, total knee arthroplasty, return to work

Abstrak

Latar belakang: Osteoarthritis merupakan gangguan muskuloskeletal yang sering dijumpai dan apabila sudah mencapai tahap yang berat, prosedur total knee arthroplasty (TKA) menjadi suatu pertimbangan. Welder / juru las adalah kelompok pekerja yang aktivitas kerjanya didominasi oleh posisi berlutut atau jongkok dalam waktu yang lama ataupun mengangkat beban berat bila diperlukan. Proses return to work (RTW) pada juru las yang menjalani TKA sangat bervariasi dalam hal durasi dan aktivitas yang terganggu pasca dilakukan tindakan

Tujuan: untuk mengetahui apakah welder yang menjalani TKA dapat kembali bekerja sesuai dengan pekerjaan sebelumnya

Metode: Pencarian literatur berbasis bukti dilakukan dengan berfokus pada pertanyaan klinis dengan metode "PICO". Penulis melanjutkan pencarian dengan menggunakan basis data: "PubMed", "Cochrane Library", "EMBASE", dan "Scopus". Kata kunci yang digunakan adalah "Osteoarthritis", "Total Knee Arthroplasty", dan "Return to Work" beserta dengan padanan kata yang dikombinasikan dengan pengoperasian Boolean. Kriteria inklusi berupa studi yang melibatkan populasi blue collar worker atau welder, menyertakan prosedur TKA paling lama 1 tahun sebelumnya, dan memiliki full text. Sementara itu, kriteria eksklusi dalam studi ini adalah studi pada white collar worker atau office worker, prosedur parsial knee arthroplasty, serta populasi studi >65 tahun

Hasil: Dari tiga literatur yang ditelaah, penulis mendapatkan gambaran mengenai durasi RTW pada pekerja yang menjalani TKA dan aktivitas yang terganggu setelah menjalani prosedur ini, serta harapan pasien setelah menjalani prosedur TKA

Kesimpulan: Welder (yang telah menjalani prosedur TKA) dapat kembali bekerja paling cepat setelah tiga bulan pasca dilakukan prosedur ini, namun tetap perlu dilakukan modifikasi pekerjaan

Kata kunci: osteoarthritis, total knee arthroplasty, return to work

Introduction

Osteoarthritis (OA) is the most common musculoskeletal disorder found, approximately 303 million cases globally in 2017. This disorder could affect any joints and knee joint is affected the most. Osteoarthritis could lead to pain and disability. OA prevalence was increasing during past ten years and will be increasing even more. Apart from health impact, OA will become an economic burden.^{1,2} Studied showed OA was the second cause of disability in the world with 10-15% occurred in people >60 years old and with the increase of aging population, OA will be predicted increased later.^{3,4}

Total knee arthroplasty (TKA) is the most common procedure done in severe OA. Nowadays, TKA procedure was done increasingly with the increased of knee OA cases that 60% will be done in workers population by 2030.^{5,6} For worker underwent this procedure, return to work (RTW) stage is important. Previous study showed that return to work after the procedure was varied, i.e., in Netherlands, only 34% of workers return to work in three months after the procedure was done and 60% in six months. Factors contributing to RTW had not studied extensively. However, post operation pain, physical limitation (kneeling and squatting position) and mental limitation (fatigue, lack of concentration), and social factors also related to RTW.⁶

A qualitative study reported that workers had high expectation after underwent this procedure so any limitation or symptoms occurred after TKA might pose a problem. Another study also found that flexibility towards the type of job and working hour were positive condition for them to return to work. At a case report in Canada, workers who underwent TKA have varied RTW process; there were some who return to work without any limitation, some workers had minimal limitation to completely unfit for his previous work therefore modification in workplace should be done.⁷

Welder is a group of workers who dominated by squatting or kneeling position (most of the time for more than 120°) in a long period of time, moreover lifting heavy weight could increase bursitis or osteoarthritis risk for welder.^{8,9} Based on Compendium of Physical Activities 2011, welder is categorized as light/moderate (assemble/repair heavy parts, welding, stocking, auto repair, pack boxes for moving, etc.) which requires 3.0 METS.¹⁰ This type of work will impact their RTW

process after underwent TKA procedure; a study stated that in light work, RTW duration is 4.6 weeks until 11.6 weeks and in moderate work, RTW varied between 4 weeks until 10.7 weeks.¹¹ Due to high volume of osteoarthritis cases in worker which require kneeling or squatting position in longer period, one of which is welder and due to high prevalence of TKA in worker and various RTW duration after TKA procedure, we wanted to find more evidence regarding RTW in welder underwent TKA procedure.

Method

A literature review was conducted on March, 29th 2023 through a search from PubMed database using the keyword “knee osteoarthritis”, “total knee arthroplasty”, and “return to work” with all the synonyms available. Under this strategy, 63 articles were found. Another strategy was carried out on the same data from Cochrane Library database. We used the keyword “knee osteoarthritis”, “total knee arthroplasty”, and “return to work or back to work” and 1043 articles were found. From the EMBASE, we used the keyword: “knee osteoarthritis”, “total knee arthroplasty or knee arthroplasty”, and “return to work” and we found 67 articles. We also searched Scopus database with the keyword “osteoarthritis AND knee”, “total AND knee AND arthroplasty”, and “return AND to AND work” and resulted 109 articles.

Inclusion criteria in this study were: study included blue collar worker or welder, study included total knee arthroplasty at most for one year, and free full text articles. From this we obtained 13 articles after removed 5 duplicate articles, and by adding exclusion criteria (white collar population or office worker, partial knee arthroplasty or other procedure except total knee arthroplasty, population age >65 years old) producing 3 useful articles for the review. After the selection, the critical appraisal was done using several aspects based on the Centre of Evidence-based Medicine, the University of Oxford for prognostic study.

Result

From the online searching, we found three articles fit with our inclusion and exclusion criteria, two of them were cohort studies and one cross sectional studies. The

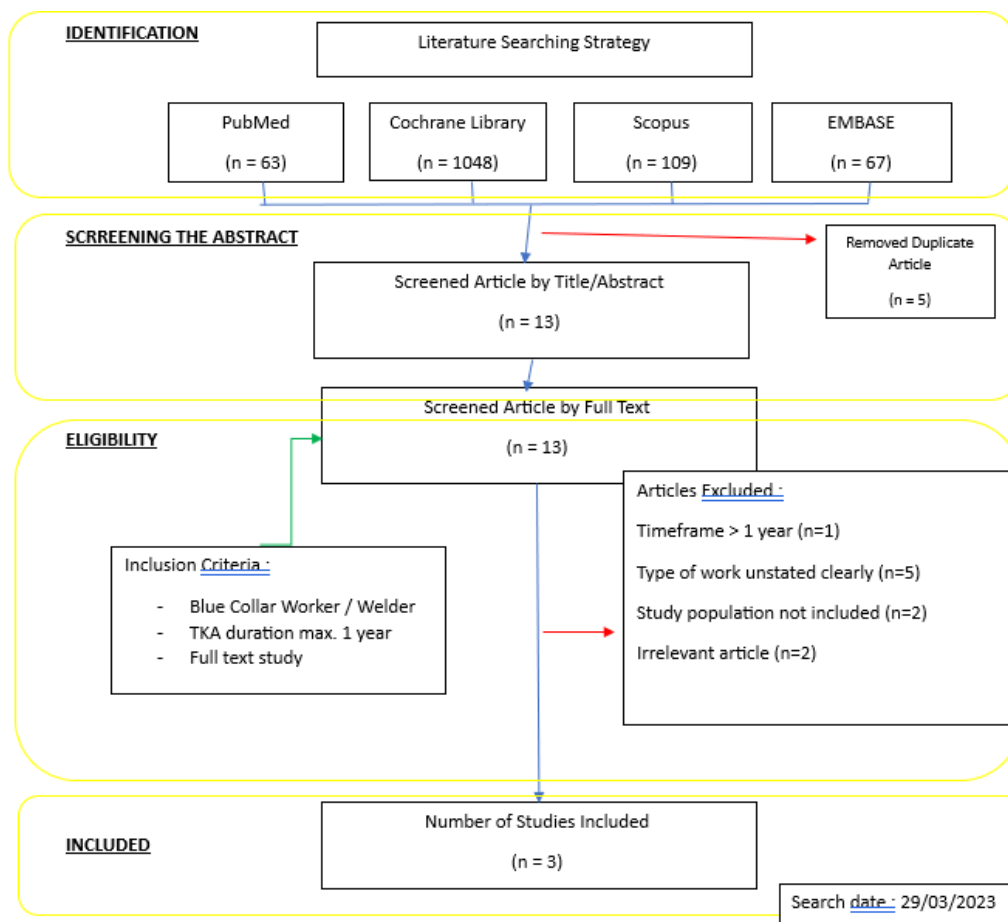


Figure 1. Searching strategy flowchart

first study is from Zaballa E, et al (2022), the second study is from Kievit AJ, et al (2019), and the last one is from Kangas K, et al (2021).

From the first article by Zaballa E, et al, we found that had been working before underwent knee arthroplasty will be returned to worked (RTW). This process could be more difficult after total knee arthroplasty than unicompartmental knee replacement. This study which was done from March 2010 – November 2016 also found that activities involving heavy lifting and ladder stepping were more difficult to do.¹²

The Second article by Kievit AJ, et al found that workers underwent unicompartmental knee arthroplasty will return to work earlier than they who underwent total knee replacement. Mean difficulty score at job involving kneeling position was found 19% better until 2 years after total knee arthroplasty was done.

The last one by Kangas K, et al found that manual workers underwent TKA procedure had RTW duration around 96-325 days compared they who did not undergo TKA procedure (17-50 days). Workers who had heavy job demand physically will need a work modification after the procedure had done.¹³

Discussion

Total knee replacement / total knee arthroplasty (TKA) is a common procedure done to reducing pain and increasing physical capacity and quality of life for workers diagnosed with severe osteoarthritis / end stage. Another important outcome is return to work (RTW) means the ability to return to his previous work after the procedure. Zaballa et al, found 82% of workers who

Table 1. The critical appraisal of the study

Literature	Validity			Importance		Applicability		Level of Evidence
	Recruitment	Follow-up	Outcome	Subgroup	Outcome	Precision	Application	
Zaballa E, et al	+	+	?	+	+	+	+	III
Kievit AJ, et al	+	+	?	-	+	-	+	III
Kangas K, et al	+	?	+	+	+	+	+	II

Note :

+ stated clearly in the article

- not stated in the article

? unclear or not stated clearly in the article

worked before underwent TKA procedure will remain return to work. However, around 17.6% underwent TKA still had problems in their knee so they couldn't return to work (also known as knee-related job loss/ KJRL). Activity limited after TKA, such as lifting weight ≥ 10 kg. This condition known to had risk 4.81 higher to become KJRL. Steeping >30 stairs per day had 4.03 higher risk to develop KJRL. Another activity, such as prolonged standing >4 hours per day, walking more than three hours per day, and kneeling/squatting position were not correlated statistically. Elementary worker defined as an occupation frequently used handheld tools and sometimes need to carrying heavy weight. In this type of work, there was around 40% RTW. Overall, about 11% of workers underwent TKA would have a modification in the workplace or moved to another position.¹²

Kievit et al also reported the same findings. The study showed there was around 72% of workers returning to work where 7% return to work within four weeks and about 49% could return to work within three months after the procedure. However, it was stated that after two years, RTW in workers underwent TKA or UKA almost no difference, although they who underwent UKA would have earlier RTW than TKA. But, they who had TKA procedure need to be carefully did they work if their job was focused on some activities, such as kneeling, squatting, or stepping stairs, like in plumbers and gardeners. They need to be informed that although TKA could reduce the pain, but it would not reduce their limitation doing some activities. Joint movement became limited after they underwent the procedure. Comparing up to three months before TKA

was done, after two years of the procedure, there was recovery in kneeling position around 19%, squatting position around 22%, carrying heavy weight around 36%, and recovery in another area.¹⁴

With the increasing number of osteoarthritis and TKA procedure will bring other concerns for the employer whether workers underwent TKA could return to work in the future. Because of that, RTW duration became important, especially for workers in productive age. Return to work process will be better if there was no sickness leave with 30 days for the same diagnosis as before. Manual worker underwent TKA had longer RTW duration (approximately 96-325 days) compared to they who did not. From a study conducted in Finlandia, we knew that 72% of manual worker had a difficult tendency to return to work than manager and professionals. However, in manual worker who did not undergo TKA, there were still 26% of workers who were difficult to return to work even though RTW duration was shorter (around 17-50 days). Data from the same study showed that 92% of workers who took sickness leave because of osteoarthritis but did not have TKA procedure will return to work within six months, meanwhile with the same condition and they had TKA procedure, only 72% could return to work within six months. In a whole year period, whether they underwent TKA or not, did not have a big difference (89% vs 96% respectively) and could return to their work.¹³ By knowing the duration of RTW process, doctor especially could give information to the stakeholders about employees' sickness leave and what modification needed in the workplace to ensure the workers could return to work safe and sound.

Conclusion

Welder as a part of elementary worker or manual worker who had underwent total knee arthroplasty could return to work at least three months after the procedure was done. However, modification in their workplace (such as working in sitting position is more preferable than in kneeling or squatting position) and job demand (such as limitation in working hours and activity) to ensure the RTW process can have a continuous positive effect for the worker.

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Conflict of interest

The authors declare no conflict of interest.

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