

Prevalence and factors affecting Return to work of patients post Primary total joint arthroplasty



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**A research report submitted to the Faculty of Health Sciences, University of
the Witwatersrand, in partial fulfilment of the requirements for the degree of
Master of Medicine**

Johannesburg, 2025

Declaration

I, Malesela Paul Maphoto declare that this research report is my own, unaided work. It is being submitted for the Degree of Master of Medicine in the division of Orthopaedic Surgery at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at any other University.

Signature: 

Date: 08 August 2025

To Almighty God

For grace and blessings

To my mother

For all the sacrifice and support

To my wife, Tshego

For all the love and care.

ABSTRACT

Background: Return to work is defined as the resumption of employment in any capacity after a surgical procedure. Return to work is an essential patient-related outcome measure that has been assessed globally to indicate the success of total joint arthroplasty in patients of working-age. There is no study reporting on return to work after joint arthroplasty in South Africa.

Objectives: The primary objective of this study was to determine the prevalence of return to work after total joint replacement at a tertiary health institution in Gauteng, South Africa. The secondary objectives were to determine the time from discharge taken to return to work and the factors associated with return to work.

Methods: The study design was a retrospective cohort study with prospective recall. We reviewed 197 patients from local arthroplasty database from 01 January 2017 to 31 December 2022. Patients were telephonically contacted. A *p-value* of < 0.05 was statistically significant.

Results: The prevalence of return to work post primary total joint replacement was 63% ($n = 124$). The mean time to return to work was 11.57 weeks. Factors that were statistically significant *p-value* < 0.05 were male sex, total hip arthroplasty, tertiary level of education, professional job status, sedentary job physicality, no post-operative sick leave, and limited number of physiotherapy sessions.

Conclusion: Most patients will return to work after total joint arthroplasty. The expected duration to return to work is within 12 weeks. Male sex, total hip arthroplasty, tertiary level education, professional job status and sedentary job physicality are likely to return to work, this is in-keeping with global trends.

Keywords: Return to work, total joint arthroplasty, total knee arthroplasty, total hip arthroplasty.

Acknowledgements

I would like thank, Dr Allan Roy Sekeitto and Dr Solomon Ndou for all the supervision and support throughout this journey. I would also like to thank, Dr Maxwell Jingo.

A special thank you to Professor Mmampapatla Ramokgopa for his leadership in the department.

To all the patients that participated in this research, I send my gratitude and appreciation.

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Presentations/Publications

Malesele Maphoto, Jurek Pietrzak, Nkodiseni Sikhauli, Lipalo Mokete, Allan Sekeitto, Wofhatwa Ndou. Prevalence and Factors affecting Return to Work Post Primary Total Joint Arthroplasty. South African Orthopaedic Association 2024 Congress. 26 August 2024.

Malesele Maphoto, Jurek Pietrzak, Nkodiseni Sikhauli, Lipalo Mokete, Allan Sekeitto, Wofhatwa Ndou. Prevalence and Factors affecting Return to Work Post Primary Total Joint Arthroplasty. Submitted to Journal of Arthroplasty May 2025.

Nomenclature

RTW: Return to work.

TJA: Total joint arthroplasty

THA: Total hip arthroplasty

THR: Total hip replacement

TKA: Total knee arthroplasty

TKR: Total knee replacement

UK: United Kingdom

UKA: Uni-compartmental Knee Arthroplasty

USA: United States of America

Definitions

- **Return-to-work** was defined as resumption of employment in any capacity, and any activity that generates an income.
- **Employment** was defined as any activity that generates an income. It encompassed the various forms of employment, which include but not limited to full time employment, part-time employment, seasonal employment and self-employment.
- **Age of patients** was measured in years from the date of last birthday.
- **Time of return to work** was measured in weeks from the date of discharge.
- **Post-operative sick leave** was determined as days off duty that were allocated by an employer or days self-allocated off duty if self-employed. Patients on 'on work, no pay' were allocated no sick leave.
- **Normal-duty or light duty** was measured based on patient self-reported normal or light duty after total joint replacement surgery.
- **Physicality of work** was measured based on the Dictionary of Occupational titles (2017) [Appendix E].
- **Occupational Category** was classified based on the South African Public Service Occupational Dictionary 2024 [Appendix F].

CHAPTER ONE – INTRODUCTION

1.1 Background and Literature Review

Primary total joint arthroplasty (TJA) are common orthopaedic procedures. (1) Historically reserved for elderly patients with severe osteoarthritis and the main objective was to alleviate pain. (2,3) Advancements in implant designs, bearing surfaces and surgical techniques have resulted in these procedures being done in younger patients. (4, 5) Younger patients have expectations beyond pain alleviation due to the need for these patients to want to return to normal activities such as work and sports. (6)

The demand for TJA surgery is predicted to increase. (7) The United States of America (USA) estimates an increase of 175% by 2030 for total hip arthroplasty (THA) and 673% for total knee arthroplasty (TKA). (7) The United Kingdom (UK), 50 000 THAs and 45 609 TKAs were performed between 1991 and 2010, projections suggest THA and TKA will grow by 427 708 and 439 097 respectively, by the year 2035. (8) Similar trends were seen in Netherlands. (9) A study in USA and Canada have demonstrated an increase in TJA for patients < 60 years. The highest change was seen in patients aged 20 – 49 years for THA and 50 – 59 years for TKA compared to other age groups. (10) This demonstrates that younger patients are receiving an increasing number of TJA.

Younger patients are required to generate an income for their livelihood. For younger patients, return to work (RTW) after TJA is an indicator of successful surgery. Thus, RTW is an essential patient reported outcome measure (PROM). (11) PROMs are becoming the norm in assessing outcomes after a surgical procedure. (6) Many patients will resume work within a few months of their TJA, with percentages as high as 87% and 85% for THAs and TKAs, respectively. (14) Time to RTW ranges from 1 – 14 weeks after THA and 8 – 12 weeks after TKA. (15)

A retrospective study conducted in the UK, involving 285 patients twelve months post THA, the mean RTW time was found to be 14 weeks and the mean time to resume sporting activities was 18.8 weeks. A lower body mass index (BMI) was associated with earlier resumption of work and sports ($p < 0.05$). (6) Nunley et al., analysed 806 physically active patients twelve months post THA in the USA, and they found a RTW percentage of 90.4%, and 94.1% returned to the same work activity level as before surgery. (5) Similar findings were seen in a study performed in Finland, involving 408 patients post THA, 94% of patients RTW after 103 days. (12) The variables associated with successful RTW were sick day leave of less than 30 days after operation, higher job status and lower BMI. (12)

For TKA, Kuijer et al., reviewed 177 patients post TKA with a minimum follow-up of twenty-four months in the Netherlands, variables associated with no RTW were pre-operative sick leave above 14 days, being female, BMI $> 30 \text{ kg/m}^2$, persisting knee symptoms and a job that placed increased load on the knee. (16) Kleim et al. reviewed 102 patients post primary TJA in the UK, patients were six months post-surgery, 80% of patients returned to work at 12 weeks post operation. Factors associated with successful resumption of work were sick leave less than 10 weeks, higher level of job status and patients post THA return to work faster than TKA ($p < 0.05$). (17)

Similar findings were seen by McGonagle et al., in a retrospective study of 115 patients performed in Australia at minimum of six months post-surgery, 91.4% of patients RTW after TJA. Time to RTW was 6.4 weeks THA, 7.7 weeks TKA and 5.9 weeks Uni-compartmental Knee Arthroplasty (UKA). It was statistically significant ($p = 0.003$) that patients with flexible working hours return to work earlier. (13) Table 1.1 provides a summary of the studies that have been stated in this section.

Table 1.1: Summary of Literature				
Author	Title	Design	Observation Time	Results
Cowie et al. United Kingdom	Return to work and sports after total hip replacement.	Retrospective study (n = 285)	12 months post THA	Time to RTW: 13.9 weeks Time to return to sports: 18.8 weeks Lower BMI return to work and sports faster
Nunley et al. USA	Do patients return to work after hip arthroplasty?	Retrospective cohort (n = 943)	12 months post THA	RTW percentage: 90.4%
Kuijer et al. Netherlands	Which patients do not return to work after total knee arthroplasty?	Retrospective cohort study (n = 177)	Working pre-op within 2 years, minimum follow-up 2 years	Pre-op sick leave > 2 weeks Female BMI > 30kg/m ² Knee demanding jog Knee symptoms
Laasik et al. Finland	Return to work after primary total hip arthroplasty: A nationwide cohort study.	Retrospective. Cohort study (n = 408)	1997- 2011	RTW percentage: 94% Successful RTW: <30 days sick leave

				• Higher job status • BMI < 30
Kleim B et al. United Kingdom	Understanding the patient-reported factors determining time taken to return to work after hip and knee arthroplasty.	Cross sectional study (n = 102)	6 month to 36 months after TJA	No sick leave ($p < 0.05$) Higher job status ($p < 0.05$) THA > TKR ($p < 0.05$)
McGongale et al. Australia	Factors influencing return to work after hip and knee arthroplasty.	Retrospective study (n = 115)	6 months post TJA	UKA>THA>TKR Order for RTW faster. Flexible working hours positive RTW ($p < 0.05$)

In South Africa, the number of TJA procedures are set to increase in-keeping with global trends. These procedures are accompanied by significant costs to the patient, medical aids and public health ministry. (18) This also justifies increased patient expectations from these procedures. In a study done at Groote Schuur Hospital, the authors reviewed waiting periods of TJA. They found the total waiting period to be approximately one-year and three months for TJA. (19)

Furthermore, they found that patients below the age of 65 years were significantly more likely to want to remain on the waiting list compared to those above the age of 65 years. (19) Although factors for this finding were not explored, return to employment might be an important driving factor for patients of working age.

There is a lack of published data on PROMs in Africa and South Africa. There is no study reporting on RTW after primary TJA of patients in South Africa.

1.2 Research Question

Do patients of working age return to work after primary total joint arthroplasty?

1.3 Study aim and Objectives

Aim:

- To review return to work of patients post total primary joint arthroplasty at a tertiary health institution in South Africa.

Objectives:

- To determine the prevalence of patients who return to work after joint replacement surgery.
- To determine the time (in weeks) after joint replacement surgery when patients return to work.
- To determine factors associated with returning to work after joint replacement surgery.

CHAPTER TWO – METHODOLOGY

2.1 Study Design

This is a retrospective cohort study with prospective recall.

2.2 Research Site

Charlotte Maxeke Johannesburg Academic Hospital, Division of Orthopaedic Surgery, Arthroplasty Unit.

2.3 Ethics

This study was approved by the University of Witwatersrand Human Research Ethics Committee (Medical)-clearance certificate number: **M231059** (see Appendix A). Approval was granted by the Hospital's Chief Executive Officer (see Appendix B).

2.4 Sample Population

The calculated sample size was 197 participants, to achieve a 95% confidence level and 5% significance level for the estimated population size of 400 participants. Participants that met the selection were identified from the Arthroplasty database from 01 January 2017 and 31 December 2022.

2.5 Data Collection

2.5.1 Patient Recruitment:

Participants whom met the inclusion criteria were identified from the arthroplasty database. A three-step process was utilised:

- i. Patients identified on the database were contacted telephonically and informed about the study and patient information leaflet was sent to them.
- ii. If “yes” then consent was recorded and the interview was conducted or if agreed to a suitable time later on
- iii. Patients were then called back at the agreed time.

2.5.2 Research Tool

The participants' data were collected using a questionnaire (see Appendix C). The questionnaire consisted of four categories: Patient demographics, type of joint arthroplasty, type of employment and return to work characteristics. The questionnaire was administered by the principle investigator. The questionnaire was designed based on work done from other studies. The questionnaire was piloted on several patients in the arthroplasty clinic to assess appropriateness and style, and no corrections were required from the feedback received.

2.5.3 Selection Criteria

Inclusion criteria:

- i. *Patients of working age between ages of eighteen and sixty years at the time of TJA.* The age was calculated in years from the time of their last birthday. Eighteen years is the accepted legal age for employment by the South African government and sixty years is the accepted legal age for retirement. (22)
- ii. *The patients must be at least six months post primary TJA.* Six months was the time frame in which patients exhibit that highest level of satisfaction after TJA, thus are expected to have been fully recovered following surgery. (20)
Bilateral TJA were staged and patients must be six months from the last TJA.
- iii. *The patient must have been working for at least two years prior to TJA.* The inclusion of minimum time working prior to joint replacement was based on work done in previous studies. (21)

Exclusion criteria:

- i. *Patients requiring revision surgery for any reason.* (13)
- ii. *Patients with postoperative complications such as deep venous thrombosis, prosthetic joint infection, fractures, or dislocations.* Patients with post-operative complications are at increased risk of prolonged hospital admission and recovery time. (5)
- iii. *Patients undergoing Joint replacement surgery for neck of femur fractures*

CHAPTER THREE - RESULTS

All data were collated and analysed using Stata version 17 statistical software. The data analysis was based on study objectives. The first objective to determine the prevalence of patients that RTW after TJA was calculated with descriptive statistics. The second objective to determine the time in weeks after TJA taken to RTW was calculated with descriptive statistics, it was expressed as a mean with standard deviations. The third objective was to determine factors associated with RTW, independent sample T-tests and chi-squared tests were utilised to determine if significant difference existed between the two groups: returned to work *versus* not returned to work. Kaplan-Meier survival analysis was used to determine if significant difference existed between the means of time to RTW based on the type of TJA. All findings were taken to be statistically significant if the *p*-value is below 0.05.

3.1 Demographic Data

The study enrolled 197 participants with an average age at time of interview of 52.8 years (range 27:67). The minimum follow-up was 48 months and maximum was 7 years. The majority of the participants were female 66.5% (*n* = 131). The average age at the time of TJA was 49 years. The participants that were married or cohabitating were 47.2% (*n* = 93). The majority of patients had no or one comorbidity, 36.5% (*n* = 72) and 44.7% (*n* = 88), respectively. Most patients had a secondary level education 68% (*n* = 134) (see Table 3.1).

Table 3.1: Demographic data based on Return to work (RTW)

Patient Characteristics					
Sex			RTW	No RTW	Total
Sex (M/F)	Male	N	48	18	66
		% within Sex (M/F)	72.7%	27.3%	100.0%
	Female	N	76	55	131
		% within Sex (M/F)	58.0%	42.0%	100.0%
Total		N	124	73	197
		% within Sex (M/F)	62.9%	37.1%	100.0%
Age at time of Surgery			RTW	No RTW	Total
18-30		N	4	3	7
		% within Age at PJA	57.1%	42.1%	100
31-40		N	25	4	29
		% within Age at PJA	86.2%	13.8%	100
41-50		N	42	19	61
		% within Age at PJA	68.9%	31.1%	100
51-60		N	53	47	100
		% within Age at PJA	53%	47%	100
Total		N	124	73	197
		% within Age at PJA	62.9	37.1	100
Married or Cohabiting			RTW	No RTW	Total
Yes		N	61	32	93
		% within Age at PJA	65.6	34.4	100
No		N	63	41	104
		% within Age at PJA	60.6	39.4	100
Total		N	124	73	197
		% within Age at PJA	62.9	37.1	100

Co-Morbidities		RTW	No RTW	Total
0	N	51	21	72
	% within Co-morbidities	70.8	29.2	100
1	N	50	38	88
	% within Co-morbidities	56.8	43.2	100
2	N	18	13	31
	% within Co-morbidities	58.1	41.9	100
3	N	4	0	4
	% within Co-morbidities	100	0	1000
4	N	1	1	2
	% within Co-morbidities count	50	50	100
Total	N	124	73	197
	% within Co-morbidities count	62.9	37.1	100
Education Status		RTW	No RTW	Total
Primary	N	7	12	19
	% within Primary education	36.8	63.2	100
Secondary	N	81	53	134
	% within Secondary education	60.4	39.6	100
Tertiary	N	36	8	44
	% within Tertiary education	81.8	18.2	100
Total	N	124	73	197
	% within Primary, Secondary Tertiary	62.9	37.1	100

3.2 Characteristics of Joint Arthroplasty Surgery

The TJA performed were THA 44.4% (n = 87), TKA 19.9% (n = 40), Bilateral THA 19.9% (n = 39), Bilateral TKA 13.3% (n = 26), THA and TKA in same patient 2.0% (n = 4) and 3 Joints replacements 0.5% (n = 1) (see Figure 3.1).

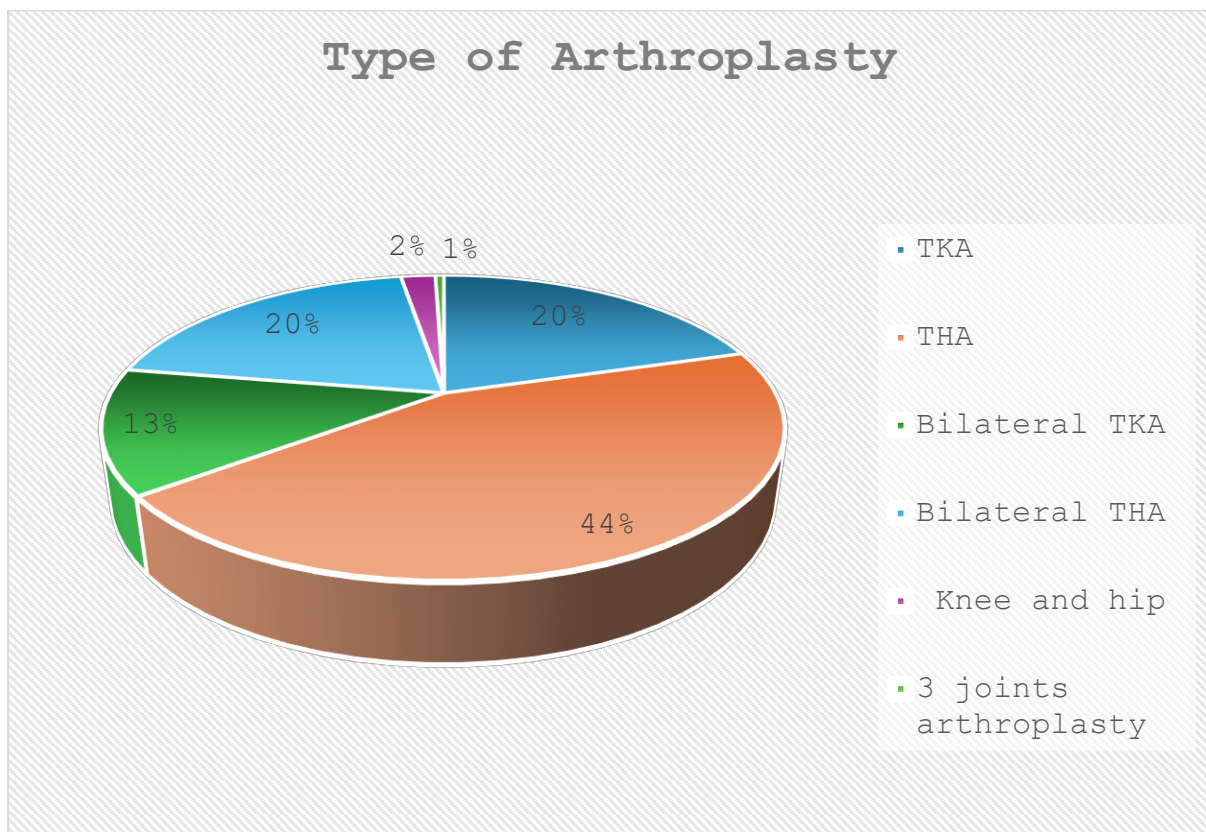


Figure 3.1: Type of Arthroplasty

3.3 Indication for Joint Arthroplasty

The main indication for TJA was primary osteoarthritis 60.9% THA, 87.5% TKA, 51.3% bilateral THA and 80.8% bilateral TKA. For THA and bilateral THA the second indication was avascular necrosis, 34.5% and 41%, respectively. For TKA and bilateral TKA, rheumatoid arthritis was a second cause for TJA, 10% and 15.4%, respectively (see Table 3.2).

Table 3.2: Indications for Joint replacement surgery based on Joint pathology

Indications for Joint Arthroplasty Surgery			
Total		Pathology	frequency (n)
		Percentage	
THA	87	Osteoarthritis	(53)
		60.9%	
		Avascular Necrosis	(30)
		34.5%	
		Hip dysplasia	(2)
TKA	40	2.3%	
		Rheumatoid arthritis	(1)
		1.1%	
		Gout	(1)
		1.1%	
Bilateral THA	39	Osteoarthritis	(35)
		87.5%	
		Rheumatoid arthritis	(4)
Bilateral TKA	26	10.0%	
		Avascular necrosis	(1)
		2.5%	
Bilateral THA	39	Osteoarthritis	(20)
		51.3%	
		Avascular necrosis	(16)
Bilateral TKA	26	41.0%	
		Rheumatoid arthritis	(3)
		7.7%	
Bilateral TKA	26	Osteoarthritis	(21)
		80.8%	

		Rheumatoid arthritis 15.4%	(4)
		Avascular necrosis 3.8%	(1)
Hip/knee	4	Osteoarthritis 75%	(3)
		Rheumatoid arthritis 25%	(1)
3 Joints	1	Rheumatoid arthritis 100%	(1)

3.4 Characteristics of Employment

Majority patients were employed 84.3 % (n = 166) *versus* self-employed. Most patients were working 8 hours/day 76.8% (n = 149). Most patients were classified into category 4 employment 31% (n = 61) based on based on the South African Public Service Occupational Classification System: Occupational Dictionary 2024 (see Table 3.3).

Table 3.3: Public Service Occupational Classification

Job Classification					
Occupational Categories		Skill Levels	NQF Levels	Frequency (n)	Percentage (%)
1	- Managers - Professionals	Skill level 4: Diploma/Degree	7 – 10	21	10.7
2	Technicians and Associate Technical Occupations	Skill level 3: Higher certificate	4 – 6	54	27.4
3	- Clerical Support workers - Skilled Agricultural, Forestry, Fishery, Craft & Related workers - Protective, Rescue Service workers, Social and Health Science and Support personal. - Plant machine Operators & Assemblers	Skill level 2: Matric Grade 12	2 – 4	55	27.9
4	Elementary Occupations	Skill level 1: Grade 9	1	61	31
5	Security and Custodial Personnel	Skill level: Varies from 2 nd to 4 th	2 – 10	6	3

The physical nature of work was classified based on the Dictionary of Occupational titles for classifying the strength demand of work (2017) (see Appendix F). The patients had an even distribution based of their occupational physical demands (see Table 3.4).

Table 3.4: Physicality of work

Category		Frequency (n)	Percentage (%)
1	Sedentary	44	22.3(%)
2	Light	27	13.7(%)
3	Medium	41	20.8(%)
4	Heavy	64	32.5(%)
5	Very heavy	21	10.7(%)
Total		197	100(%)

Majority of the patients did not receive sick leave after their joint replacement 59.7% (n = 124) (see Table 3.5).

Table 3.5: Post-operative sick leave

Breakdown of post-operative sick leave and RTW			
Post-operative Sick leave. (n,%)	Total n = 197	RTW n = 124	No RTW n = 73
Yes	73 (40.3%)	22 (17.7%)	51(69.9)
No	124(59.7%)	102 (82.4%)	22(30.1%)

3.5 Physical therapy after Total Joint Replacement

Majority of patients RTW with less than two sessions of physical therapy 79.9% (n = 46). However, there is a similar percentage note with five to six physical therapy sessions 76.2% (n = 16). Patients with six or less physical therapy sessions have a greater proportion of return to work compared with those with seven or more (see Table 3.6).

Table 3.6: Breakdown of number of Physiotherapy sessions and RTW

			Return to work		Total	% Total Physical therapy session
			RTW	No RTW		
Number of Physiotherapy sessions	1 – 2	N	46	14	60	30.4%
		% within Physiotherapy sessions	78.9%	21.1%	100%	
	3 - 4	N	34	17	51	28.8%
		% within Physiotherapy sessions	67.4%	32.6%	100%	
	5 - 6	N	16	6	22	11.2%
		% within Physiotherapy sessions	76.2%	23.8%	100%	
	7 - 8<	N	28	36	64	34.5%
		% within Physiotherapy sessions	43.8%	56.3%	100%	
Total		N	124	73	197	100%
		% within Physiotherapy sessions	63%	37%	100 %	

3.6 Prevalence of return to work post primary total joint arthroplasty

The prevalence of RTW post primary TJA was 63% (n = 124). Resumption of work at full duty was 85.5% (n = 106) and light duty 14.5% (n = 18) (see Figure 3.2).

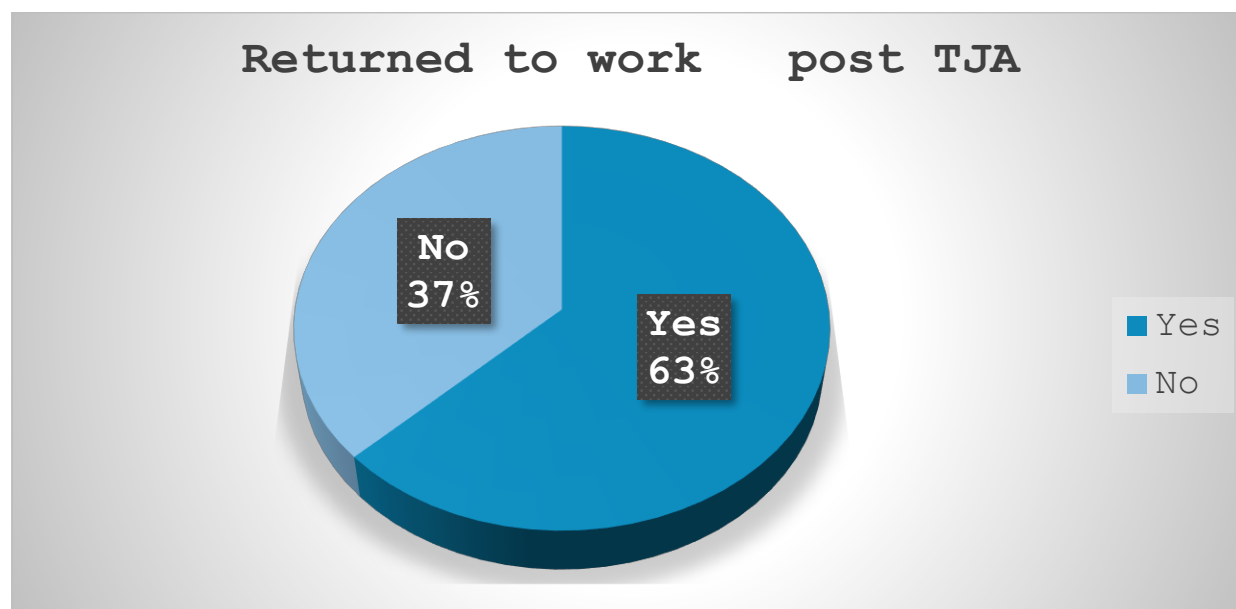


Figure 3.2: Breakdown of Prevalence of return to work

The prevalence of RTW based on the type of TJA was 70% for THA, 67% for Bilateral THA, 62.5% for TKA, 42% Bilateral TKA and 25% (n = 1) for total Hip and knee arthroplasty (see Table 3.7).

Table 3.7: Prevalence of Return to work based on Total Joint Arthroplasty

RTW based on Total Joint Arthroplasty			
	Total	Frequency (n)	Percentage (%)
Bilateral THA	40	27	67%
Bilateral TKA	25	11	44%
THA	87	60	70%
TKA	40	25	62.5%
3 Joint arthroplasty	1	0	0
Hip and Knee arthroplasty	4	1	25%
Total	197	124	63%

3.7 Timing of return to work post primary TJA

The mean time to RTW was 11.57 weeks $\pm$ 2.97. Time to RTW ranged from 1 week to 52 weeks, with 1 outlier RTW at 156 weeks. Most patients RTW at 6 weeks (24%, $n = 29$) (see Table 3.8).

Table 3.8: Breakdown of Time to Return to Work

Time to Return to Work		
Time in Weeks	Frequency (n)	Percentage (%)
1	2	1.7%
2	5	4.0%
3	15	12.0%
4	8	6.6%
5	3	2.5%
6	29	24.0%
8	18	15.0%
10	1	1.0%
12	20	16.5%
20	3	2.5%
24	1	1%
26	9	7.4%
32	2	1.7%
52	4	3.3%
156	1	1%
Total	124	100%
Percentage are rounded.		

The overall mean time to RTW after TJA was 11.57 weeks. RTW time based on type of TJA: 10.7 weeks for Bilateral THA, 8.6 weeks for Bilateral TKA, 12.7 weeks for THA, 11.2 for TKA and 6 weeks for hip and knee arthroplasty. Kaplan-Meier survival analysis was utilised to determine whether significance exist between the mean duration of RTW based on the type of TJA. There was no statistical significance between the mean duration of return to work ($p = 0.93$) (see Table 3.9).

Table 3.9: Kaplan-Meier Analysis

Means and Medians for Survival Time								
Type of joint	Mean ^a				Median			
	Estimate	Std. Error	95% Confidence Interval		Estimate	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound			Lower Bound	Upper Bound
TKR	11.208	2.194	6.909	15.508	8.000	.770	6.491	9.509
THR	12.721	2.743	7.344	18.098	8.000	.781	6.469	9.531
Bilateral TKR	8.636	2.465	3.804	13.468	6.000	.957	4.124	7.876
Bilateral THR	10.704	2.065	6.656	14.751	6.000	.255	5.500	6.500
Hip and Knee	6.000	.000	6.000	6.000	6.000	.	.	.
Overall	11.573	1.495	8.642	14.503	6.000	.341	5.332	6.668

Overall Comparisons

	Chi-Square	Df	Sig.
Log Rank (Mantel-Cox)	.805	4	.938

Test of equality of survival distributions for the different levels of Type of joint.

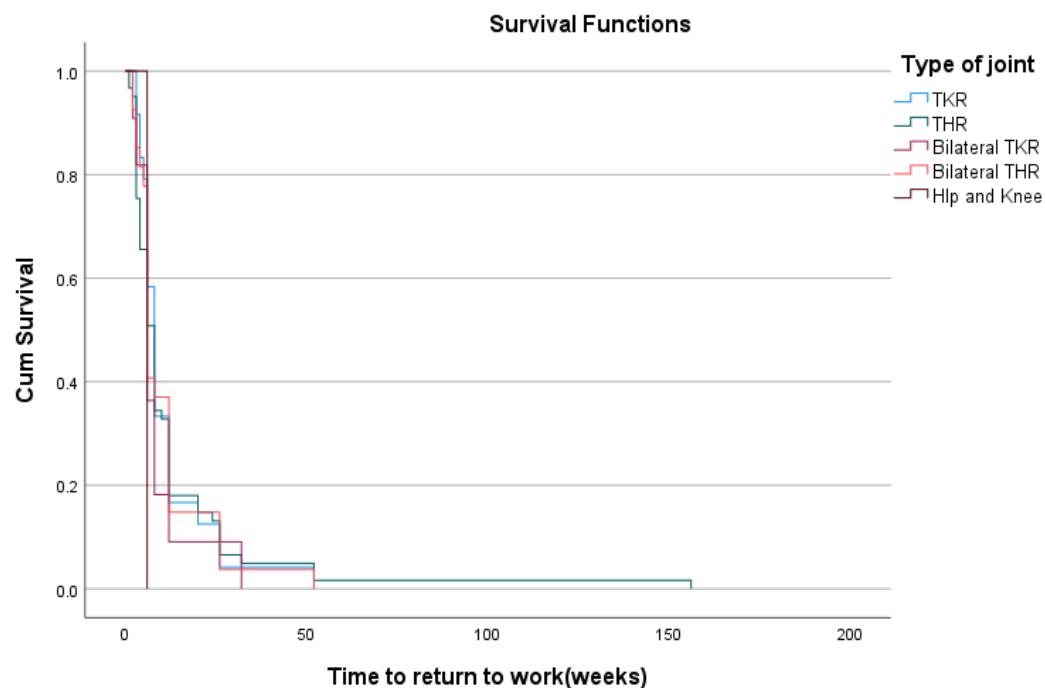


Figure 3.3. Kaplan Meier Survival analysis graph time return to work based on type of total joint arthroplasty.

3.8 Factors associated with return to work post primary total joint arthroplasty

The factors associated with RTW post primary TJA were male, age at time of TJA, tertiary education, THA , professionals/managers, no post-operative sick leave and physiotherapy sessions less than 6 (p -value < 0.05) . The factors that were not associated with RTW were number of comorbidities (p -value < 0.16) and marital status (p -value < 0.47) (see Table 3. 10). For statistical analysis of factors (see Appendix H).

Table 3.10: Factors analysed for association with return to work post primary total joint arthroplasty.

Factors		Statistical significance p -value < 0.05
Gender	Male	$p = 0.044$
Age at time of surgery	Younger age < 50 years	$p = 0.005$
No of comorbidities		$p = 0.159$
Education Status	Tertiary Education	$p = 0.002$
Marital Status		$p = 0.467$
Type of Joint	THR	$p = 0.03$
Occupational Category	Professional/ Managers	$p < 0.001$
Job physicality	Sedentary	$p < 0.001$
Post-operative sick leave	Sick leave	$p < 0.001$
Physiotherapy Sessions	1-2 sessions	$p < 0.001$

3.9 Reasons for not returning to work

No RTW was seen in 37% (n = 73). Main reason for no RTW was pain 40% (n = 29%), followed by early retirement (17%), disability grant (15%), looking for work (11%), due to another medical condition (8%), awaiting another TJA (8%) and retrenchment (1%) (see Table 3.11).

Table 3.11: Reasons for not returning to work

	Frequency	Percentage
Pain	29	40%
Early retirement/House duties	12	17%
Disability grant	11	15%
Looking for work	8	11%
Another medical conditions	6	8%
Awaiting another TJA	6	8%
Retrenchment	1	1%
Total	73	100.0%

CHAPTER FOUR - DISCUSSION

This study showed the majority of patients returned to work after primary TJA at our institution with a prevalence of 63% (n = 124). RTW at normal duty was seen in 85% of patients. Our study demonstrated a RTW prevalence based on type of TJA: 70% for THA, 62.5% for TKA, 67% for bilateral THA and 44% for bilateral TKA. THA had a higher proportion of patients that RTW.

The overall mean time to RTW was 11.57 ± 2.97 weeks. The mean time for return to work based on type of TJA was 12.7 weeks for THA, 11.2 weeks for TKA, 10,2 weeks for bilateral THA and 8,6 weeks for bilateral TKA. A Kaplan-Meier survival analysis curve demonstrated no statistical significance existed between time to RTW and type of TJA (p-value = 0.938). Majority of patients post primary TJA will RTW with mean time of 12 weeks.

Factors associated with RTW were male sex, age younger than 50 years at time of surgery, THA, tertiary level education, high occupational category, no sick leave (p-value<0.05).

Our study compared to a French study by Mangin et al, with similar inclusion and exclusion criteria, found their prevalence of RTW was 57.6% (n=86) and the mean duration was 17.7 weeks. Based on type of TJA, their prevalence of RTW was 62.5% THA and 52.7% TKA; however, no association was found of RTW and type of TJA (23)

McGongale et al, showed the prevalence of RTW was 91% (n = 106) in an Australian cohort and the mean duration to RTW was 6.6 weeks. Their inclusion criteria was limited to patients working 3 months prior to TJA and patients undergoing a single joint arthroplasty. (13) Our study and the French study by Mangin et al., enrolled patients working 2 years prior to joint replacement surgery. Our study in particular did not exclude patients with more than one joint replacement. McGongale et al. included unicompartmental knee replacements in their analysis, UKA are associated with quicker rehabilitation and recovery. (13)

Kamp et al., reviewed a Dutch cohort of 190 participants, their prevalence of return to work was 64%. A follow-up study by the same authors, over the same duration showed a mean time to RTW of 11.3 weeks. These findings are similar to our study. (27)(28)

Soleimani et al, meta-analysis involving 48 studies found prevalence of RTW after THA 70.8%. Factors associated with RTW were patients working at time of surgery, younger age and patients in jobs that are less physically demanding. (24) Pasqualini et al, meta-analysis involving 44 studies, they found a prevalence of RTW after TKA 65% (Range: 10% to 98%) and found a mean time to return to work of 12.9 weeks. (26) These are similar findings to our study. High-volume academic institutions are associated with good surgical outcomes, hence our results in-keeping with global trends. (1)

McGongale et al. found UKA returned to work faster than THA and TKA. (13) We found bilateral TKR and bilateral THR returned earlier, as these required less supervised rehabilitation as self-reported by patients. A Kaplan-Meier Survival analysis determined no association existed between the type of TJA and mean duration to RTW (p -value = 0.938).

Factors affecting return to work

Sex: In our study, male sex was associated with RTW (p -value = 0.044), however our study enrolled more females with a ratio of 2:1. Mangin et al. found no statistical significance (p -value = 0.55) between RTW and sex with an equal female to male ratio. (23) However, Rondin et al., showed significance between male gender and RTW (p -value=0.03) similar to our study. (25)

Age: We found that age at the time of TJA was statistically associated with RTW post joint arthroplasty (p -value = 0.005) for age less than 50 years. Mangin et al., had similar findings with a p -value = 0.006, patients with age less than 50 years are likely to RTW. Mangin et al. found that patients were younger in the RTW compared with no RTW group (p = 0.01). (23) However, we found no association of age between the two groups (p = 0.14).

Co-morbidities: Mangin et al. found statistical significance for RTW for patients with no co-morbidities (p -value = 0.024). (23) We found no association between the number of co-morbidities and return to work (p -value = 0.159). However, 81.2% of our patients had no or only one co-morbidity and inversely Mangin et al., had 72% of their participants with two or more co-morbidities. Soleimani et al. and Pasqualini et al. meta-analysis have not included co-morbidities in their analysis. (24)(26)

Marital status: Our study grouped participants: married or cohabitating and single or divorced to determine social support. We found no association between marital status and RTW (p -value = 0.467) (see Table 3.10). Oken et al., determine a statistical significance p -value < 0.05 for solitary individuals after THA. (29) Mangin et al. had findings similar to our study p -value= 0.06 that RTW has no association with family situation. (23) Kamp et al, showed work related support from supervisor was association with RTW. (27)

Educational status: We found that tertiary education is statistically associated with RTW with a p -value = 0.002. Soleimani et al., found no association with educational status and RTW after THA. (24) Sankar et al., found increased likelihood of patients with tertiary education to RTW odds ratio (OR) (95% CI) 2.0 (1.3 – 3.2) for THA however no association was seen in TKA. (30)

Occupational status: Based on the South African Public Service Occupational Dictionary 2024, we found association between category 1 (Professional/Managers) and RTW (p -value = 0.001). Similar findings were in Finland, Laasik et al., p -value < 0.001 after THA (12) and in the United Kingdom, Kleim et al., p -value < 0.001 after TKA (17). However, Mangin et al found no association between occupational status and RTW (p -value = 0.302). (23) Rondin et al., found self-employed have earlier RTW (p -value < 0.001). (25)

Physicality of work: Based on the physical demand classification system we found an association between sedentary work category and RTW (p -value < 0.001) (see Table 3.10). Soleimani et al., had similar findings after THA. (24) Kuijer et al. found that jobs that are more physically demanding on knee were associated no RTW OR (90%CI) 3.3 (1.2 – 8.9) after TKR (16).

Sankar et al., sedentary jobs associated with RTW for THA and TKA, OR (95% CI) 2.9 (1.1 – 7.6) and OR (95% CI) 1.3 (0.5 – 3.8). (30)

Physical therapy: Mangin et al. found no association between rehabilitation and RTW (p -value = 0.204). (23) We found the number of sessions of physical therapy was statistically associated with RTW (p -value < 0.001). However, Participants with less than 6 sessions showed RTW in greater proportion compared with those with 7 or more sessions. These results suggests that patients who are to RTW do well from day one post-operative. The limited physical therapy sessions resulted from: patients with more than one joint replacement required less supervised physical therapy sessions, as self-reported by participants and during the COVID-19 period majority of patients were directed to perform home-based physical therapy sessions.

Sick leave: We found an association between no post-operative sick leave and RTW (p -value < 0.001). However, Mangin et al. analysed pre-operative sick leave, they found no association with RTW (p = 0.107). (23) Laasik et al. and Kuijer et al., pre-operative sick leave more than two weeks were associated with no RTW. (12)(16) We determine that patient that had pre-operative and post-operative sick leave are associated with no return to work.

Reason for no return to work: The main reason for no return to work after surgery was pain 40% (n = 29), followed by early retirement/house duties 17 % (n = 12) and patients who qualified for disability grant 15% (n = 11) (see Table 3.11). Mangin et al. found the following order for no return to work: retired 42.7% (n = 26), disability 29.5% (n = 18), retirement 18% (n = 11) and long sick leave 9.8% (n = 6). (23) Prolonged waiting list may contribute to increase prevalence of pain in our population, as patients may require more complex surgery with resulted poor patient reported outcomes. Patients negative perspectives post TJA is associated with poor outcomes, however not explored in our study. (11)

4.1 Limitations/Recommendations

Our study is a retrospective study with prospective recall, therefore prone to recall bias. The second limitation is South Africa is developing country with high-

unemployment rate, therefore information bias may exist to underestimate the prevalence of patients that RTW. Our study did not assess mental readiness to RTW.

We recommended a prospective study cohort study with regular follow-ups with use of verified score to determine physical activity pre-operatively and psychological assessment for willingness to RTW and to enrol patients working at time of TJA.

CHAPTER FIVE - CONCLUSION

Most patients will return to work after total joint arthroplasty with an expected duration within 12 weeks. Most patients that return to work will resume normal duty. Male sex, total hip arthroplasty, tertiary level education, professional job status and sedentary job physicality are likely to return to work. This is in keeping with global trends.

REFERENCES

1. Judge A, Chard J, Learmonth I, Dieppe P. The effects of surgical volumes and training centre status on outcomes following total joint replacement: analysis of the Hospital Episode Statistics for England. *J Public Health (Oxf)*. 2006;28(2):116-24.
2. Charnley J. Arthroplasty of the hip. A new operation. *Lancet*. 1961;1(7187):1129-32.
3. Learmonth ID, Young C, Rorabeck C. The operation of the century: total hip replacement. *Lancet*. 2007;370(9597):1508-19.
4. Kahlenberg CA, Krell EC, Sculco TP, Katz JN, Nguyen JT, Figgie MP, et al. Differences in time to return to work among patients undergoing simultaneous versus staged bilateral total knee arthroplasty. *Bone Joint J*. 2021;103-B(6 Supple A):108-12.
5. Nunley RM, Ruh EL, Zhang Q, Della Valle CJ, Engh CA, Berend ME, et al. Do Patients Return to Work After Hip Arthroplasty Surgery. *J Arthroplasty*. 2011;26(6 Suppl):92.e1-3.
6. Cowie JG, Turnbull GS, Ker AM, Breusch SJ. Return to work and sports after total hip replacement. *Arch Orthop Trauma Surg*. 2013;133(5):695-700.
7. Kurtz S, Ong K, Lau E, Mowat F, Halpern M. Projections of primary and revision hip and knee arthroplasty in the United States from 2005 to 2030. *J Bone Joint Surg Am*. 2007;89(4):780-5.
8. Culliford D, Maskell J, Judge A, Cooper C, Prieto-Alhambra D, Arden NK, et al. Future projections of total hip and knee arthroplasty in the UK: results from the UK Clinical Practice Research Datalink. *Osteoarthritis Cartilage*. 2015;23(4):594-600.
9. Otten R, van Roermund PM, Picavet HS. [Trends in the number of knee and hip arthroplasties: considerably more knee and hip prostheses due to osteoarthritis in 2030]. *Ned Tijdschr Geneeskd*. 2010;154:A1534.
10. Crowninshield RD, Rosenberg AG, Sporer SM. Changing demographics of patients with total joint replacement. *Clin Orthop Relat Res*. 2006;443:266-72.
11. Hoorntje A, Leichtenberg CS, Koenraadt KLM, van Geenen RCI, Kerkhoffs G, Nelissen R, et al. Not Physical Activity, but Patient Beliefs and Expectations are

Associated With Return to Work After Total Knee Arthroplasty. *J Arthroplasty*. 2018;33(4):1094-100.

12. Laasik R, Lankinen P, Kivimäki M, Aalto V, Saltychev M, Makela K, et al. Return to work after primary total hip arthroplasty: a nationwide cohort study. *Acta Orthop*. 2019;90(3):209-13.

13. McGonagle L, Convery-Chan L, DeCruz P, Haebich S, Fick DP, Khan RJK. Factors influencing return to work after hip and knee arthroplasty. *J Orthop Traumatol*. 2019;20(1):9.

14. Sankar A, Davis AM, Palaganas MP, Beaton DE, Badley EM, Gignac MA. Return to work and workplace activity limitations following total hip or knee replacement. *Osteoarthritis Cartilage*. 2013;21(10):1485-93.

15. Tilbury C, Schaasberg W, Plevier JW, Fiocco M, Nelissen RG, Vliet Vlieland TP. Return to work after total hip and knee arthroplasty: a systematic review. *Rheumatol (Oxf)*. 2014;53(3):512-25.

16. Kuijter PP, de Beer MJ, Houdijk JH, Frings-Dresen MH. Beneficial and limiting factors affecting return to work after total knee and hip arthroplasty: a systematic review. *J Occup Rehabil*. 2009;19(4):375-81.

17. Kleim BD, Malviya A, Rushton S, Bardgett M, Deehan DJ. Understanding the patient-reported factors determining time taken to return to work after hip and knee arthroplasty. *Knee Surg Sports Traumatol Arthrosc*. 2015;23(12):3646-52.

18. Sekeitto AR, Aden AA. Costing total hip arthroplasty in a South African state tertiary hospital. *S Afr Med J*. 2021;111(3):250-4.

19. Kavalieratos T, Nortje M, Dunn RN. Hip and knee arthroplasty waiting list - how accurate and fair? *S Afr Med J*. 2017;107(4):323-6.

20. Judge A, Arden NK, Kiran A, Price A, Javaid MK, Beard D, et al. Interpretation of patient-reported outcomes for hip and knee replacement surgery identification of thresholds associated with satisfaction with surgery. *J Bone Joint Surg Br*. 2012;94(3):412-8.

21. Kuijer PP, Kievit AJ, Pahlplatz TM, Hooiveld T, Hoozemans MJ, Blankevoort L, et al. Which patients do not return to work after total knee arthroplasty? *Rheumatol Int.* 2016;36(9):1249-54.
22. South African government services old age pension (2022) Available from: [https://www.gov.za/services/social-benefits-retirement-and-old-age/old-agepension\(15/05/2023\)](https://www.gov.za/services/social-benefits-retirement-and-old-age/old-agepension(15/05/2023)) [Data accessed: 18/05/2023].
23. Mangin M, Galliot F, Houfani F, Baumann C, Mainard D. Return to work after primary total hip or knee arthroplasty. First French study. Retrospective study of 241 cases. *Orthop Traumatol Surg Res.* 2022;108(1):103163.
24. Soleimani M, Babagoli M, Baghdadi S, Mirghaderi P, Fallah Y, Sheikhvatan M, Shafiei SH. Return to work following primary total hip arthroplasty: a systematic review and meta-analysis. *J Orthop Surg Res.* 2023;18(1):95.
25. Rondon AJ, Tan TL, Greenky MR, Kheir MM, Foltz C, Purtill JJ. Return to Work After Total Joint Arthroplasty: A Predictive Model. *Orthopaedics.* 2020;43(5):e415-20.
26. Pasqualini I, Emara AK, Rullan PJ, Pan X, Simmons HL, Molloy RM, Krebs VE, Piuze NS. Return to Sports and Return to Work After Total Knee Arthroplasty: A Systematic Review and Meta-Analysis. *JBJS Rev.* 2023;11(7):1-9.
27. Kamp T, Stevens M, Van Beveren J, Rijk PC, Brouwer R, Bulstra S, Brouwer S. Influence of social support on return to work after total hip or total knee arthroplasty: a prospective multicentre cohort study. *BMJ Open.* 2022;12(5):e059225.
28. Kamp T, Brouwer S, Hylkema TH, van Beveren J, Rijk PC, Brouwer RW, Stevens M. Psychosocial Working Conditions Play an Important Role in the Return-to-Work Process After Total Knee and Hip Arthroplasty. *J Occup Rehabil.* 2022 ;32(2):295-305.
29. Oken FO, Yildirim OA, Asilturk M. Factors affecting the return to work of total hip arthroplasty due to of developmental hip dysplasia in in young patients. *J Orthop.* 2018;15(2):450–4.

APPENDICES

Appendix A:	Ethics Clearance Certificate
Appendix B:	Hospital CEO Approval
Appendix C:	Questionnaire
Appendix D:	Patient information leaflet
Appendix E:	Participant Consent Form
Appendix F:	Dictionary of Occupational Titles (2017)
Appendix G:	South African Public Service Occupational Dictionary (2024)
Appendix H:	Analysis of Factors associated with Return to Work

Appendix A: Ethics Clearance Certificate



R14/49 Dr Malesela Paul Maphoto

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL) **CLEARANCE CERTIFICATE NO. M231059 M240408-A-0001**

NAME: Dr Malesela Paul Maphoto
(Principal Investigator)
DEPARTMENT: Orthopaedics
Charlotte Maxeke Johannesburg Academic Hospital

DEGREE: Master of Medicine in Orthopaedic Surgery

PROJECT TITLE: *Prevalence and factors affecting return to work of patients post primary total joint arthroplasty*

DATE CONSIDERED: 27/10/2023

DECISION: Approved unconditionally

CONDITIONS:

NOTE: HREC (Medical) Application Number: MED23-08-044
If contact information regarding student study participants is required, please contact the Registrar's office - Nicoleen.Potgieter@wits.ac.za

SUPERVISOR: Dr A. Sekeitto and Dr S. Ndou

APPROVED BY: Professor Paul Ruff, Chairperson, HREC (Medical)

DATE OF APPROVAL: 08/04/2024 **EXPIRY DATE:** 08/04/2029
This clearance certificate is valid for 5 years from date of approval. Extension may be applied for.

DECLARATION OF INVESTIGATOR(S)

I/we fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated, from the research protocol as approved, I/we undertake to resubmit the application to the Committee. **I agree to submit a yearly progress report** in the month date of convened meeting each year until study is closed. Failure to submit annual report will result in ethics clearance certificate suspension. The date for annual re-certification will be one year after the date of convened meeting where the study was initially reviewed. Unreported changes to the application may invalidate the clearance given by the HREC (Medical). Login to upload signed copy of this ethics clearance certificate prior to commencing with the study <https://www.witsethics.co.za/login.aspx>. Email a signed copy of ethics clearance certificate to HREC-Medical.ResearchOffice@wits.ac.za.

M.P. Maphoto
Principal Investigator Signature

2024/4/09
Date

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

Appendix B: Hospital CEO Approval



CHARLOTTE MAXEKE JOHANNESBURG ACADEMIC HOSPITAL

Enquiries: Ms N. Mzila

Email: Nolwazi.Mzila@gauteng.gov.za

Tel: 011 488 3365

Ref: 1/7/2

Date: 10 May 2024

HRD Number: GP_202312_011

Dear Dr Malesela Maphoto

Re: Final Approval of Study

Title of Research Project : Prevalence and factors affecting Return to work of patients post Primary total joint arthroplasty"

Permission is granted for you to conduct the above-mentioned study as described in your request provided:

1. Charlotte Maxeke Johannesburg Academic Hospital will not in any way incur or inherit costs as a result of the said study.
2. Your study shall not disrupt services at the study sites.
3. Strict confidentiality shall always be observed.
4. Informed consent shall be solicited from patients participating in your study.

Please liaise with the HOD and Unit Manager or Sister in charge to agree on the dates and time that would suit all parties.

Kindly forward this office with the results of your study on completion of the research.

Supported/ Not-Supported

Dr. S. Mabunda
Acting Clinical Director

Approved / Not-Approved

Ms K. Maruma
Acting Chief Executive Officer: CMJAH

Appendix C

Study on Return to work after total joint arthroplasty.

Questionnaire

Study number: _____

Please complete the questionnaire below. All information completed will be cross-checked with your hospital file to ensure that it is correct.

All the information required in *italics* will be collected from your hospital file. You do not have to answer those questions.

Section A: Demographics

Please tell us about yourself.

1. What is your sex? Tick (X)

Female	Male
--------	------

2. How old are you (age at your last birthday)? _____ years
3. Do you have any medical conditions?

Medical Condition	Tick(X)
Hypertension	
Diabetes	
Hypercholesterolemia	
Epilepsy	
Asthma	
Others, please specify:	

4. What is your highest level of education completed?

Level of Education	Tick (X)
Primary School (Gr 1-6)	
High school (Gr7-12)	
Tertiary Education (Degree/Diploma)	

5. What is your marital status? Tick (X)

Single	Married	Cohabiting	Divorced	Widowed
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Section B: Joint Replacement

1. What type of operation did you get for your joint replacement surgery?

Type of operation	Tick (X)
Total hip replacement	
Total knee replacement	
Both total hip replacement	
Both total knee replacement	
Total hip and knee replacement	
Other please specify:	

2. How old were you when you had your joint replacement surgery?
(Age at last birthday) _____ years

If you have two or more joint replacements, please specify your age when you had the replacements?

Age (at last birthday)	Type of joint replacement

3. Which condition was affecting your joint?

Condition affecting joint:	Tick (X)
Osteoarthritis	
Inflammatory arthritis: Rheumatoid arthritis, Lupus, others Please specify:	
Gout arthritis	
Childhood disease: DDH, SUFE, Perthes, others Please specify?	
Avascular necrosis	

Section C: Employment

Please tell us about job/employment before joint replacement surgery.

1. Where you in any kind of employment in the 2 years before your joint replacement surgery?

Answer	Tick(X)
Yes	
No If no, where you • Retired. • Doing home duties. • Unable to work due to awaiting replacement. • Unable to work due to other medical condition. • Looking for work. • Volunteering. • Receiving social grant	

If you answered no to 1, you could skip the rest of the questions in section C.

2. Before your joint replacement surgery, what was your job or occupation?

3. Where you self-employed or an employee of a business or organisation?

Self- employed	Employee
----------------	----------

4. What industry of work are you involved? (Example: Manufacturing, retail, IT, teaching)
5. How many hours did you work per week?
6. Before or After your operation how did you receive sick leave?

Duration	Tick (X)
1-2weeks	
2-4 weeks	
1-3 months	
3-6 months	
>6months	
No sick leave	

Section D: Return to work.

Please tell us about your employment after the operation.

1. Before your operation when did you expect to get back to work?

_____ Weeks after the operation

2. Since your joint replacement surgery have you returned to work? Tick (X)

Yes	
No, if no please specify 1. Retired early 2. House duties 3. unable to work a. due to other medical condition b. awaiting 2 nd joint replacement. 4. Volunteering 5. looking for work 6. Permanent disability after joint replacement 7. Looking for work 8. Receiving a social grant	

3. How many weeks after your operation did you return to work?

4. When you returned to work did you start full duty or light duty? Tick(X)

Full duty	Light duty
-----------	------------

5. If light duty, when (in weeks) did you resume full duty?

6. Did you return to your usual role at work?

Answer	Tick (X)
Yes	
No	If no, please specify:

7. How many physiotherapy sessions did you attend after the operation?

Number of sessions	Tick (X)
1-2	
2-4	
4-6	
6-8	

Appendix D

Patient information leaflet

Study Title: Return to work after Total Joint Arthroplasty

Greeting: Good day Madam/Sir

Introduction:

I am Dr Malesela Maphoto, an orthopaedic surgeon in training, as part of my training I need to conduct medical research. Once my medical research is successfully completed, I will achieve my Master of Medicine degree. We are doing research on Return to work after total joint arthroplasty. Research is a process used in seeking new knowledge. Our research seeks to find out if younger patients go back to work after total joint arthroplasty is performed on them, as was the case with you.

Invitation to Participate: You are invited to take part in a research study. Before you can take part in this study you need to understand why the study is being performed. Please read the information provided below. Ask questions if you do not understand or would like more information.

What is involved in the study?

The study I am conducting seeks to understand whether patients of working-age (below the age of 65 years) go back to their jobs after a joint replacement procedure was performed on them.

Joint replacement procedures are usually performed in patients with severe joint disease, this severe disease makes it difficult for patients to work. When joint replacement procedure was first introduced, they were meant only for elderly people with severe joint disease. Technology on these procedures has improved greatly, making the implants used in these procedures stronger and better. Due to this improvement in technology, joint replacement procedures are now being done in younger patients. Younger patient (below 65 years of age) need their jobs to earn money and make a living to survive and hence, we need to know whether people who have undergone joint replacement go back to work and what factors help these people to go back to work.

If you agree to participate, I will call you by telephone at a time convenient to you and ask you a number of questions about your surgery and how well you have recovered from it. The call will last about 10 Minutes. With your permission, I would like to record our conversation. No one but my supervisor and me will hear the recording. After it has been written down, the recording will be erased. The written record will be held under lock and key.

We invite you to participate in this study to help us understand whether younger patients return to work after their joint replacement surgery. If you accept to participate in the study, you will be asked to complete the questionnaire. You will

also be asked to give us permission to access your hospital file so we can get more information from it.

People that can participate in this study require the following:

- Must be of working age (18-65)
- Must be at least six months after their joint replacement procedure.
- Must have been working at least 2 years before their joint replacement.
- Must not have a repeat operation of the replacement
- Must not have no complications from the operation
- Must not have joint replacement due to fracture of femur

If you fit the foregoing criteria then you are eligible to participate in this study.

Risks of being involved in the study:

There is no risk associated with this study. There are no monetary benefits to the study.

Benefits of being in the study:

No direct benefit. May help us improve our procedures in the future.

Participation is voluntary: Refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled and you may discontinue participation at any time without penalty, or loss of benefits to which you are otherwise entitled; there is no requirement to provide a reason for withdrawing and any data collected on you will in default be destroyed, unless you specifically consents to its retention.

Reimbursements for “out of pocket” expenses: There are no payments for participating in the study.

Confidentiality

No name and surname will be used on our questionnaire. We will be using a patient identifier and hospital file number only. In the event that our study reveals that a patient's physical health is at risk, then we may have to break confidential for the benefit of the patient's health.

If results are published, this may, exceptionally, lead to cohort, or more rarely, individual identification. No individual will be identified by name in any report or publication arising out of this study. All data collected in the course of the study will be securely retained for two (2) years, if a scientific publication arises from the study and six (6) years, if there is no publication. Thereafter it will be destroyed accordingly.

Anonymity can usually only be guaranteed in questionnaires, whether in hard copy or online

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Cell: 072 991 2240

Contact details of HREC administrator and chair – for reporting of complaints / problems.

This study has been approved by the Human Research Ethics Committee (Medical) of the University of the Witwatersrand, Johannesburg ("Committee"). A principal function of this Committee is to safeguard the rights and dignity of all human subjects who agree to participate in a research project and the integrity of the research.

If you have any concern over the way the study is being conducted, please contact the Chairperson of this Committee who is Professor Paul Ruff, who may be contacted via any one member of the secretariat. The telephone numbers for the Committee secretariat are 011 717 2700/1234/2656/1252 and the e-mail addresses are Zanele.Ndlovu@wits.ac.za, Rhulani.Mukansi@wits.ac.za, Mapula.Ramaila@wits.ac.za and Iain.Burns@wits.ac.za.

Thank you for reading this Study Information Sheet.

April 2024

Appendix E

Participant Consent Form

Project Title: Return to work after total joint arthroplasty

I hereby consent to audio recording of the interview.

I understand that:

- The recording will be stored in a secure location (a locked cupboard or password protected computer) with restricted access to the researcher and the research supervisor.
- The recording will be transcribed and any information that could identify me will be removed.
- The recording will be erased within either (a) 2 years of the publications of the research findings, or by (b) six years, if no publication arise from this research.
- Anyone wishing to access this information in the future will first have to obtain the approval of the Human Research Ethics Committee (Medical) of the University of the Witwatersrand, Johannesburg.
- Direct quotes from my interview, without any information that could identify me, may be cited in the research report or other write-ups of research.

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Ms. Z Ndlovu or Mr Rhulani Mkansi, Committee Secretariat, telephone nos.: 011 717 2700 or 1234, or by e-mail at: Zanele.Ndlovu@wits.ac.za or Rhulani.Mkansi@wits.ac.za

Name of Participant: _____

Date: _____

Place: _____

Signature or mark _____

Witnessed by:

Name of Witness: _____

Signature:_____ Date: _____

Appendix F

Dictionary of Occupational titles (2017)

Table 2. Definitions of work intensity and frequency (Adopted with permission from Classification of Jobs, Janet E. Field and Timothy F. Field, Elliott and Fitzpatrick, Inc., Athens, GA 1992.)

Strength Demands	
Sedentary:	Exerting up to 10 lbs. of force occasionally and/or a negligible amount of force frequently to lift, carry, push, pull, or otherwise move objects, including the human body. Involves sitting most of the time but may involve walking or standing for brief periods of time.
Light:	Exerting up to 20 lbs of force occasionally and/or up to 10 lbs force frequently and/or a negligible amount of force constantly. Even when weight lifted is negligible, a job is rate light when: 1) it involves walking or standing to a significant degree; 2) it requires sitting most of the time but involves pushing and/or pulling of arm or leg controls; 3) it involves working at a production rate that requires constant pushing or pulling of materials.
Medium:	Exerting 20 to 50 lbs of force occasionally and/or 10 -25 lbs force frequently and/or up to 10 lbs of force constantly. Physical demand requirements are greater than that required for Light Work.
Heavy:	Exerting 50 to 100 lbs of force occasionally and/or 25 -50 lbs force frequently and/or 10 to 20 lbs of force constantly. Physical demand requirements are greater than that required for Light Work.
Very Heavy:	Exerting greater than 100 lbs of force occasionally and/or greater than 50 lbs force frequently and/or greater than 20 lbs of force constantly. Physical demand requirements are greater than that required for Light Work.
Frequency Demands	

Never:	Activity or condition does not exist.
Occasionally:	Activity or condition exists up to 1/3 of the time.
Frequently:	Activity or condition exists from 1/3 to 2/3 of the time.
Constantly:	Activity or condition exists 2/3 or more of the time.

Appendix G

South African Public service Occupational Dictionary 2024

Occupational Categories	Skill levels	NQF Levels
- Managers - Professionals	Skill Level 4: post-secondary education	NQF Level 7-10
Technicians and Associate Technical Occupations	Skill Level 3: post-secondary education up to Higher certificate and part of the HET	NQF Level 4-6
- Clerical Support workers - Skilled Agricultural, Forestry, Fishery, Craft & Related Trades workers - Protective, Rescue Services workers, Social and Health Sciences Supplementary and Support personnel - Plant Machine Operators & Assemblers	Skill Level 2: schooling up to Grade 12, technical education, some learnerships/apprenticeships	NQF Level 2-4
Elementary Occupations	Skill Level 1: schooling up to Grade 9/ ABET level 4	NQF Level 1
Security and Custodial Personnel	Skill Level: Varies from the 2 nd to the 4 th skill level	NQF Level 2-10

Appendix H

Factors associated with return to work post primary total joint arthroplasty.

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1. Analysis of return to work and sex

Descriptive Data on Sex and Return to Work

			RTW	No RTW	Total
Sex	Male	N	48	18	66
		% of Total	24.4%	9.1%	33.5%
	Female	N	76	55	131
		% of Total	38.6%	27.9%	66.5%
Total		N	124	73	197
		% of Total	62.9%	37.1%	100.0%

Chi-Square Tests Sex and Return to Work

	Value	Df	Asymptotic Significance (2-sided)	Exact Sig. (2- sided)	Exact Sig. (1- sided)
Pearson Chi-Square	4.073 ^a	1	.044		
Continuity Correction ^b	3.466	1	.063		
Likelihood Ratio	4.176	1	.041		
Fisher's Exact Test				.060	.030
Linear-by-Linear Association	4.052	1	.044		
N of Valid Cases	197				

Symmetric Measures on Sex vs Return to work

	Value	Approximate Significance
Nominal by Nominal	Phi	.144
		.044
	Cramer's V	.144
		.044
N of Valid Cases	197	

2. Age at Time of Surgery *versus* RTW

Breakdown of Age at time of Surgery and return to work

			RTW	No RTW	Total
Age at PJA	18-30	N	4	3	7
		% of Total	2.0%	1.5%	3.6%
	31-40	N	25	4	29
		% of Total	12.7%	2.0%	14.7%
	41-50	N	42	19	61
		% of Total	21.3%	9.6%	31.0%
	51-60	N	53	47	100
		% of Total	26.9%	23.9%	50.8%
Total		N	124	73	197
		% of Total	62.9%	37.1%	100.0%

Chi-Square Tests Age at time of Surgery

	Value	Df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	11.982 ^a	3	.007	
Likelihood Ratio	12.973	3	.005	
Fisher's Exact Test				0.005
Linear-by-Linear Association	7.654	1	.006	
N of Valid Cases	197			

Symmetric Measures on Age at time of Surgery vs RTW

		Value	Approximate Significance
Nominal by Nominal	Phi	.247	.007
	Cramer's V	.247	.007
N of Valid Cases		197	

3. Number of Co-morbidities *versus* RTW

Breakdown of Number of Co-morbidities and RTW

			RTW	No RTW	Total
Co-morbidities	0	N	51	21	72
		% of Total	25.9%	10.7%	36.5%
	1	N	50	38	88
		% of Total	25.4%	19.3%	44.7%
	2	N	18	13	31
		% of Total	9.1%	6.6%	15.7%
	3	N	4	0	4
		% of Total	2.0%	0.0%	2.0%
	4	N	1	1	2
		% of Total	0.5%	0.5%	1.0%
Total		N	124	73	197
		% of Total	62.9%	37.1%	100.0%

Chi-Square Tests Co-morbidities and RTW

	Value	Df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	6.152 ^a	4	.188	
Likelihood Ratio	7.531	4	.110	
Fisher's Exact Test				0.159
Linear-by-Linear Association	.802	1	.371	
N of Valid Cases	197			

Symmetric Measures on Co-morbidities.

		Value	Approximate Significance
Nominal by Nominal	Phi	.177	.188
	Cramer's V	.177	.188
N of Valid Cases		197	

4. Education *versus* Return to work

Breakdown of Education and Return to work

			RTW	No RTW	Total
Education	Primary	N	7	12	19
		% of Total	3.6%	6.1%	9.6%
	Secondary	N	81	53	134
		% of Total	41.1%	26.9%	68.0%
	Tertiary	N	36	8	44
		% of Total	18.3%	4.1%	22.3%
Total		N	124	73	197
		% of Total	62.9%	37.1%	100.0%

Chi-Square Tests Education and RTW

	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	12.628 ^a	2	.002
Likelihood Ratio	13.144	2	.001
Linear-by-Linear Association	12.544	1	.000
N of Valid Cases	197		

5. Married or Cohabiting *versus* Return to work

Breakdown of married or cohabitating and return to work

			RTW	No RTW	Total
Married or Cohabiting	Yes	N	61	32	93
		% of Total	31.0%	16.2%	47.2%
	No	N	63	41	104
		% of Total	32.0%	20.8%	52.8%
Total		N	124	73	197
		% of Total	62.9%	37.1%	100.0%

Chi-Square Tests Married or Cohabiting

	Value	Df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.529 ^a	1	.467		
Continuity Correction	.336	1	.562		
Likelihood Ratio	.530	1	.467		
Fisher's Exact Test				.555	.281
Linear-by-Linear Association	.527	1	.468		
N of Valid Cases	197				

6. Type of joint *versus* Return to work

Breakdown of Type of joint replacement and return to work

			RTW	No RTW	Total
Type of joint	TKR	N	24	16	40
		% of Total	12.2%	8.1%	20.3%
	THR	N	61	26	87
		% of Total	31.0%	13.2%	44.2%
	Bilateral TKR	N	11	15	26
		% of Total	5.6%	7.6%	13.2%
	Bilateral THR	N	27	12	39
		% of Total	13.7%	6.1%	19.8%
	Knee and Hip	N	1	3	4
		% of Total	0.5%	1.5%	2.0%
	3 joint replacement	N	0	1	1
		% of Total	0.0%	0.5%	0.5%
Total		N	124	73	197
		% of Total	62.9%	37.1%	100.0%

Chi-Square Tests Type of Joint replacement vs RTW

	Value	Df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	11.642 ^a	5	.040	
Likelihood Ratio	11.715	5	.039	
Fisher's Exact Test				0.030
Linear-by-Linear Association	.713	1	.398	
N of Valid Cases	197			

7. Occupational Categories *versus* Return to work

Breakdown of occupational category and return to work

				RTW	No RTW	Total
Occupational Categories	1	Managers	N	20	1	21
		Professionals	% of Total	10.2%	0.5%	10.7%
	2	Technicians and Associate Technical Occupations	N	42	12	54
			% of Total	21.4%	6.1%	27.6%
	3	Clerical Support workers	N	30	25	55
		Skilled Agricultural, Forestry, Fishery, Craft & Related workers	% of Total	15.3%	12.8%	28.1%
		Protective, Rescue Service workers, Social and Health Science and Support personal.				
		Plant machine Operators & Assemblers				
	4	Elementary Occupations	N	27	33	60
			% of Total	13.8%	16.8%	30.6%
	5	Security and Custodial Personnel	N	4	2	6
			% of Total	2.0%	1.0%	3.1%
Total			N	123	73	196
			% of Total	62.8%	37.2%	100.0%

Chi-Square Tests on Occupational Category

	Value	Df	Asymptotic Significance (2-sided)	
Pearson Chi-Square	24.412a	4	.000	
Likelihood Ratio	27.562	4	.000	
Fisher's Exact Test				<0.001
Linear-by-Linear Association	19.821	1	.000	
N of Valid Cases	196			

8. Physicality of work *versus* Return to work

Breakdown of Physicality of work and Return to work

			RTW	No RTW	Total
Physicality of work	Sedentary	N	37	7	44
		% of Total	18.8%	3.6%	22.3%
	Light	N	21	6	27
		% of Total	10.7%	3.0%	13.7%
	Medium	N	26	15	41
		% of Total	13.2%	7.6%	20.8%
	Heavy	N	31	33	64
		% of Total	15.7%	16.8%	32.5%
	Very Heavy	N	9	12	21
		% of Total	4.6%	6.1%	10.7%
Total		N	124	73	197
		% of Total	62.9%	37.1%	100.0%

Chi-Square Tests Physicality of work

		Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square		20.394 ^a	4	.000
Likelihood Ratio		21.390	4	.000
Linear-by-Linear Association		19.794	1	.000
N of Valid Cases		197		

9. Return to work *versus* post-operative sick leave

Breakdown of post-operative sick leave and RTW

Post-operative Sick leave. (n,%)	Total n = 195	RTW n = 122	No RTW n = 73
Yes	81(41.5%)	71(58.2%)	10(13.7%)
No	114(58.5%)	51(41.8%)	63(86.3%)

Correlations of Sick leave and return to work

		Return to work	Sick leave(weeks)
Return to work	Pearson Correlation	1	-.278**
	Sig. (2-tailed)		<.001
	N	197	195
Sick leave(weeks)	Pearson Correlation	-.278**	1
	Sig. (2-tailed)	<.001	
	N	195	195

** . Correlation is significant at the 0.01 level (2-tailed).

10. Return to work *versus* physiotherapy sessions

Breakdown of Physiotherapy sessions and Return to work

			Return to work		Total	% Total Physical therapy session
			RTW	No RTW		
Number of Physiotherapy sessions	1 - 2	N	46	14	60	30.4%
		% within Physiotherapy sessions	78.9%	21.1%	100%	
	3 - 4	N	34	17	51	28.8%
		% within Physiotherapy sessions	67.4%	32.6%	100%	
	5 - 6	N	16	6	22	11.2%
		% within Physiotherapy sessions	76.2%	23.8%	100%	
	7 - 8<	N	28	36	64	34.5%
		% within Physiotherapy sessions	43.8%	56.3%	100%	
Total		N	124	73	197	100%
		% within Physiotherapy sessions	63%	37%	100 %	

Correlations of Physiotherapy sessions and return to work

		Return to work	Physiotherapy sessions
Return to work	Pearson Correlation	1	.251**
	Sig. (2-tailed)		<.001
	N	197	197
Physiotherapy sessions	Pearson Correlation	.251**	1
	Sig. (2-tailed)	<.001	
	N	197	197

** . Correlation is significant at the 0.01 level (2-tailed).