

Effect of an Intervention Program on Functional Restoration Post Total Knee Arthroplasty

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ABSTRACT

Objective: The purpose of the study is to determine the influence of an intervention program on the functional restoration post total knee arthroplasty, so as to establish the relationship between the demographic variables “age, gender, level of education, marital status, occupation, residence, body mass index” and functional restoration.

Study Design: A quantitative design using the a-pre-experimental study

Place and Duration of Study: This study was conducted at the pre and posttest on one group in AL-Jamhour Teaching Hospital, Mosul City from 6th July 2025 to 17th January 2026.

Methods: The objectives of the study were measured by self-administered questionnaires on the 30 patients who received exposure to the intervention program which was non-probability (purposive) sample. The statistical test employed (SPSS) version 26, descriptive statistical (frequency, percentages, mean of score) and inferential statistical analysis (Wilcoxon Signed Rank Test) was employed in the analysis of the data.

Results: The study finding the a statistically significant ($P < 0.001$) but substantially improved patient information was noted between sample of the study members; at post-test and pre-test.

Conclusion: This study concluded that patients in the sample of the study had a significantly better information at the post-test after taking the intervention program.

Key Words: Intervention Program, Functional Restoration, Total Knee Arthroplasty.

Citation of article: Abdullah MK, Awad MS, Fathi AM, Younis NM. Effect of an Intervention Program on Functional Restoration Post Total Knee Arthroplasty. Med Forum 2026;37(7):17-21. doi:10.60110/medforum.370703.

INTRODUCTION

Total knee arthroplasty (TKA) has become one of the most effective procedures to control pain and dysfunction of the knee joint in the case of end-stage osteoarthritis¹⁻³. As the incidence of OA has increased so have the number of TKAs.⁴ And hence it has become one of the most common inpatient surgical procedures as far as Medicare is concerned⁵. Patients who have gone through a TKA are usually given physical rehabilitation with an aim of maximizing postoperative results, which include strength, physical performance, reduction of pain and resumption to normal activities of daily living.

Rehabilitation, however, is not one intervention but a multi-dimensional intervention that could begin at different times (following surgery) and practised at

different intensities, frequencies, by different people, in different settings and even adapted to social, financial and individual reaction to surgery and rehabilitation⁶. Currently, it is estimated that 3.48 per cent of an estimated population is affected by Knee OA and 25 per cent of people with Knee OA are affected to a level of lifetime disability⁷. OA of knee joint may result in painful joint, loss of joint function and low quality of life. In case the joint and pain caused by OA are severe then joint replacement surgery can be needed. The total knee arthroplasties (TKAs) will expand exponentially in the future as the cases of knee OA keep on rising.⁸ Knee OA can be treated in different ways among them, the non-pharmacological ones comprise exercise and lifestyle changes, pharmacological, analgesic, corticosteroid injection, and the last option is surgery⁹. Compared to UKA (8%). On the whole, TKA is effective in terms of pain alleviation and restoration of the functionality of the joints, and more than 90% of them have been reported to achieve this. satisfactory results with the patients. Regardless of this diverse arsenal of therapeutic tools, there is still a question of how best medical, injection-based, and surgical therapies should be sequenced and timed, especially in younger, active patients and unicompartmental disease or malalignment^{10,11}. The purpose of the study is to determine the influence of an intervention program on the functional restoration post total knee arthroplasty,

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Received: March, 2026

Reviewed: April-May, 2026

Accepted: June, 2026

so as to establish the relationship between the demographic variables “age, gender, level of education, marital status, occupation, residence, body mass index” and functional restoration.

METHODS

The present research is a quantitative study with a pre-test and post-test design since it will be conducted on a sample. The data are gathered two times; one to determine baseline data and the second after the intervention program is undertaken. The research took place 6 July 2025 to 17 January 2026. Besides this, the researcher designed and manufactured instrument tools to the intervention program design. To address the gaps in the information on patients, which rely on a review of the scientific literature and previous research, a non-probability (purposive) sample (30) of patients was selected randomly in the AL-Jamhory teaching hospitals in Mosul City that are directly exposed to an intervention program. A questionnaire that correlates with the assessment data of patients treated with proximal bone nailing of the intertrochanteric fractures (specifically on the activities of daily living). All the patients undergo an interview under the supervision of the researcher, (28 to 35 minutes) will be needed for each patient to answer. The questionnaire will be divided in two parts. The demographic data will be presented in the first part, and the second half will be linked to the patient information that is divided into four main axes “I know, I do not know” containing 50 items. The former axis deals with patient data related to TKA, which comprise (10) items. The second axis is functional restoration after surgery TKA which entails (30) items as follows “getting in and out of bed, toileting, showing, dressing, Get in and out of car, House activity”. There are (5) items on 3rd axis (patient information saving falls). There are five (5) items for Furth axis to inform the patients of wrong positions to avoid to prevent problems after TKA surgery. These items have the following ratings based on the Likers scale: I know (1); I do not know (0). The information of this investigation was interpreted by applying two statistical methods. Descriptive statistics involve frequency, percentage and Arithmetic Mean (x) whereas inferential statistics involve Wilcoxon Signed Rank Test to compare related samples. The results were considered non-significant, significant and high significant at $P > 0.05$, $P < 0.05$ and $P < 0.01$, respectively.

RESULTS

Table (1) The analysis showed the patient was more than half 60% of the patients being female and 33% of patients aged between 40 and 49 and. 87% of the participants are married and 50% hold Intermediate graduate. The researchers established that 67 percent of

the participants in the study group are urban dwellers. On the occupation aspect, most of the study participants were self-employed with an occupation rate of 40%. here, we are talking of the body mass index of the patients. We identified that there was a considerable percentage in the range of 25-29.9 which was 53%.

Table No.1: Sociodemographic variables distribution among the study sample (N = 30)

Variable	Items	F	%
Gender	Male	12	40
	Female	18	60
Age	20-29	3	10
	30-39	4	13
	40-49	10	33
	50-59	9	30
	≥ 60	4	13
Marital status	Married	26	87
	single	4	13
level of education	Primary Graduate	8	27
	Intermediate graduate	15	50
	High school graduate	7	23
Residency	Urban	20	67
	Countryside	10	33
Occupation	government employee	10	33
	freelance	12	40
	Housewife	8	27
BMI	18-24.9	11	37
	25-29.9	16	53
	30-34.9	3	10
Total		30	100

Table No.2: Significant Differences in Patients' Knowledge related Total Knee

Functional Restoration.	Pre-Post Test	Wilcoxon Signed Rank Test			
		Mean rank	Z	P-value	Sig.
“In and out of bed”	Pre	0.00	4.673	0.000	H.S
	Post	14.60			
Toilet Use	Pre	4.50	4.454	0.000	H.S
	Post	15.64			
Showering.	Pre	3.80	4.483	0.000	H.S
	Post	15.40			
Dressing.	Pre	5.60	4.275	0.000	H.S
	Post	16.06			
“Get in and out of car”	Pre	4.90	4.645	0.000	H.S
	Post	15.48			
House activity.	Pre	8.65	3.630	0.000	H.S
	Post	15.36			
Over all.	Pre	0.00	4.798	0.000	H.S
	Post	15.90			

Z= Wilcoxon Signed Rank Test; Sig= significant;

H.S= highly significant

Table No.3: Relationships among Patients' information and their Sociodemographic Variables in the Study Sample.

Variable	Class	Spearman's rho correlation					
		pre			Post		
		r ^s	P -value	Sig.	r ^s	P -value	Sig.
Gender	Male	0.462	0.008	H.S	0.429	0.018	S
	Female						
Age	20-29	0.055	0.769	N.S	-0.208	0.290	N.S
	30-39						
	40-49						
	50-59						
	≥60						
Marital status	Married	0.154	0.435	N.S	-0.210	0.253	N.S
	Single						
	Divorced						
	Widow						
level of education	Primary Graduate	0.354	0.057	N.S	0.318	0.086	N.S
	Intermediate graduate						
	High school graduate						
Residency	Urban	0.068	0.733	N.S	-0.091	0.637	N.S
	Countryside						
Occupation	government employee	-0.383	0.038	N.S	0.061	0.759	N.S
	freelance						
	Housewife						
BMI	18-24.9	-0.452	0.014	S	0.206	0.286	N.S
	25-29.9						
	30-34.9						
	over than 35						

Table (2) shows that there is a highly significant difference related to posttest for study sample in overall domains and subdomain when analyzed by Wilcoxon Signed Rank Test. Figure (1) shows that patients in the study sample show poor to fair level on knowledge during pre-intervention (62%, 42% and 6% related to good) There is a dramatic improvement at post-intervention, with 77.1% of respondents now rating the situation as good, The poor ratings have completely diminished, with Fair ratings dropping to 22.9%.

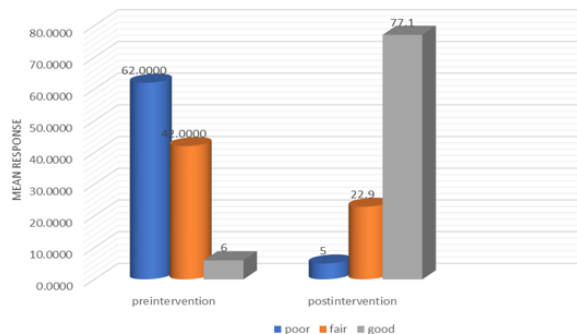
**Figure No.1: Level of patient's knowledge Functional Restoration for Total Knee Arthroplasty**

Table (3) indicates that there is no significant relationship has reported between the overall information scores of patients in the study sample and

the sociodemographic variables; age, Marital status, level of education, residency and occupation. Accept Gender it was high at the pretest and also significant at posttest. Correlated with BMI, it was significant during pretest and non-significant during the posttest.

DISCUSSION

In this study, we described the effect of an intervention program on functional restoration following total knee arthroplasty. Data analysis of the results of the present investigation revealed that 60 % of the study sample are female make, which is in agreement with the study conducted by ^{12,13}. He claims that 52.2% of his sample consisted of females. With regard to the agreement study, it is shown that female have more than male, with 10 (33%) in the study sample falling within the age range 40-49 years. A study by ¹⁴. Validates these findings and demonstrates the mean age was 53.92 ±6.75 years and over half of the groups examined were between 50 and 60 years old. More than two-thirds of the sample 26 (87%) were married, this result was corroborated by ¹⁵. "Tai chi chuan exercises improve functional outcomes and quality of life in patients with primary total knee arthroplasty due to knee osteoarthritis" which suggesting that the majority of both groups studied were married. Regarding educational level a large percentage of patients in my

study have low education status, 15 (50%) illiterate (intermediate Graduates) my study agrees with study ¹⁶. Nine (30%) of the patients in the study group and 11 (36.7%) of the patients in the control group had completed primary school, and there was no significant difference between the two groups. The patients in the study group and the patients in the control group did not differ significantly in terms of their educational attainment 9 (30%) vs. 11 (36.7%) had finished primary school). With regards to place of residence, the majority of patients in sample reside in urban areas (20 67%). This present study conforms with the earlier study in ¹⁷. Who found that all of the groups in both groups under study resided in urban areas. Higher percent of individuals in the study sample were independent contractors (40%). This is comparable with a study by ^{18,19} where the control group (n=13; 43.3%) and majority of the study group (n=10; 33.3%) were independent contractors, also 40.0% of patients in the study group and 33.3% of patients in the control group were independent contractors. Related to the results of our study, 53% of the participants are classified as overweight based on body mass index indications". Our results in Table (2) demonstrate that the scores across all domains of Activities of Daily Living (ADLs) were higher in the post-test compared to the pre-test after intervention, corroborated by research conducted by ²⁰⁻²². These results clearly show that daily living activities were significantly higher in the post-tests, demonstrating the program's impact. Figure (1) Illustrates that, there is a marked improvement in the study sample percentage of total knowledge from (62%, 42%, 6%) poor, fair, good, respectively. pre of intervention program implementation, into (poor 5%, fair 22,9%, good 77.1%) immediately post intervention. My finding agrees with others study conducted by ^{23,24} Patients who receive G-EXE on top of standard ambulation and ADLs exercises had superior knee ROM, quadriceps strength, and knee pain during discharge compared to those who carried out I-EXE besides normal ambulation and ADL exercises. G-EXE is advantageous to patients during their hospitalization in the acute recovery phase after TKA. Finally, the table (3) We find that the overall information scores of patients in the study sample did not have any significant relationship with socio-demographic factors: age, marital status, level of education, residency, and occupation, which was significant in the pretest and significant in the posttest. Compared to the BMI, it was not significant at the posttest but significant during the pretest. These findings are correlated with the research of ²⁵. Where it was determined that Association Between Osteoporotic Patients Balance Level and their Socio-demographic "gender, age, level of education, marital status, and occupation" data for study group that all socio-demographic no significant except level of education was significant. Agree with another study done by ^{26,27} talk about BMI and related to demographical characteristic.

CONCLUSION

The patients undergoing total knee arthroplasty because had a significant improvement in knowledge, satisfaction and outcomes after the implementation of the intervention program, relative to the knowledge, satisfaction, and outcomes before the intervention ($P \leq 0.001$). Moreover, both functional restoration and total knowledge scores in the study sample indicated a positive relationship right after the intervention and the participants three weeks following the intervention.

Recommendations: The study recommends conducting larger-scale studies that fully encompass hospitals at the national and provincial levels.

Author's Contribution:

Concept & Design or acquisition of analysis or interpretation of data:	Mohanned Khaleel Abdullah, Mohammad Salih Awad
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Final Approval of version:	All the above authors
Agreement to accountable for all aspects of work:	All the above authors

Conflict of Interest: The study has no conflict of interest to declare by any author.

Source of Funding: None

Ethical Approval: No. 231/156 in 19.05.2025

REFERENCES

1. Neuprez A, Neuprez AH, Kaux JF, Kurth W, Daniel C, Thirion T, et al. Total joint replacement improves pain, functional quality of life, and health utilities in patients with late-stage knee and hip osteoarthritis for up to 5 years. *Clinical rheumatol* 2020;39(3):861-71.
2. Dailiana ZH, Papakostidou I, Varitimidis S, Liaropoulos L, Zintzaras E, Karachalios T, et al. Patient-reported quality of life after primary major joint arthroplasty: a prospective comparison of hip and knee arthroplasty. *BMC musculoskeletal disorders* 2015;16(1):366.
3. Podmore B, Hutchings A, van der Meulen J, Aggarwal A, Konan S. Impact of comorbid conditions on outcomes of hip and knee replacement surgery: a systematic review and meta-analysis. *BMJ open* 2018;8(7):e021784.
4. Majeed HM, Hassan AF, Jasim AH, Al-Ganmi AH. Protective health behaviors among critical care nurses concerning pressure ulcer prevention for hospitalized patients at Baghdad teaching hospitals. *Al-Rafidain J Med Sci (ISSN 2789-3219)* 2023;5:205-10.
5. Cavanaugh AM, Rauh MJ, Thompson CA, Alcaraz JE, Bird CE, Gilmer TP, et al. Rehabilitation after

- total knee arthroplasty: do racial disparities exist? *The J arthroplasty* 2020;35(3):683-9.
6. Ahmed JA, Ajil ZW. Predictive Determinants of Pediatric Nursing Practices for Children Undergoing Lumbar Puncture in Oncology-Hematology Units: A Descriptive Correlational Study. *Med Forum* 2026;37(4):20-24. doi:10.60110/medforum.370404.
 7. de Grae MN, Nasehi A, Dalury DF, Masri BA, Sheridan GA. Improved performance of cementless total knee arthroplasty (TKA) across international registries: a comparative review. *Irish J Med Science* (1971-). 2025;194(2):675-81.
 8. Liu CY, Li CD, Wang L, Ren S, Yu FB, Li JG, et al. Function scores of different surgeries in the treatment of knee osteoarthritis: a PRISMA-compliant systematic review and network-meta analysis. *Medicine* 2018;97(21):e10828.
 9. Alzarooni A, Ali RM, Aftab A, Vaja F, Abdulvahab M, Rajmohankumar V, et al. A Comprehensive Review of Operative Considerations, Surgical Techniques, Outcomes, and Future Perspectives in Total Knee Arthroplasty. *Cureus* 2025;17(10).
 10. Javed S, Khan FF, Ahmed M, Haider A, Raza MS, Zaib A, et al. Medical and Surgical Management of Osteoarthritis of Knees. *J Health, Wellness and Comm Res* 2025 Nov 24:e977-.
 11. Peng H, Ou A, Huang X, Wang C, Wang L, Yu T, et al. Osteotomy around the knee: the surgical treatment of osteoarthritis. *Orthopaedic Surg* 2021; 13(5):1465-73.
 12. Tanaka R, Hayashizaki T, Taniguchi R, Kobayashi J, Umehara T. Effect of an intensive functional rehabilitation program on the recovery of activities of daily living after total knee arthroplasty: A multicenter, randomized, controlled trial. *J Orthopaedic Sci* 2020;25(2):285-90.
 13. Fathi AM, Ali Hattab WA. Effectiveness of an Instructional Program on Activity of Daily Living for Patients undergo Proximal Femoral Nailing. *Bahrain Medical Bulletin* 2025;47(2).
 14. Lincoln LK, Wajid WA. Outcome of Intra-Articular Triamcinolone Acetonide Injection in Osteoarthritis of Knee. *Med Forum* 2026;37(4):60-64. doi:10.60110/medforum.370412.
 15. Li L, Cheng S, Wang G, Duan G, Zhang Y. Tai chi chuan exercises improve functional outcomes and quality of life in patients with primary total knee arthroplasty due to knee osteoarthritis. *Complementary Therapies in Clinical Pract* 2019; 35:121-5.
 16. Buhagiar MA, Naylor JM, Harris IA, Xuan W, Adie S, Lewin A. Assessment of outcomes of inpatient or clinic-based vs home-based rehabilitation after total knee arthroplasty: a systematic review and meta-analysis. *JAMA network open* 2019;2(4):e192810.
 17. Abu El-Kass S, Mostafa Ragheb M, Abdel-Kader Ali H, Mohamed Hamed S. Effect of an educational program on satisfaction and outcomes among patients with femoral neck fracture. *Journal of Nursing Science Benha Univ* 2022;3(1):996-1012.
 18. Ayed AY, Younis NM, Ahmed MM. Teachers' knowledge about communicable disease control at primary schools in Mosul City: A cross-sectional study. *Int J Acad Med* 2024;10(2):75-9.
 19. Naser AA, Khuder KM, Khshain WH. Effectiveness of Instruction Program in Improving Balance Level among Seniors with Osteoporosis. *Central Asian J Med Natural Sci* 2023;4(6): 1366-73.
 20. Bakaa N, Chen LH, Carlesso L, Richardson J, Macedo L. Reporting of post-operative rehabilitation interventions for Total knee arthroplasty: a scoping review. *BMC musculo-skeletal disorders* 2021;22(1):602.
 21. Ali JM, Younis NM. Utilizing an intervention based on the health beliefs model to enhance nurses' perceptions of drug dosage errors. *Int J Pediatr Adolescent Med* 2025;12(4):184-8.
 22. Younis NM, Taher AK. Efficacy of Trans theoretical model intervention for improving behaviors related to electronic hookah smoking among healthcare workers in Mosul Hospital: a randomized control trail. *Int J Membrane Sci Tech* 2023;10(2):1433-9.
 23. Tanaka R, Hayashizaki T, Taniguchi R, Kobayashi J, Umehara T. Effect of an intensive functional rehabilitation program on the recovery of activities of daily living after total knee arthroplasty: A multicenter, randomized, controlled trial. *J Orthopaedic Sci* 2020;25(2):285-90.
 24. Fleischman AN, Crizer MP, Tarabichi M, Smith S, Rothman RH, Lonner JH, et al. Insall Award: recovery of knee flexion with unsupervised home exercise is not inferior to outpatient physical therapy after TKA: a randomized trial. *Clin Orthopaedics Related Research®* 2019;477(1): 60-9.
 25. Mohammed AJ, Younis NM. Efficacy of an Training Program Based Intervention in Changing Knowledge Nurses Concerning Medication Dosage Errors in Pediatric ward in Mosul City, Iraq. *Bahrain Medical Bulletin* 2025;47(2).
 26. Karthikeyan VU, Karpagalakshmi R, Ramesh A, Asokan TV, Preethi K. Perceived Stress, Anxiety and Depression among medical undergraduate students in a private medical college—A cross-sectional observational study. *Pravara Med Review* 2025;17(1).
 27. Fathi AM, Hattab WA. Effect of an Intervention Program on Activities of Daily Living Post Intertrochanteric Fracture Surgery. *Salud, Ciencia y Tecnología-Serie de Conferencias* 2025(4):1549.