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FUNCTIONAL OUTCOME OF PATIENTS PRESENTING TO GHURKI TRUST TEACHING HOSPITAL WITH PELVIC FRACTURES

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Abstract

Background: *Pelvic fractures, although relatively uncommon, are associated with high morbidity due to their complex anatomy and frequent association with polytrauma. Functional disability is a major concern in survivors, particularly in resource-limited settings. The Majeed Pelvic Score (MPS) is a validated tool to assess functional recovery.*

Objective: *To evaluate the functional outcomes of patients with pelvic fractures managed at Ghurki Trust Teaching Hospital, Lahore, using the Majeed Pelvic Score.*

Methodology: *This Prospective study was conducted in the Department of Orthopaedics & Spine Centre, Ghurki Trust Teaching Hospital. A total of 83 patients aged 14–70 years with radiologically confirmed pelvic fractures were enrolled using consecutive non-probability sampling. Patients with neurovascular disorders, neglected fractures, or those lost to follow-up were excluded. Management strategies included both conservative and surgical interventions. Functional outcomes were assessed at 3 months post-injury using the Majeed Pelvic Score. Data were analyzed using SPSS version 23, with Wilcoxon Rank and Mann–Whitney U tests applied; $p \leq 0.05$ was considered significant.*

Results: *The mean age was 37.45 ± 15.26 years, with 84.3% males. Road traffic accidents were the leading cause of injury (53.0%). Most fractures were closed (89.2%), and 19.3% had associated injuries. The mean preoperative Majeed score was 26.10 ± 5.54, improving significantly to 90.06 ± 9.22 at follow-up ($p < 0.001$). Construct-wise analysis revealed that most patients reported minimal or no pain (53.0%), normal gait (71.1%), independent ambulation (72.3%), pain-free sitting (75.9%), and unrestricted sexual function (91.6%). Work reintegration was partial, with 28.9% returning to full performance. Younger patients (14–35 years) had significantly better outcomes compared to older patients ($p < 0.001$), while gender, injury type, associated injuries, and mechanism of injury showed no significant differences.*

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Conclusion: *Pelvic fractures demonstrate favorable short-term functional outcomes with appropriate management. Younger age predicts better recovery, emphasizing the importance of timely multidisciplinary care and structured rehabilitation in optimizing patient outcomes.*

INTRODUCTION

The trauma that presents to orthopedic clinics and emergency rooms (ERs) ranges from simple sprains to life-threatening pelvic injuries. Fortunately, the life-threatening injuries that involve the pelvic ring and acetabulum are rare, with a documented prevalence of 3% among all fractures.[1] The reason behind this low prevalence is that the pelvic ring is highly stable because the body's strongest ligaments support its three-dimensional anatomy. Hence, only very high-energy trauma presents in the form of significant pelvic injuries. However, low-energy injuries can result in pelvic injuries in extreme age groups, i.e., children and the elderly.[2,3]

Despite the fact that pelvic injuries are relatively uncommon, they are of utmost significance in traumatology. The reason is that this has a debilitating and life-threatening nature. The estimated mortality rate of the aforementioned injuries is around 19-31%. This has primarily been associated with rapid exsanguination that occurs with injury to vascular structures around the pelvic ring. This leads to early and severe hemodynamic instability.[3] Mortality rate has been found to be higher in pelvic fracture cases that present to the ER with hemodynamic instability. Secondly, pelvic injuries are more often than not associated with other body injuries, including head, thoracic, abdominal, and extremity injuries. These alone or in combination with pelvic injuries can result in severe debilitation or fatality. Hence, brisk multidisciplinary management of pelvic injuries is important.[4]

However, in the developing world, the availability of limited resources impedes the timely provision of multidisciplinary care to these patients. Hence, not only is the mortality rate higher, but the functional debilitation is also very common in these low to middle-income countries following pelvic trauma.[5,6] An attempt has been made to quantify the functional debilitation in these patients by use of the Majeed pelvic score (MPS). The score has been developed specifically for pelvic injuries. It assesses the functional outcome in terms of seven items, including pain, sitting, standing, unaided gait, walking distance, sexual intercourse, and work.[6]

L Brouwers et al studied the prognosis and quality of life following pelvic fractures in 2020. They deducted a mean MPS of 70 with a standard deviation of 19 at a 3-month follow-up of patients aged 65 years or less.[7]

Since literature is scarce on the functional outcome of pelvic injury cases, especially in resource-limited settings like our country, the rationale of this study is to provide data regarding the functional outcome of pelvic trauma patients. This will help pave the way for further research on the subject and subsequent development of best practice guidelines for the management of these debilitating injuries.

Materials and Methods

This prospective cohort study was conducted at the Orthopedic Unit of Ghurki Trust Teaching Hospital, Lahore from February 03, 2025 to June 03, 2025. Approval for the study was obtained from the Institutional Review Board of the hospital, and informed written consent was taken from each participant. The calculated sample size was 67 patients, determined at a 95% confidence level and 90% power of test, using a known Majeed Pelvic Score (MPS) of 70 and an anticipated score of 62.5 with the WHO calculator. [7] A non-probability consecutive sampling technique was used. Patients were eligible for inclusion if they had radiologically proven pelvic fractures, were between 10 and 65 years of age, and of either gender. Patients with a pre-diagnosed history of neurovascular disorders, old neglected pelvic fractures, or those lost to follow-up were excluded. Patients presenting with pelvic trauma were managed initially in the emergency room according to the ATLS protocol, ensuring

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cardiopulmonary stability. A pelvic binder was applied at the earliest, followed by radiological assessment with anteroposterior, inlet, and outlet views, and, where required, a 3D CT scan of the pelvis. Treatment decisions, whether conservative (pelvic binder or traction) or surgical (open reduction and internal fixation), were made by the dedicated Pelvis Team. Demographic and clinical data, including age, gender, mode of injury, type of injury, associated injuries, and management details, were recorded on a predesigned proforma by the researcher. Patients were subsequently followed up in the outpatient department at 3 weeks, 6 weeks, and 3 months after discharge. Functional outcome was assessed at 3 months using the Majeed Pelvic Score, which evaluates pain, sitting, standing, unaided gait, walking distance, sexual intercourse, and work capacity, with a maximum score of 100. Data were analyzed using SPSS version 23. Mean and standard deviation were calculated for quantitative variables such as age. In contrast, frequencies and percentages were calculated for categorical variables such as gender, mode of injury, associated injuries, and management type. The Majeed score was stratified for age, gender, type of injury, associated injuries, and management method. Normality of data was checked through the Kolmogorov-Smirnov test. After that, Post-stratification comparisons were performed using the Mann-Whitney U test and Wilcoxon's Rank Test, with a p-value ≤0.05 considered statistically significant. Results were presented in tabular form.

Results

A total of 83 patients with pelvic fractures were included in the study, with a mean age of 37.45 ± 15.26 years (range: 14–70 years). The majority were male (84.3%), while females constituted 15.7% of the cohort. Road traffic accidents were the predominant mode of injury, accounting for 53.0% of cases, followed by falls (44.6%) and heavy object impacts (2.4%). Most injuries were closed fractures (89.2%), with open fractures observed in only 10.8% of patients. Associated injuries were present in 19.3% of patients, while the remaining 80.7% had isolated pelvic fractures. Functional recovery was notable, as the mean preoperative Majeed Pelvic Score was 26.10 ± 5.54, which improved substantially to 90.06 ± 9.22 postoperatively, reflecting significant functional gains after management.

Table 1. Demographic and Baseline Characteristics of Patients (n = 83)

Variable	Category	Frequency (%)	Mean ± SD (Range)
Age (years)			37.45 ± 15.26 (14–70)
Gender	Male	70 (84.3)	
	Female	13 (15.7)	
Mode of Injury	Road Traffic Accident	44 (53.0)	
	Fall	37 (44.6)	
	Heavy Object Impact	2 (2.4)	
Type of Injury	Open	9 (10.8)	
	Closed	74 (89.2)	
Associated Injuries	Yes	16 (19.3)	
	No	67 (80.7)	
Pre-op Majeed Score			26.10 ± 5.54 (20–46)
Post-op Majeed Score			90.06 ± 9.22 (52–100)

Inferential statistics demonstrated a highly significant improvement in functional outcome following treatment, with postoperative Majeed scores being markedly higher than preoperative values ($p < 0.001$). Subgroup analysis revealed that gender did not significantly influence recovery

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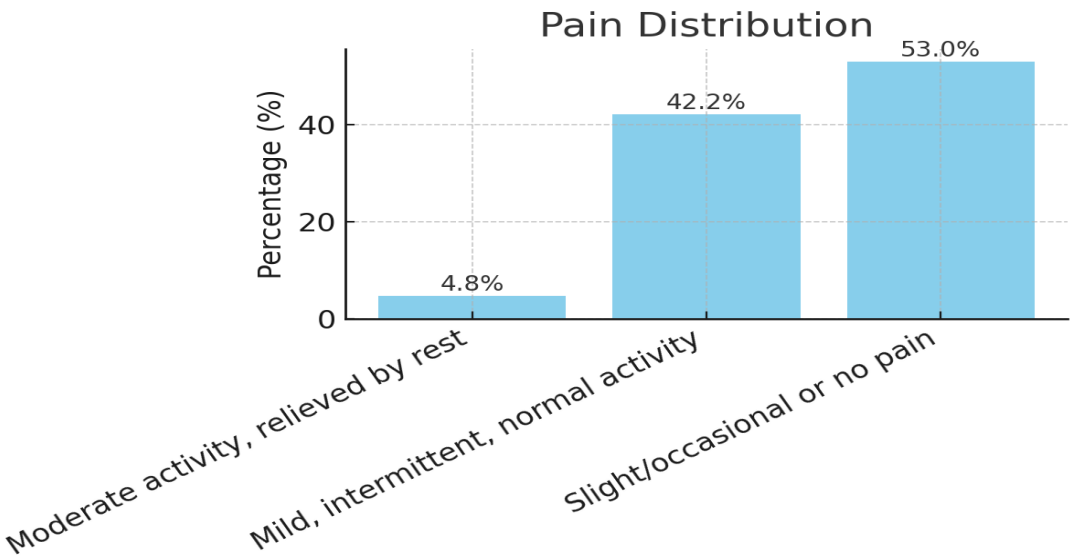
outcomes (male vs. female, p = 0.632). However, age was found to be an important determinant; patients aged 14–35 years had significantly better outcomes compared to those older than 35 years (67.9 ± 6.7 vs. 60.3 ± 10.7, p < 0.001). The type of injury (open vs. closed) did not show a statistically significant difference in outcomes (p = 0.213), nor did the presence of associated injuries (p = 0.616). Similarly, the mode of injury (road traffic accident, fall, or heavy object impact) was not associated with significant differences in functional recovery (p = 0.748). Overall, these findings suggest that age was the most influential factor in determining functional recovery. At the same time, gender, injury type, associated injuries, and mechanism of injury did not significantly affect postoperative outcomes. (Table 2)

Table 2. Inferential Statistics for Functional Outcome (Majeed Score Improvement)

Variable	Category / Comparison	Mean Difference ± SD	p-value
Pre- vs Post-op	26.10 ± 5.54 vs 90.06 ± 9.22	—	<0.001*
Gender	Male vs Female	63.7 ± 10.1 vs 65.2 ± 7.2	0.632
Age Group	14–35 vs >35	67.9 ± 6.7 vs 60.3 ± 10.7	<0.001*
Type of Injury	Open vs Closed	67.8 ± 8.6 vs 63.5 ± 9.8	0.213
Associated Injuries	Yes vs No	65.1 ± 12.6 vs 63.7 ± 8.9	0.616
Mode of Injury	RTA / Fall / Heavy Object	64.6 ± 7.7 / 63.1 ± 11.9 / 66.0 ± 1.4	0.748

Functional Outcome Constructs – Figures (1a-h) Pain (Figure 1a)



Work (Figure 1b)

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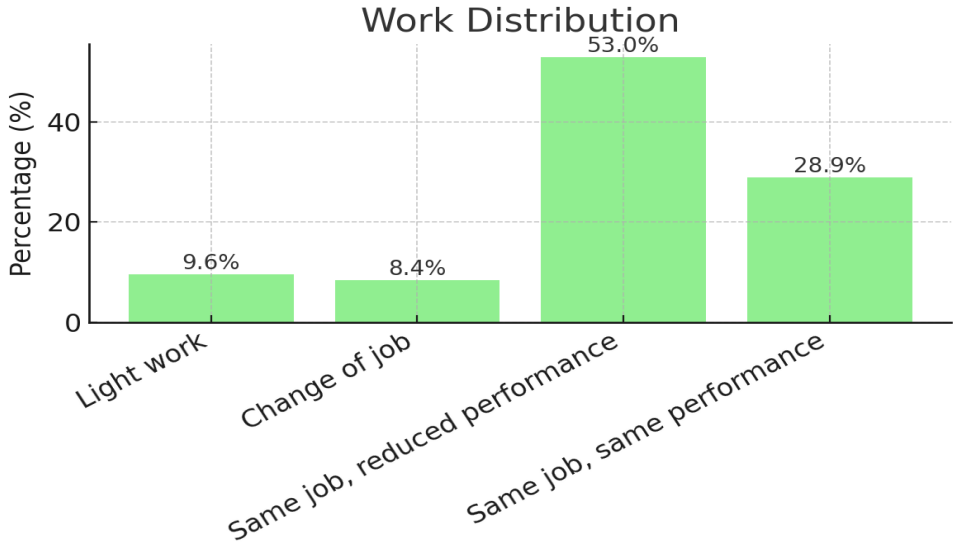
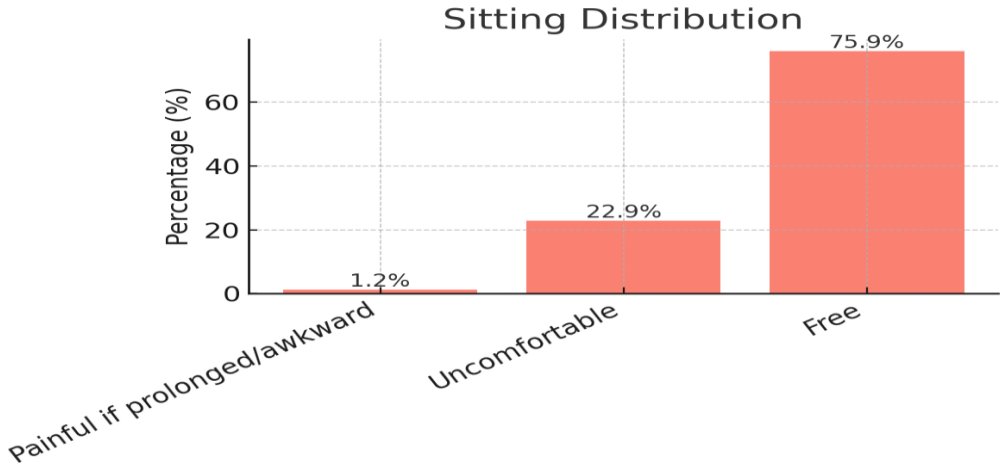


Sitting (Figure 1c)



Sexual Intercourse (Figure 1d)

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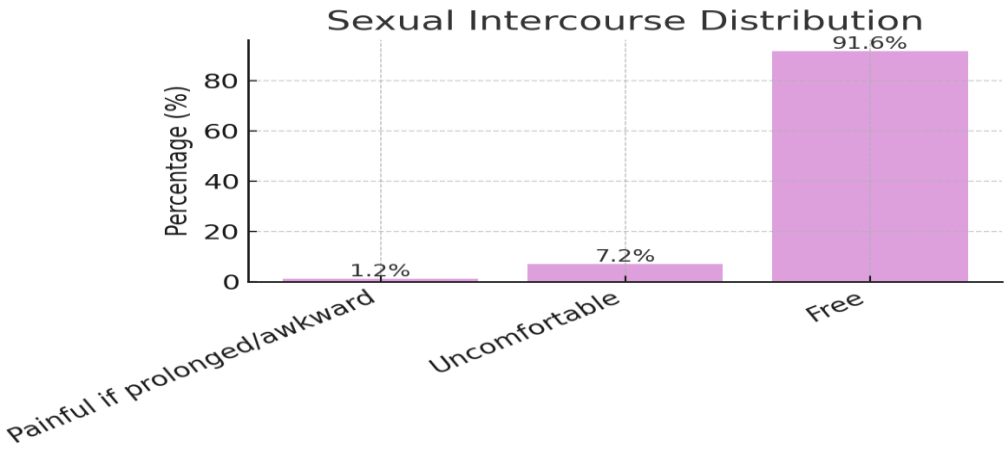
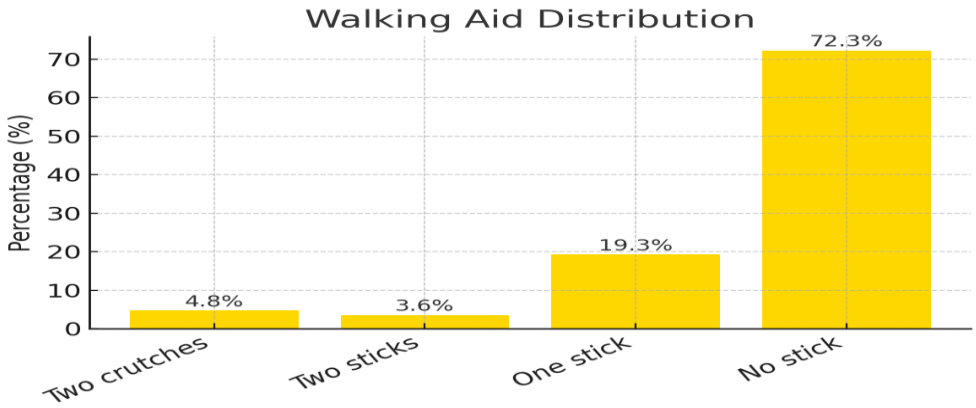
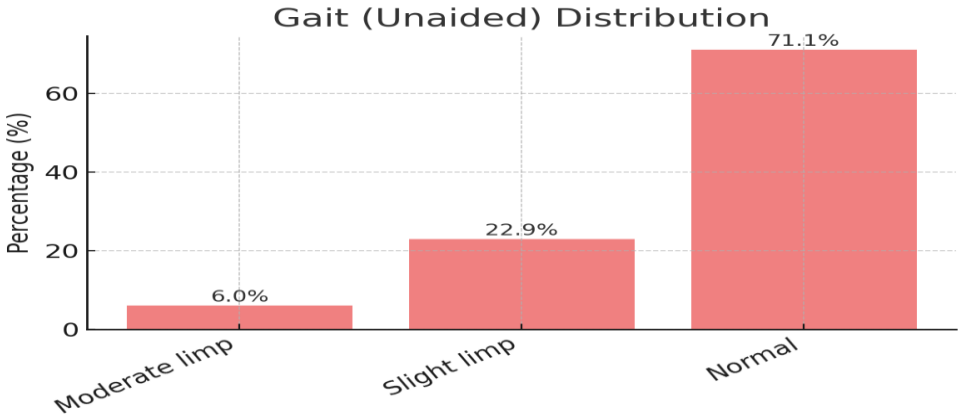


Walking Aid (Figure 1e)



Gait (Unaided) (Figure 1f)



Walking Distance (Figure 1g)

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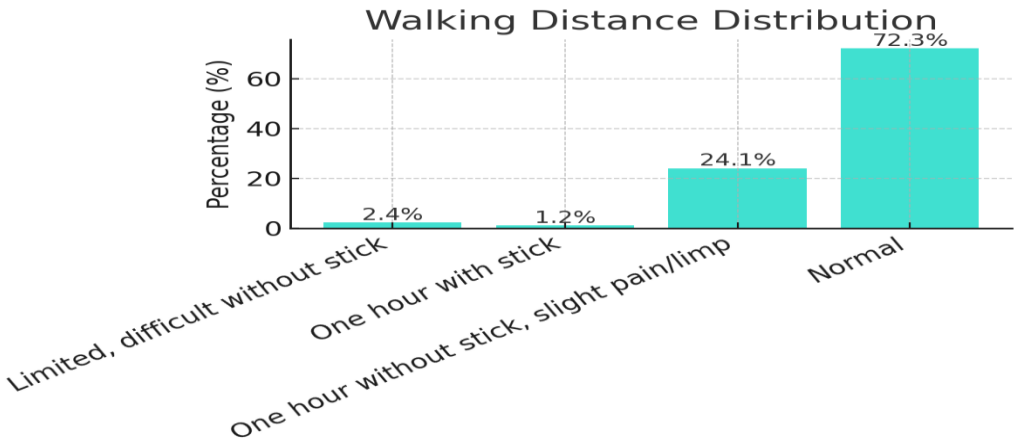

According to the Above Figures, Functional outcome assessment using the Majeed Pelvic Score at 3-month follow-up demonstrated encouraging recovery across multiple domains. With respect to pain, the majority of patients (53.0%) reported only slight or occasional discomfort or no pain at all, while 42.2% experienced mild intermittent pain not limiting daily activities, and only 4.8% continued to suffer from moderate pain relieved by rest. Occupational reintegration was also favorable, as more than half of the patients (53.0%) were able to resume their previous jobs with reduced performance, and 28.9% maintained their work at the same level. In contrast, a minority either shifted to light work (9.6%) or required a change of job (8.4%). Sitting tolerance was largely restored, with 75.9% reporting completely pain-free sitting, 22.9% experiencing discomfort, and only 1.2% reporting prolonged or awkward sitting as painful. Sexual function was similarly preserved in most cases, with 91.6% of patients reporting pain-free intercourse, while 7.2% described it as uncomfortable, and 1.2% reported pain during prolonged or awkward activity. Mobility outcomes were also favorable; 72.3% of patients walked unaided without any support, 19.3% required a single stick, and only 8.4% depended on two sticks or crutches. Restoration of gait was evident as 71.1% achieved a normal gait, 22.9% demonstrated a slight limp, and only 6.0% continued to walk with a moderate limp. Walking distance capacity further reflected functional recovery, with 72.3% able to walk normal distances without limitation and 24.1% managing up to one hour of walking with only mild discomfort. In comparison, just 3.6% experienced significant restrictions.

Discussion

The present study demonstrates that patients with pelvic fractures managed to achieve significant short-term functional improvement, as evidenced by a marked increase in Majeed Pelvic Score (MPS) at three months post-injury. These findings are consistent with, but in some respects more favorable than, outcomes reported in other settings, particularly in resource-limited environments.

Several studies have evaluated functional outcomes after pelvic fractures using the MPS and other validated tools. In a prospective study from Cameroon, the mean MPS at long-term follow-up (mean 36 months) was 67.8, with better outcomes in younger patients and those managed surgically. Poorer outcomes were associated with advanced age, comorbidities, and conservative management. [8] Similarly, a Japanese cohort reported a mean MPS of 79.7 at an average of 47 months, with neurologic injury and poor radiological reduction as key predictors of worse outcomes.[9] In contrast, the current study's mean MPS of 90.1 at three months suggests excellent early recovery, particularly among younger patients and those receiving timely multidisciplinary care.

A large multicenter Dutch study (BIOS) found that most pelvic fracture patients did not regain pre-injury quality of life within one year, with high injury severity and female gender predicting poorer outcomes.[10] Consistent with the literature, younger age was a strong predictor of better functional

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recovery in the present study. The lack of significant association between gender, injury type, or mechanism and outcome is also supported by some studies. However, others have found these factors to be relevant in specific subgroups. The importance of surgical management and achieving good anatomical reduction is highlighted in multiple studies as a determinant of superior functional results [8-11]

Return to full work capacity remains a challenge after a pelvic fracture. In the current study, only 28.9% of patients returned to full work performance at three months, which is comparable to or slightly lower than rates reported in other studies at longer follow-up intervals.[9,10] This underlines the need for structured rehabilitation and vocational support.

Furthermore, Petryla et al. (2021) studied short-term functional results after B2.1 pelvic fractures treated both surgically and non-surgically in young patients and reported MPS values close to 80 at 3 months. Their findings parallel our results, suggesting that early functional recovery is achievable with appropriate fracture management, particularly in younger populations.[12]

Work reintegration rates in our study, where only 28.9% returned to full work performance at three months, are comparable yet somewhat lower than those reported in other studies with longer follow-up intervals. Ansari et al. (2023) described partial return to previous work levels in approximately 30-40% of patients post pelvic fixation at six months, advocating for enhanced rehabilitation protocols to improve occupational outcomes.[13]

The functional domains assessed by the MPS in our study also align with Mishra et al. (2022), who reported significant improvement in pain control, sitting tolerance, and ambulation ability post management, regardless of conservative or surgical approaches. This supports the notion that appropriate supportive care and early mobilization play critical roles in recovery.[14]

Another study indicated the MPS came as 85.93 (12.89) with 37 patients graded as "excellent." [15] Twenty-seven patients had Majeed scores of excellent, twenty-nine had good, twelve had fair, and seven had bad. [16]

Taken together, these comparative data highlight that our findings of a significant increase in MPS from 26.10 preoperatively to over 90 post-treatment represent a positive functional trajectory, especially remarkable given the 3-month assessment period in a resource-limited setting. They underscore the importance of early surgical management, age consideration, and structured rehabilitation as integral factors for improved outcomes.

While the present study demonstrates excellent short-term outcomes, longer-term follow-up is necessary to determine if these results are sustained, as several studies report stagnation or decline in function beyond the first year, particularly in older adults or those with severe injuries Additionally, psychological factors and comorbidities, which were not extensively assessed in this study, have been shown to influence recovery and should be considered in future research and clinical practice.

Conclusion

This study demonstrates that the majority of patients with pelvic fractures managed at Ghurki Trust Teaching Hospital achieved satisfactory functional recovery within three months, as reflected by significant improvement in Majeed Pelvic Scores. Pain control, restoration of gait, independent ambulation, and return to sexual and social activities were attained in most patients. However, work performance remained compromised in a considerable proportion, highlighting the residual burden of pelvic trauma. Younger age was the only factor significantly associated with superior recovery, while gender, type of injury, associated injuries, and mechanism of trauma had no significant impact. These findings emphasize the importance of early multidisciplinary care and structured rehabilitation in optimizing outcomes for pelvic fracture patients in resource-limited settings.

References

Nana CT, Ngo-Yamben MA, Fokam P, Mahamat A, Bombah FM, Boukar ME, Kenedy M, Chichom-Mefire A. Functional outcome of unstable pelvic fractures treated in a level III hospital in a developing country: a 10-year prospective observational study. J Orthop Surg Res. 2022 Apr 4;17(1):198. doi: 10.1186/s13018-022-03088-3. PMID: 35379270; PMCID: PMC8981602.

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

Ansari M, Kawedia A, Chaudhari HH, Teke YR. Functional Outcome of Internal Fixation (INFIX) in Anterior Pelvic Ring Fractures. Cureus. 2023 Mar 14;15(3):e36134. doi: 10.7759/cureus . 36134. PMID: 37065289; PMCID: PMC10101190.

Shiela Marie B. Delizo, Isagani E. Garin. A Correlation of Functional Outcome Measures of Pelvis Fracture Following Operative Management, A Retrospective Case Series, 25 August 2023, PREPRINT (Version 1) available at Research Square [https://doi.org/10.21203/rs.3.rs-3219093/v1]

Petryla G, Uvarovas V, Bobina R, Kurtinaitis J, Sveikata T, Ryliškis S, Puronaitė R, Kvederas G, Šatkauskas I. Short-Term Functional Outcomes and Quality of Life after B2.1 Type Pelvic Fractures for Surgically and Non-Surgically Treated Young Patients. Medicina (Kaunas). 2021 May 21;57(6):513. doi: 10.3390/medicina57060513. PMID: 34063870; PMCID: PMC8224058.

Mishra S,Satapathy D, Zion N, Lodh U. Early Outcome Analysis of Management of Closed Pelvic Ring Fractures in Emergency: Conservative Versus Surgical at Level III Trauma Center in India. Cureus. 2022 Jun 22;14(6):e26195. doi: 10.7759/cureus 26195. PMID: 35891872; PMCID: PMC9306436.

Soni A, Gupta R, Vashisht S, Kapoor A, Sen R. Combined Anterior Pelvic (CAP) approach for fracture acetabulum fixation - Functional outcome evaluation and predictors of outcome. J Clin Orthop Trauma. 2020 Nov-Dec;11(6):1136-1142. doi: 10.1016/j.jcot.2020.10.012. Epub 2020 Oct 14. PMID: 33192020; PMCID: PMC7656484.

Brouwers L, de Jongh MAC, de Munter L, Edwards M, Lansink KWW. Prognostic factors and quality of life after pelvic fractures. The Brabant Injury Outcome Surveillance (BIOS) study. PLoS One. 2020 Jun 11;15(6):e0233690. doi: 10.1371/journal.pone.0233690. PMID: 32525901; PMCID: PMC7289384.

Nana CT, Ngo-Yamben MA, Fokam P, Mahamat A, Bombah FM, Boukar ME, Kenedy M, Chichom-Mefire A. Functional outcome of unstable pelvic fractures treated in a level III hospital in a developing country: a 10-year prospective observational study. Journal of Orthopaedic Surgery and Research. 2022 Apr 4;17(1):198.

Suzuki T, Shindo M, Soma K, Minehara H, Nakamura K, Uchino M, Itoman M. Long-term functional outcome after unstable pelvic ring fracture. Journal of Trauma and Acute Care Surgery. 2007 Oct 1;63(4):884-8.

Brouwers L, de Jongh MA, De Munter L, Edwards M, Lansink KW. Prognostic factors and quality of life after pelvic fractures. The Brabant Injury Outcome Surveillance (BIOS) study. PLoS One. 2020 Jun 11;15(6):e0233690.

Lai CY, Lai PJ, Tseng IC, Su CY, Hsu YH, Chou YC, Yu YH. Postoperative reduction quality may be the most important factor that causes worse functional outcomes in open and closed pelvic fractures. World journal of surgery. 2022 Mar;46(3):568-76.

Petryla G, Uvarovas V, Bobina R, Kurtinaitis J, Sveikata T, Ryliškis S, Puronaitė R, Kvederas G, Šatkauskas I. Short-term functional outcomes and quality of life after B2. 1 type pelvic fractures for surgically and non-surgically treated young patients. Medicina. 2021 May 21;57(6):513.

Ansari M, Kawedia A, Chaudhari HH, Teke YR, Chaudhari Sr HH, Teke Sr YR. Functional outcome of internal fixation (INFIX) in anterior pelvic ring fractures. Cureus. 2023 Mar 14;15(3).

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

Mishra S, Satapathy D, Zion N, Lodh U, MISHRA S, SATAPATHY D, Lodh Sr U. Early outcome analysis of management of closed pelvic ring fractures in emergency: conservative versus surgical at level III trauma center in India. Cureus. 2022 Jun 22;14(6).

Aggarwal S, Mehta L, Patel S, Kumar V, Kumar P. Long-term Patient-reported Functional Outcome after Pelvic Ring Injuries: Analysis using Two Different Types of Outcome Scores. Journal of Orthopaedic Case Reports. 2025 Jun;15(6):269.\

Ghosh S, Aggarwal S, Kumar P, Kumar V. Functional outcomes in pelvic fractures and the factors affecting them–A short-term, prospective observational study at a tertiary care hospital. Journal of Clinical Orthopaedics and Trauma. 2019 Sep 1;10(5):896-9.