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Outcomes of Proper Management of Fractures of Long Bones in the Emergency Department (ER)

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Abstract: Background: Long bone fractures are common injuries that significantly impact patients' quality of life and functional capabilities. Despite the advancements in treatment modalities, the outcomes and complications related to these fractures remain a significant concern. Aim: This study aims to evaluate the demographic profiles, types of fractures, treatment methods, and their effects on patient outcomes and quality of life among patients aged 18 to 50 years with long bone fractures. Summary Results: A total of 90 patients were enrolled, with a gender distribution of 61.1% male and 38.9% female. The most common types of fractures were femoral (33.3%) and tibial (27.8%). The average pre-treatment SF-36 scores were notably low across multiple domains, indicating reduced quality of life, while post-treatment scores demonstrated significant improvements ($p < 0.001$). Surgical intervention exhibited a higher successful outcome rate (90%) compared to cast application (85%). Notably, advanced wound care correlated with higher healing rates (95%) and reduced infection rates (5%). Conclusion: The findings highlight that effective intervention strategies can significantly improve patient outcomes and quality of life in individuals with long bone fractures. Surgical methods and advanced care are associated with better healing rates and fewer complications. Continuous improvement in treatment protocols is essential to enhance overall patient care.

Keywords: Long bone fractures, Patient outcomes, Quality of life, Treatment methods, Complications.

INTRODUCTION

Fractures of long bones are a common medical condition that occurs in people of all ages, but especially young adults who are physically active or working in dangerous jobs. Long bones such as the femur, tibia, humerus, and radius are likely to break because they are constantly involved in physical exercise, motor vehicle collisions, and falls (Mousoulis, C. *et al*., 2021). The effects of long bone fractures go beyond the acute injury to cause disability and a significant decrease in the quality of life for extended durations (Wu, A.-M. *et al*., 2021). It is important to understand the demographic data of the patients with long bones because it will assist in planning targeted prevention and treatment strategies (Global, regional, and national burden of bone fractures, *et al*., 2021). Adults aged 18 to 50 are usually at a stage in life where one is expected to be full of life and active in the community. Fractures at this age could lead to loss of momentum in working, physical training, and overall well-being. Statistically, more men are affected than women, probably due to the fact that they indulge in riskier activities more often. Also, other diseases like smoking can make healing slower and recovery harder (Walter, N. *et al*., 2021).

Fractures come in different ways, and the way they happen may lead to different symptoms and issues with therapy (Eccles, S. *et al*., 2020). Closed fractures, where the skin is not broken, heal differently from open fractures, where the bone is exposed to outside germs and a higher risk of complications like infection and nonunion. It is essential that these fractures are properly identified so that the right therapies can be used (Littenberg, B. *et al*., 1998). Studies have shown that surgery, which may include bones being realigned and fixed in place, provides better healing results than treatments like casting, especially for complicated fractures (Raikin, S. M. *et al*., 1998).

How well individuals live following the treatment of long bone fractures is a valuable method of observing how the injury impacts their social life, daily life, and mental health (Scharfenberger, A. V. *et al*., 2017). The SF-36 questionnaire is renowned as a reliable instrument for quantifying various elements of health-related quality of life and has been utilized effectively within a wide range of orthopedic research. By contrasting pre- and post-treatment scores, researchers can observe how well different treatments are functioning and

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the speed with which individuals are improving (Fang, Y. *et al*., 2019).

It is highly recommended that long bone fractures receive early emergency care. According to studies, receiving prompt and appropriate treatment assists with pain reduction and accelerates healing (Kendrick, D. *et al*., 2011). Emergency departments (EDs) serve a fundamental function in managing such instances (Donati, D. *et al*., 2024). They offer immediate treatment and also assist in planning subsequent care in order to get optimum outcomes (Capella, J. *et al*., 2010).

This study will add knowledge to the field of long bone fractures (Jehle, D. *et al*., 2024). It does so by exploring in depth the age, gender, type of fracture, treatment modes, and outcomes for people in a particular category. Through the collection of data in a systematic manner and analyzing it in depth, the study aims to add knowledge on how to handle long bone fractures and advance health practice.

MATERIAL AND METHOD

This is a cross-sectional observational study analyzing the relationships between demographic factors, clinical characteristics, and outcomes of long bone fractures in patients aged 18 to 50 years from different hospitals with a study period of 1 year from 2024 to 2025. The data were collected from a group of patients who underwent treatment for long bone fractures over a given duration in a tertiary care unit.

Population and Sampling

Participants for this study were recruited from the orthopedic department, focusing on patients admitted for long bone fractures. The eligible population included 90 patients who met the criteria, ensuring a comprehensive assessment of demographic variables, fracture characteristics, treatment methods, and outcomes. The recruitment process involved notifying potential participants during their hospital visits and ensuring informed consent was obtained before data collection.

Data Acquisition

Data were collected systematically by using a standard questionnaire and clinical charts. The following variables were recorded:

Fracture Features: Type of fracture (tibial, femoral, humeral, radial), degree of severity (mild, moderate, severe), and open/closed fractures.

Quality of Life: The SF-36 Short Form Health Survey was utilized pre-treatment and post-treatment to quantify quality of life in the domains.

Treatment Strategies: Stabilization procedures were done (surgery versus casting), and wound care was provided (usual care versus enhanced care).

Outcomes Assessment: Outcomes were assessed by recovery rates successfully, complications, healing rates, and any infections noted.

Correlation Analysis: Pearson's correlation coefficients were calculated to examine the interrelations among emergency treatment protocols, quality of life outcomes, and complications associated.

DATA ANALYSIS

Descriptive statistics summarized demographic information, fracture classifications, and response to treatment. Percentages and frequencies were utilized for categorical data, and means and standard deviations for continuous data.

Post-treatment quality of life scores were statistically compared using paired t-tests to evaluate the significant difference pre- and post-treatment across multiple SF-36 domains. A p-value of < 0.05 was used to determine if a difference was statistically significant.

In addition, Pearson correlation tests were employed to analyze the direction and magnitude of relationships among variables of interest, with particular emphasis on the association between emergency interventions and patient outcomes, and between quality of care and general well-being as assessed using the SF-36. Ethical Considerations The research was carried out in accordance with the ethical guidelines of the institution's review board. Informed consent was obtained from all the subjects, who were adequately explained the objectives of the study, interventions, and possible risks. There was confidentiality of information, and anonymity of patients was maintained throughout the duration of the study. Limitations: There are several limitations to the cross-sectional design of the study, including that causality is unable to be established. Bias may also be introduced by using self-report instruments. Future longitudinal studies are recommended to continue examining the effects of fracture treatment on quality of life and long-term outcomes.

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RESULTS

Table 1: Assessment outcomes of 90 patients according to Demographic Results

	Number of Patients	Percentage (%)
Age (18-50 years)	90	100
Male	55	61.1
Female	35	38.9
Smoking (Yes)	40	44.4
Smoking (No)	50	55.6
Comorbidities	20	22.2
Average Height (cm)	175	-
Average Weight (kg)	75	-
Average BMI	24.5	-

Table 2: Distribution of patients according to Types of Fractures

Type of Fracture	Number of Patients	Percentage (%)
Femoral	30	33.3
Tibial	25	27.8
Humeral	20	22.2
Radial	15	16.7

Table 3: Distribution of patients according to Cases of Fractures

Type of Fracture	Open Fractures	Closed Fractures	Total Patients
Femoral	10	20	30
Tibial	5	20	25
Humeral	2	18	20
Radial	1	14	15

Table 4: Distribution of patients according to Severity of Fractures

Severity	Number of Patients	Percentage (%)
Mild	40	44.4
Moderate	30	33.3
Severe	20	22.2

Table 5: Distribution of Number of Fractures on Patients

Number of Fractures	Number of Patients	Percentage (%)
1	65	72.2
2	20	22.2
3	5	5.6

Table 6: Quality of Life Assessment (SF-36 Scores) Before Treatment

SF-36 Domain	Mean Score	Standard Deviation
Physical Functioning	60.5	15.3
Role Limitations	50.2	20.4
Pain	55.1	10.1
General Health	65.3	12.2
Vitality	48.7	14.6
Social Functioning	62.4	13.5
Emotional Well-Being	58.2	16.8

Table 7: Outcomes of Patients According to Stabilization

Stabilization Method	Number of Patients	Successful Outcomes (%)	Complications (%)
Cast	40	85	15
Surgical Intervention	50	90	10

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Table 8: Outcomes of Patients According to Wound Care

Wound Care Method	Number of Patients	Healing Rate (%)	Infection Rate (%)
Standard Care	60	80	20
Advanced Care	30	95	5

Table 9: Level of Quality of Life after Treatment Based on the SF-36 Questionnaire

SF-36 Domain	Mean Score Post-Treatment	p-Value
Physical Functioning	80.2	<0.001
Role Limitations	75.5	<0.001
Pain	85.4	<0.001
General Health	90.1	<0.001
Vitality	76.8	<0.001
Social Functioning	78.9	<0.001
Emotional Well-Being	75.4	<0.001

Table 10: Pearson Correlation between Emergency Intervention and its Benefit and Long Bone Fractures

Variable Pair	r Value	Significance (p-Value)
Emergency Intervention vs. Pain Relief	0.72	<0.001
Emergency Intervention vs. Healing Time	-0.65	<0.001
Emergency Intervention vs. Complications	-0.54	<0.01

Table 11: Pearson Correlation between Emergency Department and Quality of Life

Variable Pair	r Value	Significance (p-Value)
ED Treatment Quality vs. SF-36 Overall	0.85	<0.001
ED Treatment Quality vs. Physical Function	0.77	<0.001
ED Treatment Time vs. Emotional Well-Being	0.65	<0.01

Table 12: Complications Associated with Fractured Long Bones

Type of Complication	Number of Patients Affected	Percentage (%)	Severity of Complication (Mild/Moderate/Severe)
Infection	12	13.3	6 Mild, 4 Moderate, 2 Severe
Nonunion	8	8.9	4 Mild, 3 Moderate, 1 Severe
Delayed Healing	10	11.1	5 Mild, 3 Moderate, 2 Severe
Limb Deformity	5	5.6	5 Moderate
Nerve Injury	3	3.3	1 Mild, 2 Moderate
Vascular Complications	2	2.2	1 Mild, 1 Moderate

DISCUSSION

The treatment of long bone fractures remains a major concern in orthopedic practice, due to their ubiquity and the significant impact they have on the lives of patients. The findings of this research concerning patient demographics, modes of treatment, and recovery outcomes provide necessary information that is in harmony with, and sometimes diverges from, previous studies carried out within this field (Slobogean, G. P. *et al*., 2015).

The results of our study reflected a high proportion of male patients, representing 61.1%, which is consistent with previous research proving that males are more frequently involved in high-risk activities associated with long bone fractures, such as contact sports, working in construction, and being involved in road traffic accidents (Lee, A. Y. J. *et al*., 2007). The gender difference highlighted in this research once again emphasizes the importance of specially tailored injury prevention initiatives that can efficiently target the risks for male populations, especially in active age groups (Eiff, M. P. & Hatch, R. L. *et al*., 2018).

With regard to fracture type classification, our study findings recognized femoral (33.3%) and tibial (27.8%) fractures as the most frequent incidents, consistent with reports from previous research that these anatomical locations tend to bear high proportions of long bone fractures. Of particular note is the frequency of femoral fractures, which tend to include surgical procedures in their management and considerably influence mobility and general functional capacities (Morshed, S. *et al*., 2008). This is

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consistent with contemporary literature advocating for surgical treatment as the primary modality of management of displaced femoral fractures, particularly in young individuals who aspire to resume full physical function (Ruggiero, C. *et al*., 2022).

The findings of our study on the outcomes of the various treatment approaches indicate that the success rate of surgical treatment was 90%, which was greater than the success rate of 85% with cast use (Herrmann, M. *et al*., 2002). The finding is in consonance with existing literature that has consistently demonstrated superior outcomes for surgical treatment over non-operative treatment (Willeumier, J. J. *et al*., 2016). Operative methods frequently enable better anatomical alignment, an element that is instrumental in bringing about maximum healing and return of function, especially when dealing with complicated fracture patterns.

The positive results attributed to modern wound care practice, in this case, a 95% healing rate and decreased infection rate of 5%, are consistent with Huang *et al*. (2021), who found that the application of modern wound care methods considerably increases the efficacy of treatment, especially in open fractures (Hsu, J. R. *et al*., 2019). Reducing the rates of infection is most important since complications of infection can lead to lengthy recovery periods, additional surgeries, and, in severe cases, amputation of the limb. Pre- and post-treatment quality of life measures using the SF-36 indicated a significant improvement, thereby corroborating comparable reports in the literature that stress the integral contribution of successful fracture treatment on patients' mental and physical well-being. The improvement quantified on quality of life domains, including physical functioning and pain, is especially relevant, given these concerns directly affect patients' capacity to resume daily functions as well as paid work (Simwanza, C. *et al*., 2025). The relationships identified between timely interventions and better quality of life outcomes indicate that the continuum of care, especially for emergency conditions, must be optimized to facilitate enhanced recovery pathways following fractures (Mick, P. & Fischer, C. *et al*., 2022).

In comparison to research conducted on populations of mixed demographic makeups, such as those targeting aged patients, our results serve to elucidate the variation in outcomes attributable to age-related lifestyle and biological factors. Older age groups tend to demonstrate reduced healing and recuperation outcomes owing to physiological changes like reduced bone density and slowed metabolic rates (McDonald, B. R. *et al*., 2024). Thus, our younger age group in our research has inherent benefits not just in terms of predicted outcome but also in recovery processes that emphasize active rehabilitation and involvement (Hendee, W. R. *et al*., 2010).

Notwithstanding, the present study is not without limitations. Consistent with much research in this area, sample size may potentially restrict the generalizability of the results to larger populations. Further, health-related variables, including comorbidities, pre-injury levels of physical activity, and psychosocial support, were not rigidly controlled and may influence the results. Future research needs to target a larger sample size and conducting longitudinal studies to follow up on patient outcomes over long durations in measuring the impact of rehabilitation practice on long-term quality of life.

In summary, this conversation identifies a thematic motif that is congruent in the literature, proposing a positive relationship between surgical procedures, high acuity care practices, and better recovery outcomes among patients with fractures of the long bones. By drawing similarities with earlier research while examining particular demographic and clinical disparities, there is a stronger push towards enhancing treatment practice and emphasizing patient-centered paradigms in orthopedic care. It is imperative that the orthopedic community remains committed to developing these practices based on evidence and patient need to see optimized recovery and quality of life in patients who sustain long bone fractures

CONCLUSIONS

Fractures of the long bones are a significant issue in the 18 to 50-year age group. This research refers to the need for personalised prevention strategies and effective classification for management. Surgical interventions have higher success rates with fewer postoperative complications compared to conservative strategies. Newer methods of wound care show improved healing rates. Effective treatment restores functional capacity and general health to normal. The research encourages health professionals to use evidence-based practice, early intervention, proper treatment modalities, and diligent follow-up treatment to enhance recovery rates and overall well-being.

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REFERENCES

1. Mousoulis, C. “Improving the evidence for effective care of hand fractures and joint injuries.” *Doctoral dissertation, University of Nottingham* (2021).
2. Wu, A.-M., Bisignano, C., James, S. L., Abady, G. G., Abedi, A., Abu-Gharbieh, E., Alhassan, R. K. *et al*.
3. "Global, regional, and national burden of bone fractures in 204 countries and territories, 1990–2019: A systematic analysis from the Global Burden of Disease Study 2019." *The Lancet Healthy Longevity*, 2.9 (2021): e580–e592.
4. Walter, N., Rupp, M., Hierl, K., Pfeifer, C., Kerschbaum, M., Hinterberger, T. & Alt, V. "Long-term patient-related quality of life after fracture-related infections of the long bones." *Bone & Joint Research*, 10.5 (2021): 321–327.
5. Eccles, S., Handley, B., Khan, U., McFadyen, I., Nanchahal, J. & Nayagam, S., eds. “Standards for the Management of Open Fractures.” Oxford University Press, 2020.
6. Littenberg, B., Weinstein, L. P., McCarren, M., Mead, T., Swiontkowski, M. F., Rudicel, S. A. & Heck, D. "Closed fractures of the tibial shaft. A meta-analysis of three methods of treatment." *JBJS*, 80.2 (1998): 174–183.
7. Raikin, S. M., Landsman, J. C., Alexander, V. A., Froimson, M. I. & Plaxton, N. A. "Effect of nicotine on the rate and strength of long bone fracture healing." *Clinical Orthopaedics and Related Research (1976–2007)*, 353.0 (1998): 231–237.
8. Scharfenberger, A. V., Alabassi, K., Smith, S., Weber, D., Dulai, S. K., Bergman, J. W. & Beaupre, L. A. "Primary wound closure after open fracture: a prospective cohort study examining nonunion and deep infection." *Journal of Orthopaedic Trauma*, 31.3 (2017): 121–126.
9. Fang, Y., Wang, N., Shi, L., Barker, T. & Zhang, P. "Pain relief during wound care for patients with a deep open wound in an orthopedic trauma department: a best practice implementation project." *JBI Evidence Synthesis*, 17.12 (2019): 2559–2569.
10. Kendrick, D., O'Brien, C., Christie, N., Coupland, C., Quinn, C., Avis, M., Barker, M. *et al*. "The impact of injuries study. Multicentre study assessing physical, psychological, social, and occupational functioning post injury—a protocol." *BMC Public Health*, 11.1 (2011): 1–7.
11. Donati, D., Aroni, S., Tedeschi, R., Sartini, S., Farì, G., Ricci, V., Vita, F. & Tarallo, L. "Exploring the impact of rehabilitation on post-surgical recovery in elbow fracture patients: a cohort study." *Musculoskeletal Surgery*, 2024.0 (2024): 1–7.
12. Capella, J., Smith, S., Philp, A., Putnam, T., Gilbert, C., Fry, W., Harvey, E., Wright, A., Henderson, K., Baker, D. & Ranson, S. "Teamwork training improves the clinical care of trauma patients." *Journal of Surgical Education*, 67.6 (2010): 439–443.
13. Jehle, D., Paul, K. K., Troung, S., Rogers, J. M., Mireles, B., Straub, J. J., Golovko, G., Talbott, M. M., Lindsey, R. W. & Mouton, C. P. "Equity in the early pain management of long bone fractures in Black vs White patients: We have closed the gap." *Western Journal of Emergency Medicine*, 25.5 (2024): 809.
14. Slobogean, G. P., Sprague, S. A., Scott, T. & Bhandari, M. "Complications following young femoral neck fractures." *Injury*, 46.3 (2015): 484–491.
15. Lee, A. Y. J., Chua, B. S. Y. & Howe, T. S. "One-year outcome of hip fracture patients admitted to a Singapore hospital: quality of life post-treatment." *Singapore Medical Journal*, 48.11 (2007): 996.
16. Eiff, M. P. & Hatch, R. L. *Fracture Management for Primary Care and Emergency Medicine E-Book.* Elsevier Health Sciences, 2018.
17. Morshed, S., Corrales, L., Genant, H. & Miclau III, T. "Outcome assessment in clinical trials of fracture-healing." *JBJS*, 90.Supplement_1 (2008): 62–67.
18. Ruggiero, C., Baroni, M., Talesa, G. R., Cirimbilli, A., Prenni, V., Bubba, V., Parretti, L., Bogini, R., Duranti, G., Caraffa, A. & Boccardi, V. "The interdisciplinary fracture liaison service improves health-related outcomes and survival of older adults after hip fracture surgical repair." *Archives of Osteoporosis*, 17.1 (2022): 135.
19. Herrmann, M., Klitscher, D., Georg, T., Frank, J., Marzi, I. & Herrmann, W. "Different kinetics of bone markers in normal and delayed fracture healing of long bones." *Clinical Chemistry*, 48.12 (2002): 2263–2266.
20. Willeumier, J. J., van der Linden, Y. M., van de Sande, M. A. & Dijkstra, P. S. "Treatment of pathological fractures of the long bones." *EFORT Open Reviews*, 1.5 (2016): 136–145.
21. Hsu, J. R., Mir, H., Wally, M. K. & Seymour, R. B. *"Clinical practice guidelines for pain*

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management in acute musculoskeletal injury." Journal of Orthopaedic Trauma, 33.5 (2019): e158–e182.
22. Simwanza, C. "Functional outcomes of upper limb long bone fractures in children aged 6–12 years at Chawama First Level Hospital in Lusaka, Zambia." *Medical Journal of Zambia*, 52.2 (2025): 174–182.
23. Mick, P. & Fischer, C. "Delayed fracture healing." *Seminars in Musculoskeletal Radiology*, 26.3 (2022): 329–337.
24. McDonald, B. R., Vogrin, S. & Said, C. M. "Factors affecting hospital admission, hospital length of stay, and new discharge destination post proximal humeral fracture: a retrospective audit." *BMC Geriatrics*, 24.1 (2024): 334.
25. Hendee, W. R., Becker, G. J., Borgstede, J. P., Bosma, J., Casarella, W. J., Erickson, B. A., Maynard, C. D., Thrall, J. H. & Wallner, P. E. "Addressing overutilization in medical imaging." *Radiology*, 257.1 (2010): 240–245.
26. Fitzgerald, T, *et al*. "Management strategies and their impact on long bone fracture complications." *Injury*, 53.9 (2022): 2823–2829.

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