

# Patient Preferences for Surgical Versus Non-Surgical Management of Fractures at Mayo Hospital, Lahore

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## ABSTRACT

**Background:** Fracture management decisions are influenced not only by radiographic and clinical findings but also by patient perceptions regarding cost, pain, recovery, and operative risk. Local evidence on fracture-treatment preference in Pakistan remains limited despite the clinical importance of shared decision-making in orthopedic practice. **Objective:** To assess patient preferences for surgical versus non-surgical fracture management and to identify factors associated with these preferences among patients presenting to Mayo Hospital, Lahore. **Methods:** This cross-sectional observational study included 85 adult patients with radiologically confirmed fractures. Data were collected using a structured interviewer-administered questionnaire capturing demographic characteristics, fracture profile, treatment preference, and factors influencing decision-making. Descriptive statistics were used to summarize responses, and associations with preference for surgery were examined using comparative analysis with odds ratios and p-values. **Results:** Of 85 participants, 49 (57.6%) preferred non-surgical treatment and 36 (42.4%) preferred surgery. Major factors influencing decisions included physician advice in 63 (74.1%), high cost of surgery in 52 (61.2%), fear of postoperative pain in 47 (55.3%), family influence in 41 (48.2%), and fear of surgical complications in 39 (45.9%). Among those refusing surgery, financial cost was the leading reason in 20 of 49 patients (40.8%), followed by fear of postoperative pain in 15 (30.6%). Preference for surgery was significantly associated with severe fracture ( $p=0.002$ ), severe pain ( $p=0.001$ ), and failure of conservative treatment ( $p=0.004$ ). **Conclusion:** Non-surgical treatment was preferred more frequently than surgery, largely due to cost and fear-related barriers. However, patients were significantly more likely to prefer surgery when fracture severity, pain intensity, and prior treatment failure increased. **Keywords:** fracture; surgery; non-surgical treatment; patient preference; decision-making; Pakistan.

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## INTRODUCTION

Fractures impose a substantial clinical and socioeconomic burden because they are frequently associated with acute pain, impaired mobility, temporary or permanent loss of function, productivity loss, and considerable treatment expenditure. Management decisions in fracture care often extend beyond radiographic classification and surgical indication alone, as patients and families also weigh financial implications, anticipated pain, perceived risks, recovery time, and confidence in the treating team when choosing between operative and non-operative treatment. In contemporary musculoskeletal care, patient-centered decision-making has therefore become increasingly important, particularly in settings where out-of-pocket expenditure and sociocultural influences may materially shape acceptance of surgery (1,2).

The literature suggests that treatment preference in musculoskeletal and trauma care is influenced by a complex interaction of clinical severity, expected functional recovery, physician recommendation, fear of complications, and individual values regarding disability and return to activity. A mixed-methods

systematic review on decision-making for musculoskeletal surgery showed that patients' choices are rarely determined by biomedical factors alone and are instead strongly modified by beliefs, expectations, prior experiences, and social context (3). Among fracture populations, discrete choice and qualitative studies have demonstrated that patients prioritize pain relief, restoration of independence, speed of recovery, and avoidance of complications, but the relative weight assigned to these outcomes varies across age groups, injury patterns, and healthcare systems (4–8). In pelvic, lower-extremity, scaphoid, and distal radius fractures, preferences regarding operative versus non-operative care have been shown to shift when fracture stability, functional expectations, and treatment burden are explicitly discussed, underscoring the need for context-specific evidence to guide shared decision-making (9–12).

Although international evidence on fracture-related treatment preferences is expanding, data from Pakistan remain scarce. Available Pakistani studies on surgical decision-making have largely focused on other specialties or broader operative choices rather than fracture-specific preferences. A local study on spine surgery reported that pain intensity, disability severity, counseling quality, social-emotional context, and socioeconomic status significantly shaped surgical decisions, highlighting the broader relevance of patient perspective in operative care within Pakistan (13). Similarly, evidence from orthodontic patients in Karachi showed that increased cost, postoperative pain, and fear of complications were major reasons for refusing surgery, suggesting that economic and psychological barriers may also influence orthopedic decision-making in the local context (14). However, these findings cannot be directly generalized to fracture care, where urgency, deformity, instability, and the threat of long-term functional impairment may alter patient priorities.

Fracture management presents a particularly important setting for preference research because conservative treatment remains appropriate for many simple or stable injuries, whereas displaced, comminuted, unstable, or function-threatening fractures may benefit from operative fixation. Existing outcome studies comparing operative and non-operative treatment of fractures, including ankle fractures, indicate that treatment selection has meaningful implications for healing, alignment, rehabilitation burden, and patient satisfaction (2,15). Moreover, epidemiological evidence from hand trauma indicates that conservative treatment remains common in selected fracture types, reinforcing that the decision for surgery is not universal and must be individualized (16). What remains insufficiently understood in the Pakistani setting is how patients with fractures weigh surgery against non-surgical care and which factors most strongly influence that preference at the point of clinical decision-making.

This knowledge gap is clinically relevant for several reasons. First, failure to understand patient preference may reduce adherence to treatment plans, delay definitive management, or contribute to dissatisfaction and poor follow-up. Second, in low- and middle-income contexts, cost sensitivity and family participation in treatment decisions may have a stronger role than that described in high-income settings. Third, quantifying preference patterns and associated factors may help orthopedic teams refine counseling, identify barriers to acceptance of indicated surgery, and develop communication strategies better aligned with patient concerns. Accordingly, the present study was designed to assess preferences for surgical versus non-surgical management among Pakistani patients presenting with fractures at Mayo Hospital and to identify the demographic, clinical, and decision-related factors associated with these preferences. It was hypothesized that non-surgical treatment would be preferred more frequently overall, whereas severe fracture pattern, greater pain burden, failed conservative treatment, and physician recommendation would be associated with increased preference for surgery.

## **MATERIALS AND METHODS**

This hospital-based cross-sectional observational study was conducted at Mayo Hospital to evaluate patient preferences regarding surgical versus non-surgical management of fractures and to identify factors associated with acceptance or refusal of operative treatment. A cross-sectional design was selected

because the primary objective was to measure treatment preference and related decisional influences at a defined point in the clinical pathway, before longitudinal outcomes were considered. The study targeted adult patients presenting with radiologically confirmed fractures who were sufficiently stable to participate in an interview-based assessment and to provide informed responses regarding treatment choice.

A total sample of 85 participants was included. Patients were recruited consecutively from the orthopedic service to reduce arbitrary selection and to improve the representativeness of routinely presenting fracture cases. Eligible participants were male and female patients aged 18 years or older with upper-limb, lower-limb, or spinal fractures diagnosed on clinical and radiographic evaluation. Both newly presenting patients and those undergoing treatment planning after initial assessment were considered eligible if a decision regarding operative versus non-operative management remained clinically relevant. Patients were excluded if they had pathological fractures, polytrauma requiring emergency life-saving intervention, altered mental status precluding reliable communication, or inability to provide informed consent. Patients with severe cognitive impairment, major psychiatric instability, or communication barriers that prevented completion of the survey were also excluded.

After eligibility screening, patients were approached in the clinical setting and invited to participate. The study purpose was explained in clear language, written informed consent was obtained, and confidentiality was assured before data collection. Recruitment was limited to consenting patients, and no proxy responses were used. To minimize coercion, participation was voluntary and did not influence the treatment plan decided by the clinical team. Interviews were conducted after routine clinical assessment so that participants had already received preliminary information regarding the nature of the fracture and broad management options.

Data were collected using a structured investigator-administered questionnaire developed from the study objectives and the relevant literature on surgical decision-making and musculoskeletal treatment preferences (13,14). The instrument captured demographic variables, including gender, age group, education level, and residence, as well as fracture-related variables, including fracture site, fracture severity, and previous fracture history. Fracture site was categorized as upper limb, lower limb, or spine. Fracture severity was operationally classified into simple, displaced, and comminuted fractures based on treating surgeon assessment and radiographic findings recorded in the clinical file. The primary outcome variable was treatment preference, categorized as preference for surgical treatment or preference for non-surgical treatment, including casting or traction. Secondary decisional variables included fear of postoperative pain, high cost of surgery, fear of surgical complications, advice from the doctor, family influence, and previous negative surgical experience. For participants who did not prefer surgery, the principal reason for refusal was additionally recorded as financial cost, fear of postoperative pain, fear of complications, preference for traditional treatment, or family influence.

To improve content relevance, the questionnaire was structured around variables repeatedly identified in prior literature as important determinants of treatment choice, including symptom burden, treatment risk perception, prior experience, physician counseling, and socioeconomic considerations (3–5,13,14). Data were obtained through direct interview and supported, where necessary, by chart review for confirmation of fracture characteristics. The interview format was selected to reduce missing data and to permit clarification of response categories in participants with varying educational backgrounds. Responses were recorded on a standardized data collection form and entered into the study database using predefined coding categories to maintain consistency.

Several measures were adopted to reduce bias. Consecutive recruitment was used to limit selection bias within the accessible hospital population. Standardized interviewing procedures and uniform wording of response options were used to reduce interviewer variability. Fracture characteristics were verified from the clinical record to minimize misclassification. Because physician advice could itself influence treatment preference, this variable was measured explicitly rather than assumed, allowing it to be

examined analytically as a potential explanatory factor. Demographic and clinical variables that might confound the relationship between decisional factors and treatment preference, particularly fracture severity and pain burden, were retained for inferential comparison. Data forms were checked on the day of collection for completeness and internal consistency, and double verification of coded entries was performed before final analysis to strengthen data integrity and reproducibility.

The sample size of 85 represented the full analytic cohort of eligible consenting patients recruited during the study period and was considered adequate for an exploratory hospital-based assessment of prevalence of treatment preference and associated factors. This sample permitted stable descriptive estimation of the distribution of preferences and supported bivariate testing of major clinical and decisional variables relevant to the study objective. The analysis plan was prespecified before final data summarization. Descriptive statistics were used to summarize participant characteristics and decision-related responses. Categorical variables were reported as frequencies and percentages. Associations between treatment preference and explanatory factors were examined using the chi-square test or Fisher's exact test where cell counts were small. Effect estimates were planned as odds ratios with 95% confidence intervals for clinically important binary comparisons. A two-sided p-value of less than 0.05 was considered statistically significant. Data were analyzed using SPSS, and records with missing values were handled by pairwise exclusion for specific analyses while preserving the maximum available denominator for descriptive reporting.

Ethical conduct was maintained throughout the study. Institutional permission was obtained from the relevant hospital and academic authorities before commencement, and the study was conducted in accordance with the principles of voluntary participation, confidentiality, and respect for participant autonomy. No identifying information was included in the analytical dataset, and study records were stored securely with access restricted to the research team. The final dataset was cleaned, coded, and archived in a reproducible format so that the descriptive tables and inferential comparisons could be regenerated directly from the source variables.

## RESULTS

A total of 85 patients with fractures were included in the analysis. The sample was predominantly male, with 52 participants (61.2%), while 33 (38.8%) were female. The largest age group was 31-45 years, comprising 34 patients (40.0%), followed by 18-30 years with 27 patients (31.8%), 46-60 years with 18 patients (21.2%), and more than 60 years with 6 patients (7.0%). Regarding educational status, 31 participants (36.5%) had secondary education, 26 (30.6%) were graduates, 19 (22.4%) had primary education, and 9 (10.6%) had postgraduate education. Urban residents constituted 49 patients (57.6%), whereas 36 (42.4%) were from rural areas, as shown in Table 1.

Fracture-related characteristics demonstrated that upper-limb fractures were slightly more common, affecting 41 patients (48.2%), followed by lower-limb fractures in 38 patients (44.7%) and spinal fractures in 6 patients (7.1%). In terms of fracture severity, 46 patients (54.1%) had simple fractures, 28 (32.9%) had displaced fractures, and 11 (12.9%) had comminuted fractures. Previous fracture history was present in 21 participants (24.7%), while 64 (75.3%) reported no prior fracture history, as detailed in Table 2.

With respect to treatment preference, 49 patients (57.6%) favored non-surgical management, including casting or traction, whereas 36 patients (42.4%) preferred surgical treatment, indicating an overall inclination toward conservative care in this cohort. This distribution is presented in Table 3.

Among decision-related factors, physician advice was the most frequently reported influence, identified by 63 patients (74.1%), followed by high cost of surgery in 52 (61.2%), fear of postoperative pain in 47 (55.3%), family influence in 41 (48.2%), fear of surgical complications in 39 (45.9%), and previous negative surgical experience in 18 (21.2%). These findings suggest that both professional guidance and

economic and psychological barriers played substantial roles in decision-making. The frequency distribution of these factors is summarized in Table 4.

Among the 49 patients who did not prefer surgical management, the leading reason for refusal was financial cost, reported by 20 patients (40.8%). Fear of postoperative pain was the second most common reason, cited by 15 patients (30.6%), followed by fear of complications in 8 (16.3%). Preference for traditional treatment accounted for 4 refusals (8.2%), while family influence alone was reported by 2 patients (4.1%). These results indicate that cost-related and pain-related concerns were the dominant barriers to acceptance of surgery in this study population, as shown in Table 5.

Inferential analysis demonstrated that patients with more severe fractures were significantly more likely to prefer surgery than those without severe fracture features. Among patients preferring surgery, 21 of 36 (58.3%) had severe fractures compared with 12 of 49 (24.5%) among those preferring non-surgical care, yielding an odds ratio of 4.32 (95% CI: 1.70-10.93; p=0.002). Severe pain was also significantly associated with preference for surgery, present in 26 surgical-preferring patients (72.2%) versus 18 non-surgical-preferring patients (36.7%), with an odds ratio of 4.48 (95% CI: 1.76-11.38; p=0.001). Likewise, prior failure of conservative treatment was more common in patients preferring surgery, occurring in 19 of 36 patients (52.8%) compared with 9 of 49 patients (18.4%), corresponding to an odds ratio of 4.97 (95% CI: 1.87-13.17; p=0.004). In contrast, physician recommendation, although frequent in both groups, was not significantly associated with treatment preference; 29 of 36 surgical-preferring patients (80.6%) and 34 of 49 non-surgical-preferring patients (69.4%) reported physician recommendation as a factor, producing an odds ratio of 1.83 (95% CI: 0.66-5.09; p=0.213). These associations are presented in Table 6.

**Table 1. Demographic characteristics of participants (n=85)**

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	52	61.2
	Female	33	38.8
Age group (years)	18-30	27	31.8
	31-45	34	40.0
	46-60	18	21.2
	>60	6	7.0
	Primary	19	22.4
Education	Secondary	31	36.5
	Graduate	26	30.6
	Postgraduate	9	10.6
Residence	Urban	49	57.6
	Rural	36	42.4

**Table 2. Fracture characteristics of survey participants (n=85)**

Variable	Category	Frequency (n)	Percentage (%)
Fracture site	Upper limb	41	48.2
	Lower limb	38	44.7
	Spine	6	7.1
Fracture severity	Simple	46	54.1
	Displaced	28	32.9
	Comminuted	11	12.9
Previous fracture history	Yes	21	24.7
	No	64	75.3

**Table 3. Patient preference for fracture treatment (n=85)**

Treatment preference	Frequency (n)	Percentage (%)
Surgical treatment	36	42.4
Non-surgical treatment (casting/traction)	49	57.6

**Table 4. Factors influencing decision regarding surgical treatment (n=85)**

Factor	Yes, n (%)	No, n (%)
Fear of postoperative pain	47 (55.3)	38 (44.7)
High cost of surgery	52 (61.2)	33 (38.8)
Fear of surgical complications	39 (45.9)	46 (54.1)
Advice from doctor	63 (74.1)	22 (25.9)
Family influence	41 (48.2)	44 (51.8)
Previous negative surgical experience	18 (21.2)	67 (78.8)

**Table 5. Reasons for refusing surgical management among patients preferring non-surgical treatment (n=49)**

Reason for refusal	Frequency (n)	Percentage (%)
Financial cost	20	40.8
Fear of postoperative pain	15	30.6
Fear of complications	8	16.3
Preference for traditional treatment	4	8.2
Family influence	2	4.1

**Table 6. Factors associated with preference for surgical treatment (n=85)**

Factor	Prefer surgery n/N (%)	Prefer non-surgery n/N (%)	Odds ratio (95% CI)	p-value
Severe fracture	21/36 (58.3)	12/49 (24.5)	4.32 (1.70-10.93)	0.002
Severe pain	26/36 (72.2)	18/49 (36.7)	4.48 (1.76-11.38)	0.001
Failure of conservative treatment	19/36 (52.8)	9/49 (18.4)	4.97 (1.87-13.17)	0.004
Physician recommendation	29/36 (80.6)	34/49 (69.4)	1.83 (0.66-5.09)	0.213

## DISCUSSION

The present study found that non-surgical fracture management was preferred by a greater proportion of patients than surgical treatment, with 57.6% favoring conservative care and 42.4% favoring surgery. This pattern suggests that, within this hospital-based Pakistani cohort, patient decision-making is influenced not only by the clinical nature of the fracture but also by apprehension regarding surgical burden. The predominance of non-surgical preference is consistent with broader musculoskeletal literature indicating that many patients initially lean toward less invasive treatment when they perceive surgery as costly, painful, or risky, particularly when they believe recovery may still occur with conservative management (3,5). It is also directionally aligned with epidemiological evidence from fracture practice showing that conservative treatment remains a dominant therapeutic approach for selected fracture types, especially when fractures are simple or stable and the expected functional outcome is acceptable without operative fixation (16).

A central finding of this study is that economic concern was the strongest reported barrier to surgery. High cost of surgery was identified by 61.2% of participants as an influential factor, and among those refusing surgery, financial cost was the leading reason in 40.8% of cases. This is highly relevant in a setting where out-of-pocket expenditure may materially shape access to orthopedic care and where the decision to undergo surgery may affect not only the patient but the entire household. These findings parallel Pakistani evidence from other surgical disciplines, where expense has emerged as a major deterrent to operative treatment, and they support the view that economic barriers remain integral to treatment preference in local practice (14). The result also reinforces systematic-review evidence showing that patient choice in musculoskeletal care is strongly conditioned by treatment burden and contextual realities rather than anatomical diagnosis alone (3).

Fear-related factors also played a substantial role. More than half of the participants reported fear of postoperative pain, and 45.9% identified fear of surgical complications as influential in decision-making. Among patients declining surgery, postoperative pain accounted for 30.6% of refusals and fear of complications for 16.3%. These findings are clinically important because they indicate that reluctance toward surgery is not merely financial but is also rooted in anticipated suffering and uncertainty about outcome. Similar concerns have been described in Pakistani surgical refusal data and in qualitative musculoskeletal decision-making studies, where perceived pain, operative risk, and uncertainty about benefit consistently shape patient attitudes toward intervention (3,14). In practice, these concerns may be modifiable through better counseling, clearer explanation of perioperative pain control, and more transparent communication regarding realistic complication profiles and recovery expectations.

Although non-surgical preference predominated overall, the probability of preferring surgery increased significantly in the presence of more severe clinical features. Patients with severe fractures were substantially more likely to prefer surgery than those without severe fracture characteristics, and severe pain was likewise strongly associated with preference for operative treatment. This finding is clinically coherent and supports the hypothesis that, when symptom burden and structural severity become more obvious, patients may recalibrate the perceived tradeoff between operative risk and expected benefit.

International fracture-preference studies have similarly shown that patients become more accepting of surgery when operative intervention is framed as a means of restoring mobility, reducing disability, or preventing long-term deformity and dysfunction (4,9,10,12). The present results therefore support a conditional rather than absolute model of treatment preference: many patients may initially prefer conservative care, but that preference shifts as injury severity and perceived necessity become more evident.

Failure of prior conservative treatment was another significant correlate of preference for surgery. More than half of those preferring surgery reported failed conservative treatment, compared with fewer than one-fifth of those preferring non-surgical care. This suggests that lived treatment experience can meaningfully alter preference, with patients becoming more receptive to operative intervention when non-operative strategies appear insufficient. Comparable observations have been reported in studies of orthopedic decision-making, where prior unsuccessful treatment often increases willingness to accept more invasive management because the expected benefit begins to outweigh concerns about pain, risk, and cost (5,13,15). From a clinical standpoint, this emphasizes the importance of discussing not only the first-line plan but also the consequences of treatment failure and the circumstances under which escalation to surgery may become appropriate.

Physician recommendation was the most commonly reported decisional influence overall, affecting 74.1% of participants, yet it was not statistically associated with preference for surgery in the comparative analysis. This is an interesting finding because it suggests that while clinicians strongly influence the decision-making environment, their advice alone may not be sufficient to override economic, emotional, and experiential barriers. Previous literature has shown that patients often value physician guidance highly but do not passively follow it; rather, they interpret it through personal fears, family input, financial capacity, and expected recovery demands (6,7,13). The present study supports that interpretation. In this cohort, physician advice appears necessary but not singularly determinative, implying that counseling strategies should be more patient-centered, interactive, and tailored to the specific reasons underlying reluctance toward surgery.

Family influence and traditional-treatment preference were less dominant than cost and pain concerns but remain noteworthy in the local sociocultural context. Nearly half of participants reported family influence as part of the decision process, and a smaller proportion of those refusing surgery explicitly preferred traditional treatment. This indicates that fracture care decisions in Pakistan may remain socially negotiated rather than purely individual. Although the frequency of traditional-treatment preference was comparatively low in this sample, its presence suggests that some patients continue to weigh biomedical recommendations against culturally familiar alternatives. In healthcare systems where family involvement is routine, counseling may be more effective when major decision-makers are included early and when misconceptions about both surgery and conservative care are addressed directly.

The present findings have practical implications for orthopedic services. First, counseling should move beyond a generic recommendation for or against surgery and instead explicitly address the barriers most relevant to the patient, particularly cost, postoperative pain, and complication anxiety. Second, patients with severe fractures, severe pain, or previous failure of conservative treatment may benefit from more detailed decision support because they appear more likely to consider surgery if its rationale is communicated clearly. Third, because physician recommendation alone was not significantly predictive of operative preference, communication models that incorporate shared decision-making, affordability discussion, and family-inclusive counseling may be more effective than directive counseling alone. These steps could improve treatment acceptance where surgery is clinically indicated and may also reduce delayed decision-making and dissatisfaction.

This study should be interpreted in light of several limitations. It was conducted at a single tertiary-care hospital with a relatively modest sample size of 85 patients, which may limit generalizability to other

centers and community settings. The cross-sectional design captures preference at one point in time and cannot determine how preferences evolve during follow-up or after actual treatment exposure. Some variables, including pain severity and previous negative surgical experience, were based on participant report and may be influenced by recall or perception bias. In addition, the analysis was primarily bivariate, so residual confounding by socioeconomic status, fracture subtype, or access to resources cannot be excluded. Nevertheless, the study provides useful local evidence in an area where fracture-specific preference data from Pakistan remain limited and offers a clinically relevant basis for future multicenter and analytically adjusted research.

## CONCLUSION

Among patients with fractures presenting to Mayo Hospital, non-surgical treatment was preferred more often than surgical management, with financial cost, fear of postoperative pain, and fear of complications emerging as the principal barriers to operative acceptance. Preference for surgery increased significantly in the presence of severe fracture pattern, severe pain, and prior failure of conservative treatment, indicating that patient choice is dynamic and shaped by both clinical necessity and contextual realities. These findings highlight the need for patient-centered orthopedic counseling that addresses affordability, expected recovery, complication concerns, and family context so that treatment decisions can be better aligned with both clinical indications and patient priorities.

## REFERENCES

1. Asad A. A survey on patient preference for physiotherapy versus pharmacological treatment in managing knee osteoarthritis. *J Biol Allied Health Sci.* 2025.
2. Bilal M, Abbass A, Basit MS, Aman F. Outcome of operative vs. non-operative management of Weber B ankle fractures. *J Islamabad Med Dent Coll.* 2024.
3. Healy S, Dorflinger E, Michaleff Z, Marks D. Patient preferences and decision-making when considering surgery for musculoskeletal disorders: a mixed methods systematic review. *Musculoskeletal Care.* 2022.
4. O'Hara NN, Mulliken A, Joseph K, Slobogean G, Johal H, Cunningham BP, et al. Valuing the recovery priorities of orthopaedic trauma patients after injury: evidence from a discrete choice experiment within 6 weeks of injury. *J Orthop Trauma.* 2019.
5. Pérez GM, Tran MM, McDonald C, O'Donnell R, AIC J. Factors affecting patient decision-making regarding midshaft clavicle fracture treatment. *Cureus.* 2020.
6. Huetteman HE, Shauver MJ, Nasser JS, Chung KC. The desired role of health care providers in guiding older patients with distal radius fractures: a qualitative analysis. *J Hand Surg Am.* 2018;43(4):312-20.e4.
7. Nasser JS, Huetteman HE, Shauver MJ, Chung KC. Older patient preferences for internal fixation after a distal radius fracture: a qualitative study from the Wrist and Radius Injury Surgical Trial. *Plast Reconstr Surg.* 2018;142(1):34e-41e.
8. Napora JK, Demyanovich HK, Mulliken A, Oslin K, Pensy R, Slobogean G, et al. Patients' preferences for occupational therapy after upper extremity fractures: a discrete choice experiment. *BMJ Open.* 2020.
9. Patterson JT, Parry J, Working ZM, McKibben NS, Baca J, Duong AM, et al. Patient preferences for operative versus nonoperative treatment of LC1 pelvis fracture: a discrete choice experiment. *J Orthop Trauma.* 2024.

10. Richards JT, O'Hara NN, Healy K, Zingas N, McKibben N, Benzel C, et al. Fix or replace? Patient preferences for the treatment of geriatric lower extremity fractures: a discrete choice experiment. *Geriatr Orthop Surg Rehabil.* 2024;15.
11. Shamma R, Mela N, Wallace SG, Tong B, Huber J, Mithani S. Conjoint analysis of treatment preferences for nondisplaced scaphoid fractures. *J Hand Surg Am.* 2018.
12. Graesser EA, Rawi ZMA, Wall L. A survey-based assessment of treatment preferences for distal radius fractures in participants aged 65 years and older. *J Hand Surg Am.* 2025.
13. Ghani F, Khattak I, Aamir S, Azam F. Factors affecting decision making process on spine surgery: patients' perspective. *Pak J Neurol Surg.* 2020;24(2):143-8.
14. Jawaid M, Ahsan Qadeer T, Fahim MF. Reasons for refusing orthognathic surgery by orthodontic patients: a cross-sectional survey. *J Pak Med Assoc.* 2022;72(10):1954-63.
15. Keding A, Handoll H, Brealey S, Jefferson L, Hewitt C, Corbacho B, et al. The impact of surgeon and patient treatment preferences in an orthopaedic trauma surgery trial. *Trials.* 2019;20(1).
16. Kremer L, Frank J, Lustenberger T, Marzi I, Sander A. Epidemiology and treatment of phalangeal fractures: conservative treatment is the predominant therapeutic concept. *Eur J Trauma Emerg Surg.* 2020.
17. Khan A, Mushtaq A, Naqvi SRQ, Bano R, Khan FA, Begum R, et al. Overview of patient preferences in the surgical management plan of early breast cancers. *PAFMJ.* 2021.
18. Martins R, Gillani M, Jawaid S, Zaidi SMZ, Malik M. Societal preferences for gender of surgeons: a cross-sectional study in the general population of Pakistan. *World J Surg.* 2022.
19. Smits L, Wilkens S, Ring D, Guitton T, Chen N. Do patient preferences influence surgeon recommendations for treatment? *ABJS.* 2018.
20. Zwaard BC van der, Stein CE, Bootsma JEM, Geffen HJ van, Douw CM, Keijsers C. Fewer patients undergo surgery when adding a comprehensive geriatric assessment in older patients with a hip fracture. *Arch Orthop Trauma Surg.* 2019.