

The willingness of orthopaedic trauma patients in Uganda to accept financial loans following injury

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Abstract

Background: Early access to a monetary loan may mitigate some of the socioeconomic burden associated with surgical treatment and lost wages following injury. The primary objective of this study was to determine the willingness of orthopaedic trauma patients in Uganda to accept a formal financial loan shortly after their time of injury.

Methods: A consecutive sample of adult orthopaedic trauma patients admitted to Uganda's national referral hospital was included in the survey. The primary outcome was the self-reported willingness to accept a financial loan. Secondary outcomes included the preferred loan terms, fracture treatment costs, and the factors associated with loan willingness.

Results: Of the 40 respondents (mean age, 40 years; 58% male), the median annual income was \$582 United States dollars (USD) (range: \$0–\$6720). Around 50% reported a willingness to accept a loan with any terms. Patients requested loans with a median principal of \$500 USD and a median interest rate of 5% with 12 months to pay back. Patients had received loans with a median principal of \$142 USD, an interest rate of 10%, and payback of 6 months. These received loans covered a mean of 63% of the treatment costs. Patients with higher median incomes (\$857 USD vs \$342 USD) were more willing to accept a loan.

Conclusion: This study demonstrated a limited interest of orthopaedic trauma patients in Uganda to procure loans through formalized lending. This observed resistance must be overcome in future programs that rely on mechanisms such as conditional cash transfers or microfinancing to improve clinical and socioeconomic outcomes after injury.

Keywords: economics, financing, fracture, global health, loan, trauma

1. Introduction

In sub-Saharan African countries, out-of-pocket patient expenses represent nearly half of overall health spending.^[1] For many patients, insufficient funds to pay for the cost of treating an injury may lead to delays in care, cause the patient to choose less costly treatment options, or forgo treatment altogether.^[2–4] A recent study by Shrimel et al^[5] estimated that each year 81.3 million people worldwide are driven to financial catastrophe due to the medical and nonmedical costs associated with surgery. Even in Uganda's publicly funded healthcare system, patients must contribute substantial amounts toward their treatment.^[6] It is common for patients to solicit loans from friends, relatives, money lenders, and banks to pay for treatment costs and cover lost wages during the recovery period.^[7]

In Uganda, several different governmental and nongovernment strategies have been attempted to reduce the socioeconomic burden of surgically treated conditions.^[8] Government policies have included universal public financing of healthcare services and task-shifting some surgical treatments to nonsurgical or nonmedical providers. Surgical “camps” or “missions” and self-contained mobile surgical units have also been utilized by governmental and nongovernmental organizations to expand access to surgical treatment without user fees. These policies, however, only address direct medical costs, which represent the minority proportion of the economic burden of care for severe musculoskeletal injury.^[8]

Cash transfers are gaining popularity in development economics as a strategy to improve living standards in low-income areas. State-sponsored cash transfers, such as the unconditional cash transfer programs recently evaluated in Zambia,^[9] have demonstrated positive effects on per capita consumption, investment, and productivity. Other options for providing temporary financial stability, such as conditional cash transfers and microfinancing loans, have had little attention in the postinjury population.

Previous studies have demonstrated that loans are commonly obtained by trauma patients in low- and middle-income countries (LMICs) to cover medical and nonmedical costs.^[3,7] These loans are typically informal and have the potential to leave patients exposed to predatory lending practices, further exacerbating the financial impact of their injury.^[7] However, in a labor-based economy with limited social protection mechanisms, patients commonly require “bridge financing” in order to cover medical and nonmedical costs until they can re-enter the workforce. A formalized financial intervention during this employment gap may mitigate the socioeconomic burden of orthopaedic injury. However, there is a paucity of data on current lending practices and the demand for financial support by patients after a

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traumatic injury in Uganda to guide the development of a formalized financial intervention.

The primary objective of the study was to determine the willingness of orthopaedic trauma patients in Uganda to accept a formal financial loan shortly after their time of injury. The secondary objectives were to compare ideal loan terms to the terms of current loans held by the patients, estimate the costs associated with treatment for these patients, and determine which patient characteristics were associated with willingness to take a loan. Additionally, we investigated the preferred purposes for the loans beyond the payment of medical expenses. We hypothesized that patients would be willing to accept loans for their medical expenses and recovery, assuming highly favorable terms.

2. Materials and methods

A cross-sectional survey was conducted at Mulago National Referral Hospital from September to October 2017. Mulago National Referral Hospital is the largest public hospital in Uganda and main academic hospital for the Makerere University College of Health Sciences. This study was approved by the Mulago Research and Ethics Committee (# 462).

A consecutive sample of patients aged 18 years or older admitted to Mulago National Referral Hospital with a traumatic extremity fracture during the study time period was included in the survey. The surveys were administered by orthopaedic residents at the hospital and translated into the language most comfortable to the patient by the multilingual team of orthopaedic residents.

The primary outcome of the study was the self-reported willingness to accept a financial loan. The secondary outcomes were the preferred terms for the loans, the costs incurred by the patients for their fracture treatment, and the intended nonmedical uses for a loan. Additional sociodemographic and clinical characteristics were collected during the interview and augmented with information from the medical charts. Information on whether the study participants had a bank account and the terms on any current loans was ascertained for all patients. Information provided by the respondents in Ugandan shillings has been converted to USD, at an exchange rate of 1 USD = 3500 Uganda shillings. The entire survey is available as a Supplementary Document, <http://links.lww.com/OTAI/A1>.

All statistical analyses were performed using JMP Pro Version 13 (SAS Institute, Cary, North Carolina). Sociodemographic and clinical characteristics for the study participants were described using counts and proportions for categorical variables and means with standard deviations or medians with interquartile ranges (IQRs) for continuous variables, depending on the distribution of the data. The costs associated with the fracture treatment were summarized by the type of treatment using medians and ranges. The willingness to accept a loan, with terms defined by the study participants, was reported as a proportion of the total sample. The patient characteristics of those willing to take a loan versus those unwilling to take a loan were compared using Fisher's exact test for categorical variables and Student's *t*-tests and Wilcoxon rank-sum test for continuous variables, depending on the distribution of the data. A sample size of 40 patients allowed the estimation of proportions within a 15% margin of error with a confidence interval of 95%. As a pilot study, the level of significance for the bivariate testing was set at $\alpha=0.1$ and no adjustments were made for multiple testing.

3. Results

Forty of the 42 eligible patients (95%) agreed to participate in the study. Of the included study participants, the mean age was 40 years (standard deviation: 16) and 58% were male (Table 1). The majority (70%) had completed a secondary school education or higher. The median annual income was \$582 USD (range: \$0–\$6720 USD) and 80% were the main income earner for their household. The most common occupations were a vendor or trader (28%) followed by a farmer (23%). 13% were unemployed or not working at the time of their injury. Only 2 (5%) participants received medical benefits from their employer. A total of 38% of the sample reported having a bank account. Over half (55%) of the study participants were married and supported a median of 3 dependents (IQR: 1–5) at their time of injury. Most study participants (90%) had a lower extremity fracture. Six participants had an upper extremity fracture and 2 had a pelvic fracture. 10% of the sample had fractures in multiple locations. The median time from injury to admission was 3 days (IQR: 0–67) and the median time from injury to surgical treatment was 10 days (IQR: 2–54). The median time from injury to survey completion was 30 days (IQR: 14–72).

Table 1
Patient characteristics (n=40).

Variable	
Age, years, mean (SD)	40 (16)
Sex, male, n (%)	23 (58)
Education level obtained, n (%)	
None	2 (5)
Primary	10 (25)
Secondary	19 (48)
Diploma	3 (8)
University	6 (15)
Occupation, n (%)	
Vendor/Trader	11 (28)
Farmer	9 (23)
Not working/unemployed	5 (13)
Operative/technician	5 (13)
Driver	3 (8)
Professional	3 (8)
Laborer	2 (5)
Student	2 (5)
Medical benefits from employer, n (%)	2 (5)
Annual income, USD, median (range)	582 (0–6720)
Main income earner, n (%)	
Patient	32 (80)
Spouse	6 (15)
Other relative	2 (5)
Bank account, yes, n (%)	15 (38)
Marital status, n (%)	
Married	22 (55)
Single	12 (30)
Divorced	3 (8)
Widowed	3 (8)
Number of dependents, median (IQR)	3 (1–5)
Fracture location, n (%)	
Lower extremity	36 (90)
Pelvis/acetabulum	2 (5)
Upper extremity	6 (15)
Time from injury to admission, days, median (IQR)	3 (0–67)
Time from injury to surgical treatment, days, median (IQR)	10 (2–54)

Note: Four patients (10%) had fractures in multiple locations. Operative treatment was received by 68% of the sample (n=27).

Table 2**Costs associated with treatment.**

Treatment	N	Implant costs, USD	Total costs, USD
External fixation	9	200 (129–214)	600 (154–1714)
Intramedullary nail	8	179 (100–286)	371 (143–1714)
Plates/screws	7	100 (71–157)	285 (114–514)
Arthroplasty	2	400 (285–514)	971 (428–1514)
Pins	2	10 (0–20)	19 (0–38)
Nonoperative treatment	13	—	11 (0–257)

Note: Total costs also include implant costs. One patient was treated with external fixation and an intramedullary nail.

The costs are given in USD and documented as the median (range).

Twenty-seven study participants (68%) received surgical treatment for their fracture. The median patient-reported out-of-pocket treatment cost was \$228 USD (IQR: \$50–\$429) and the median implant cost was \$137 USD (IQR: \$100–\$229) (Table 2). The most common treatment was external fixation ($n = 9$) and was associated with a median treatment cost of \$600 USD (IQR: \$154–\$1714). Arthroplasty was the most expensive treatment at a median cost of \$971 USD (IQR: \$428–\$1514). One-third of the sample was treated nonoperatively. The median cost of nonoperative treatment was \$11 USD (IQR: \$0–\$257).

Half of the sample ($n = 20$) indicated that they would be willing to accept a loan with any terms (Table 3). Of those, 13 had already obtained loans and 7 had not. In study participants who had not obtained a loan, the requested hypothetical loans ranged from \$57 USD to \$4285 USD, with a median of \$500. Participants said that they would be willing to pay interest between 0% and 20% per annum, with a median of 5% and requested at least 2 months to pay back the loan (median: 12 months). By comparison, 13 study participants had received loans from friends, family, or moneylenders following their injury. The median principal on the loans was \$142 USD (range: \$71–\$1914), with a median interest rate of 10% per annum (range: 0%–20%) and a median payback of 6 months (range: 2 months to no defined limit). The received loans were, on average, 76% of the patient's annual income (range: 2%–500%) and covered 63% of the overall treatment costs (range: 32%–375%). In addition to covering their medical expenses, study participants said that they would use a loan for their business ($n = 15$), food ($n = 3$), and school fees for their children ($n = 3$).

Of the 11 sociodemographic and clinical characteristics tested for their association with the patient's willingness to take a loan following their fracture, only annual income was within our level of significance (Table 4). Patients with higher median incomes (\$857 USD vs \$342 USD) were more willing to accept a loan ($P = .09$).

Table 3**Accrued loans and willingness for loans.**

	Accrued loan* ($n = 13$)	Requested loan† ($n = 20$)
Loan terms		
Principal, USD, median (range)	142 (71–1914)	500 (57–4285)
Annual interest rate, %, median (range)	10 (0–20)	5 (0–20)
Payback duration, months, median (range)	6 (2 to unlimited)	12 (2 to unlimited)

* Loans that have been received to date by the study participants.

† Desired loan terms from study participants that were willing to accept a loan.

Table 4**Characteristics of patients willing to take a loan versus those unwilling to take a loan.**

	Willing to take loan ($n = 20$)	Unwilling to take loan ($n = 20$)	P value
Age, mean (SD)	39 (11)	41 (19)	.70
Sex, male, n (%)	11 (55)	12 (60)	1.00
Education, secondary or higher, n (%)	14 (70)	14 (70)	1.00
Married, n (%)	9 (45)	9 (45)	1.00
Number of dependents, mean (SD)	4 (4)	4 (3)	.82
Main income earner, n (%)	18 (90)	14 (70)	.24
Annual income, median (IQR)	857 (96–3942)	342 (0–1028)	.09
Bank account, n (%)	9 (45)	6 (5)	.51
Loans since injury, n (%)	7 (35)	6 (30)	1.00
Operative treatment, n (%)	15 (75)	12 (60)	.50
Cost of treatment, median (IQR)	257 (154–421)	134 (6–557)	.37

4. Discussion

Social protection is defined by the United Nations Research Institute for Social Development as “protecting individuals and households during periods when they cannot engage in gainful employment or obtain enough income to secure their livelihoods—due to unemployment, sickness, chronic ill health or disability, old age, or care responsibilities.”^[10] Further, the World Bank has outlined the importance of providing social protection programs in vulnerable populations, as these programs can build human capital through better health, improved schooling, and greater skills.^[11] The past research has demonstrated that orthopaedic trauma patients and their families fall into this category of vulnerable populations in the months and years following their injury.^[3,7] Despite this, there is little in the way of social protection available to these patients in LMICs. Improving the treatment and recovery of orthopaedic trauma patients in LMICs requires an understanding of the financial barriers these patients face, and effective strategies to overcome those barriers.

Contrary to our hypothesis, only half ($n = 20$) of the patients that completed the survey stated that they would be willing to accept a loan, under any terms. Only 33% had obtained a loan at the time of the survey, which was conducted a mean of 87 days from the time of their injury. This differs considerably from a previously reported cohort, who at 1-year postinjury had an 80% rate of obtaining a loan.^[7] This difference perhaps reflects the financial realities that these patients face in the months following their injuries. A previous study in this population has shown that only 35% of patients were back at work by 12 months.^[3] We would anticipate that the number of patients from this cohort who sought out a loan would continue to rise over the subsequent few months.

In patients who had not taken out a loan but were interested in obtaining one, the amount requested was approximately 3 times greater than the actual amounts borrowed by the cohort of patients who already had a loan. The terms under which this group would expect to obtain a loan included an interest rate one-half of the mean rate in the loan obtained group and a term that was twice as long. Most patients who were interested in receiving a loan requested amounts that were less than the cost of their medical expenses. Actual loan amounts were an even lower proportion of medical expenses. For both groups, the loan principal was considerably less than the amounts seen in a previous similar cohort at 1 and 2 years postinjury. These amounts were \$635 USD and \$1069 USD, respectively,

indicating that the principal of the debt is likely to increase with delays in re-entering the workforce in this population.

A number of patients indicated that they would spend a portion of their hypothetical loans on nonmedical expenses such as maintaining a business or paying school fees. This is consistent with the position of the World Bank,^[11] in that social protection programs build or protect human capital during times of vulnerability. The third nonmedical item the patients identified as a likely expenditure for hypothetical loans was food. A similar finding was reported in a recent Cochrane review,^[12] which identified food security as a major health benefit of unconditional cash transfers in vulnerable populations.

Patients with higher incomes were significantly more willing to accept a loan. This association between willingness to receive a loan and an increased income suggests an underlying effect of financial confidence and literacy. Patients with higher preinjury incomes likely have more confidence in their ability to pay back a loan. Financial literacy is widely recognized as an important development measure and is viewed as a predictor of financial resilience.^[13] A financial literacy assessment tool recently developed by the Organization of Economic Cooperation and Development tests respondents on concepts such as numeracy, compounding, risk assessment, the purchasing power of money, and diversification. Previous research suggests low levels of financial literacy in Uganda, which will likely remain a barrier to broader acceptance of cash transfers or loans after injury.^[14]

Nonoperative treatment incurred considerably lower costs than surgical treatment (\$11 USD vs \$228 USD). The effect of treatment costs on patient's willingness to accept a loan could not be reliably ascertained in this relatively small population but could be expected to have an effect and warrant further study. Similarly, a lower extremity injury that compromises mobility may have a greater effect on that patient's need for financial support when compared to a patient with an upper extremity injury.

The results from this study are comparable to several recent extremity fracture studies conducted in metropolitan and rural Ugandan communities with respect to patient demographics and treatment costs.^[3,4,6,7,15] Therefore, we believe the sample to be representative of this population.^[3,4,6,7,15] A recent study at a large publicly funded region hospital in Southwestern Uganda assessed the effect of surgical costs, for all types of surgical treatment, on impoverishment.^[6] The authors estimated that costs of surgical care led to impoverishment for nearly half of their study participants. We expect the effect to be amplified in orthopaedic patients given the higher costs associated with orthopaedic treatment, largely driven by high implants costs. We acknowledge that the generalizability of the findings to extremity fracture patients in other countries in the region may be limited given the variation in healthcare financing and public attitudes toward formal and informal financial lending.

Despite uncertainty regarding the generalizability of the study's specific findings to the rest of sub-Saharan Africa, the study highlights several issues pertaining to the financial resources, the financial literacy, and the financial confidence of patients following orthopaedic injury. A number of studies have previously investigated financial barriers to fracture treatment with several studies focusing on patient's ability to pay for treatment.^[2,16–20] However, addressing financial barriers to orthopaedic treatment, in any geographic region, will require an understanding of the patient population's financial position.^[16] This study provides insight into the variability in financial preferences of patients following injury. This observation has

been obtained through a consecutive sample of a multilingual population.

The study has several limitations that must be considered when interpreting the results. The survey was conducted at a single geographic region, and the findings may not be generalizable to other LMICs. The study participant responses were based on a hypothetical scenario and their actual preferences may be different. Patient attitudes toward lending may not be static and could change depending on their time from injury. It is possible that the willingness to receive a loan may increase if the patients' economic hardships continue for several months post-discharge. The patient's loan history prior to injury was not collected, and we are therefore unable to analyze how previous borrowing habits may impact an individual's willingness to accept loans following injury. Finally, given the size of the sample, the findings should be interpreted with a 15% margin of error.

5. Conclusion

Traumatic injury and the costs associated with treatment and recovery impose financial hardship on patients in Uganda. The study investigates the willingness of orthopaedic trauma patients in Uganda to accept an early loan to offset medical expenses and cope with household expenses prior to returning to employment. We hypothesized that patients would be willing to accept loans, but would request highly favorable terms. However, only half of the respondents were willing to receive a loan, with any terms. The unwillingness to accept loans may be related to the patient's confidence in their ability to repay the loan or may be related to financial literacy. The design of interventions to provide access to financial capital following catastrophic medical events must take these factors into account. This study demonstrates a limited interest of orthopaedic trauma patients in Uganda to procure loans through a formalized process. This observed resistance must be overcome in future programs that rely on mechanisms such as cash transfers or microfinancing to improve clinical and socioeconomic outcomes after injury.

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