

ORIGINAL RESEARCH

Fall Injuries in Nepal: A Countrywide Population-based Survey

Shailvi Gupta, MD, MPH, Shyam Kumar Gupta, MS, MRCS, Sagar Devkota, MBBS, Anju Ranjit, MBBS, MPH, Mamta Swaroop, MD, FACS, Adam L. Kushner, MD, MPH, FACS, Benedict C. Nwomeh, MD, MPH, FACS, Gregory P. Victorino, MD, FACS

Abstract

BACKGROUND An estimated 424,000 fatal falls occur globally each year, making falls the second leading cause of unintentional injury-related deaths after road traffic injuries. More than 80% of fall-related fatalities occur in low- and middle-income countries. Data from low-income South Asian countries like Nepal are lacking, particularly at the population level. The aim of this study was to provide an estimate of fall-injury prevalence and the number of fall injury-related deaths countrywide in Nepal and to describe the epidemiology of fall injuries in Nepal at the community level.

METHODS A countrywide cross-sectional study was performed in 15 of the 75 districts in Nepal using the Surgeons OverSeas Assessment of Surgical Need (SOSAS) survey tool. The SOSAS survey gathers data in 2 sections: demographic data, including the household's access to health care and recent deaths in the household, and assessment of a representative spectrum of surgical conditions, including injuries. Data was collected regarding an individuals' experience of injury including road traffic injuries, falls, penetrating trauma, and burns. Data included anatomic location, timing of injury, and whether health care was sought. If health care was not sought, the reason for barrier to care was included. Descriptive statistics were used to analyze the data.

RESULTS Of 2695 individuals from 1350 households interviewed, 141 reported injuries secondary to falls (5.2%; 95% confidence interval [CI], 4.4%–6.1%), with a mean age of 30.7 years; 58% were male. Falls represented 37.2% of total injuries (n = 379) reported (95% CI, 32.3%–42.3%). Twelve individuals who suffered from a fall injury were unable to access surgical care (8.5%; 95% CI, 4.5%–14.4%). Reasons for barrier to care included no money for health care (n = 3), facility/personnel not available (n = 7), and fear/no trust (n = 2). Of the 80 recent deaths reported, 7 were due to fall injury (8.8%; 95% CI, 3.6%–17.2%), and patients had a mean age of 46 years (SD 22.8). Surgical care was not delivered to those who died for the following reasons: no time (n = 4), facility/personnel not available (n = 1), fear/no trust (n = 1), and no need (n = 1).

CONCLUSION The Nepal SOSAS study provides countrywide, population-based data on fall-injury prevalence in Nepal and has identified falls as a crucial public health concern. These data highlight persistent barriers to access to care for the injured and the need to improve trauma care systems in developing countries such as Nepal.

KEY WORDS global surgery, falls, trauma, developing countries, Nepal

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SG and SKG were responsible for the drafting of the manuscript. ALK, SG, AR, and BCN were responsible for study design. SG and SD collected data in the field. SG, SKG, SD, AR, MS, ALK, BCN, and GPV were all responsible for the critical edits and revisions of the manuscript. All authors approved the final manuscript for publication. The authors have nothing to disclose.

From the University of California, San Francisco – East Bay, Department of Surgery, Surgeons OverSeas, Oakland, CA (SG); Government Medical College Jammu, Jammu & Kashmir, India (SKG); BP Koirala Institute of Health Sciences, Dharan, Nepal (SD); Department of Surgery, Brigham and Women's Hospital and Harvard Medical School, Boston, MA (AR); Division of Trauma and Critical Care, Feinberg School of Medicine, Chicago, IL (MS); Department of International Health and Surgeons OverSeas, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD (ALK); Department of Pediatric Surgery and Surgeons OverSeas, Nationwide Children's Hospital, Columbus, OH (BCN); Department of Surgery, University of California, San Francisco – East Bay, Oakland, CA (GPV). Address correspondence to S.G. (Shailvi.gupta@gmail.com).

INTRODUCTION

With growing empirical evidence, traumatic injuries have earned a position as a global health priority, claiming more than 5.8 million lives worldwide per year.¹ Within the realm of traumatic injuries, 424,000 fatalities per year are a result of fall injuries, second only to road traffic injuries for unintentional injury-related deaths.² Low- and middle-income countries (LMICs) experience 80% of fall-injury mortality worldwide.² Such global discrepancies in mortality highlight a considerable disparity of access to timely care for fall injuries, as adequate trauma systems are often deficient in LMICs.^{2,3}

Although not all fall injuries are fatal, nearly 37.3 million fall injuries are severe enough to require medical attention annually and account for more than 17 million disability-adjusted life-years lost.² Although such estimates exist to quantify the effect of fall injuries worldwide and provide invaluable data to policymakers and public health authorities, much of this data has been extrapolated either from high-income countries or incomplete hospital-level data.⁴ Hospital-based studies have limited generalizability in LMICs because many patients may be unable to access a hospital because of lack of availability, funds, transportation, or limited personnel.^{5,6} Thus, the actual prevalence of fall injuries in LMICs is unknown, and community-level data capturing individuals unable to access hospital-level health care is lacking, particularly in LMICs.

Surgeons OverSeas, a US-based nongovernmental organization, created a population-based surgical needs assessment tool, the Surgeons OverSeas Assessment of Surgical Need (SOSAS), to facilitate the investigation of the prevalence of surgical disease at a community level.⁷ To date, SOSAS surveys have been executed countrywide in 3 low-resource settings: Rwanda (2011), Sierra Leone (2012), and Nepal (2014).⁸⁻¹⁰ In Rwanda, 45% of all injuries reported were due to falls, the most common type of injury endured by the Rwandan population sampled.¹¹ Similarly, in Sierra Leone, falls were the most common cause of injuries, accounting for more than 40% of lifetime injuries.¹² SOSAS was executed in Nepal in 2014 given that countrywide community-level data regarding fall injuries was lacking outside of sub-Saharan Africa and enthusiastic local collaborators.

Nepal is a relatively small (147,181 km²) low-income country in South Asia, with a population of approximately 28 million.¹³ Of Nepal's inhabitants,

25.2% live at or below the national poverty lines and the current life expectancy at birth is 68 years.¹³ With 80% of Nepal's territory dominated by the dramatic peaks of the Himalayas in the north, only 43% of the population has access to all-weather roads; the inaccessibility of adequate transportation thus results in delays in providing timely health care.^{13,14} Nepal's government has required that at least one primary health post be available in each Village Development Committee (VDC), the smallest administrative unit in Nepal. Subsequently, Nepal has more than 95 hospitals, including 8 tertiary care centers, 205 primary health care centers, and thousands of primary health care posts.¹⁵ Although many health facilities exist in Nepal, qualified professionals often are unwilling to work in such low-resource settings given the lack of incentive, and therefore such facilities lack adequate resources and personnel to provide adequate care.¹⁶ The objective of this study was to provide an estimate of fall-injury prevalence and the number of fall injury-related deaths countrywide in Nepal, and to describe the epidemiology of fall injuries at the community level in Nepal. Given the terrain, economic status, and health care restraints in Nepal, we hypothesized that fall injuries contributed greatly to the burden of overall injuries among Nepali people.

METHODS

A nationally representative cross-sectional study was performed in Nepal using the SOSAS survey tool from May 25 to June 12, 2014. SOSAS is a cluster, randomized cross-sectional survey, described in more detail previously.¹⁷ The SOSAS survey is divided into 2 sections. The first section collects demographic data regarding the household's access to health care and recent deaths in the household. If a household member died within the previous year, further questions regarding health care received, access to surgical care, barriers to surgical care, and death specifics were asked. For the second section, 2 household members were selected randomly; each member underwent a verbal head-to-toe examination of the following 6 anatomical regions:

1. face, head and neck,
2. chest and breast,
3. abdomen,
4. groin and genitalia,
5. back, and
6. extremities.

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