



# State of clinical pain research in Nepal: a systematic scoping review

Saurab Sharma<sup>a,b,\*</sup>, Mark P. Jensen<sup>c</sup>, Anupa Pathak<sup>b</sup>, Sweekriti Sharma<sup>d,e</sup>, Mukesh Pokharel<sup>f</sup>, J. Haxby Abbott<sup>d</sup>

## Abstract

Before determining the pain research priorities for a country, a comprehensive literature review of existing research is warranted. We aimed to (1) identify and describe the extent and nature of pain research performed in Nepal, (2) identify existing knowledge and significant knowledge gaps, and (3) provide recommendations for future studies. We conducted a systematic scoping review of the literature, in accordance with recommended guidelines. We searched local and international databases to identify research conducted in Nepal on individuals with a diagnosis of clinical pain conditions. A pair of independent reviewers screened the studies for inclusion. We identified 1396 records and included 116 studies. Most studies were published in Nepalese journals (75%) and were conducted in clinical settings (73%). Postsurgical pain was the most commonly studied pain condition (33%), followed by musculoskeletal pain (16%), headache (14%), and low back pain (13%). The most common research topics, in order of frequency, were (1) medical management (40%), (2) pain prevalence/incidence (21%), (3) diagnostic procedures (15%), (4) surgical management (8%), and (5) patient-reported outcome measurement (8%). Research gaps and potential areas of research waste were identified. Although a large number of research articles about pain in Nepal have been published, the majority of these have focused on the biomedical diagnosis and management of pain. Other topic areas (eg, psychological and social aspects of pain) are under-represented. The findings may inform future research directions for maximizing the knowledge that could be gained.

**Keywords:** Pain, Pain management, Chronic pain, Headache, Back pain, Musculoskeletal pain, Postoperative pain, Developing countries, Nepal

## 1. Background

Given its high prevalence, costs, and impact on physical, mental, and social function, and all aspects of quality of life,<sup>48</sup> pain remains a significant health problem worldwide.<sup>12</sup> One-year

prevalence of chronic pain is more in developing countries (41%) compared with developed countries (37%).<sup>47</sup> The economic burden of chronic pain is extremely high, with annual estimates of the cost of treatment in the United States to be from US\$ 560 billion and US\$ 635 billion<sup>12</sup> and about £1 billion in the United Kingdom.<sup>47</sup>

Knowledge from pain research comes predominantly from developed countries; pain research in developing countries—including Nepal—is relatively sparse. Currently, musculoskeletal pain conditions are the number one cause of disability in Nepal with a 32% increase in the last 3 decades.<sup>9,11</sup> Despite this, pain is not currently viewed as a priority research area in Nepal. For example, the Nepal Health Research Council's (NHRC) research priority agenda does not include pain research as one of its priorities.<sup>21</sup> However, recently, there have been promising signs that research related to pain in Nepal is growing.<sup>17,25,30,32,36,38,45</sup>

Given the scarce resources for performing research in Nepal in general, it is important that researchers should (1) avoid duplicating research efforts and (2) address the research questions that are most likely to be impactful. Thus, the purpose of this review is to clarify the current state of pain research in Nepal, identify the extent and nature of research published, identify significant knowledge gaps, and provide recommendations for future studies. To achieve these aims, here, we included studies irrespective of study design that focused on a range of topics, including research that evaluated interventional procedures (eg, medical, surgical, and

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<sup>a</sup> Department of Physiotherapy, Kathmandu University School of Medical Sciences, Dhulikhel, Nepal, <sup>b</sup> Centre for Musculoskeletal Outcomes Research, Department of Surgical Sciences, Dunedin School of Medicine, University of Otago, Dunedin, New Zealand, <sup>c</sup> Department of Rehabilitation Medicine, University of Washington, Seattle, WA, USA, <sup>d</sup> Sydney School of Public Health, Faculty of Medicine and Health, The University of Sydney, Sydney, Australia, <sup>e</sup> Institute for Musculoskeletal Health, Sydney, Australia, <sup>f</sup> Department of Physiotherapy, Annapurna Neurological Institute and Allied Sciences, Kathmandu, Nepal

\*Corresponding author. Address: Department of Physiotherapy, Kathmandu University School of Medical Sciences, Dhulikhel Hospital Kathmandu University Hospital, Box 11008, Dhulikhel, 45210, Nepal. Tel.: +977-9841634043; fax: +977-1-490707. E-mail address: saurabsharma1@gmail.com (S. Sharma).

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rehabilitation), epidemiological research, and outcome measurement studies, among others. As a part of this review, we also hoped to estimate the prevalence of pain conditions, to identify the outcome measures used to assess pain and related domains, and the treatment approaches used to treat pain conditions in Nepal.

## 2. Methods

A scoping review was conducted using recent guidelines.<sup>26</sup> The study aims and methods were defined a priori. An extension of Preferred Reporting Items for Systematic reviews and Meta-Analysis (PRISMA) guidelines for scoping reviews was followed for reporting the review.<sup>46</sup>

### 2.1. Study eligibility criteria

We included studies that (1) were conducted in Nepal; (2) included participants who had a diagnosis of a clinical pain condition (eg, low back pain, headache, chronic pain, musculo-skeletal pain, neuropathic pain, postsurgical pain, pediatric pain, cancer pain, etc) or included pain as the primary outcome (eg, fracture management); and (3) used either qualitative or quantitative research designs. We did not exclude studies based on language of publication, year of publication, study design, or age of study participants. However, we did exclude studies that (1) included healthy volunteers and animals instead of human participants; (2) were editorials or review articles; (3) included participants who did not have a clear pain condition or diagnosis, or had pain as only 1 symptom of another primary condition being studied (eg, infectious diseases such as typhoid); or (4) were conducted outside of Nepal.

### 2.2. Search strategy

We searched MEDLINE, Embase, Scopus, Cochrane library, Google Scholar, and Nepal Journals Online (NepJOL, <https://www.nepjol.info/>) from inception to November 2018. We also searched the reference lists of included studies. We collated articles in the Endnote software and removed duplicates. The lead author (S.S.) developed the search strategy and amended it after receiving feedback from all authors. We used a combination of terms “pain” or “analgesia” and “Nepal” or their alternative terms and adapted search strategies for each database. Details of search terms and strategies used can be found as supplementary file 1a (available at <http://links.lww.com/PR9/A54>).

### 2.3. Data screening

A pair of authors (S.S. and Sw.S., and A.P. and M.P.) independently screened the title and abstract of all the articles. Disagreements about inclusion were resolved through discussions. A third independent reviewer (S.S. or A.P.) who was not a member of the original pair made a final decision in case consensus was not reached. We then performed the screening of the full-text articles that required further reading. Next, we performed data charting (see below).

### 2.4. Data charting process

Data charting was performed using an Excel spreadsheet created by S.S. The form was pretested on 10 studies by first 5 study authors and finalized. One of 4 authors (A.P., M.P., S.S., and Sw.S.) then extracted data from the included studies, and a second author confirmed that the data were extracted correctly. If included studies were authored or coauthored by one of the

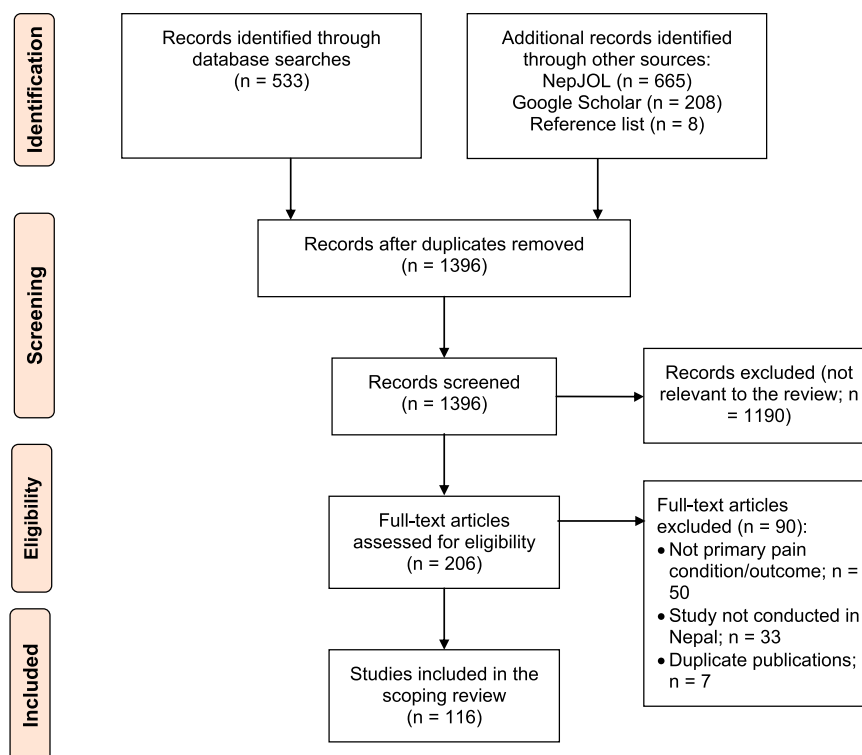


Figure 1. Flow diagram.

authors of this review, a review author who was not the author of the study extracted the data. Any discrepancies were discussed with S.S., and the final decision was made through consensus. Based on the results from all the studies included, the lead author (S.S.) classified the studies into key themes to organize the presentation and discussion.

### 2.5. Data items

We extracted data related to (1) the year of publication, (2) place of data collection/research, (3) source of publication (local or international journal, PubMed indexed or not indexed journal), (4) study design (qualitative study, clinical trial, study protocol, observational design, case series, or case studies), (5) study setting (clinical, community, or mixed), (6) population studied (headache pain, musculoskeletal pain, postoperative pain, and low back pain), (7) participant characteristics (age and sex), (8) measures used, (9) treatment delivered, and (10) key findings.

### 2.6. Synthesis of results

We computed the frequency for publication types, setting (community or hospital), study design, type of pain condition, age categories, and scope of the study. We then classified the results based on the broader themes of pain research, for example, interventional studies (medical or surgical management and rehabilitation), epidemiological studies, outcome measurement studies, and diagnostic studies.

## 3. Results

A total of 1414 articles were identified, of which 116 studies were included in the review (**Fig. 1**). A complete list of included studies is presented in the supplementary file 1b (available at <http://links.lww.com/PR9/A54>).

### 3.1. Characteristics of sources of evidence

Eighty-seven studies (75%) were published in Nepalese journals. Eighty-five studies (73%) were conducted in clinical settings and 8 (7%) in community settings. The most common study design was cross-sectional design (40%), followed by randomized controlled trials (35%). The most commonly studied pain condition was postsurgical pain (33%), followed by musculoskeletal pain (16%), headache (14%), and low back pain (13%). The majority of studies were conducted in adults (76%), followed by studies that included both adolescents and adults together (9%). Only 3% of the studies were conducted with children only. Detailed characteristics of included studies are presented in **Table 1**.

### 3.2. Themes of identified studies

A total of 40% studies focused on medical management, followed by studies on prevalence/incidence of pain conditions (21%), diagnostic studies (15%), and surgical management and outcome measurement (8% each; see **Fig. 2** and the Tables in supplementary file 2, available at <http://links.lww.com/PR9/A54>).

#### 3.2.1. Interventional studies

A total 29 of 46 studies (63%) studied postoperative analgesia. Four studies (9%) tested the effectiveness of steroid injections and 3 the effectiveness of epidural steroids for back pain. The

**Table 1**

### Characteristics of sources of evidence.

Study characteristic domain	Frequency (n = 116)	Percentage
<b>Pain types and or sites</b>		
Postsurgical pain	38	33
MSK pain (excluding low back pain)	18	16
Headache pain of different origins	16	14
Low back pain	15	13
Chronic pain (general)	6	5
Neuropathic pain	6	5
Pelvic pain	3	3
Labour pain	3	3
Scrotal or penile pain	2	2
Orofacial pain	2	2
Abdominal pain	2	2
Mixed pain (MSK and abdominal pain)	1	1
Pain due to infection	1	1
Widespread pain	1	1
Cancer-related pain	1	1
Chest pain	1	1
Pain after trauma	1	1
<b>Age categories</b>		
Adults (18 y and older)	88	76
Adolescent and adults (10 y and older)	11	9
All ages	5	4
Pediatrics	3	3
Pediatrics and adolescent (younger than 18 y)	2	2
Missing	7	6
<b>Study designs</b>		
Cross-sectional study	46	40
Randomized trial	41	35
Case study or case series	14	12
Longitudinal study	12	10
Trial protocol	1	1
Qualitative study	1	1
Nonrandomized comparative study	1	1
<b>Setting</b>		
Hospital/clinical setting	85	73
Mixed sample	11	9
Community	8	7
Workplace or university sample	6	5
Base camp (mountains) or trekking route	3	3
Health camps*	2	2
Online survey	1	1

\* Health professionals' visit in rural community for the diagnosis and treatment of health conditions. MSK, musculoskeletal.

most commonly studied postoperative pain management drug was bupivacaine (n = 17), followed by morphine (n = 9) and tramadol (n = 6). Nine studies (8%) evaluated the role of surgical procedures in pain. Only 3 studies studied rehabilitation interventions, 2 of which studied effect of posture on post-lumbar puncture headache, and 1 was a protocol of a feasibility trial.<sup>14,15,29</sup>

#### 3.2.2. Prevalence and incidence of pain conditions

Estimates of prevalence or incidence of musculoskeletal conditions were most commonly studied (n = 9 studies), followed by headache disorders (n = 8), chronic pain (n = 2), and neuropathic pain (n = 2).

Prevalence of any pain condition in a community sample was 50%, 94% of which were chronic pain.<sup>3</sup> Prevalence of low back pain ranged from 52% to 91%, and musculoskeletal pain ranged from 35% to 70%. In a large population level survey of 2100 individuals, 85% of the participants reported headache in the last year.<sup>20</sup> Details are summarized in **Table 2**.

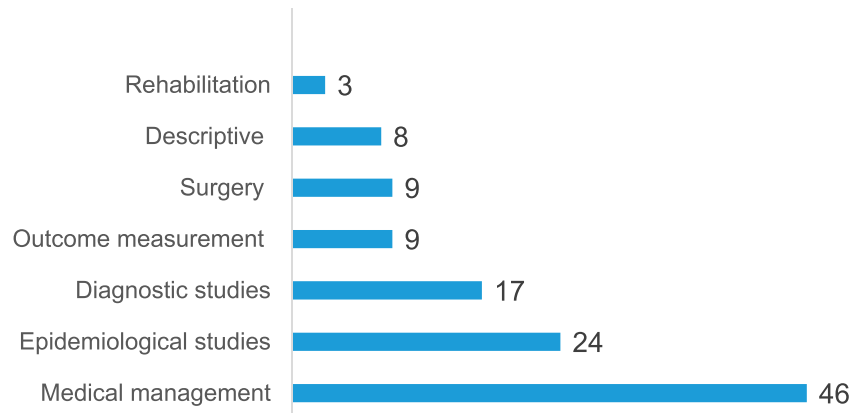


Figure 2. Study scope or purpose.

### 3.2.3. Outcome measurement studies

Nine studies focused on outcome measurement<sup>1,25,31–35,37,39</sup> with 7 examining the psychometric properties of patient-reported measures in pain population.

### 3.2.4. Diagnostic imaging and investigation studies

Of 17 diagnostic studies identified, 3 used computed tomography scan in diagnosis of headache disorders<sup>10,22,43</sup> and 3 used a magnetic resonance imaging for diagnosis of low back pain.<sup>13,24,44</sup>

### 3.2.5. Cost of pain treatment

One community survey on a sample of 882 participants in Eastern Nepal reported the cost of chronic pain treatment, with the participants reporting that they spent an average of 8.4% of their total income for chronic pain treatment.<sup>3</sup>

## 4. Discussion

This systematic scoping review of research related to pain in Nepal identified 116 articles. Most studies evaluated the efficacy of biomedical interventions or studied pain prevalence. These findings indicate a predominance of the biomedical model of pain in Nepal. The review also identified some areas of research redundancy and critical knowledge gaps, which have both research and clinical implications for Nepal, and also perhaps for other similar developing countries.

### 4.1. Areas of research redundancy

Most published studies asked similar (and sometimes even the same) research question(s) in identifying optimal medical management of postoperative pain, effect of posture on spinal headache, or use of imaging for diagnosis of a nonspecific pain conditions. This suggests a potential problem of a waste of limited research resources. Also, the focus on imaging research

represents a potential ethical problem, given that diagnostic imaging is rarely recommended for chronic pain management.

### 4.2. Knowledge gaps

The findings highlight several gaps in the topic areas of pain research in Nepal. First, no studies were identified that sought to estimate the incidence or prevalence of a number of important pain conditions, or pain in specific populations, including pediatric pain, cancer pain, and pain in ageing populations. Also, the studies that estimated the prevalence of pain conditions were usually limited to very specific regions of the country and had small samples. Large population-level studies to estimate prevalence and incidence of various pain conditions would provide better estimates of disease burden. Third, research studies to cross-culturally adapt patient-reported outcome measures were limited to adult populations and patients with chronic pain or musculoskeletal pain. Cross-cultural adaptation of patient-reported outcome measures in other pain populations is needed to advance research in these areas. Finally, there were very few studies that focused on biopsychosocial assessment and pain management.

### 4.3. Recommendations for research

#### 4.3.1. Limiting redundant research

Several approaches could be adapted to limit redundant research. First, researchers should perform comprehensive reviews of the literature before conducting any clinical trial. If meta-analyses of intervention studies have not been reported in the literature, this would be a more valuable contribution than a redundant additional trial. Second, associations and the national research authority (NHRC, Nepal Medical Council, and Nepalese Association for the Study of Pain in the context of Nepal) should consider encouraging researchers to prospectively register clinical trials. Along these lines, national journals should mandate clinical trial registration before data collection for an article to be considered for publication, consistent with the recommendations from International Committee of Medical Journal Editors.<sup>5</sup>

**Table 2****Prevalence of pain conditions.**

Pain condition	Population	Prevalence
Musculoskeletal pain		
All musculoskeletal pain	Surgeons	70%
	Community sample	44%
	Children working in brick kiln	37%-56%
Low back pain	Dentists	52%-91%
	Community sample	71% (w 74%; m 68%)
	Nurses	65%
	General working adults	63%
	Surgeons	60%
Neck pain	Software professionals	57%
	Dentists	52%
Shoulder pain	Dentists	50%
	Software professionals	38%
Upper back pain	Dentists	42%
Wrist and hand pain	Software professionals	40%
	Dentists	37%
General body pain	Software professionals	36%
Headaches		
Headache	Population survey	85%
Chronic headache	Outpatients visit	1%
High-altitude headache	Mountain climbers	83%
Spinal headache	Patients undergoing spinal anesthesia	25%
Chronic pain	Community sample	48%-50%
Any pain	Leprosy	52%
Neuropathic pain	Leprosy	35%
Dysmenorrhoea	Women in reproductive age	85%

m, men; w, women.

**4.3.2. Mobilizing research funding for pain research**

Addressing the burgeoning pain problem in Nepal requires more thoughtful use of limited research funds. Identifying pain as a research priority is the first step. Funding should be directed towards (1) developing additional culturally appropriate outcome measures, (2) implementing clinical practice guidelines, (3) evaluating the challenges for implementation of guidelines, and (4) conducting effectiveness trials of population-level interventions, including the analysis of cost-effectiveness.

**4.3.3. Administering scales and outcome measures**

Researchers should consider using valid, reliable, and responsive instruments with reference to core-outcome sets for clinical trials.<sup>4,6</sup> When a desirable instrument is unavailable in a local language, a first step would be to cross-culturally adapt and validate the needed instrument(s) using recommended guidelines.<sup>2,7</sup>

**4.4. Recommendations for practice**

Overall, clinical assessment and treatment of pain should align more with contemporary clinical practice guidelines. The respective regulatory authorities and pain society should reinforce the use of treatment guidelines among their members.

**4.4.1. Preventing overdiagnosis and overtreatment of pain conditions**

Clinicians should stop routinely using expensive and sometimes invasive diagnostic procedures, including imaging, for nonspecific pain conditions.<sup>8,28,42</sup> These diagnostic procedures can have significant costs and have limited benefits.<sup>40</sup> The "Choosing Wisely" Campaign ([www.choosingwisely.org](http://www.choosingwisely.org)) could

help clinicians and consumers in appropriate use of diagnostic tests and interventions in Nepal.

Invasive interventions, including surgeries and injections which continue to be provided for the management of pain conditions in Nepal, have significant risks and have been shown to have limited benefits.<sup>16,18,19,23,27,41</sup> Thus, some of these treatments should be avoided until further better evidence supports their safety and efficacy.

**4.5. Study strengths and limitations**

We adapted recommended guidelines for conducting and reporting a scoping review<sup>26,46</sup> and performed comprehensive literature searches. However, we did not search the grey literature (other than Google Scholar). A systematic review of the research literature that included a critical appraisal of methodological quality of pain research conducted in Nepal would provide an overview of quality of research conducted in the country.

**5. Conclusions**

Most articles identified focused on the biomedical diagnosis and treatment of pain, suggesting a biomedical focus of pain research and clinical practice in Nepal. Pain diagnosis and management should be in line with clinical practice guidelines, include more comprehensive contemporary biopsychosocial approaches, and a pain research priority agenda should be supported at the national level.

**Disclosures**

Eleven of 116 included studies (9%) are authored by one or more author(s) of the current scoping review. Otherwise, the authors have no other conflicts of interest to declare.

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**Appendix A. Supplemental digital content**

Supplemental digital content associated with this article can be found online at <http://links.lww.com/PR9/A54>.

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