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Review

Direct, indirect and intangible costs of acute hand and wrist injuries: A systematic review

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ABSTRACT

Background: Injuries sustained to the hand and wrist are common, accounting for 20% of all emergency presentations. The economic burden of these injuries, comprised of direct (medical expenses incurred), indirect (value of lost productivity) and intangible costs, can be extensive and rise sharply with the increase of severity.
Objective: This paper systematically reviews cost-of-illness studies and health economic evaluations of acute hand and wrist injuries with a particular focus on direct, indirect and intangible costs. It aims to provide economic cost estimates of burden and discuss the cost components used in international literature.
Materials and methods: A search of cost-of-illness studies and health economic evaluations of acute hand and wrist injuries in various databases was conducted. Data extracted for each included study were: design, population, intervention, and estimates and measurement methodologies of direct, indirect and intangible costs. Reported costs were converted into US-dollars using historical exchange rates and then adjusted into 2015 US-dollars using an inflation calculator
Results: The search yielded 764 studies, of which 21 met the inclusion criteria. Twelve studies were cost-of-illness studies, and seven were health economic evaluations. The methodology used to derive direct, indirect and intangible costs differed markedly across all studies. Indirect costs represented a large portion of total cost in both cost-of-illness studies [64.5% (IQR 50.75–88.25)] and health economic evaluations [68% (IQR 49.25–73.5)]. The median total cost per case of all injury types was US$6951 (IQR $3357–$22,274) for cost-of-illness studies and US$8297 (IQR $3858–$33,939) for health economic evaluations. Few studies reported intangible cost data associated with acute hand and wrist injuries.
Conclusions: Several studies have attempted to estimate the direct, indirect and intangible costs associated with acute hand and wrist injuries in various countries using heterogeneous methodologies. Estimates of the economic costs of different acute hand and wrist injuries varied greatly depending on the study methodology, however, by any standards, these injuries should be considered a substantial burden on the individual and society. Further research using standardised methodologies could provide guidance to relevant policy makers on how to best distribute limited resources by identifying the major disorders and exposures resulting in the largest burden.

Contents

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Introduction

Injuries sustained to the hand and wrist are common and account for approximately 20% of all emergency department presentations [1,2]. While most people with uncomplicated injuries will recover full function, some will require a long period of recovery and rehabilitation, and a proportion of these individuals face the potential of long-term disability. The burden of these injuries can be very extensive and is thought to rise sharply with the increase of severity contributing significant cost to both the individual and society [2–4].

Literature to date has mostly provided isolated descriptions of burden in specific health systems, with high levels of heterogeneity in methodology [3]. These variations can make it difficult to guide decisions based on evidence-based research, and can lead to misinformed strategies when attempting to mitigate the burden. Accurate and consistent estimates of health burden at a population level, whether using a state, national or global focus have several significant benefits. First, they can attract the attention of policy makers and the community by showing the size of a problem. Second, they can provide guidance to policymakers on how to allocate limited resources by identifying the major disorders and the exposures resulting in the largest burden. Finally, they can identify possible strategies for reducing the cost of injury by implementing appropriate preventative action or treatment strategies [5,6].

We therefore aimed to provide an accurate estimate of the burden of injury from a societal perspective using cost-of-illness (COI) studies and health economic evaluations by systematically reviewing published estimates relating to acute hand and wrist injuries. To assist readers in understanding some of the basic principles of health economics pertinent to the studies summarised in this review, a brief overview of important concepts related to COI and health economic evaluation studies is presented below.

Cost-of-illness (COI) studies

The economic burden of a disease is described as the sum of all costs associated with a condition that would not be incurred if that disease did not exist [7,8]. This approach calculates how much a society spends on a particular disease by totaling direct, indirect, and intangible costs [1,3,6,9].

Direct medical costs relate to diagnostics and the actual treatment provided (e.g. surgery, inpatient admission, medications, imaging, and postoperative care) [3,9]. Direct non-medical costs are costs and resources used in connection with the health service but are not health sector costs (e.g. transport to and from medical facility). These expenses are easily overlooked when estimating disease burden, but can be significant.

Indirect costs most commonly relate to productivity losses due to morbidity and mortality that are borne by the individual, family, society or the employer [3,8,9]. These costs are due to work absences resulting in foregone productivity (absenteeism), reduced work capacity due to impairment related to their condition (presenteeism), and unpaid productivity (reduced possibilities of performing usual activities at home such as housework or caring for family members) due to illness or disease [7,8,10–12]. Indirect costs are often harder to calculate than direct costs as it is difficult to measure productivity when considering presenteeism or unpaid roles objectively or with certainty.

Intangible costs extend beyond the monetary costs of goods and services and include other sequelae that reflect decreased enjoyment of life because of illness. Such costs are associated with functional limitations, pain, psychological distress, and decreased social interaction [13]. The inclusion of intangible costs when estimating the economic burden varies because an accurate quantification in monetary terms is difficult [6,14–16]. It is, however, important to recognise that the consequences of a given condition combine to create a burden for the individual that, while difficult to calculate, should still be considered in the economic equation [17,18].