

RESEARCH PAPER**A DESCRIPTIVE STUDY ON HAND INJURIES PRESENTED TO A TERTIARY CARE HOSPITAL IN SRILANKA**Wickramaratne PAJN¹¹Senior Registrar, Emergency Medicine, Post Graduate Institute of Medicine, Sri Lanka**Corresponding Author:** Wickramaratne PAJN email: nilankawickramaratne@ymail.com

Abstract

Hands can be considered as the body part which directly contributes towards a considerable spectrum of economical and habitual survival of mankind. Therefore, it is extremely important to manage these injuries with maximum care and accuracy. A descriptive cross-sectional study was conducted at the Orthopaedic unit, National Hospital Sri Lanka for a period of three months duration in 2020. Sample size was 150 and participants were selected by using the consecutive sampling technique. An interviewer administered data collection sheet and a data extraction sheet were used as the study instruments. Data analysis was done by using SPSS version 25.0. Project was ethically cleared by the ethics review committee of National Hospital of Sri Lanka. Mean age of the study participants was 40.92 years (SD=14.23). A male predominance was observed in the study findings (N=123; 82.0%). Occupational injuries were commonly observed (42%) and work place was considered (36%) as the place with the highest risk. Majority of the hand injuries were soft tissue injuries (62.0%). Hand injuries were commonly observed during wood work. Occupational injuries (OR=2.41), hand injuries caused during road traffic accidents (OR=2.31) and injuries occurred during usage of tools (OR=2.4) were significantly associated with surgical interventions. Fractures and soft tissue injuries are the most common hand injuries reported in Sri Lanka. Occupational interventions and road traffic accidents provide a larger contribution for hand injuries. A significant majority of the patients with hand injuries demand surgical treatment procedures. Usage of safety measures and personal protective equipment play an important role in reduction of severity of injury and prevention of hand injuries. It is appropriate to pay attention on developing specified acute hand injury management protocols and display them at emergency management centres for rapid access. Using Personal Protective Equipment according to accurate protocols should be promoted and using hand held instruments with adequate safety measures should be emphasized. Stakeholders external to the health sector should be identified for hand injury prevention promotion activities and special attention should be paid on programs with multisectoral contribution.

Introduction

An injury can be simply defined as any type of harm or physical trauma to the body or any part of the body caused by an external force (1). At the time of injury or after an injury many pathological changes could occur at the site of injury or at other parts of the body (2). These pathological changes may or may not require medical interventions. Classification of injuries around the world are done according to many methods(3). Classification according to injury type is commonly observed and other methods include location of injury, etiological factors of injury and activities of victim at the time of injury. However, injuries can be defined as a health care morbidity which should be considered in several aspects and which absorbs considerable amount of health care resources. Around the world, injuries are responsible for 5.2 million deaths for a single year (4). 16% of the disabilities in a single year are caused by injuries. 90% of the injury related mortalities and morbidities are reported from low- and middle-income countries. In Sri Lanka, 11% of the hospital admissions occur due to injuries(5). According to the weekly epidemiological report October 2013," 49 fatal and 1525 non-fatal occupational accidents were reported(6). Industrial Safety Division of the Ministry of Labour reports that, Sri Lanka losses around 500,000 man-days each year owing to occupational accidents(7). Home accidents are another important area where more concern may be needed. The exact magnitude of this problem is not known." Major proportion of injuries mentioned above must be related to hand injuries(8).

Hands can be considered as the body part which directly contributes towards a considerable spectrum of economical and habitual survival of mankind. Wide range of applicability of hand skills among humans has created a pathway for eventual improvement and development of human nature. Therefore, temporary or permanent loss of functions of hands due to any pathological condition could affect any person's not only health, but also his/her earning capacity and socio-economic stability of his/her family as well. Although, it is essential to reverse any morbidity created by an injury, it may not be practical to achieve this goal. As a result, a hand injury becomes a more challengeable health incidence. For any type of injury, patients seek initial treatment from an emergency care unit of the hospital. Therefore, it is extremely important to manage these injuries with maximum care and accuracy. Because there are higher chances of creating life-long effects for the victim with any mistake done at the initial treatment unit. On the other hand, patients present to emergency treatment units with various types of first-aid interventions which are not always rational. This situation also creates a challenging environment for initial health management procedures.

Methodology

Hospital based descriptive prospective study was conducted in Accident & Orthopaedic service unit at National Hospital, Sri Lanka. All admissions to the Accident & Orthopaedic service of the National Hospital

of Sri Lanka. Patients admitted to the accident service unit as a result of hand related injuries were included and Participants who underwent self-inflicted injuries, Injuries due to assaults, people who went missing from the ward without knowledge were excluded from the study. Data were collected by using a two-part data collection sheet which included an interviewer administered questionnaire and a data extraction sheet to collect relevant clinical findings and management details from the clinical records. An interviewer administered questionnaire was administered to patients which included information regarding the incident, general information and contributing factors. Also, hospital records were used to evaluate injuries occurred due to accident; in case patient was transferred from another hospital, details of patient's injuries and treatment were traced from those relevant hospitals. Hand injury

severity score was calculated for each patient according his/ her injuries and was used for analysis.

Results

Age of study participants ranged from 21 years to 74 years (Mean=40.92 years and SD=14.23 years). Majority of the study participants were included into the 21-30 years age group (N=48; 32.0%). Significant majority of the study participants represented male gender ($z=11.1$; $p<0.001$) (Table 1). When the nature and the location of occurring hand injuries are considered, occupational injuries appear more frequent. Significantly larger number of hand injuries were reported at the domestic setup as well. Work places demonstrate a higher vulnerability for occurring hand injuries. Domestic setup and road traffic environment also exhibit a significant vulnerability for occurring hand injuries (Table 2).

Table 1 : Distribution of age and sex of the study participants.

	Frequency(N)	Percentage (%)
Age Category		
21-30 years	48	32.0
31-40 years	28	18.7
41-50 years	32	21.3
51-60 years	23	15.3
>61 years	19	12.7
Sex		
Male	123	82.0
Female	27	18.0
Total	150	100.00

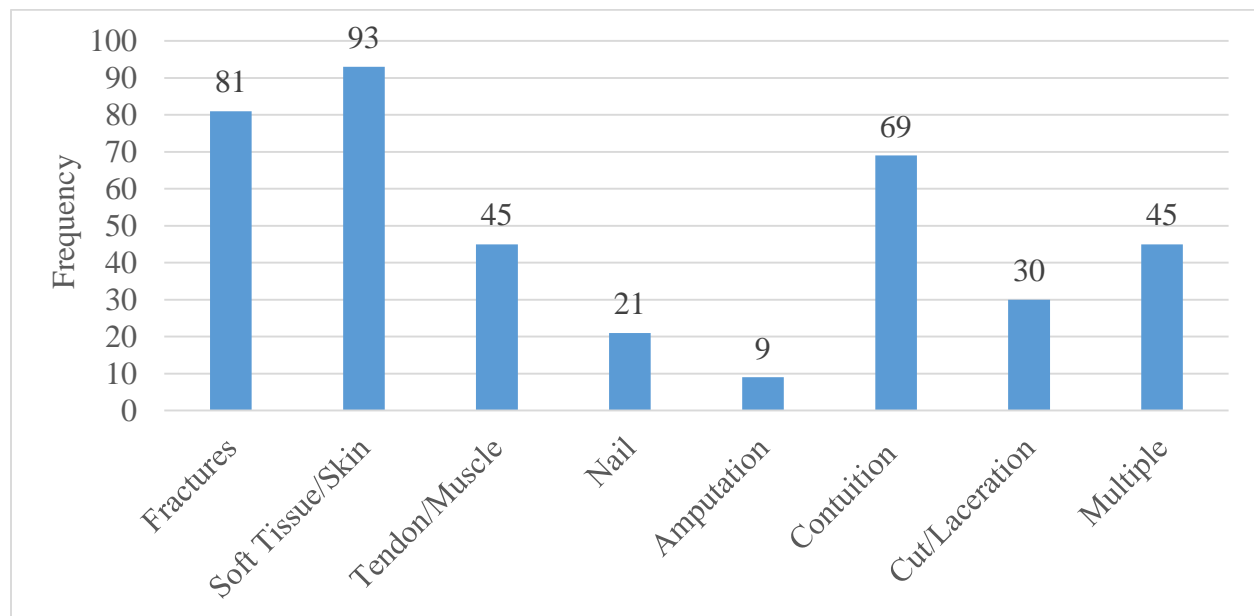
Table 2: Distribution of nature and location of injuries taken place

		Frequency	Percentage (%)
Nature	Occupational	63	42
	Recreational	15	10
	Domestic	36	24
	Travel	30	20
	Other	6	4
	Total	150	100
Location	Home	39	26
	Public area	15	10
	Street	36	24
	Work place	54	36
	Other	6	4
	Total	150	100

Majority of the study participants were hospitalized due to soft tissue injuries. Also, a considerable majority of the participants were admitted due to fractures. Number of

the study participants who got admitted to hospital due to more than one injury type was 30% (N=45) (Figure I).

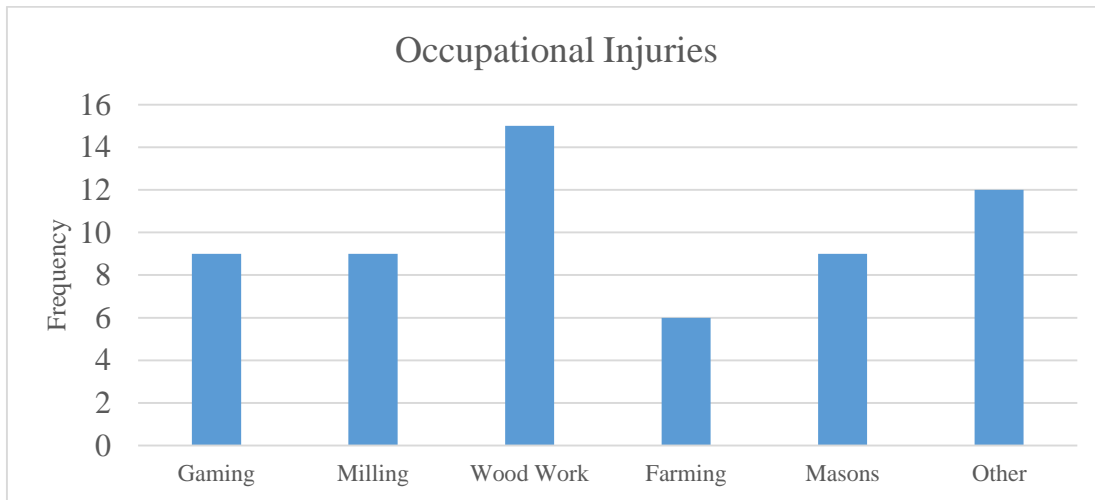
Figure I: Distribution of injuries.



When day to day injuries were considered, significant majority had experienced injuries associated with their occupation. Work place

of the study participants was noted as the most prone place for occurring injuries (Figure II).

Figure II : Distribution of occupational injuries



When the aetiological factors for occurring injuries were considered, road traffic accident was noted as the most common cause for occurring injuries. 35 hand injuries

were reported due to unexpected collisions and 33 injuries had occurred during usage of different instrumental tools (Figure III).

Figure III : Distribution of etiological factors of hand injuries

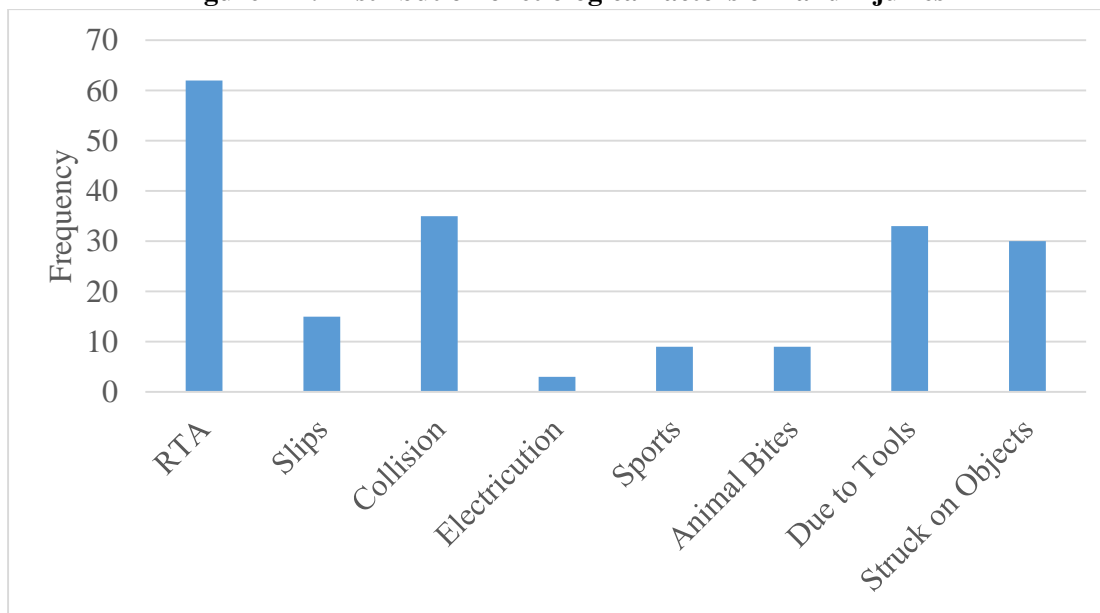


Table 3 : Associated characteristics of injuries which underwent surgical procedures as the treatment method.

	Underwent Surgery		OR	95% CI
	Yes	No		
Alcohol				
Yes	12	18	0.714	0.316-1.61
No	56	60		
PPE used				
Yes	15	12	1.52	0.66-3.53
No	54	66		
Collison				
Yes	20	15	1.71	0.079-3.69
No	49	63		
Recreational				
Yes	3	12	0.25	0.067-0.927
No	66	66		
Occupational				
Yes	36	24	2.45	1.25-4.81
No	33	54		
RTA				
Yes	35	24	2.31	1.18-4.54
No	34	54		
Domestic				
Yes	21	15	1.83	0.85-3.93
No	48	65		
Due to tools				
Yes	21	12	2.40	1.08-5.36
No	48	66		
Falls				
Yes	3	12	0.25	0.067-0.927
No	66	66		

A significant association was noted between experiencing surgical procedures as treatment method when hospitalized with hand injuries and encountering the injury as an occupational injury. A significant association was also noted between

experiencing hand injuries with road traffic accidents and experiencing surgical procedures as the treatment method. Significant majority of the participants who experienced recreational activity associated injuries were not subjected to surgical

procedures and they were settled with inward treatment methods. A significant association was not identified between having influence of alcohol at the time of injury and being subjected to surgical procedures for treatment. Also, a significant association was not identified with wearing PPE at the time of experiencing injury and being subjected to surgical procedures for treatment (Table 3).

Discussion

Present study findings confirm that there is a higher vulnerability for occurring hand injuries among male gender and at specific occupational settings. These findings were demonstrated in a study done in 2010 by Siddigh et al as well (9). But, Trybus et al had shown that there is 20% contribution from occupational settings for occurring hand injuries(2). Only hospital admissions were included into the present study and minor injuries which occur at domestic setup were not included. Therefore, comparing these data could create many problems. On the other hand, Neiman et al in Finland had confirmed that male gender and people included into the working age group are more prone to get hand injuries(10). Present study findings also confirm above results. However, it is expected that when people acquire occupational injuries, irrespective of the severity of the injury, there could be a higher incidence of hospital admissions, as hospitalization appears mandatory for obtaining claims. Therefore, it is possible to expect that, in a hospital-based study, presentation of occupational injuries is higher than presentation of domestic injuries at any setting. Identified vulnerability for hand

injuries among 21 years to 40 years age group during the present study appears compatible with the findings of the study done in India by Ashwili Gupta et al and the study done in Finland by Neiman et al(10,11). However, it is a well-known fact that male gender is more prone to be involved in procedures with high risk when compared with female gender. Also, it is possible to observe facts that reveal the incorporated contribution of machinery injuries, occupational injuries, male gender and Road Traffic Accidents towards hand injuries.

Hand skills can be considered as a predominant factor which affects the economic stability of a person as well as a physical ability which builds one's personality throughout his career. Therefore, limitation of hand skills due any pathological condition creates more burden than limitation of any other organ of the body. Most often, hand injuries do not create life threatening situations. But effects created due to encountered disabilities could last for a lifetime. Therefore, it is more cost-effective to prevent hand injuries than prevention of other disease conditions.

According to the study findings, it is demonstrated that most vulnerable situations for hand injuries are occupational settings and RTA. On the other hand, usage of many types of instruments and tools contributes for occurring hand injuries. To face these situations, most suitable and essential practice should be usage of PPE. But, according to the study findings, it is demonstrated that significant number of study participants who experienced injuries

were using PPE at the time of injury. At this stage, two main factors emerge as an explanation and one is identified as presence of collected data associated information bias. Other concern includes incorrect usage of PPE at the time of injury. To correct these errors, it is suitable to pay more attention on health promotional interventions. As this situation cannot be corrected by the health sector alone, it is more beneficial to implement a multisectoral involvement to achieve this goal.

Remarkable number of orthopaedic interventions were also recorded and they may require longer postoperative follow-up period as well. Therefore, health care burden created due to these injuries and the out of pocket expenses to the patient are relatively high. On the other hand, it could be difficult to achieve complete cure for the patient as well. All these injuries can be considered as acute health incidences and initially they present to the emergency treatment unit of any hospital. Initial management at these emergency treatment units significantly affects the long-term outcome of these injuries. More often, patients are taken to the hospital following application of local treatment methods or informal first-aid procedures. Therefore, it is more beneficial to carry out programs to upgrade knowledge on managing hand injuries and proper training programs at emergency treatment units of

Conclusions

Fractures and soft tissue injuries are the most common hand injuries reported in Sri Lanka. Occupational interventions and road traffic accidents provide a higher contribution for

main hospitals. Study findings demonstrate that significant number of injuries are identified as fractures and long-term application of informal treatment methods for a fracture could result in seriously harmful effects. Human hand comprises of a complex vasculature which permits a higher bleeding tendency with a sharp instrumental injury. According to the study findings, considerable number of cut injuries resulted from sharp instruments are also recorded and therefore, it is more beneficial to focus more attention on developing skills to manage these emergencies as well.

It is important to prepare specific user-friendly protocols for acute management of most common injuries according to study findings and display these protocols at emergency management units for easy referral. This preparation may help to minimise the adverse effects created due to many human resource deficiencies at any emergency situation.

Study findings indicate that there is a distinct need for creating awareness among general public regarding prevention of hand injuries, basic interventions and first-aid activities required during an accidental hand injury. It is preferable to draw attention of relevant policy makers and stakeholders regarding this concern.

hand injuries. A significant majority of the patients with hand injuries require surgical treatment procedures. Usage of safety measures and personal protective equipment play an important role in reduction of injury

severity and prevention of hand injuries. It is appropriate to pay attention on developing specified acute hand injury management protocols and display them at emergency management centers for rapid access.

Using Personal Protective Equipment according to accurate protocols should be

promoted and using hand held instruments with adequate safety measures should be emphasized. Stakeholders external to the health sector should be identified for hand injury prevention promotion activities and special attention should be paid on programs with multisectoral contribution.

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