

Clinico-Demographic Profile of Orthopedic Trauma in a Tertiary Hospital from 2015 - 2019

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Abstract- The present descriptive-quantitative study described the Orthopedic trauma incidence in Western Visayas State Medical Center from 2015-2019. This study was conducted to determine the clinic-demographic profile of orthopedic trauma locally which would be a basis for the data for the community. There were 4299 orthopedic qualified patients for this study. Checklist for the demographic profile of the patients was used to gather the data. Descriptive statistics was used for data analysis that includes frequency count and percentage. As described in the results of Orthopedic trauma, fractures, dislocations and amputations were most often caused by vehicular accidents and fall. Other causes of trauma include machinery, gunshot, assault, and others. Results also revealed that most of the patients were male and unemployed. These outcomes contributed to the overall mortality and morbidity which caused a major burden on the health system and economy of the country. In this study, it is recommended for a better understanding of the epidemiology of trauma cases should be considered in formulating better road safety as well as post trauma care. However, due to poor documentation, the epidemiology of trauma was not well understood and it was also suggested in this study to use the AO/OTA classification of fractures used in the face chart for the better and easier data interpretation. Furthermore, these data will be available for the sectors that can find it useful especially the health sector which identifies those who are at risk and can then develop preventive measure to decrease the incidence of orthopedic trauma.

Index Terms- Age, Diagnostics, Disposition, Location of injury, Management

I. INTRODUCTION

Trauma is defined as injury caused by an external blunt or penetrating force that results to concussion, cuts or fractured bones.²¹ In orthopedic medicine, orthopedic trauma includes severe injury to the musculoskeletal system (muscles, joints, ligaments, bones, and soft tissue).²² These trauma injuries include fractures², dislocations³⁸ and amputations³⁶. Most trauma which often result from vehicular accidents include collision with another vehicle, pedestrian, animal, geographical

and architectural obstacles.⁴⁵ According to the study of Consunji et al. (2011),¹⁰ 28.6% of the admitted patients in the Trauma Division of Philippine General Hospital are due to vehicular accident. The top 3 common vehicles involved in road traffic accidents in the Philippines are the automobiles, motorcycles, and jeepneys which contributed 27%, 21% and 19%, respectively.⁴⁵

Most of the developing countries, including the Philippines, are undergoing rapid modernization and industrialization, which has led to significant increase in the number of automobiles. In fact, in the year 2016, 3,921,795 vehicles were registered; a 2.2% increase from the previous year's 3,834,542.¹⁸ This has led to rise in number of trauma cases due to road traffic accidents (MVAs), thereby making it a major health hazard. In the year 2016, there were 12,560 reported cases of vehicular accidents in Western Visayas.²³ Previously, it was mainly a problem of the developed countries; but now, developing countries are also undergoing "epidemiology of transition" and hence facing similar challenge. Trauma is one of the leading health problems worldwide wherein 50% of all deaths occur within minutes of injury.²⁶ Trauma due to other causes such as injuries at work place¹⁵, home¹¹, fall¹², assault⁸, and gunshot injuries⁵ also contribute significantly to the overall mortality and morbidity. Since such a large number of trauma cases cause a major burden on the health system and economy of the country, a better understanding of the epidemiology of trauma cases can be very helpful in formulating better road safety as well as post trauma care. Due to poor documentation, the epidemiology of trauma is not well understood.

II. PROBLEM, METHODOLOGY, AND COLLECTION OF DATA

Locally, there is a lack of study with regards to the epidemiology of patients with orthopedic trauma. This is the first study to determine the clinico-demographic profile of orthopedic trauma locally which will be used as basis of data for the WVSU - MC department of Orthopedics.

This is a descriptive cross-sectional study (medical records review) which aims to determine the clinico-demographic profile

of patients with orthopedic trauma in West Visayas State University Medical Center.

Sex	2015	2016	2017	2018	2019	Total	%
Male	522	609	586	610	630	2957	68.78
Female	249	243	282	281	287	1342	31.22
Total	771	852	868	891	917	4299	100

The study analyzed all patients who satisfied the inclusion criteria that consulted at the Emergency Room of West Visayas State University from January 1, 2015 to December 31, 2019.

Inclusion Criteria

- All patients eighteen-year-old and above with orthopedic trauma who consulted at the Emergency Room of West Visayas State University Medical Center from January 1, 2015 to December 31, 2019.

Exclusion Criteria

- Pathologic fractures and fragility fractures
- Patients with established deformity or previously injured limb at the site of injury

III. RESULTS AND FINDINGS

Year	Frequency
2015	771
2016	852
2017	868
2018	891
2019	917
Total	4299

A total of 4299 patients were and West State Center in the specifically Orthopedics department.

The trend in incidence is shown in Figure 1.

Table 1: Total number of Orthopedic Patients

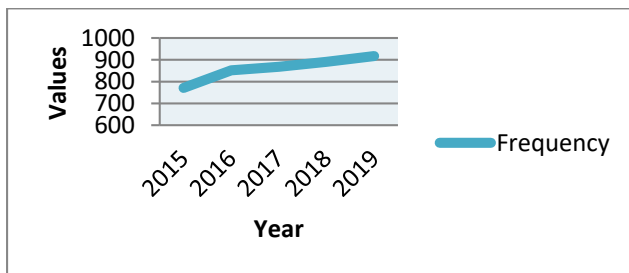


Figure 1: Incidence of Orthopedic trauma injuries per year

Of the 4299 cases with orthopedic incidence as respondents for the study, the largest group was 18-25 (23.45%) with a mean age

of 21.5 years, followed by the 26-35 (21.89%) age group with a mean age of 30.5 years old.

Table 2. Age of patients with Orthopedic Injury

Age	2015	2016	2017	2018	2019	Total	(%)
18-25	183	211	193	209	212	1008	23.45
26-35	175	196	184	184	202	941	21.89
36-45	111	138	151	157	131	688	16.004
46-55	111	95	95	123	120	544	12.65
56-65	83	88	97	96	103	467	10.86
66-75	48	70	61	59	66	304	7.07
75 above	60	54	87	63	83	347	8.07
Total	771	852	868	891	917	4299	100

In terms of sex, 68.78% of the 4299 qualified patients were males and only 31.22% were females.

Table 3. Sex of patients with Orthopedic Injury

As shown in the study, 45.78% of the patients were single, 45.20% were married and 9.03% was neither single nor married.

Table 4. Marital Status of patients with Orthopedic Injury

Marital Status	2015	2016	2017	2018	2019	Total	%
Single	345	378	396	418	431	1968	45.78
Married	354	409	376	397	407	1943	45.20
Others	72	65	96	76	79	388	9.02
Total	771	852	868	891	917	4299	100

The results of the study showed that majority of the patients who suffered from traumatic spinal injury were unemployed (36.89%), followed by 27.19% who were laborers, 16.77% did not answer in this section which means due to poor data gathering where the respondents were not able to answer this section, 11.19% were others, 4.21% were government employees, and the remaining 3.75% were farmers.

Table 5. Occupation of patients with Orthopedic Injury

Occupation	2015	2016	2017	2018	2019	Total	%
Unemployed	211	334	268	362	411	1586	36.89
Laborers	122	217	264	276	290	1169	27.19
Farmers	24	42	18	33	44	161	3.75
Gov't Employees	43	32	35	37	34	181	4.21
Others	124	100	104	78	75	481	11.19
Did not answer	247	127	179	105	63	721	16.77
Total	771	852	868	891	917	4299	100

Motor vehicular accidents (31.80%) and Fall (24.61%) were the most common causes of orthopedic trauma injuries. In this report, there were 37 patients who sustained gunshot injury (0.86%). Others (13.38%) and 25.28% had no records due to poor data gathering were reported in this study.

Table 5. Mechanism of injury of Orthopedic trauma per year

Mechanism	2015	2016	2017	2018	2019	Total	%
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MVA	232	291	226	277	341	1367	31.80
MVA (unspecified)	195	244	156	228	296	1119	26.03
MVA - Driver	21	29	44	24	28	146	3.40
MVA - Pedestrian	11	14	11	11	7	54	1.26
MVA- Passenger	5	4	15	14	10	48	1.12
Fall	148	191	225	237	257	1058	24.61
Machinery	11	15	19	12	8	65	1.51
Gunshot	10	5	11	9	2	37	0.86
Assault	21	32	22	22	13	110	2.56
Others	65	82	105	139	184	575	13.38
No record	284	236	260	195	112	1087	25.28
Total	771	852	868	891	917	4299	100

TABLE 6: LOCATION OF ORTHOPEDIC TRAUMA PER YEAR

Lower Extremity	2015			2016			2017			2018			2019		
	Open	Close	Total	Open	Close	Total	Open	Close	Total	Open	Close	Total	Open	Close	Total
Pelvis	0	8	8	1	7	8	0	13	13	2	19	21	0	9	9
Hip	2	54	56	1	48	49	0	61	61	0	44	44	3	67	70
Thigh	5	19	24	2	10	12	4	39	43	7	38	13	36	49	49
knee	5	42	47	9	24	33	9	48	57	11	62	73	30	56	76
leg	16	56	72	27	44	71	28	45	73	18	50	68	33	61	95
ankle	6	56	62	6	16	22	7	32	39	17	53	70	6	63	83
foot	8	31	39	16	17	33	17	71	88	8	52	60	12	53	85
Total	39	241	280	62	195	257	65	257	322	83	318	401	121	346	467

Upper extremity	2015			2016			2017			2018			2019		
	Open	Close	Total	Open	Close	Total	Open	Close	Total	Open	Close	Total	Open	Close	Total
Shoulder	2	89	91	3	89	92	5	82	87	1	138	139	5	126	131
Arm, humerus	4	19	23	6	15	21	1	9	10	1	18	19	2	13	15
Elbow	3	49	52	4	48	52	7	44	51	0	57	57	9	59	68
Forearm (radius/ulna)	6	50	56	65	9	74	15	36	51	7	72	79	13	73	86
Wrist (distal radius)	2	73	75	94	6	100	9	41	50	2	131	133	10	130	140
Hand	58	162	220	57	216	273	39	230	269	51	239	290	54	205	259
Total	75	442	517	229	383	612	76	442	518	62	655	717	93	606	699

Hip	6 (2.14)	274 (97.86)	280 (16.21)
Thigh	31 (17.92)	142 (82.08)	173 (10.02)
knee	54 (18.88)	232 (81.12)	286 (16.56)
leg	122 (31.69)	263 (68.31)	385 (22.29)
ankle	53 (20.62)	204 (79.38)	257 (14.88)
foot	101 (35.19)	186 (64.81)	287 (16.62)
Total	370 (21.42)	1357 (78.58)	1727 (100)

Table 7. Severity of Orthopedic trauma

As shown in the table 7 above, most of the orthopedic trauma injuries were mild since most of the injuries were close 82.53% and 78.58% in the upper and lower extremities, respectively. Only 17.47% for upper extremity and 21.42% lower extremity are open.

Table 8. Associated injuries of Orthopedic trauma

Associated injuries	Frequency	%
head	53	1.23
chest	30	0.70

abdomen	10	0.23
spine	12	0.29
genitourinary	3	0.07

Diagnostics	2015	2016	2017	2018	2019	Total	%
xray	525	582	547	578	510	2742	60.64
CT	15	18	25	20	20	98	2.17
MRI	0	0	0	1	2	3	0.06
Total	781	864	884	935	1058	4522	100

N=4299

Among the 4299 patients in the orthopedic department, there were identified associated injuries which include: head (53 patients), chest (30 patients), abdomen (10 patients), spine (12 patients) and genitourinary (3 patients)

Table 9. Diagnostics of Orthopedic trauma per year

Out of the 4299 patients with orthopaedic trauma injuries, most were diagnosed clinically using the x-ray (60.64%). Only 2.17% and .06% of the cases were able to undergo CT scan and MRI, respectively, mostly for pre-operative planning prior to doing surgery.

Table 10. Management of Orthopedic trauma per year

Management	2015	2016	2017	2018	2019	Total	%
surgical	253	277	330	350	529	1739	39.33
nonsurgical	516	576	536	564	491	2683	60.67
Total	769	853	866	914	1020	4422	100

Based on the cases of 4299 patients with orthopaedic trauma injuries, 60.67% were nonsurgical while 39.33% undergone the surgical process.

Table 11. Disposition of Orthopedic trauma per year

Disposition	2015	2016	2017	2018	2019	Total	%
Admitted	258	303	332	351	435	1679	39.06
Discharged	500	536	529	531	478	2574	59.88
Transferred	13	12	6	8	4	43	1.0002
Expired	0	1	1	1	0	3	0.07
Total	771	852	868	891	917	4299	100

The results showed that most patients were discharged (59.88%), followed by 39.06% who were admitted and only 1.0002% and 0.07% who were transferred and expired, respectively.

IV. DISCUSSION AND RECOMMENDATIONS

Discussion

Orthopedic trauma injury is one of the most serious injuries, which do not only affect the individual, but the entire family and community as well. The results of this study can be used as basis for WVSU - MC department of Orthopedics to decrease the orthopedic injuries and for the better implementation of strategies to better cater the patients. Based on the results of this study, the cases of orthopedic injuries during 2015-2019 increased rapidly from 771 to 917.

In this study, the 18-25 age group was the most commonly affected and 68.78% of the population were males. The most common mechanism of injury was motor vehicle accidents and

followed by accidental fall. The results of this study was the same with the study of (Rohilla, et al, 2019)³⁴ which states that the rise in number of trauma cases due to road traffic accidents (RTAs), thereby making it a major health hazard. In addition, all studies mentioned, motor vehicular accident and fall are the most common cause of injury, with male as the most commonly affected sex.

In a study by Hong-yong, et al. (2011)¹⁴, occupation was mentioned, in contrast to other studies that it was rarely mentioned. He reported that most of the population affected were unemployed individuals, followed by peasants and workers. In this study, it is noted that majority of affected individuals are unemployed, followed by laborers and other group of occupations.

The population mostly affected in this study were unemployed, and this could be one of the factors why only 28% and 27.4% of the cases were able to undergo CT scan and MRI, respectively. One possible factor for the diagnostics is that the institution only acquired an MRI unit later in the study and most cannot afford to pay out of pocket for MRI in other institutions. Those who consented for operation are the ones with complete radiographs, CT scan and MRI to be used for pre-operative planning.

In terms of the management, majority of the cases were managed non-surgically (60.67%) with Gardner-Wells tong application, rigid cervical collar and bracing. Economic status was one of the limiting factors why patients were not able to undergo surgical procedures for better stability of the orthopedic trauma injuries because of the high cost of spine implants and most of the injuries were close; therefore, they were not advised to undergo the surgical process and only 39.33% of the patients undergone the surgical process. Most of the patients were discharged (59.87%) after the treatment in emergency room and there were only 3 patients who did not sustain the injuries and eventually expired (0.07%).

Recommendations

Since this study is only limited by its population coming only from one institution and for only 5 years, it is suggested for future studies to have a topic regarding the Clinico-Demographic orthopedic trauma injuries in a wider scope and longer time.

The data gathering tools in this study did not anchor legibly on the variables of this study; thus, it is also recommended to the future researchers to use the AO/OTA classification of fractures used in the face chart for better and easier data interpretation. Lastly, the same study can be innovated and conducted in other institutions to make it a multicenter study.

It is also recommended that data from this study be used as basis to increase awareness of the population at risk, the debilitating effects of orthopedic trauma injuries to the family and increase awareness of the government and non-government offices, especially in the health sector, to better address the problems identified.

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