

Every Contact Leaves a Trace: A Cross-Sectional Study of Medico-Legal Cases in a Tertiary Hospital*

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ABSTRACT

Background: Cutaneous findings are the most common manifestations of abuse. Hence, a thorough dermatologic evaluation is crucial to rule out the possibility of injuries - accidental or intentional. Underreporting and incomplete documentation were also identified research gaps. The objectives of this study are to establish a baseline database, describe trends in the WCPU and ER medicolegal cases, and identify relationships among demographics, cutaneous findings, and injuries.

Methodology: This is a case-control study conducted in a Tertiary Hospital in the Philippines. Medico-legal records from the emergency room and WCPU during 2019-2023 were retrieved and analyzed.

Results: There were 2,611 WCPU Cases and 9511 ER Cases. Only 2,663 ER Cases (28%) have complete findings. The majority of the physically abused patients in the ER and WCPU perpetrators were adult males. Most WCPU patients were minor females. Only 25% of the WCPU cases were reported within three days. The majority of sexual perpetrators are not strangers to their victims. A significant fraction of sexual abuse is also incestuous. Several significant cutaneous findings suggestive of physical abuse were observed in this study. Intuitively, Gunshot wounds and stab wounds were associated with intentional injuries. Contusion and hematoma were more likely seen in cases of assaults involving accessible areas during altercations – the cheek, eye, eyelid, and nose. Injuries over protected body sites such as the chest and neck also warrant suspicion of intentional injuries. The abdomen, back, and chest were sites of predilection for both GSW and stab wounds.

Conclusion: It should be second nature for all physicians to identify dermatologic and demographic cues to rule out possible cases of abuse.

Keywords: Medico-legal cases, Physical Abuse, Rape, Forensic Dermatology, Dermatology

INTRODUCTION

Dermatologic Examination highlights a careful visual inspection, thorough history-taking, and diagnostic tests (e.g. biopsy) to come up with plausible diagnoses of skin lesions^[1]. Not obvious to most, dermatologic evaluation takes into consideration different etiologies including ruling the possibilities of injuries - may it be accidental or intentional. This is crucial since cutaneous lesions are the most common manifestations of abuse^[2]. Diseases like atopic dermatitis may mimic asphyxiation. Cigarette burns may present as ulcers with rolled-out borders seen in tumors. This proves an undeniable relationship between dermatology and forensic science^[3,4,5].

Forensic dermatology is a highly specialized field that deals with the examination of the skin, hair, and nails to identify the cause and mechanism of injury^[3]. It is not fully practiced in most countries including the Philippines. Currently, its utility is almost exclusive to medico-legal cases. However, screening for possible abuse should be second nature for all physicians^[3,4,5].

seen in the Emergency Room (ER) and Women and Children Protection Unit (WCPU) in a Tertiary hospital. Underreporting and incomplete reporting of findings were identified research gaps. Hence, the importance of delving into the completeness of dermatologic evaluation and the creation of a baseline census of medico-legal cases. The study identified the demographic profiles, cutaneous findings, and their associations to recognize dermatologic cues of physical abuse. The researcher also described the trends of medico-legal cases during the SARS- CoVid pandemic.

METHODOLOGY

Study Design

The study used a cross-sectional design. This was utilized to identify associations between and among age (minor or pediatric vs. adult patients), sex (male vs. female), nature of abuse (sexual vs physical; incest vs non-incest), type of injury, site of injury, and nature of injury (physical abuse vs accidental injuries; vehicular, Emergency Room (ER) and the Women and

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Children Protection Unit (WCPU) in a tertiary hospital.

Study Setting

The study was conducted at a Tertiary Hospital in the Philippines that offers medico-legal and Women and Children Protection Unit services. Data gathering and analysis were conducted for twelve months.

Study Population

The study included medico-legal cases with records in the ER and WCPU seen from 2019-2023. 2,611 cases from the Women Children Protection Unit and 2,663 cases in the Emergency Room were deemed complete.

Inclusion Criteria

Inclusion criteria are as follows: 1. Male or Female, 2. Adult and Pediatric patient, 3. Those who availed medico-legal services in the ER or WCPU from years 2019-2023, 4. With accessible and complete Medical Records.

The confidential and legal nature of WCPU cases limited the investigator's access to the entirety of the case files. Hence, for this study the researcher defined a complete WCPU record to include the date of consult, victim's age and sex, type of abuse, duration of reporting, and perpetrator's age, sex, and relation to the victim.

A complete ER record includes the date of consult, patient's age and sex, and type, site, and nature of injury. Records without specific site and nature of injury were still included in the demographics to further elucidate the completeness of forensic dermatology documentation in the ER setting.

Exclusion Criteria

Medico-legal cases seen before Year 2019 and after 2023 will be excluded. Those records deemed as incomplete by the research standards were also excluded.

Study Procedure

Data gathering commenced after the permission was granted and the accomplishment of necessary documents. The primary researcher gathered data supervised by Medical Records and WCPU Representative. Codes and identifiers had been used to uphold confidentiality. Unnecessary personal data were not accessed and obtained. Data were initially recorded in an Excel file and were stored in a secured and password-protected computer. Statistical Package for Social Sciences (SPSS) was used to process the data.

Tools and Instruments

The primary tool utilized in this study is a secured, encrypted, and password-secured laptop. Microsoft Excel will be used for storage. SPSS was used for data analysis.

Data Analysis

The collected data will be presented through tables and figures which will be further analyzed through Statistical Package of Social Sciences as the main Statistical Software. Pearson chi-square was used to analyze the level of association. Odds ratio is utilized to further elucidate risks. Only completed records will be subjected to Pearson chi-square and odds ratio computation. Confidence interval of $p < 0.05$ was set to determine the level of significance in this study.

Results

Table 1A. Demographics of Medico-Legal Patients in the ER

	Number of Cases (%)
ER Patients	
Total:	9511
Complete:	2663 (28%)
<i>With missing data:</i>	<i>6848 (72%)</i>
Sex	
Male:	2010 (76%)
Female:	653 (24%)
Age	
Mean:	31 years old
Median:	29
Mode:	23
Range:	1-90
Age Group	
Adult (≥ 19 y/o):	2246 (84%)
Pediatric (0-18 y/o):	417 (16%)
Nature	
<i>Accident</i>	<i>1725 (65%)</i>
<i>Physical Abuse</i>	<i>938 (35%)</i>
Sex	
Male	642 (68%)
Female	296 (32%)
Age	
Mean:	32 years old
Median:	29
Mode:	21
Range:	1-84
Age Group	
Adult (≥ 19 y/o):	806 (86%)
Pediatric (0-18 y/o):	132 (14%)

Table 1B. Demographics of WCPU Patients

	Number of Cases (%)
WCPU Patients	
Total:	2611
Sex	
Female:	2525 (97%)
Male:	86 (3%)
Age	
Mean:	15.5 years old
Median:	14
Mode:	14
Range:	9 mo. – 91 y/o
Age Group	
Minor (0-18 y/o):	2036 (78%)
Adult (≥ 19 y/o):	575 (22%)

Table 1C. Demographics of WCPU Perpetrators

	Number of Cases (%)
WCPU Perpetrators	
Total:	2611
Sex	
Male:	2581 (99%)
Female:	30 (1%)
Age	
Mean:	32 years old
Median:	30
Mode:	18
Range:	6 – 89
Age Group	
Minor (0-18 y/o):	345 (13%)
Adult (≥ 19 y/o):	2266 (87%)

There were 2,663 ER cases and 2,611 WCPU cases with complete records. Most ER patients were adult male patients. While the majority of the WCPU cases were minor female patients. Most perpetrators were adult male patients. However, there are still few minor perpetrators (13%), the youngest being 6 years old.

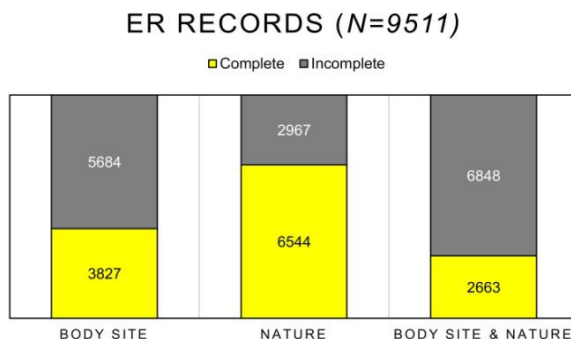


Figure 1. Distribution of complete and incomplete records of Medico-legal ER cases. Out of all the 9511 ER cases, 60% has no specified body site, 31% did not specify the nature of injury, and majority (72%) of the ER records lacks site or nature of injuries.

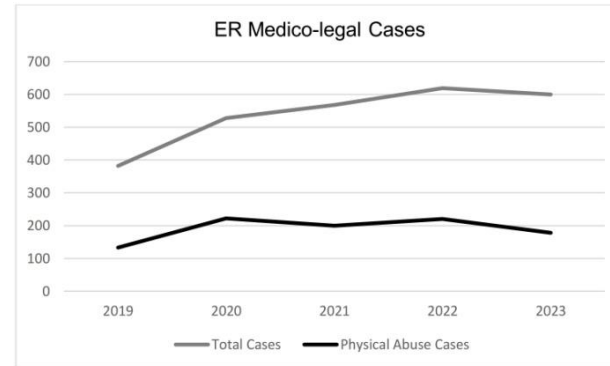


Figure 2. Trends of ER Medico-legal cases during 2019-2023. There is a 66% increase in the number of medico-legal cases and physical abuse from 2019 to 2020. The number of cases during the pandemic (2020-2022) remains almost constant.

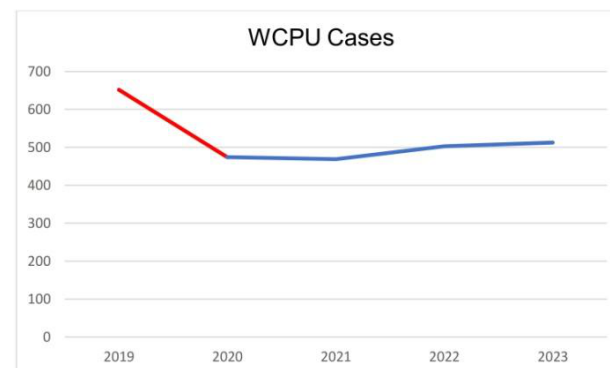


Figure 3. Trends of WCPU cases during 2019-2023. The number of reported WCPU cases fell during the pandemic. In 2019, there were 652 cases while the following years had 474, 469, 503, and 513 cases, respectively.

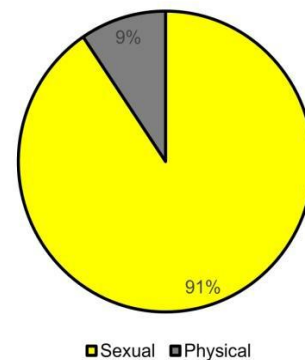
Types of Abuse (n = 2611)

Figure 4. Nature of abuse in WCPU cases. Majority (91%) of abuse cases in WCPU are sexual in nature.

Reporting (n = 2611)

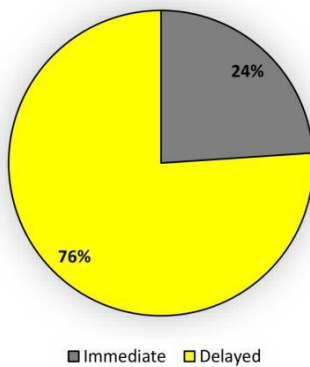


Figure 5. Proportion of Immediate (acute or ≤ 3 days) vs Delayed (chronic or > 3 days) reported cases. Only 24% of the WCPU patients consulted within three days from the incidence of abuse.

Nature of Sexual Abuse (n = 2611)

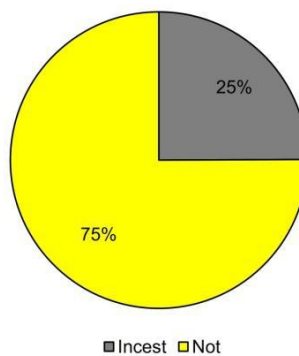


Figure 6. Nature of Sexual abuse. 25% of the sexually abused WCPU cases are incestuous in nature.

Table 2. Most Common Perpetrators in WCPU Case

Relation	Cases	% of cases
Boyfriend	305	12%
Neighbor	305	12%
Uncle	258	10%
Father	218	9%
Acquaintance	167	6.40%
Cousin	147	5.60%
Stepfather	136	5.20%
Friend	109	4.10%
Husband	98	3.80%
Live-in Partner	91	3.50%
Grandfather	82	3.10%
Brother-in-law	47	1.80%
Relative	41	1.60%
Chatmate	33	1.30%
Stranger	29	1.10%
Suitor	23	0.90%

This table shows that most abused patients are familiar and related to their perpetrators. Most common perpetrators were boyfriend (12%), neighbor (12%), uncle (10%), and father (9%).

Table 3. Significant findings in the demographics of both victims and perpetrators, type of abuse and incestuous relationship of WCPU Cases

	<i>p</i> (<0.05)	Patient Odds Ratio		<i>p</i> (<0.05)	Perpetrator Odds Ratio	
		Age			Age	
		Minor	Adult		Adult	Minor
SA*	0.000	5.8	-	-	-	-
Incest	0.000	1.8	-	0.000	1.8	-
		Sex			Sex	
		Female	Male		Male	Female
SA*	0.000	11.4	-	0.000	8.8	-
Incest	0.001	3.3	-	-	-	-

SA - Sexual Abuse

Minor patients are five to six times more likely to be sexually abused (SA) and are also twice more likely to be abused by a relative. Female patients are eleven times more likely to be sexually abused than males. They are also three times more likely abused by a relative. Adult perpetrators are almost twice more likely to commit incestuous sexual abuse. While male perpetrators are eight to nine times more likely to commit sexual abuse.

Table 4. Nature of Injury Summary Table

	Cases
Accidents	1725 (65%)
Vehicular Accident	1,339
Motor vehicular Accident	212
Work-related injury	110
Foreign body injury	64
Physical Abuse	938 (35%)
Assault	822
Stabbing	87
Gunshot wound	29

Accidents comprised 65% of the medico-legal cases in the ER. Out of the accidents, majority are caused by vehicular (78%) and motor vehicular accidents (12%). While, physical abuse cases are commonly associated with assault (88%).

Table 5. Most common type of injuries in Physical Abuse Cases

Injuries	Cases	Percentage
Abrasion	482	51%
Contusion	159	17%
Laceration	123	13%
Stab wounds	46	5%
Gunshot wound	25	2.6%
Fracture	24	2.5%
Hematoma	24	2.5%
Stab wounds	46	1.3%
Hematoma	45	1.3%
Avulsion	31	0.9%
Gunshot wound	26	0.8%

The majority of the Physical abuse cases in the ER reported abrasion (44%), followed by multiple physical injury (23.7%), laceration (10.3%), contusion (6.4%), and fracture (4.6%).

Table 6. Significant findings between demographics and types of injury in physical abuse cases

	<u>Adult</u>		<u>Male</u>	
	<i>p</i> (<0.05)	OR*	<i>p</i> (<0.05)	OR
Gunshot wound	0.035	4.4	0.034	3.4
Laceration	0.003	3.2	0.000	3.4
Stab wounds	0.042	3.9	0.002	3.9

*OR – Odds Ratio

Adult physical abuse patients are more likely to present with gunshot wound (OR: 4.4), stab wounds (3.9), or laceration (OR: 2.9) in the ER than pediatric patients. Male patients are three to four times more likely to present with gunshot wound, laceration, or stab wounds compared to female patients.

Table 7. Significant findings between types of injury vs site of injury of physical abuse cases

<u>Site</u>	<u>Laceration</u>		<u>Stab wounds</u>		<u>GSW</u>	
	<i>p</i> (<0.05)	OR	<i>p</i> (<0.05)	OR	<i>p</i> (<0.05)	OR
Abdomen	-	-	0.000	11.4	0.042	2.7
Back	-	-	0.001	5.3	-	-
Chest	-	-	0.000	4.5	-	-
Eyebrow	0.000	13	-	-	-	-
Eyelid	0.000	5.2	-	-	-	-
Hand	0.020	2.4	-	-	-	-
Head	0.000	3.1	-	-	-	-
Lip	0.016	2.1	-	-	-	-

Lacerations caused by physical abuse are most commonly seen in the eyes (OR: 13), eyelid (5.2), hand (2.4), head (3.1), or lips (2.1). Stab wounds are typically seen on the abdomen (11.4), back (5.3), or chest (4.5). Gunshot wounds (GSW) are mostly seen at the abdomen (2.7).

Table 8. Significant findings between nature of injury (Physical Abuse vs. Accidental) and types of injury in emergency room cases

	<i>p</i> (<0.05)	<u>Nature of Injury</u>	
		Physical Abuse	Accidental
<u>Types of Injuries</u>		Odds Ratio (OR)	
Abrasion	0.000	-	1.4
Avulsion	0.011	-	3.7
Contusion	0.000	5.7	-
Fracture	0.000	-	3.1
GSW*	0.000	47	-
Hematoma	0.010	2.1	-
MPI**	0.000	-	3.5
Stab wounds	0.000	89	-

*GSW – Gunshot wound, **MPI – Multiple physical injuries

Contusion (5.7), gunshot wounds (OR: 47), hematoma (2.1), and stab wounds (89) are more characteristic of Physical abuse seen in the ER. Abrasion (1.4), avulsion (3.7), fractures (3.1), and multiple physical injuries (3.5) are more likely seen in accidental injuries.

Table 9. Significant findings between assault, stabbing, gunshot wound, vehicular accidents, work-related injuries vs type and site of injury of emergency room cases

<u>Physical Abuse</u>				<u>Accident</u>			
		<i>p</i> (<0.05)	OR			<i>p</i> (<0.05)	OR
<u>Assault</u>				<u>Vehicular Accident</u>			
<u>Types of Injury</u>				<u>Types of Injury</u>			
Contusion	0.000	7.1		Abrasions	0.000	2.4	
Hematoma	0.001	2.6		Contusion	0.000	3.5	
<u>Sites of Injury</u>				MPI*	0.000	3	
Cheek	0.000	4.1		Swelling	0.004	4.3	
Chest	0.022	1.6		<u>Sites of Injury</u>			
Eye	0.000	3.8		Ankle	0.000	2.4	
Eyelid	0.000	3.3		Elbow	0.000	1.6	
Lip injuries	0.000	4.8		Face	0.041	1.8	
Neck	0.000	3.5		Knee	0.000	3.2	
Nose	0.000	3.4		Leg	0.000	3	
<u>Stabbing Injury</u>				<u>Motor Vehicular Accident</u>			
<u>Sites of Injury</u>				<u>Types of Injury</u>			
Abdomen	0.000	6.2		Contusion	0.003	1.8	
Back	0.000	4.5		Dislocation	0.044	3.5	
Chest	0.000	6.1		Fracture	0.000	3	
<u>Gunshot Wound</u>				<u>Types of Injury</u>			
<u>Sites of Injury</u>				Ankle	0.030	2	
Abdomen	0.000	8		Feet	0.014	1.9	
Back	0.000	5.6		<u>Work-Related Accident</u>			
Chest	0.000	7.6		<u>Types of Injury</u>			
				Laceration	0.000	13	
				<u>Sites of Injury</u>			
				Foot	0.000	4.6	
				Finger	0.000	15.7	
				Hand	0.000	10.1	

*MPI: Multiple physical injuries

Assault victims more commonly present with contusion (OR: 7.1) or hematoma (2.6) on the cheek (4.1), chest (1.6), eye (3.8), eyelid (3.3), lip (4.8), neck (3.5), or nose (3.4). Stab wounds and Gunshot wounds are typically observed on the abdomen (6.2, 8), back (4.5, 5.6), or chest (6.1, 7.6). Characteristic findings of vehicular accidents are abrasions (2.4) contusion (3.5), multiple physical injuries (MPI) (3), and swelling (4.3) on the ankle (2.4), elbow (1.6), face (1.8), knee (3.2), or leg (3). Motorcycle vehicular accidents are commonly associated with contusion (1.8), dislocation (3.5), fractures (3) on the ankle (2), or foot (1.9). Work-related injuries will more likely present with laceration (13) on the foot (4.6), finger (15.7), or hand (10.1).

DISCUSSION

Several significant cutaneous findings suggestive of physical abuse were observed in this study. Intuitively, Gunshot wounds (GSW) and stab wounds were associated

with intentional injuries. Contusion and hematoma were more likely seen in cases of assaults involving accessible areas during altercations - the cheek, eye, eyelid, and nose. Injuries over protected body sites such as the chest and neck also warrant suspicion of intentional injuries [7,8,9]. In a study by Naidoo, lips are the most common site of oral injuries [10]. A study by Dougherty noted that gunshot wounds (GSW) most commonly involved the extremities [11]. For this study, the abdomen, back, and chest were sites of predilection for both GSW and stab wounds. These identified sites are more than merely indications to rule in or out possible abuse. They are also useful guides for a more thorough dermatologic examination.

Adult males comprised the majority of physical abuse cases in the ER. They typically present with lacerations, GSW, and stab wounds. Lacerations typically involved the hands, consistent with defensive wounds during altercations.

Children still accounted for 15% of physical abuse cases in the ER. In 2021, seven million children died because of child abuse worldwide. In a study conducted by UNICEF Philippines last 2016, 80% of the 3,866 respondents experienced some forms of violence. 60% of them experienced any form of physical violence during childhood [12]. Hence, it is important to implement programs geared towards child safety and protection.

Majority of the patients seen in WCPU were sexually abused female children aged 14-15 years old. Unfortunately, the youngest patient was nine months old. Overall, 17.1% of children experienced any forms of sexual violence. While, 15% of them also experienced physical, psychological, and sexual abuse [12].

The Inter-Agency Council on Violence Against Women and their Children (IACVAWC) noted a 30% decline in physical abuse cases from 2019-2020 [13]. Interestingly, the recorded physical abuse cases in the ER increased by 66% during the start of the pandemic, when most victims were also confined within their homes. A study by Philippine Statistics Authority last 2017, noted that 26% of females in the country has ever experienced physical, emotional, or sexual violence by their partners. 14% of female experienced physical violence, while 5% experienced sexual violence by their partners [14]. In the study by UNICEF Philippines last 2021, majority (60%) of physical abuse and 13% of sexual abuse happen at home [12]. This further supports the study findings that the majority of sexual perpetrators are not strangers to their victims. A significant fraction of sexual abuse is also incestuous in nature.

There was a 27.2% decrease in recorded cases of Violence against Women and Children. IACVAWC Secretariat emphasized that the pandemic restrictions prevent individuals from reporting [13]. Consistent with the national average, there was a 27% decreased of WCPU cases from 2019-2020. However, the unit remained operational during the pandemic. In retrospect, it is vital to have a functional unit even during a pandemic.

Another significant finding in this study noted the delay in the consultation following abuse. To preserve pertinent evidences, a rape kit must be conducted as soon as possible. Although an immediate consultation is advantageous, sexual assaults must be reported within three days for legal and medical purposes. Presence of sperm cells may still be detected during this period which could help to further build their legal cases [15]. Emergency contraception may be administered to prevent pregnancy [16]. To avoid developing Sexually Transmitted Diseases, post-exposure HIV prophylaxis and doxycycline prophylaxis may also be administered [17,18]. However, the utility of the aforementioned were limited due to the delays in reporting. This can be a significant opportunity for health or legal programs to improve victims' health-seeking behavior and reporting.

Cases of abuse in the Philippines were underreported. This study found the lack of fully a standardized, updated, centralized and digitized database a serious issue. 72% of the records were excluded due to incomplete documentation. This further emphasized the need for a standardize and uniform forensic dermatology reporting.

CONCLUSION

Abuse can happen to anyone at any time. However, this study underscores the susceptibility of female and children to such maltreatments. It is also unfortunate to learn that most perpetrators of sexual abuse are related to their victims. This was further aggravated by the pandemic. Victims were forced to be confined in their home together with their abusers. They are also restricted from reporting their perpetrators. This highlighted the need for functional and responsive centers that can consistently cater to abuse patients.

Cutaneous findings are important indicators of intentional injuries. Hence, it should be second nature for all physicians to identify dermatologic and demographic cues of abuse. There should be mandated integration and reinforcement on the screening of possible signs of abuse into medical education, residency training, nursing program, law enforcement, and social services, including their respective board examinations. Medico-legal

evaluation should also be carefully conducted and reported completely. This will help build better baseline databases and in turn improve our understanding on the current landscape of these issues at hand. As a result, better laws and protocols focusing on child safety and providing safe spaces ^[19] will be established and reinforced.

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