

A RETROSPECTIVE STUDY OF AUTOPSY CASES CARRIED OUT IN QENA, LUXOR AND ASWAN GOVERNORATES, UPPER EGYPT DURING THE PERIOD OF 2008 – 2011

*Nora Zeidan Abdellah¹, Hamdy Fathy Ali², Nagwa Mahmoud Ghandour¹
Forensic and Clinical Toxicology Department, Faculty of Medicine, Assiut University, Egypt¹
Forensic and Toxicology Department, Faculty of Medicine, Aswan University, Egypt²*

ABSTRACT

Background: Medico-legal autopsies are done on request by the police for investigating sudden, suspicious and unnatural deaths. It is done to establish a cause and manner of death. Manner of death could be classified according to the circumstances of death to; unnatural manners e.g. (homicidal, accidental, suicidal), naturally or unidentified. **Objective:** To identify the epidemiological profile and characteristics of death in medico-legal autopsies in Qena, Luxor and Aswan governorates. **Methodology:** A retrospective descriptive statistical analysis of the medico-legal autopsies conducted at Qena, Luxor and Aswan governorates, during the period from 2008 to 2011. **Results:** Total number of medico-legal autopsies performed during the study period was 511 cases. Homicidal cases were 57.34%, accidental cases were 16.83%, 12.72% were suicidal, 4.89% were natural deaths, and manner of death was not identified in 8.22% of autopsies. Most of the homicidal victims were males representing 79.9% of homicidal deaths, 73.3% of accidental deaths and 47.7% of suicidal deaths. Age groups of 21-30 year and 31- 40 years accounted for 26.62% and 21.72% of the deaths respectively. Firearm, blunt and stab injuries were the main recorded injuries representing 34.44%, 13.31%, and 12.72% respectively. The Chest was the target of firearm and stab wounds while the head was the target of blunt trauma. Asphyxial deaths represented 8.61 % of all deaths. drowning represented 34.1% of asphyxial deaths. Poisoning was the cause of death in 12.13% of autopsies and 80.65% of poisoning deaths were caused by hair dye. **Conclusion:** High incidence of homicidal firearm mortality in these districts. High incidence of homicidal death was recorded in males and it was mainly due to firearm, stab and blunt trauma while suicide showed a higher incidence in females ,especially using hair dyes. Males committed suicide by more violent methods; hanging, ligature strangulation and firearms.

Keywords: Autopsy, Unnatural deaths, Homicidal deaths, Suicidal deaths

INTRODUCTION

Autopsy, literally meaning self-study of a dead body. A medico-legal autopsy is carried out to determine the cause and manner of death, establish the identity of the deceased, determine time since death, and collect trace evidences and reconstruction of the crime scene, thus helping to solve the crime (Kotabagi et al., 2005 and Afandi, 2012). All cases of unnatural death are subjected to an inquest. Violent injuries account for 10% of the world's deaths. About 5.8 million people die each year because of injuries (Haagsma et al., 2015).

Determining manner of death is important for the victim's family, police investigation, research, death statistics, and for insurance issues (Advenier et al., 2015).

There are four manners of death; natural, accidental, suicidal, and homicidal.

Natural death is caused by the natural process of disease or aging. Accidental death is a death in which trauma causes or contributes to the cause of death, but the inflicted trauma is not intentional. Suicide is a death caused by intentional self inflicted act to cause one's own harm or death. Homicidal death means the killing of one person by the act of another person. Manner of death is certified as undetermined when it is impossible to decide whether the death was intentional or accidental (Breiding and Wiersema, 2006).

Homicide is more common in developing countries with rapidly increasing population, income inequality, poverty, unemployment, frustration, illiteracy, easy availability of weapons and weak law enforcement (Turner, 2009). The various patterns of homicidal deaths include assault by sharp weapon, blunt weapon, firearm,

strangulation, hanging, smothering, drowning, burns, poisoning, etc. (Santhosh et al., 2011).

This study aimed to identify the epidemiological profile and characteristics of death in medico-legal autopsies in Qena, Luxor and Aswan governorate.

MATERIAL AND METHODS

The present descriptive study was conducted retrospectively reviewing records of 511 autopsies in Qena, Luxor and Aswan governorates during the span of four years, from 1st of January 2008 to 31st of December 2011. Data were collected from archives of forensic medicine authority, 511 records of deaths were analyzed using Statistical package for social science SPSS (Version 22). A descriptive analysis of all data was calculated in terms of frequency and percentage. Comparative Analysis of data was made by one-way ANOVA, independent T-test and Chi-square test. P value less than 0.05 was considered significant.

Ethical considerations: Confidentiality of all records in this study was protected and all ethical aspects related to research on records in Assiut University were implicated in the study after the approval of the ethical committee.

Design: Observational retrospective descriptive study.

Conflict of Interest: None

Fund: None.

RESULTS

Five hundreds and eleven autopsies were conducted through years from 2008 to 2011 in Qena, Luxor and Aswan governorates. **Table (1) and Fig. (1)** show that the highest percentage of autopsies were done on victims aged 21-30 years, this age group represented 26.62% (136 cases) followed by age group of 31-40 years with 21.72% (111 cases), then 11-20 years age group which represented 17.61% (90 cases). Age groups of (41-50 years) and (51-60 years) represented 9.2% (47 cases) and 9% (46 cases) respectively. From birth to 10 years represented 8.81% (45 cases including 19 newborns and 6 infants). The victims of age groups (61-70 years) and (71-80 years)

represented 4.5% (23 cases) and 0.98% (5 cases) respectively, while fetuses represented 0.78 % (4 cases) of total autopsies. Male victims represented 72.4% (370 cases) of all deaths. Male victims showed preponderance in all age groups except for the first decade, female victims represented 53.3% of this group. **Table (2)** shows mean of male victim's age is 32.67 ± 16.87 and mean of age for female victims is 24.66 ± 15.76 . A statistically significant difference between means of victims' age in relation to gender was demonstrated.

Regarding the manner of death; **Table (3) and Fig. (2)** show that homicidal deaths represented 57.34% of autopsies (293 cases), accidental deaths were 16.83% (86 cases), and suicidal deaths were 12.72% (65 cases). Natural deaths represented 4.89 % (25 cases) of all deaths, and manner of death was not identified in 8.22% (42 cases) of autopsies. Male victims constituted 79.9% of the homicidal deaths, 73.3% of accidental deaths, 47.7% of suicidal deaths, 72% of natural deaths and 57.1% of unidentified deaths. While females represented 27.6% (141 cases) of all deaths. They constituted 20.1% of homicidal deaths, 26.7% of accidental deaths, 52.3% of suicidal deaths, 28% of natural deaths and 42.9% of unidentified deaths. A statistically significant relationship between gender and manner of death was documented.

Table (4) and Fig. (3) show mean of age of victims in relation to different trauma. There is a statistically significant difference between mean of age of victims according to different types of trauma.

Table (5) shows that out of the 511 deaths; 160 cases (31.3%) of deaths occurred during summer months with peak during August (71 deaths representing 13.9% of total deaths). In addition, 46.2% of suicidal deaths occurred during summer months.

Table (6) shows that firearm injuries were the cause of death in 176 cases of all studied autopsies (34.44%), blunt trauma was the second cause of death in 68 cases (13.31%)

followed by stab wounds 65 (12.72%) deaths. Poisoning represented 12.13% of deaths (62 cases), and 44 cases (8.61%) of deaths were caused by asphyxia. 13 (2.54%) deaths were caused by chop wounds (heavy sharp trauma) and 7 (1.37%) deaths were caused by burn. Each of electrocution, cut wounds and traffic accidents caused 5 deaths (0.98%). Two (0.39%) deaths were caused by starvation. No apparent injuries were found in 58 (11.35%) autopsies. One death due an animal was encountered during the study in a newborn. The newborn was a result of an illegitimate pregnancy.

Table (7) shows that 49 cases (27.84%) of firearm deaths were in their third decade of life, followed by 39 cases (22.16%) in fourth decade, then 30 cases (17.05%) in second decade, 20 cases (11.36%) in fifth decade (41-50), while only one (0.57%) firearm death occurred in 8th decade (71-80). Male victims represented 88.64% (156 cases) out of the 176 firearm deaths, while female victims represented 11.36 % only (20 cases).

Regarding types of firearm weapons used in firearm deaths; **table (8)** shows that 159 firearm deaths were caused by rifled weapons, 12 cases were caused by non-rifled weapons and 1 case was caused by cap pistol, while the firearm weapon type could not be detected in 4 cases.

Table (9) shows that a single anatomical region was injured by in 126 cases (71.59%) of firearm deaths, 2 anatomical regions were injured in 27 cases (15.34%), 3 regions were injured in 7 cases (3.98%) and 4 parts were injured in 16 cases (9.09%). The chest was the target of firearm injury in 53 (30.11%) of cases, while the head was the target in 48 cases (27.27%) of firearm deaths.

Tables (6 and 10) show that blunt trauma was the cause of death in 68 autopsies represented (13.31%) of all autopsies, 64 cases were homicidally inflicted (48 males and 16 females) and four were accidentally inflicted. Single anatomical region was involved in 58

cases (85.29%). Head was the target part in 54 cases (79.41%) of all blunt trauma.

Tables (6 and 11) show that stab wounds were the cause of death in 65 cases (12.72%). Stab wounds were homicidally inflicted in 64 cases; 49 of victims were males and 15 were females. Only one case of stab deaths was suicidal in a male victim. Stab wounds involved single region in 47 cases (72.3%), the chest was the target region in 33 cases representing 50.77% of all stab deaths.

Table (12) shows that asphyxia was the cause of death in 44 cases of autopsies. Drowning was the cause of death in 15 cases (34.1% of asphyxial deaths). Seven cases of drowning were accidental, 2 cases were homicidal and 1 case was suicidal, while the manner of death was undetermined in 5 cases. Hanging represented 25% of asphyxial deaths. Hanging was suicidal in 10 cases (9 male victims and only one female victim), and was homicidally inflicted in only one male case. Ligation strangulation was the cause of death in 10 cases (22.73%). It was homicidally inflicted in 5 cases (2 males and 3 females) and suicidal in 5 male cases. Three homicidal throttling cases (6.81%) were encountered during the study (all were males). The records also revealed 3 accidental (6.81%) traumatic asphyxia and 2 homicidal (4.5%) smothering.

Table (13) shows that poisoning was the cause of death in 62 autopsies. Poisoning cases analysis revealed that 50 cases (80.65% of poisoning deaths) were caused by hair dye and 6 cases (9.68%) were caused by insecticide. Each of rodenticide, ethanol and bleaching liquid (sodium hypochlorite) was the cause of death in 1 case (1.61% for each). Three cases of poisoning (4.84%) were caused by an unknown substance. The manner of death in poisoning cases was suicidal in 41 cases, homicidal in 4 cases, accidental in 9 cases and unidentified in 8 cases. Forty three of poisoning victims were females while 19 of victims were males. Victims committed suicide in 36 cases by ingestion of hair dye.

Table (1): Frequency and Distribution of Death in Different Age Groups of All Autopsied Cases

Age Death	Birth-10 years N (percentage)	11-20 years N (percentage)	21-30 years N (percentage)	31-40 years N (percentage)	41-50 years N (percentage)	51-60 years N (percentage)	61-70 years N (percentage)	71-80 years N (percentage)	Fetuses N (percentage)	Unknow n age N (percenta ge)	Total N (percentage)
Males	21 (46.7%)	65 (72.2%)	87 (64%)	88 (79.3%)	40 (85.1%)	35 (76.1%)	21 (91.3%)	5 (100%)	4 (100%)	4 (100%)	370 (72.4%)
Females	24 (53.3%)	25 (27.8%)	49 (36%)	23 (20.7%)	7 (14.9%)	11(23.9%)	2 (8.7%)	0	0	0	141 (27.6%)
Total	45 (8.81%)	90 (17.61%)	136 (26.62%)	111 (21.72%)	47 (9.2%)	46 (9%)	23 (4.5%)	5 (0.98%)	4 (0.78%)	4 (0.78%)	511

N = number of cases

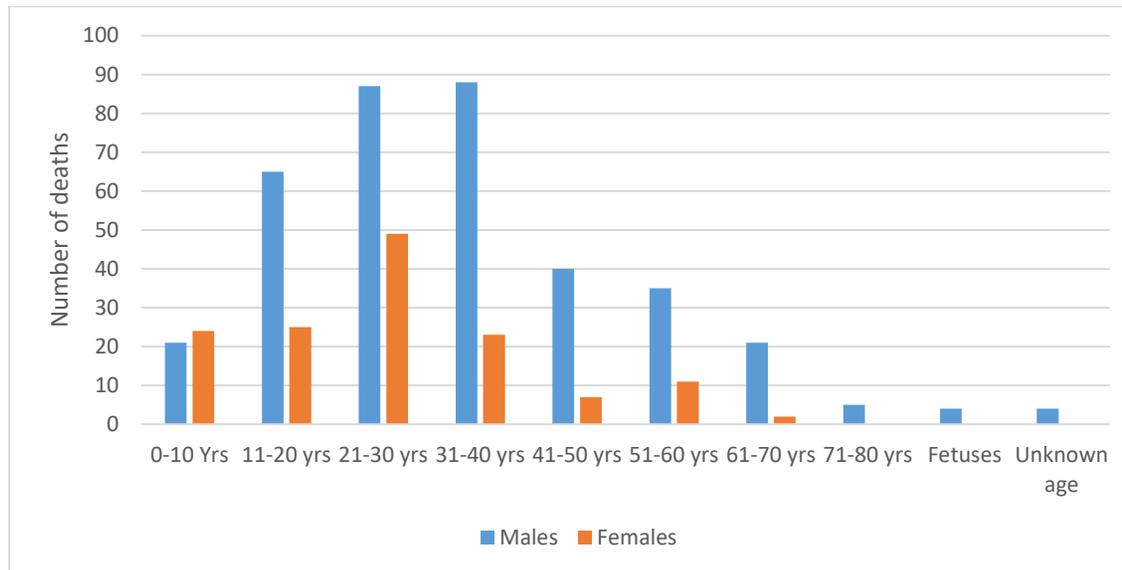


Figure (1): A bar chart showing gender distribution among different age groups of all autopsied cases

Table (2): Statistical Comparison of Means of Victims' Age in Relation to Gender using independent T-test

Gender of Victims	Mean of age ± SD	P value
Males	32.67± 16.87	0.000
Females	24.66±15.76	

Table (3): Statistical Analysis of Manner of Death According to Gender Using Chi-Square Test

Manner of death	N (percentage)	Male victims N (percentage)	Female victims N (percentage)
Homicidal	293(57.34%)	234 (79.9%)	59 (20.1%)
accidental	86(16.83%)	63 (73.3%)	23 (26.7%)
Suicidal	65(12.72%)	31 (47.7%)	34 (52.3%)
Natural	25(4.89%)	18 (72%)	7 (28%)
unidentified	42 (8.22%)	24 (57.1%)	18 (42.9%)
Total	511(100%)	370 (72.4%)	141 (27.6%)
Pearson Chi-Square χ^2		32.96	
df		4	
P value		0.000	

N = number of cases

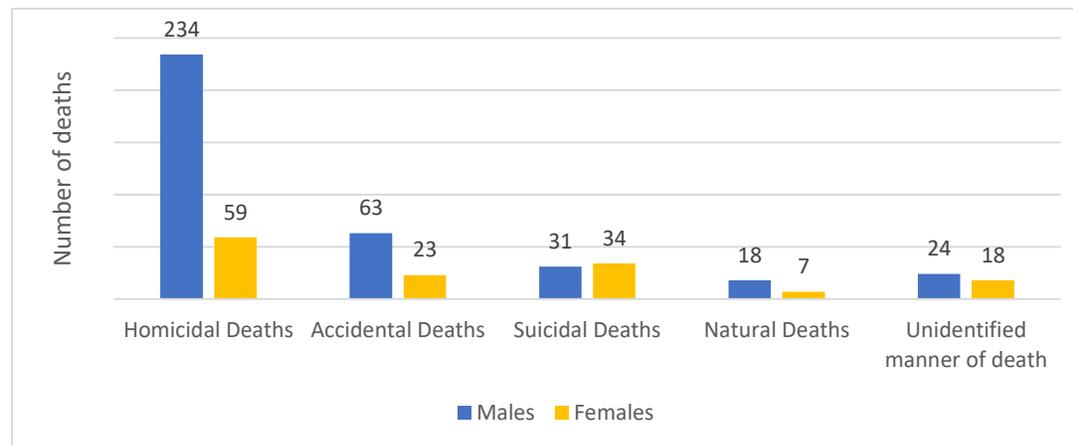


Figure (2): A bar chart showing manner of death and gender distribution in all 511 autopsied cases in the study

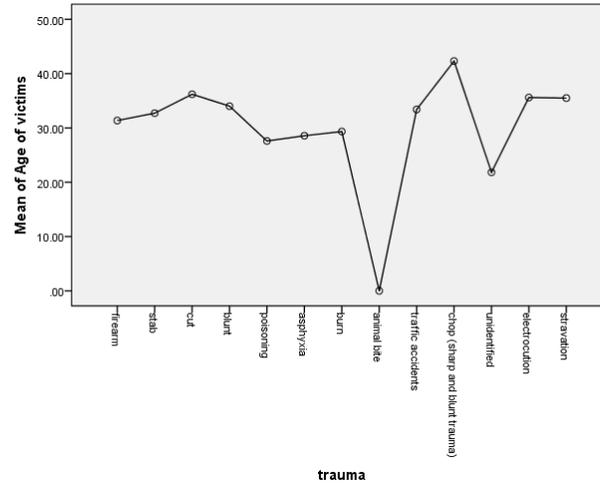


Figure (3): A plot chart showing means of age according to different trauma

Table (4): Statistical Comparison of Means of Victims' Age in Relation to Type of Trauma by Using One-Way ANOVA test

Type of Trauma	Mean of age (in years) Mean ±SD	P.Value
Firearm	31.4±15.8	0.001
Stab	32.7±15.7	
Cut	36.2±22.9	
Blunt	34±20.5	
Chop	42.3±15.8	
Asphyxia	28.6±16.9	
Poisoning	27.6±12.8	
Burn	29.3±8.6	
Electrocution	35.6±17.1	
Traffic Accident	33.4±7.1	
starvation	35.5±14.8	
Animal Bite	.0027	
Unidentified trauma	21.8±18.7	
Total	30.43±16.9	

Table (5): Seasonal and Monthly Variation of Different Types of Deaths

season	Homicidal	Suicidal	Accidental	Natural	Undetermined	Months
Winter 124 (24.3%)	78 (26.6%)	12 (18.5%)	21 (24.4%)	4 (16%)	9 (21.4%)	January 34 (6.7%)
						February 34 (6.7%)
						March 44 (8.6%)
Spring 130 (25.4%)	81 (27.6%)	14 (21.5%)	13 (15.1%)	10 (40%)	12 (28.6%)	April 52 (10.2%)
						May 46 (9%)
						June 35 (6.8%)
Summer 160 (31.3%)	76 (25.9%)	30 (46.2%)	35 (40.7%)	8 (32%)	11 (26.2%)	July 46 (9%)
						August 71 (13.9%)
						September 45 (8.8%)
Autumn 97 (19%)	58 (19.9%)	9 (13.8%)	17 (19.8%)	3 (12%)	10 (23.8%)	October 32 (6.3%)
						November 39 (7.6%)
						December 33 (6.4%)
Total	293	65	86	25	42	511

Table (6): Distribution of Type of trauma and Manner of Death According to Gender

Type of Trauma	N (Percentage)	Homicidal		Suicidal		Accidental		Undetermined		Natural	
		Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
unidentified	58 (11.35%)	3		0		8		23		24	
		1	2			3	5	12	11	17	7
Firearm	176 (34.44%)	124		4		44		4		0	
		112	12	4	0	36	8	4	0		
chop (sharp and heavy trauma)	13 (2.54%)	13		0		0		0		0	
		10	3								
Electrocution	5 (0.98%)	1		0		4		0		0	
		0	1			3	1				
Starvation	2 (0.39%)	1		0		1		0		0	
		0	1			1	0				
Stab	65 (12.72%)	64		1		0		0		0	
		49	15	1	0						
Cut	5 (0.98%)	3		0		2		0		0	
		3	0								
Blunt	68 (13.31%)	64		0		4		0		0	
		48	16								
Poisoning	62 (12.13%)	4		41		9		8		0	
		0	4	12	29	4	5	3	5		
Asphyxia	44 (8.61%)	14		15		9		6		0	
		9	5	13	2						
Burn	7 (1.37%)	0		5		1		1		0	
				1	4	1	0	1	0		
animal bite	1 (0.2%)	1		0		0		0			
traffic accidents	5 (0.98%)	1		4		0		0		0	
		1	0	3	1						

N= Number of cases

Table (7): Firearm Deaths According to Gender and Age Group (N= 176)

Age group	Males N	Females N	Total N (Percentage)
Birth -10	10	4	14 (7.95%)
11-20 yrs	30	-	30 (17.05%)
21-30 yrs	41	8	49 (27.84%)
31-40 yrs	36	3	39 (22.16%)
41-50 yrs	18	2	20 (11.36%)
51-60 yrs	12	3	15 (8.52%)
61-70 yrs	8	-	8 (4.55%)
71-80 yrs	1	-	1 (0.57%)
Total	156 (88.64%)	20 (11.36%)	176

N= Number of cases

Table (8): Types of Firearm Weapons Used in All Firearm Deaths (N=176)

Firearm weapon	Rifled weapons	Non Rifled weapons	Cap pistol	Not identified
Frequency	159	12	1	4

Table (9): Anatomical regions involved in Firearm Injuries (N=176)

Anatomical regions involved	N (percentage)
Involvement of single anatomical region	126 (71.59%)
Head	48 (27.27%)
Neck	2 (1.14%)
Chest	53 (30.11%)
Abdomen	11 (6.25%)
back	5 (2.84%)
Lower limbs	5 (2.84%)
Upper limbs	1 (0.57%)
Pelvis	1 (0.57%)
Involvement of 2 anatomical regions	27 (15.34%)
Involvement of 3 anatomical regions	7 (3.98%)
Involvement of 4 anatomical regions	16 (9.09%)

N= Number of cases

Table (10): Anatomical Regions Involved in Blunt Trauma (N=68)

Anatomical regions involved	N (percentage)	
Involvement of single anatomical region	58 (85.29%)	
	head	54 (79.41%)
	Chest	1 (1.47%)
	Abdomen	3 (4.41%)
Involvement of 2 anatomical regions	8 (11.77%)	
Involvement of 4 anatomical regions	2 (2.94%)	

N= Number of cases

Table (11): Anatomical regions involved in Stab Wounds (N=65)

Anatomical regions involved	N (percentage)	
Involvement of single anatomical region	47 (72.3%)	
	Neck	4 (6.15%)
	Chest	33 (50.77%)
	Abdomen	8 (12.3%)
	Lower limbs	2 (3.08%)
Involvement of 2 anatomical regions	16 (24.62%)	
Involvement of 3 anatomical regions	1 (1.54%)	
Involvement of 4 anatomical regions	1 (1.54%)	

N= Number of cases

Table (12): Distribution of Asphyxial Deaths (N= 44)

Type of asphyxia	N (Percentage)	Homicidal	Suicidal	Accidental	Undetermined
Drowning	15 (34.1)	2	1	7	5
Ligature strangulation	10 (22.73)	5 (2 males, 3 females)	5 males	0	0
Hanging	11 (25)	1 male	10 (9 males, 1 female)		
Manual strangulation	3 (6.81)	3 male	0	0	0
Traumatic	3 (6.81)		0	3 males	0
Smothering	2 (4.55)	2 females one of them was a newborn	0	0	0
Total	44	13	16	10	5

N= Number of cases

Table (13): Manner of Deaths due to Poisoning and Gender Distribution (N= 62)

	Rodenticide N (Percentage) 1 (1.61%)		Insecticide N (Percentage) 6 (9.68%)		Ethanol N (Percentage) 1 (1.61%)		Bleaching liquid N (Percentage) 1 (1.61%)		Hair dye N (Percentage) 50 (80.65%)		Unknown N (Percentage) 3 (4.84%)		Total N 62
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	
Accidental	0	0	1	5	1	0	0	0	14	36	3	0	9
Homicidal	0	0	0	0	0	0	0	0	0	4	0	0	4
Suicidal	0	1	0	1	0	0	0	1	10	26	2	0	41
Undermined	0	0	0	1	0	0	0	0	2	4	1	0	8

N= Number of cases

DISCUSSION

Medico-legal autopsies are performed to establish the cause of death, the manner of death, the identity of the deceased, postmortem interval, and to collect trace evidences (**Kotabagi et al., 2005**). The aim of this study was to describe the profile of medico-legal autopsies regarding age, sex, season, the manner of death, type and site of trauma in Luxor, Qena and Aswan governorates during the period from 2008 to 2011.

Among 511 cases that were evaluated in the current study; homicidal, accidental, suicidal and natural deaths represented 57.34%, 16.83%, 12.72% and 4.89 % of total autopsies respectively. The manner of death could not be identified in 8.22% of autopsies. Homicidal death was reported to be the predominant manner of death in many studies (**Afandi, 2012**). Studies in countries with high incidence of road traffic accidents like India reported accidental death as the predominant manner of death in medico-legal autopsies (**Santhosh et al., 2011**). Road traffic accident fatalities are reported as an "unusual death, but a medico-legal autopsy is not performed in most cases in Egypt, in addition many reports of road traffic deaths did not follow the internationally recommended definition of a road traffic fatality, which includes a 30-day follow-up (**Puvanachandra et al., 2012**).

The current study demonstrated that the victims subjected to medico-legal autopsies were predominantly males. In this study, male victims represented 79.9% of homicidal deaths and 73.3% of accidental deaths. A male predisposition of dying a homicidal death was reported in almost all parts all over the world (**Lemard and Hemenway, 2006**). This can be explained by the less exposure of females to violence because of cultural and religious beliefs. This is consistent with national and international studies (**Aboul-Hagga et al., 2013**).

Female victims were predominant in suicidal deaths (52.3%). This is contrary to the worldwide ratio, where men commit suicide at nearly two to three times the rate of females (**Pietro and Tavares, 2005**). In the present study, male preponderance was distinct in *violent* suicides evidenced by the four firearm suicides that were all committed by males, the five suicidal ligature strangulations were also committed by males. In addition, 9 out of 10 suicidal hanging victims were males, while females chose poisoning as a method of suicide. Females prefer less violent suicidal methods than males (**Voros et al., 2004**).

The current results showed that age groups of 21-30 and 31- 40 years, which are the most economically productive age groups accounted for 26.62 % and 21.72% of the deaths respectively. This is in agreement with the work of **Afandi (2012)**, **Radhakrishna et al., (2015)** and **Patel et al (2016)** in Indonesia and India.

The present study showed that 46.2% of all suicidal deaths occurred during summer months, which confirm that seasonal rhythms have an impact on the risk of violent death in humans, with more evidence available in suicide (**Sisti et al., 2012**). Human biometeorological researches revealed that seasons have effects on the affective state of humans, incidence of affective disorders, seasonal affective disorders, suicide and neurotic complaints (**Maes et al., 1993**). In addition, hospital admission of maniac patients increase during summer months, which explained by the seasonal variation levels of serotonin in the hypothalamus (**Retamal and Humphreys, 1998**).

The firearm related deaths vary from country to country and from city to city within the same country. This depends on the availability of firearms in the region (**Marri and Bashir, 2010**). Firearm deaths in the United States is relatively high, while in European countries; rates of firearm death from are lower (**Christoffel, 2007**). The percentage of firearm

related deaths was 34.44 % in the present study. According to **Karp (2007)**, Firearm injuries account for the third cause of deaths in Qena, this can be expected because of the availability of firearm weapons in Egypt particularly Upper Egypt. The estimated rate of private firearm ownership (both legal and illegal) per 100 people in Egypt is 3.5. In addition, imprisonment for one month and a fine is the maximum penalty for illegal possession of a firearm in Egypt (penalty certain firearms is life imprisonment with hard labour) (**Parker, 2011**).

In the present study, 88.64% of the firearm victims were males. Males by nature are more aggressive and they easily indulge in violent actions and revenge. The chest was most frequently targeted in firearm deaths (30.11%) followed by the head (27.27%). This is in agreement with the study of (**Marri and Bashir, 2010**). These regions are mostly involved as these regions have the vital organs of the body, indicating that the motive was to kill. These results are consistent to previous studies (**Molina et al., 2013**).

Blunt trauma represented 13.31% (68 cases) of all deaths in the current study. Blunt trauma was inflicted homicidally in 64 cases, in which male victims constituted 75% of them (48 cases). The head was the target in 79.41% of all blunt trauma. This is because blunt trauma would rarely be fatal if inflicted on body areas other than the head. While the target of blunt trauma was the head; the chest was the target region in 50.77% of stab deaths. This is in agreement with work of **Parmar et al (2015)**. This because of the easy penetrability of chest and presence of the heart as a target vital organ.

As regarding asphyxia; the present results show that drowning represented 34.1% of asphyxial deaths. Seven cases of drowning were accidental, while the manner of death was undetermined in 5 case. The manner of death in drowning can be classified as undetermined, when it is unclear whether it has been unintentional or purposely inflicted (**Lunetta et**

al., 2014). The manner of death is difficult to prove in drowning and in other deaths as road-accidents, and falls from a height (**Breiding and Wiersema, 2006**).

Poisoning is the most preferred method of suicide for females (**CDC, 2009**). The current study confirmed this preference; 41 suicides by poisoning were documented during this study, 29 of suicides by poisoning were females representing 70.73%.

What is unique about the current data is that hair dye was used as a poison in 36 suicidal deaths. Intentional ingestion of hair dye is a big concern in Upper Egypt particularly in females (**Mohamed et al., 2014**). Intentional poisoning by hair dye containing Para-phenylenediamine represents a recent great concern in developing world particularly in rural areas (**Senthilkumaran and Thirumalaikolundusubramanian, 2015**).

Burn injuries are global health problem accounting for approximately 265000 deaths per year (**Tripathee and Basnet, 2017**). Seven fatal burns were recorded in the current study. The manner of death was suicidal in five cases, 4 of them were females accounting for 80%. This is confirmed by a Pakistani study, which showed that females representing 80.64% of suicidal burn victims. Many studies from developing countries as India and Pakistan reported that females commonly commits suicide by burn (**Saaq, 2016; Mishra et al., 2016; Korah et al., 2016**).

Electrocution deaths represented 0.98 % (5 cases) of all medico-legal autopsies surveyed in this study. This is in agreement with results of a study in Indian rural areas, which reported that electrocution represented the cause of death in 1.29% of autopsies included in the study (**Reddy et al., 2014**). In the current study, 4 electrocution deaths were accidental representing 80% of all electrocution and one was inflicted homicidally.

Homicidal starvation is withholding of food intentionally, the usual victims usually children (unwanted children, stepchildren, illegitimate children), elderly

people (**Rajesh, 2011**). This study documented a case of homicidal starvation against a mature woman in her third decade by her family.

CONCLUSION

High incidence of firearm mortality in Qena, Luxor and Aswan governorates. Rifled firearm was the weapon of choice for homicides. In addition, male predominance was evidenced in deaths caused by firearm, stab, and blunt trauma. Head and chest were the most targeted regions of the body. Suicidal and homicidal hair dye poisoning is common. Females committed most suicidal poisoning, while males committed most violent suicides by hanging, ligature strangulation and by firearm.

RECOMMENDATIONS

Law enforcement and strict measures should be taken to control the possession of illegal firearms and sharp weapons. Awareness through media should be increased about the dangers of using weapons as a matter to settle disputes.

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