

Type of the Paper (Article)

Medico-legal study of alleged sexual assault cases in Fayoum and Aswan governorates from 2010 -2016: comparative study

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Abstract

Introduction: Sexual assault is one of the most annoying crimes, which occur in all cultures, worldwide. That affects the health, reputation, and safety of the victim, particularly, females.

Aim of the study: The present study aims to recognize the most susceptible age group to be sexually assaulted and demonstrate physical injuries associated with the assault.

Subjects and Methods: The study included 265 alleged sexual assault cases of different age groups. All participants were examined medico-legally in the Fayoum and Aswan Departments of Forensic Institute. We collected the retrospective data during the period starting from January 2010 to the end of December 2016.

Results: The socio-demographic data of the sexually assaulted victims of the study showed a statistically significant association between the age and gender of the studied victims of sexual assault in Fayoum and Aswan. Male victims were more likely to be sexually assaulted in the age group <18 years (89.47%). Female cases in the age group (18-40 years old) in Fayoum were more subjected to sexual assault, while those less than (18 years old) in Aswan were more subjected to sexual assault.

Conclusion: Evaluation of physical abuse yields solid medico-legal opinion in most cases. In contrast, the nature of genital and anal injuries was more confusing. That raises a lot of uncertainties. Therefore, rapid medico-legal assessment of the victims of sexual crimes along with the cautious interpretation of findings is advisable.

Keywords: Sexual assaults; Medico-legal assessment; Allegations; post-traumatic stress disorder; Drug

1. Introduction

Sexual assault on women and children is one of the most heinous crimes against mankind. Sexual violence is ubiquitous; it occurs in every culture, at all levels of society, and in every country of the world. Sexual violence has a significant negative impact on the health of the

population. The root causes of sexual and gender-based violence lie in a society's attitudes towards and practices of gender discrimination, which place women in a subordinate position to men [1].

Rape cases show a constantly rising pattern with a low conviction rate. No age is safe from rape, with maximum number of victims in the age group 16-20 years, because of multiple physical, social, and mental factors. Unmarried young women are at increased risk. A significant number of cases report late to the police doctor. That delay might result in loss of valuable biological trace material evidence [2].

Child sexual abuse might occur within the family, by a parent, step-parent, sibling, other relatives, or outside the home such as a friend, neighbor, childcare person, teacher, or stranger. When sexual abuse occurs, the victim might develop variable distressing feelings, thoughts, and behaviors [3].

Sexual abuse includes a spectrum of activities ranging from rape to physically less intrusive sexual abuse. Sexual activities might include all forms of Oro-genital, genital or anal contact, or child abuse that does not involve a direct contacting, such as exhibition-ism, voyeurism, or using the child in pornography [4].

Sexual violence can adversely affect the physical and mental health of survivors. It is a considerable public health and human rights problem because of the associated morbidity and mortality. The complications of sexual assault crimes include Physical, Psychological, and Social-complicated effects [5].

2. Subjects and methods

2.1. Subjects

The study included 265 sexual assault cases of different age groups. It conducted these cases that were medico-legally examined in the Fayoum and Aswan Departments of Forensic Institute of the Ministry of Justice to analyze the victims of sexual assault. It included a collection of retrospective data during the period starting

Sexual assault, although underreported, is known to be a problem that affects lives of millions of women worldwide regardless of age, race, appearance, marital status, sexual orientation, ability, and socioeconomic and health status. Women may be sexually assaulted by multiple assailants or experience gang rape. Rape might be a weapon in wars, racism, and genocide. Also, it was documented in refugee camps and as a manner of torture in prisons and police stations. Political sexual scandals caused a threat to the political future of politicians. Incidents of sexual violence have long been a brutal part of the human story. Sometimes they have changed the course of history. Nearly as long as people have been recording history, they have documented sexual assaults. From the writings of ancient Greek, Bible, the letters of early explorers, and modern history, sexual violence was a brutal part of the human story. Some as-saults changed the course of history and, like all history, what we know about sexual assaults of the past was, generally, what was told by the victors-mostly men [6].

The work aims to recognize the most susceptible age group among males and females to be sexually assaulted, demonstrate physical injuries associated with assault, make a spot on the relation between the victim and the assailant and make a comparative study between real and fake allegations in Fayoum and Aswan.

from January 2010 to the end of December 2016.

2.2. Inclusion criteria

The study included all the victims of sexual assault examined in both Fayoum and Aswan Departments of Forensic Institute of the Ministry of Justice.

2.3. Methods:

The obtained data of the study included the following items:

- Complete data of the assault, type of sexual assault, and scene or location of the assault.
- Data on the mental state of the subject.
- Data of the examination of the clothes.
- Data of the General Examination of the whole body.
- Data of the local Examination of the vulvovaginal, perineal, and anal regions.
- Swabs samples were taken from the local areas.
- Data of the additional investigations if done.

All collected data from the cases' reports included the following:

- Personal data for Socio-demographic data: Sex, Age, and marital status.
- Assault data: the date of the incidence, the season of the incidence, the date of the medico-legal examination, the delay time (time between assault and medico-legal examination), and the place of the assault (different districts of the Fayoum and Aswan governorates).
- Type of the sexual assault: Rape (forceful vaginal penetration of a woman by a man's penis), attempted rape, anal sex, mixed rape and anal sex, alleged anal sex, alleged rape attempt, sexual harassment, and alleged rape and anal sex.
- Number of assailants: Single and multiple.
- Victim-assailant relationship: Relative, and non-relative.
- Medico-legal examination: The delay time between the sexual assault and the medico-legal examination.
- General examination: Type of the injury such as, Bruises, abrasion, laceration, and other injuries.
- Local examination: Vulvovaginal examination includes labial injuries, hymen (type – injury), vaginal wall, and vaginal swab.

- Perineal examination: The perineum is a region of the body including the perineal body and the surrounding structures. There is some variability in how the boundaries are defined. According to some definitions, in females, it is located between the vagina and anus, and in males between the scrotum and anus.
- Anal examination includes Skin corrugations, anal opening, adjacent area, anal reflex, Sphincter tone, tear of anal mucosa (recent – old), and anal swab.
- Examination for the victim's clothes, Detection of the pregnancy, and additional investigations.

The clinical injury extent score (CIES) was used to evaluate the severity of injury in every case, as follows:

- Score (0) (no injury): No documented signs or symptoms of injury.
- Score (1) (mild injury): Redness or tenderness only or minor injuries with no expected impact on physical function.
- Score (2) (moderate injury): injury or injuries expected to have some impact on the physical function and/or more than redness or tenderness of the genitalia (including anal and rectal areas), e.g., lacerations, bruising, abrasions, and/or injuries requiring treatment (lacerations requiring suturing, wounds requiring dressings) and/or bruising of the head and neck expected to result in neurological manifestations.
- Score (3) (severe injury): head injury with a concussion and/or evidence of attempted strangulation and/or other major injuries, e.g., fracture, internal organ contusion.

2.4. Statistical analysis

All the tested variables were expressed as numbers and percentages in brackets. A Chi-square test was used. A P value of ≤ 0.05 was considered statistically significant. All analyses were performed using SPSS 20.0 for Windows (SPSS Inc., Chicago, Illinois, USA). Chi-square:

Chi-square test is a non-parametric statistical test in which each member is observed and classified in one of several different categories.

3. Results

The present study included 265 cases of sexual assault examined, investigated and recorded in the Fayoum and Aswan Departments of Forensic Institute of Ministry of Justice. Data obtained from retrospective study in the period from January 2010 to the end of December 2016.

The result of the study on sexual assault victims in both Fayoum and Aswan Departments of Forensic Institute of Ministry of Justice indicates that the percent-age of victims under 18 years of age (57% and 77.4%, respectively) was significantly higher than those aged between 18- 40 years (41.9% and 22.6% respectively) and those exceeding the age of 40 years (1.2% and 0% respectively). The mean age

of the studied group of victims in Fayoum was 15.79 ± 8.59 years and 12.96 ± 7.19 years in Aswan (Table 1).

Regarding the gender of the studied victims of sexual assault in Fayoum, the percentage of female cases is more than that of the males (55.8% compared to 44.2% respectively), while the percentage of males exceeded that of the females among Aswan cases (68.8% and 31.2%, respectively). Most of the studied cases in the Fayoum and Aswan groups were unmarried (80.2% and 92.5%, respectively) and significantly higher than those who were married and then those who were divorced (Tables 2-5).

Table 1: Socio-demographic data of the studied sexual assault victims in both Fayoum and Aswan Departments of Forensic Institute of Ministry of Justice (N= 265).

Variables		Fayoum (n = 172)	Aswan (n = 93)	Stats	P-value
Gender	Male	76 (44.2%)	64 (68.8%)	$\chi^2=14.696^*$	<0.001*
	Female	96 (55.8%)	29 (31.2%)		
Age (years)	< 18	98 (57%)	72 (77.4%)	$\chi^2=11.186^*$	MC 0.002*
	18-40	72 (41.9%)	21 (22.6%)		
	< 40	2 (1.2%)	0 (0%)		
	Range	3-64	2-38	t=2.710*	0.007*
	Mean \pm SD.	15.79 \pm 8.59	12.96 \pm 7.19		
Marital status	Unmarried	138 (80.2%)	86 (92.5%)	$\chi^2=9.877^*$	MC 0.003*
	Divorced	2 (1.2%)	2 (2.2%)		
	Married	32 (18.6%)	5 (5.4%)		
Area of assault	Rural	98 (57%)	55 (59.1%)	$\chi^2=0.116$	0.734
	Urban	74 (43%)	38 (40.9%)		

χ^2 : Chi square test; MC: Monte Carlo; *: Statistically significant at $P<0.05$.

Table 2: The association between age and gender of the studied victims of sexual assault in both Fayoum and Aswan Departments of Forensic Institute of Ministry of Justice (N= 265).

Variables	Fayoum (n = 172)		Aswan (n = 93)	
	Male (n=76)	Female (n=96)	Male (n=63)	Female (n=30)
Age (years)	< 18	68 (89.47%)	30 (31.25%)	53 (84.12%) 19 (63.33%)

18-40	6 (7.89%)	66 (68.75%)	11 (15.87%)	10 (36.66%)
< 40	2 (2.63%)	0 (0%)	0 (0%)	0 (0%)
χ^2	38.014		42.098	
P-value	<0.001*		<0.002*	

χ^2 : Chi square test; *: Statistically significant at $P<0.05$.

Table 3: Comparison between Fayoum group and Aswan group according to the type of the sexual assault (N= 265).

Variables	Fayoum (n = 172)	Aswan (n = 93)	$\chi^2=$	P-value
Rape	44 (25.6%)	14 (15.1%)	27.437*	MC <0.001*
Anal sex	36 (20.9%)	41 (44.1%)		
Rape and anal sex	4 (2.3%)	2 (2.2%)		
Alleged anal sex	34 (19.8%)	23 (24.7%)		
Alleged rape attempt	18 (10.5%)	4 (4.3%)		
Sexual harassment	36 (20.9%)	7 (7.5%)		
Alleged rape and anal sex	0 (0%)	2 (2.2%)		

χ^2 : Chi square test; MC: Monte Carlo; *: Statistically significant at $P<0.05$.

Table 4: Comparison between Fayoum group and Aswan group according to the type of the sexual assault (N= 265).

Variables	Fayoum (n = 172)	Aswan (n = 93)	$\chi^2=$	P-value
Abrasions	0 (0%)	2 (11.76%)	39.154*	MC <0.001*
Abrasions and bite marks	2 (5.55%)	0 (0%)		
Abrasions and contusions	8 (22.2%)	0 (0%)		
Contusion	8 (22.2%)	1 (5.88%)		
Double striped contusion	0 (0%)	5 (29.4%)		
Fabricated abrasions	8 (22.2%)	0 (0%)		
Nail abrasions	0 (0%)	2 (11.76%)		
Old scars	4 (11.11%)	0 (0%)		
Scabs	2 (5.55%)	6 (35.3%)		
Scabs and abrasions	0 (0%)	1 (5.88%)		
Scabs, abrasions, and contusions	4 (11.11%)	0 (0%)		

χ^2 : Chi square test; MC: Monte Carlo; *: Statistically significant at $P<0.05$.

Table 5: Comparison between Fayoum group and Aswan group of sexual assault victims according to the type of swabs taken and its results.

Source of swab	Fayoum	Aswan	$\chi^2=$	P-value
Vaginal	Negative	14 (77.77%)	235.24*	<0.001*
	Positive	4 (22.2%)		
	Total	18		
Anal	Negative	10 (33.33%)	223.66*	<0.001*
	Positive	20 (66.66%)		
	Total	30		

χ^2 : Chi square test; *: Statistically significant at $P<0.05$.

4. Discussion

The actual prevalence of the different types of sexual violence against girls and women is not well established in the Arab world, especially in Egypt [7].

In the current study, the socio-demographic data of the sexual assault victims of this study revealed that the victims' mean age in Fayoum was 15.79 ± 8.59 , while in Aswan, it was 12.96 ± 7.19 . That result was partially in agreement with Karanfil *et al.* (2013), who stated that the mean age of victims in their study on the cases of sexual assault examined in Turkey, was 16.78 ± 7.16 years [8]. On contrary, McGregor *et al.* (2002) revealed that the mean age of sexual assault victims examined in British Columbia was 26.7 years [9]. The inconsistent results might be attributed to the cultural changes in different societies.

Our results revealed an increased incidence of sexual assaults among victims less than 18 years old, which could be explained as those victims spend more time outdoors, not under the supervision of their families. Moreover, they are not oriented to the sexual signals because of the lack of awareness about the sexual assault. Multiple studies are in agreement with our findings [10-11].

The present study revealed that in Fayoum, the female victims' percentage was higher than that of the males (55.8% and 44.2%, respectively). The results agreed with those obtained by Hwa *et al.* (2010), who conducted their study on sexual assault cases in Taiwan and found that 93.9% of cases were females [2].

The current study revealed that in Aswan, the percentage of male victims exceeded that of the female victims (68.8% and 31.2%,

respectively). The result of the gender of Aswan's victims is in agreement with Sivarajasingam *et al.* (2004), who found that the male victims outnumbered the female victims (72% and 28%, respectively) [12]. Also, similar findings from the study conducted by Mwaheb *et al.* (2016) and Celbis *et al.* (2006), which revealed that a most of the victims were related to the rural areas [13-14]. On contrary, the studies conducted by of El-Elemi *et al.* (2011) and Sherif *et al.* (2018) demonstrated that most of the female sexual assault cases were from urban areas [7, 10]. That contradiction might be attributed to the type of society in Fayoum and Aswan, which tended to be rural.

The current study revealed most of sexual assault cases were unmarried. In agreement with the present results, Sherif *et al.* (2018) and El-Elemi *et al.* (2011) showed that most of the studied cases of sexual assault were female victims and significantly higher than married victims [7, 10]. Also, the study conducted by Coid *et al.* (2003), which recruited female victims in East London, mentioned that married women were less likely to report rape than unmarried victims [15]. Das *et al.* (2013) also reported that most of the victims of sexual assault (60.3%) were unmarried [16]. Many of the reasons related to the beliefs and culture of the victims of the sexual assaults as reported will cause undesired shame and stigma in the community that will affect their social condition and their psycho-logical state [7].

In the presents study, it was found that rape (complete vaginal penetration) was the most frequently accounted for the type of sexual assault in Fayoum (25.6%), followed by both the anal sex and sexual harassment (20.9%),

whereas combined rape with anal sex assault represented only 2.3% of the cases. In Aswan, anal sex was the most frequently documented type of sexual assault (44.1%), followed by alleged anal sex (24.7%), whereas both combined rape with anal sex assault (real and alleged) represented only 2.2% of the cases.

Coinciding with Fayoum's results in this study, De Munnynck et al. (2006), in the study conducted in Belgium between 1997-2002, reported that rape and other types of sexual violence consist about 0.5% of all reported crimes, and the majority of the cases were rape [17]. Karanfil et al. (2013) following Fayoum's results in the present study, reported that the most common type of sexual assault was vaginal penetration (49.4%), while about 36.3% had anal penetration and 18.5% had only foreplay [8]. Another study in Louisiana State University, USA, recorded that most of the as-saults were perpetrated by a single attacker as opposed to multiple attackers (81.9% and 18.1% respectively) [11]. Also, another study revealed that 80% of the re-ported sexual assault female cases were committed by a single assailant, while the assault in the rest of the cases (20%) was committed by more than one assailant [7]. Sherif et al. (2018) revealed that the majority of sexual as-saults were perpetrated by a single assailant (78.6%), while multiple assailants were responsible for 21.4% of the sexual cases [10]. Many other studies reported a high percentage of involvement of single assailants in their studies on sexual assault victims (93.9%, 82.7%, and 86.5%, respectively) [2, 8, 18].

The results showed that the highest percentage of the sexual assault cases were committed by a non-relative identified person to the victims (69.18% and 78.5%, respectively), while the percentages of the assault cases that conducted by a related person to the victim were (30.81% and 21.5%, respectively). Avegno et al. (2009) noticed that 53% of the sexual assault

cases had awareness of their attacker (or at least one of their offending assailants if multiple perpetrators), 42.2% did not know the assailant and 4.8% were unsure [11]. Feldhaus et al. (2000) reported that assaults with unknown assailants were more likely to occur than those with known perpetrators [19]. Also, Sherif et al. (2018) revealed that the vast majority of the sexual assaults were perpetrated by an unknown assailant to the victim (91.3%), while other cases were committed by relatives such as husband, father, or other members of the family (3.5%, 1.3%, and 3.9%, respectively) [10]. Furthermore, the majority of the studied victims were seen and examined medico-legally less than ten days after the assault (68.6%), while about 16.1% were examined in a period ranging between 10-50 days after the assault [10]. Besides, the majority of females were victims of rape followed by attempted rape, followed by anal sex (8%), and mixed rape (6.9%) [10]. Another study found that bruises were the most frequently observed injury type (50%) regardless of the body region [20]. In addition, Hwa et al., (2010) stated that the most frequent general physical injuries included bruises (86%) and abrasions (23.3%), and only one case had a cut wound that was inflicted by a weapon [2]. Moreover, a previous study revealed absence of injuries in 66.37% of the studied cases, while the rest of the cases had abrasions (46.75%), contusions (41.55%), and bites (1.29%) [10]. The Absence of injuries might be due to the over-threatening acts by the assailants over the victims, or the victims may be affected by drugs [7].

The present study revealed that among Fayoum and Aswan cases (37.5% and 37.94%, respectively) there were no local injuries, while 62.5% and 62.06%, respectively, showed variable local injury types, with the hymenal tear (old and recent) being the major encountered local injury in both Fayoum and Aswan groups of cases (80% and 66.66% respectively). The

least encountered local injuries in Fayoum cases were an old perineal tear, mixed vulvoanal injuries and mixed vulvovaginal with perineal injuries (3.33%), while the least encountered local injuries in Aswan were the recent anal fissure with annular anal contusion and mixed vulvo-anal injuries (11.11% for each). Abrasion and contusion were found in only two cases in the labia majora, posterior fourchette, and vaginal wall; these last two cases were also associated with the hymenal tear. No injuries were seen in the mons-pubis or clitoris in the Fayoum and Aswan groups. Agreeing with these results, Karmakar, (2015) stated that the annular hymen constituted the most frequent hymen among females [21]. Sherif *et al.*, (2018) also revealed that annular hymen was the most common type of the hymen (61.87%), and the least number of the studied hymen types was septate hymen in only (1.25%) of studied cases [10]. Also, Hwa *et al.* (2010) recorded the presence of anal skin abrasions and/or laceration in about 57.1% of the male victim, while an anal mucosal tear was present in 53.1% of female victims and 57.1% of male victims [2]. Mawaheb *et al.* (2016) revealed that the perianal signs were found in 80% of the victims, though they were absent in 20% of them [13].

Our results demonstrated that the majority of cases among both Fayoum and Aswan cases (77.9% and 81.7%, respectively) were CIE scores zero, while the remaining cases in Fayoum (22.1%) and Aswan (18.3%) were CIE score 2 (they had redness, tenderness of the genitalia including anal and rectal are-as, bruises or abrasions requiring treatment and/or lacerations that required suturing or dressing). The CIE score 1 (redness or tenderness only or minor injuries with no expected impact on physical function) and score 3 (head injury with a concussion and/or evidence of attempted strangulation and/or other major injuries, e.g., fracture or internal organ contusion) were not seen among the studied sexual assault cases.

Sherif *et al.* (2018) revealed that more than half of cases (58.5%) were a zero score of CIES, they had no injuries, while the remaining cases (41.5%) were a CIE score two, besides, most of the victims were <18 years (54.7%) and unmarried (73.7%) of score 2 [10]. Alempijevic *et al.* (2007) reported that the majority of victims (44%) sustained light injuries (CIES-1), while 18% of cases has moderate injuries (CIES-2), whereas severe injuries (CIES-3) were documented in only one victim of sexual assault [20].

No swabs were taken from 126 cases (73.3%) out of 172 examined cases in Fayoum, while in Aswan no swabs were taken from 62 cases (66.7%) out of 93 examined cases. The vaginal swabs in Fayoum were taken from 18 cases out of 96 examined female cases (18.75%) for rape, attempted rape, or mixed rape-anal sex. Positive swabs' results for the presence of semen were detected in 22.22% of the cases, while 77.77% of swabs were negative. Anal swabs were taken from 30 (42.85%) cases out of 70 examined cases for anal sex and alleged anal sex. Positive results for the presence of semen were detected in 66.66% of cases, while 33.33% of swabs were negative. In an agreement, a previous study reported that the biological sampling was performed with positive results for DNA extraction in 51.5% [18].

Negative vaginal swabs could be attributed to many probabilities as drainage, which is the primary cause of loss of seminal fluid constituents followed by dilution with vaginal secretion. The effect of drainage is enhanced by bathing/showering, or ejaculation outside the vagina, or the semen may be azoospermia if the diagnosis of semen depends on the presence of sperm. These reasons may lead to negative swabs [22].

5. Conclusion

From the present study, it was concluded that the highest incidence of all sexual assault cases was in the age group <18 years. Females in Fayoum and males in Aswan constituted the major victims of sexual assaults. Urbanization and inmarriage are suggest risk factors for increased incidence of sexual assaults. Rape and anal sex are the most frequently reported types of sexual assault in Fayoum and Aswan cases, respectively. Furthermore, the majority of all studied cases reported the assault by non-relatives in less than 14 days. The most frequent injuries seen in Fayoum group, during the general examination were fabricated and mixed abrasions with contusions, while scabs of wounds were the most frequent injuries seen in Aswan group. The majority of cases showed no tear, while in the rest of cases had anal lacerations, many of which were accompanied by annular anal skin contusion. Regarding the clinical injury extent score (CIES) of the studied victims, it is demonstrated that majority of the

cases hadn't any obvious injury (CIE score zero), while the remaining cases were CIE score 2.

Funding: This research is not funded.

Ethical Approval Statement: For the collection of the retrospective data, approvals have been obtained from the heads of the Fayoum and Aswan Departments of Forensic Institute of the Ministry of Justice. Confidentiality of records and data were maintained by keeping the records and pieces of information anonymous.

Informed Consent Statement: A detailed informed consent had been signed by the eligible participants before recruitment and randomization.

Conflicts of Interest: All authors declare no conflict of interest.

Acknowledgement: The authors are grateful for the patients without whom this study would not have been done.

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