

Work-Related Violence among Female Employees in a University Hospital in Alexandria: An Epidemiologic Study

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Abstract: Violence is one of the most prevailing and dangerous occupational hazards facing health care workers (HCWs) notably female HCWs. Recently, violence became a major concern in different Egyptian hospitals notably after the 25th of January revolution and bursting increase demand on hospitals. **Objectives:** to determine prevalence of workplace violence in the last 12 months prior to the survey and its risk factors among female employees at the Main University Hospital in Alexandria, Egypt. **Subjects and methods:** A cross sectional interviewing survey was conducted in The Main University Hospital in Alexandria from 1st of August 2011 till 1st April 2012 targeting 540 female HCWs. **Results:** Prevalence of violence incidents was (72.6%) among female HCWs. Verbal violence (70.7%) was the most common form encountered among female HCWs followed by physical (17.4%) and sexual violence (2.2%). Female HCWs exposed to violence were significantly younger than those who did not experience violence ($P=0.048$). Being single constituted risk for violence (OR=4.18, CI: 2.23-7.94) so as the positive history of exposure to violence at home (OR=2.6, CI: 1.7-4.1), engaging in rotating shifts (OR=2.2 CI: 1.5-3.4). Long-term impact of exposure to violence was in the form of arguments with colleagues (97.4%), dissatisfaction with current job (73.5%), depression (38.8%), and negative effects on social life (28.5%) and on job performance (19.4%). **Conclusion:** Violence is prevalent among female HCWs in Main University Hospital, Alexandria. Special attention should be directed to control violence against young single nurses in rotating shifts specially who had history of exposure to violence.

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1. Introduction

Violence is one of the most prevailing, complex and dangerous occupational hazards facing health care workers (HCWs) especially when directed to female HCWs. Women represent nearly 80% of the healthcare work force.⁽¹⁾ The real size of the problem is largely unknown and recent information shows that the current knowledge is only the tip of the iceberg.⁽²⁾

The national Institute for Occupational Safety and Health (NIOSH) defines workplace violence as violent acts (including physical assaults and threats of assaults) directed towards person at work or on duty.⁽³⁾ As violence in health care settings attains special concern, it was specifically defined as verbal, non-verbal or physical behavior that is threatening or cause harm to HCWs or to the property.⁽⁴⁾ Different definitions of violence were adopted in different studies resulting in wide variation of violence prevalence at health care settings.⁽⁵⁾

Recently it was reported that Healthcare professionals are 16 times more likely to be attacked on the job than any other service professional.⁽⁶⁾ Studies have shown that between 35% and up to 90% of HCWs

have been physically assaulted at least once during their career.⁽⁷⁻¹⁰⁾

Many factors may play a role in occurrence of violence against HCWs. Individual characteristics of HCWs including female gender of worker,⁽¹¹⁾ relation between HCWs, patients and visitors, emotional stress of patient and relatives, and the stressful work environment are among the most important determinants of violence.^(8, 12) Since health care workforce is in its large majority female, the gender dimension of the problem is very evident.⁽¹¹⁾

Understandably, experiencing violence has a negative impact on job satisfaction and performance. Moreover, violence at hospitals can lead to shortage of health care workers and undermine the quality of health care services.⁽¹³⁾ Unfortunately, post-incident management of violence is generally neglected even in research. Yet, few studies reported negative effects on psychological and physical wellbeing of HCWs.

Although it is possible to prevent or reduce healthcare worker exposure to different occupational hazards, healthcare workers continue to experience injuries and illnesses in the workplace. Cases of

nonfatal occupational injury and illness among to healthcare workers are among the highest of any industry sector.⁽³⁾

Recently, violence became a major concern in different Egyptian hospitals notably after the 25th of January revolution and bursting increase demand on hospitals.

The study is conducted to determine prevalence of workplace violence in the last 12 months prior to the survey and its risk factors among female employees at the Main University Hospital in Alexandria.

2. Subjects and methods:

Study design, setting and period:

A cross sectional survey was conducted in The Main University Hospital in Alexandria. The hospital is the main teaching hospital serving 3 governorates; Alexandria, El-Behera, and Matrouh. The study was conducted from 1st of August 2011 till 1st April 2012

The study targeted all female HCWs; nurses and workers, who worked in direct contact with patients and/or visitors. Female HCWs were affiliated to the hospital at the main departments of the hospital namely; surgery, internal Medicine, radiotherapy, outpatient clinics, and emergency department. The total respondents were 540 from total of 597 female HCWs.

Data collection tool:

An interviewing questionnaire was developed in Arabic to collect the needed data after reviewing literature. The questionnaire contained two parts. The first part entails data about socio-demographic and occupational characteristics of the studied female HCWs. The second part focused on gathering data about violence incidents during 12 months prior to the study, its circumstances, reaction of female HCWs and impact of exposure to such violence.

The questionnaire was reviewed by an expert panel for appropriateness and ability to collect the needed data.

A pilot study was conducted on 20 randomly selected female HCWs who were excluded the main study. Some questions were rephrased.

Ethical considerations

The research protocol was approved by Alexandria Faculty of Medicine research committee so as the committee of research ethics affiliated to Alexandria Main University Hospital. An Informed consent was obtained from all subjects before participation in the study. Objectives of the study were clarified to the respondents and participants' privacy was guaranteed.

Statistical analysis:

Raw data was coded, entered and analyzed using SPSS system files (SPSS package version 18). Data was described using frequency; distribution, trimmed mean, and standard deviation. Normality of data distribution was tested using

Kolmogorov – Smirnov test. Univariate analyses were conducted using Mann Whitney test for quantitative variables and Chi-square test for qualitative variables. Odds ratio (95% CI) was calculated to quantify risk of different factors. Multivariate analysis using binary logistic regression was conducted to delineate predictors of exposure to violence among female HCWs. The significance of the results was at the 5% level of significance.

3. Results:

Prevalence of violence:

Prevalence of violence was high as about three quarters (72.6%) of the studied female HCWs were exposed to violence. Verbal violence (70.7%) was the most common form of violence encountered among female HCWs followed by physical (17.4%) and sexual violence (2.2%).

Table (1): Occurrence of violence among studied nurses:

| Exposure to violence | Female HCWs (n=540) | |
|----------------------|---------------------|------|
| | No. | % |
| No | 148 | 27.4 |
| Yes | 392 | 72.6 |
| Verbal violence | 382 | 70.7 |
| Physical violence | 94 | 17.4 |
| Sexual violence | 12 | 2.2 |

Characteristics of female HCWs:

Female HCWs exposed to violence were significantly younger (37.2 ± 12.3 years) than those who did not experience violence (39.7 ± 9.9 years) where ($P=0.048$). Being single constituted risk for violence ($OR=4.18$, $CI: 2.23-7.94$). Moreover, a positive history of exposure to violence at home posed risk for exposure to violence at work ($OR=2.6$, $CI: 1.7-4.1$). Differences in monthly income or crowding index among studied HCWs were not statistically significant. Female HCWs who were previously exposed to violence at home were significantly more exposed to violence at work (83.3%) than those who did not expose to violence at home (65.4%); ($P<0.0001$, $OR=2.6$ $CI: 1.7-4.1$) (Table2).

The studied female HCWs were nurses and workers from different hospital departments namely surgery, internal medicine, radiotherapy, outpatient units, and emergency department. The majority of nurses in the studied departments except radiotherapy (42.9%) suffered exposure to violence with highest frequency observed in emergency department (85.2%) followed by other departments (78.0%-72.3%). The differences were statistically significant ($P<0.0001$). Violence was significantly more encountered among female HCWs engaged in rotating shifts as compared to those with fixed shift; ($P<0.0001$, $OR=2.2$ $CI: 1.5-3.4$). Meanwhile, no significant differences were observed between female HCWs of both groups

regarding duration of employment, joining extra-job, duration of working hours, or frequency and duration of breaks during shift. (Table 3)

The majority of female HCWs who did not expose to violence reported that they have good relations with their direct supervisors (73.0%), physicians (87.8%), colleagues (93.2%), and patients (82.4%). Meanwhile, lower percentages of good relation were reported by female HCWs who experienced violence. Differences observed were statistically significant. Moreover, having poor relations with direct supervisors (OR=2.0 [1.3-3.1]), physicians (OR=2.3 [1.3-4.0]), colleagues (OR=3.8 [1.8-8.0]), and patients (OR=2.1 [1.3-3.5]) constituted risk factors for violence exposure. (Table 4)

The majority of female HCWs who were exposed to violence reported that they were exposed to such incidents more than once (89.8%), mostly by patients (71.9%) and their relatives (88.3%). Nearly equal percentages of violence were caused by supervisors (37.2%), physicians (31.6%) and colleagues (30.6%). Violence was committed nearly equally by both males (67.9%) and females (64.2%). Violence was evident during day shift (71.4%) as compared to night shift (28.6%).

Being a female (91.1%), suffering from excess work load (67.9%), and/or absence of security guards (48.2%) were the causes perceived by female HCWs for being exposed to violence. (Table 5)

Circumstances of violence incidents:

Table 6 shows that the majority of perpetrators, regardless type of violence, were patients and their relatives.

Female HCWs exposed to violence stated that they reported about half of the violence incidents (52.6%) to hospital authority. Yet, no action was taken by hospital authority regarding majority of those reported incidents (61.2%). Causes of not reporting violence incidents included the concept of no need for reporting (74.2%) as violence was considered as part of the job, feeling ashamed (13.9%), and fear from the perpetrator (11.8%). (Table 7)

Consequences of exposure to violence:

Regarding immediate response for being exposed to violence, only (3.6%) of females HCWs exposed to violence left the shift as a consequence for being exposed to violence. Moreover, (1.8%) required treatment, and (15.3%) were absent for one shift thereafter and for more than one shift (5.6%).

Long-term impact of exposure to violence was in the form of arguments with colleagues (97.4%), dissatisfaction with current job (73.5%), depression (38.8%), negative effects on family and social life (28.5%), negative effects on job performance (19.4%), and even change place of work (4.6%). (Table 8)

Multivariate analysis showed that predictors for exposure of female HCWs to violence are being single, having poor relation with colleagues and supervisors and history of exposure to violence at home. (Table 9)

Table (2): Socio-demographic characteristics of the studied female HCWs exposed and non-exposed to violence.

| ocio-demographic characteristics | Female HCWs (n=540) | | | | | | Significance (P) | Odds ratio | (95% CI) |
|--|---------------------------------|------|-----------------------------|------|---------------|------|--|-----------------------------|---|
| | Not exposed to violence (n=148) | | Exposed to violence (n=392) | | Total (n=540) | | | | |
| | No. | % | No. | % | No. | % | | | |
| Age (years) | | | | | | | | | |
| Min-Max | 18-59 | | 18-59 | | 18-59 | | Z=1.97 (0.048)* | | |
| Trimmed mean±SD | 39.7±9.9 | | 37.2±12.3 | | 37.8±11.7 | | | | |
| Marital status | | | | | | | X²=30.8 (<0.0001)* | 4.18 1.0 0.58 | 2.23 - 7.94 1.0 0.28 - 1.17 |
| Single | 14 | 10.1 | 124 | 89.9 | 138 | 25.6 | | | |
| Married | 116 | 32.0 | 246 | 68.0 | 362 | 67.0 | | | |
| Divorced/ Widow | 18 | 45.0 | 22 | 55.0 | 40 | 7.4 | | | |
| Education | | | | | | | X²=9.66 (0.022)* | 0.54 2.03 1.44 1.0 | 0.22 - 1.28 0.73 - 5.95 0.92 - 2.27 |
| Illiterate | 14 | 46.7 | 16 | 53.3 | 30 | 5.6 | | | |
| Basic education | 6 | 18.8 | 26 | 81.3 | 32 | 5.9 | | | |
| Secondary education | 82 | 24.6 | 252 | 75.4 | 334 | 61.9 | | | |
| Higher education | 46 | 31.9 | 98 | 68.1 | 144 | 26.7 | | | |
| Monthly income of the family (LE) | | | | | | | X ² =0.75 (0.686) | 1.51 0.89 1.0 | 0.46-5.44 0.5-1.58 |
| Less than 200 | 4 | 20.0 | 16 | 80.0 | 20 | 3.7 | | | |
| 200- | 22 | 29.7 | 52 | 70.3 | 74 | 13.7 | | | |
| 300 or more | 122 | 27.4 | 324 | 72.6 | 446 | 82.6 | | | |
| Crowding index | | | | | | | Z=0.748 (0.455) | | |
| Min-Max | 0.5-6.0 | | 0.3-7.0 | | 0.25-7.0 | | | | |
| Trimmed mean±SD | 1.7±0.9 | | 1.8±1.0 | | 1.8±0.9 | | | | |
| History of exposure to violence at home | | | | | | | X²=20.87 (<0.0001)* | 1.0 2.6 | 1.7-4.1 |
| No | 112 | 34.6 | 212 | 65.4 | 324 | 60.0 | | | |
| Yes | 36 | 16.7 | 180 | 83.3 | 216 | 40.0 | | | |

Z: Mann Whitney test

X²: Chi-Square test

*significant at P≤0.05

Table (3): Occupational characteristics of the studied female HCWs exposed and non-exposed to violence

| Occupational characteristics | Female HCWs (n=540) | | | | | | Significance (P) | Odds ratio | (95% CI) |
|--|---------------------------------|------|-----------------------------|------|---------------|------|------------------|------------|-----------------|
| | Not exposed to violence (n=148) | | Exposed to violence (n=392) | | Total (n=540) | | | | |
| | No. | % | No. | % | No. | % | | | |
| Job | | | | | | | | | |
| Nurse | 128 | 26.8 | 350 | 73.2 | 478 | 88.5 | $X^2=0.83$ | 1.3 | 0.7-2.4 |
| Worker | 20 | 32.3 | 42 | 67.7 | 62 | 11.5 | (0.363) | 1.0 | |
| Department | | | | | | | | | |
| Surgery | 52 | 27.7 | 136 | 72.3 | 188 | 34.8 | | 3.5 | 1.7-7.4 |
| Internal medicine | 42 | 26.9 | 114 | 73.1 | 156 | 28.9 | $X^2=24.46$ | 3.6 | 1.7-7.8 |
| Radiotherapy | 24 | 57.1 | 18 | 42.9 | 42 | 7.8 | (<0.0001)* | 1.0 | |
| Outpatient clinics | 22 | 22.0 | 78 | 78.0 | 100 | 18.5 | | 4.7 | 2.0-11.1 |
| Emergency department | 8 | 14.8 | 46 | 85.2 | 54 | 10.0 | | 7.7 | 2.7-22.9 |
| Duration of employment | | | | | | | | | |
| Min-Max | 1-44 | | 1-38 | | 1-44 | | Z=1.392 | | |
| Trimmed mean±SD | 17.6±9.9 | | 16.2±10.5 | | 16.6±10.4 | | (0.164) | | |
| Type of shift | | | | | | | | | |
| Rotating | 50 | 19.4 | 208 | 80.6 | 258 | 47.8 | $X^2=16.0$ | 2.2 | 1.5-3.4 |
| Fixed | 98 | 34.8 | 184 | 65.2 | 282 | 52.2 | (<0.0001)* | 1.0 | |
| Joining an extra-job | | | | | | | | | |
| No | 142 | 27.3 | 378 | 72.7 | 520 | 96.3 | | 1.0 | |
| Yes | 6 | 30.0 | 14 | 70.0 | 20 | 3.7 | $X^2=0.07$ | 0.9 | 0.3-2.6 |
| | | | | | | | (0.79) | | |
| Number of working hours/day | | | | | | | | | |
| Min-Max | 6-13 | | 2-15 | | 2-15 | | Z=1.65 | | |
| Trimmed mean±SD | 7.8±2.4 | | 8.3±2.7 | | 8.1±2.6 | | (0.1) | | |
| Frequency of breaks during shift (no/shift) | | | | | | | | | |
| Min-Max | 0-2 | | 0-5 | | 0-5 | | Z=0.107 | | |
| Trimmed mean±SD | 0.5±0.6 | | 0.5±0.7 | | 0.5±0.7 | | (0.92) | | |
| Duration of breaks (minutes/shift) | | | | | | | | | |
| Min-Max | 0-60 | | 0-120 | | 0-120 | | Z=0.01 | | |
| Trimmed mean±SD | 8.7±13.5 | | 9.4±18.5 | | 9.0±17.3 | | (0.99) | | |

Z: Mann Whitney test X^2 : Chi-Square test *significant at $P \leq 0.05$ **Table (4): Perception of social relations of the studied female HCWs at their work environment exposed and non-exposed to violence.**

| Social relations at work | Female HCWs (n=540) | | | | | | Significance (P) | Odds ratio | (95% CI) |
|--------------------------------|---------------------------------|------|-----------------------------|------|---------------|------|------------------|------------|----------------|
| | Not exposed to violence (n=148) | | Exposed to violence (n=392) | | Total (n=540) | | | | |
| | No. | % | No. | % | No. | % | | | |
| With direct supervisors | | | | | | | | | |
| Poor | 40 | 27.0 | 166 | 42.3 | 206 | 38.1 | $X^2=10.69$ | 2.0 | 1.3-3.1 |
| Good | 108 | 73.0 | 226 | 57.7 | 334 | 61.9 | (0.001)* | 1.0 | |
| With physicians | | | | | | | | | |
| Poor | 18 | 12.2 | 102 | 26.0 | 120 | 22.2 | $X^2=10.01$ | 2.3 | 1.3-4.0 |
| Good | 130 | 87.8 | 290 | 74.0 | 420 | 77.8 | (0.002)* | 1.0 | |
| With colleagues | | | | | | | | | |
| Poor | 10 | 6.8 | 84 | 21.4 | 94 | 17.4 | $X^2=16.09$ | 3.8 | 1.8-8.0 |
| Good | 138 | 93.2 | 308 | 78.6 | 446 | 82.6 | (<0.0001)* | 1.0 | |
| With patients | | | | | | | | | |
| Poor | 26 | 17.6 | 122 | 31.1 | 148 | 27.4 | $X^2=9.92$ | 2.1 | 1.3-3.5 |
| Good | 122 | 82.4 | 270 | 68.9 | 392 | 72.6 | (0.002)* | 1.0 | |

 X^2 : Chi-Square test *significant at $P \leq 0.05$

Table (5): Circumstances of violence incidents among the studied female HCWs previously exposed to violence.

| Circumstances of violence incidents | Female HCWs exposed to violence (n= 392) | |
|--|--|------|
| | No. | % |
| Frequency of exposure to violence | | |
| Once | 40 | 10.2 |
| More than once | 352 | 89.8 |
| The perpetrator[#] | | |
| Patients | 282 | 71.9 |
| Relatives of patients | 346 | 88.3 |
| Physicians | 124 | 31.6 |
| Colleagues | 120 | 30.6 |
| Supervisors | 146 | 37.2 |
| Gender of perpetrator[#] | | |
| Male | 266 | 67.9 |
| Female | 252 | 64.2 |
| Timing of exposure to violence[#] | | |
| Day | 300 | 76.5 |
| Night | 112 | 28.6 |
| Perceived causes for exposure to violence[#] | | |
| Being a female | 266 | 91.1 |
| Excess work load | 72 | 67.9 |
| Absence of security guards | 189 | 48.2 |

[#] More than one choice

Table (6): Perpetrator of different types of violence (can be more than one choice)

| Perpetrator | Type of violence experienced by female HCWs (n=392) | | | |
|--------------------|---|--------------------------|------------------------|------------------------|
| | Verbal violence (n=382) | Physical violence (n=94) | Sexual violence (n=12) | Total violence (n=392) |
| Patient | 236 (61.8) | 40 (42.6) | 6 (50.0) | 282 (71.9) |
| Patient's relative | 272 (71.2) | 64 (68.1) | 10 (83.3) | 346 (88.3) |
| Physician | 116 (30.4) | 6 (6.4) | 2 (16.7) | 124 (31.6) |
| Colleague | 120 (31.4) | -- | -- | 120 (30.6) |
| Supervisor | 142 (37.2) | 4 (4.3) | -- | 146 (37.2) |

Table (7): Reporting of violence incidents to hospital authority by female HCWs exposed to violence.

| Reporting of violence incidents | Female HCWs exposed to violence (n= 392) | |
|---|--|------|
| | No. | % |
| Reporting incident to hospital authority | | |
| No | 186 | 47.4 |
| Yes | 206 | 52.6 |
| Causes for not reporting (n=186) | | |
| No need to report | 138 | 74.2 |
| Fear from the perpetrator | 22 | 11.8 |
| Feeling shame | 26 | 13.9 |
| Action taken by hospital authority (n=206) | | |
| None | 126 | 61.2 |
| Investigating the incident | 80 | 38.8 |

[#] Categories are not mutually conclusive

Table (8): Impact of exposure to violence on the studied female HCWs exposed to violence.

| Consequences of violence exposure [#] | Female HCWs exposed to violence (n= 392) | |
|---|--|------|
| | No. | % |
| Immediate response to exposure to violence | | |
| Leave work at the shift | | |
| No | 138 | 35.2 |
| Yes | 254 | 64.8 |
| Requiring treatment after exposure to violence | | |
| No | 385 | 98.2 |
| Yes | 7 | 1.8 |
| Absence in the following shifts | | |
| No | 310 | 79.1 |
| Absent for 1 shift | 60 | 15.3 |
| Absent for more than 1 shift | 22 | 5.6 |
| Long-term consequences of violence | | |
| Arguments with colleagues | 382 | 97.4 |
| Un-satisfaction with current job | 100 | 73.5 |
| Depression | 152 | 38.8 |
| Psychological effects on family and social life | 112 | 28.5 |
| Negative effect on performance | 76 | 19.4 |
| Change place of work | 18 | 4.6 |

[#] Categories are not mutually conclusive

Table (9): Multivariate analysis of predictors for violence exposure among female HCWs (not exposed/exposed) as revealed by binary regression model (enter method).

| Variables | B | SE | Wald | P | Exp (B) |
|---|----------------|--------------|---------------|--------------------|----------------|
| Marital status (single/married) | -1.0 | 0.318 | 9.882 | 0.002* | 0.368 |
| Relation with patients (poor/good) | - 0.461 | 0.283 | 2.65 | 0.104 | 0.631 |
| Relation with physician (poor/good) | - 0.103 | 0.329 | 0.098 | 0.755 | 0.902 |
| Relation with colleagues (poor/good) | - 1.022 | 0.415 | 6.048 | 0.014* | 0.36 |
| Relation with supervisors (poor/good) | - 0.531 | 0.247 | 4.607 | 0.032* | 0.588 |
| Type of shift (rotating/fixed) | - 0.243 | 0.242 | 1.012 | 0.314 | 0.784 |
| History of exposure to violence at home (No/Yes) | 0.815 | 0.239 | 12.646 | <0.0001* | 2.341 |
| Constant | 6.696 | 1.062 | 39.715 | <0.0001* | 808.961 |

Model summary: X²=65.795, P<0.0001*, R²=0.18

4. Discussion:

Generally, the majority of female HCWs (72.6%) suffered from violence. Such prevalence is lower than the prevalence reported by an earlier Egyptian study that was conducted in obstetric and gynecological departments in Cairo hospitals revealed that the

majority of nurses (86.1%) had been exposed to violence.⁽¹⁴⁾

Again, the observed prevalence is low as compared to international studies such as an Australian research (2007) conducted on violence among paramedics which reported violence among (87.5%) of the studied subjects.⁽⁹⁾

Nearly all female HCWs exposed to violence suffered from verbal violence (70.7%) while physical violence constituted 17.4%. In comparison, 91.1% of Turkish HCWs (2007) were exposed to verbal violence while 33% were exposed to physical violence.⁽¹⁵⁾ Again, national studies conducted at different hospitals in England, Hong Kong, China, Bulgaria and Brazil reported prevalence of verbal violence ranging between 27.4% up to 73%.⁽¹⁶⁻¹⁹⁾

Meanwhile, physical violence ranged from 3% in Lebanon to 17% in South Africa in other epidemiological studies.⁽²⁰⁾ A similar study conducted in Saudi Arabia (2010) revealed that only 27.7% of primary health care workers were exposed to physical, psychological violent attacks.⁽²¹⁾ Much lower rates of both physical and verbal violence were reported among Jordanian nurses; 37.1% and 18.3% respectively.⁽²²⁾

Sexual violence was neglected in many studies conducted in health care settings. The current study found that (2.2%) of female HCWs were exposed to such incidents mainly by patients' relative (83.3%) and patients (50%). Studies reported prevalence of sexual harassment of (1.4%) among Saudi primary health care workers⁽²¹⁾, 0.7% among nursing staff in a general hospital in Thailand⁽²³⁾, 9.3% among Australian general practitioners,⁽²⁴⁾ and 14% among British female GPs.⁽²⁵⁾

Only few studies have explored violence among female HCWs including only nurses and workers. Still, variation in study designs, definition of violence, difference in recall duration and gender of included HCWs complicates comparing results of different researches.

Socio-demographic characteristics were investigated to delineate risk factors to be a victim for violent attack at hospital. Female HCWs exposed to violence were significantly younger than those who did not expose to violence ($P=0.048$). A similar result was reported by Hahn et al (2012)⁽⁵⁾ and **Jackson and Ashley (2005)**.⁽²⁶⁾ Meanwhile, **El-Guilany et al (2010)**⁽²¹⁾, **Mayhew and Chappell (2003)**⁽²⁷⁾, and **Steinman (2003)**⁽²⁸⁾ could not identify particular age for being victim for violence.

Younger female HCWs may be less experienced to deal with other's anger. Moreover, they may not have the skills to predict violent situations. Still, duration of experience did not show significant difference between exposed and non exposed female HCWs to violence.

Regarding marital status of female HCWs, being single hampered risk to violence exposure ($OR=4.18$, $CI: 2.2-7.9$). Such relation was not revealed in an earlier

Egyptian study (2010) conducted on male and female nurses.⁽²⁹⁾

Surprisingly, history of being exposed to violence at home constituted risk for violence exposure at hospital ($OR=2.6$, $CI: 1.7-4.1$). More research is needed to clarify causes of such association. Exposure to violence at home causes psychological problems that may yield into being more prone to violence incidents at workplace. **Jewkes et al (2002)** revealed that personal experience of violence during childhood or experience of a close friend or relative may stimulate the reproduction of violent behavior in adult life.⁽³⁰⁾ Similarly, childhood abuse or previous assault experience was previously reported as personal risk factors for workplace violence.^(31,32)

Occupational characteristics of female HCWs revealed that violence against female HCWs was evident in the emergency department ($OR=7.7$, $CI: 2.7-22.9$) followed by outpatient clinics ($OR=4.7$, $CI: 2.0-11.1$), internal medicine department ($OR=3.6$, $CI: 1.7-7.8$) and surgery department ($OR=3.5$, $CI: 1.7-7.4$). All departments were compared in relation to radiotherapy department. Still, the highest risk was observed in emergency department which is 24 hours accessible, lack security guards and entails highly stressful environment. These are some of the reasons leading to such high risk observed in emergency department.

Joining rotating shifts constituted risk for exposure to violence ($OR=2.2$, $CI: 1.5-3.4$). Similar result was obtained in an Egyptian study where nurses involved in job rotation were more exposed to violence.⁽²⁹⁾

Exposure to violence was strongly associated with poor relation with supervisors, physicians, colleagues and patients. Such disturbed relations could be direct consequence for being exposed to violence or it could be the trigger for exposure to violence. Chicken -egg dilemma exists and needs further comprehensive research.

Perpetrators in the majority of violent incidents were patients (71.9%) or their relatives (88.3%). Similar result was also reported by **Abbas et al (2010)**⁽²⁹⁾ and **Kwok (2006)**.⁽¹⁷⁾ Meanwhile, **Ayranci (2006)** reported that 49.5% of nurses reported that they never experienced violence by patients or their relatives.⁽³³⁾

Generally, Post incidence management was generally neglected in research. In the current study, reporting to supervisors and or hospital authority was stated by (52.6%) of female HCWs who experienced violence. Rate of reporting in the current study was found to be higher than that revealed by **Hahn et al (2012)**, where only 6.4% of studied nurses exposed to violence discussed the incident with their supervisors (16.4%).⁽⁵⁾ Again, the current result is higher than percentage reported by an earlier Egyptian study where less than 50% of nurses used the formal systems to report abuse.⁽¹⁴⁾

Unfortunately, no action was taken by the hospital authority regarding more than half of the reported incidents (61.2%) which constituted much frustration to female HCWs and raised questions about worth of such reporting.

Violence had social and psychological effects on female HCWs. The most dangerous effects were affection on job performance, work dissatisfaction and even trying to change place of work. Same consequences were reported in previous studies with different percentages.⁽³⁴⁾

Furthermore, severity of violence incidents was judged by work days lost after exposure to violence. It was found that (20.9%) of the studied female HCWs exposed to violence reported absence for one shift or more after the incident. Impact of violence on absenteeism was also studied by **O'brien-Pallas et al (2009)** who showed that violence causes significant increase in likelihood of nurses absenteeism thus negatively impacts quality of nursing care offered at hospital.⁽³⁵⁾

Limitations of the study: there is a need to use multiple measuring techniques as using combination of reporting procedures and diary keeping in conjunction to survey to increase quality of collected data. Still, unavailability of records hampers such verification procedure.

Recommendations:

Special attention is needed to reduce incidence of violence at different departments of the hospital notably the emergency department and outpatient clinics.

Training on communication skills and anger management is essential for violence prevention. Such training should be directed to all HCWs especially young single female HCWs who are involved in rotating shifts.

Providing health social atmosphere at the hospital among health care providing personnel is crucial to reduce violence. Stress on importance of establishing system for incidence reporting and adopting policy for management of such incidents.

Further research is needed to study strategies that should be adopted to control violence against HCWs. Moreover, comprehensive understanding of patients and visitors satisfaction will help in reduction of violence at the hospital.

Special emphasis on high need for presence of security guards at the hot spots in hospital so as the need for social workers at emergency department to alleviate emotional stress of patients and their relatives.

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