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Workplace violence and risk for psychiatric morbidity among health workers in a tertiary health care setting in Nigeria: Prevalence and correlates

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ABSTRACT

The objectives were to evaluate the workplace violence and risk for psychiatric morbidity, as well as their correlates, among health workers in a tertiary healthcare setting in Nigeria. A stratified random sampling technique was used to recruit the health workers. Each participant was administered a socio-demographic questionnaire, the ILO/ICN/WHO/PSI Workplace Violence Questionnaire and the 12- item General Health Questionnaire. A total of 380 health workers were recruited, with a mean age of 36.4 (± 7.64) years. The prevalence rates of workplace violence and risk of psychiatric morbidity were 39.9% and 38.5%. Factors with independent associations with workplace violence included young age, female sex and worry about workplace violence while a widowed, separated or divorced marital status and being victim of workplace violence independently increased risk for developing psychiatric morbidity. This study therefore showed that workplace violence is common in the health care setting, and significant proportion of workers are at risk for developing psychiatric morbidity. These observations suggest need for the regular mental health screening of health workers, as well as the need for programmes aimed at preventing workplace violence in this setting.

1. Introduction

Workplace violence describes incidents where staff are abused, threatened or assaulted in occupationally-related circumstances, including commuting to and from work, involving an explicit or implicit challenge to their safety, well-being or health (Wynne et al., 1997). It can be physical or psychological and is expressed in terms of assault/attack, abuse, bullying/mobbing, harassment, sexual harassment and racial harassment (Steinman, 2003).

Violence occurs in all work-related environments. However, it is of particular importance in the healthcare sector, considering that violence in this sector constitutes one of every four of all workplace violence incidents and more than half of healthcare workers have experienced at least one incident of physical or psychological violence in their professional lifetime (Talas et al., 2011). In addition, relative to other sectors, the health care sector reports the highest rates of non-fatal workplace assaults (Ferri et al., 2016; Zhao et al., 2015; Phillips, 2016). A recent study indicated that the problem of aggression towards health care staff is global and on the rise (Park et al., 2015). However, it is difficult to correctly measure the extent of the problem since workplace violence is under-reported (Shahzad and Malik, 2014) which may be partly explained by social factors (Celik and Celik, 2007). For example, it has been reported that nurses expected violence to be an integral part of their jobs (Speroni et al., 2014). Lack of strong violence prevention programs and protective regulations in health care facilities, as well as organizational realities such as staff shortages and increased patient load may contribute to this high prevalence (McPhaul and Lipscomb, 2004; Najafi et al., 2018).

Exposure to violence in the health care setting has been associated with adverse effects on the mental health of health workers such as anxiety, depression, insomnia, stress-related disorders, loss of self-confidence (Park et al., 2015; Ferri et al., 2016), suicidal ideation (Nielsen et al., 2015), irritability, aggression and psychoactive substance abuse (Ferri et al., 2016) . This can adversely affect the quality of health care service that will be provided by the affected workers. For example, medical errors that could cause harm to a patient's health and well-being have been reported following health workers' experience of violence (Sofield and Salmond, 2003). It has also been reported that healthcare workers can develop a degree of compassion fatigue which may render them desensitized to the problems of patients (Henderson, 2003), and may lower their professional efficacy and satisfaction (Rossi et al., 2012).

Although workplace violence is a global problem, health workers in low- and middle-income countries (LAMICs) may even be more at risk. It has been observed that more than half of the health sector personnel in the developing countries experienced at least one incident of physical

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or psychological violence (Sisawo et al., 2017). Government spending on health is significantly low in poor nations where an average of $23 per person is spent annually (purchasing power parity adjusted) (Global Burden of Disease Health Financing Collaborator Network, 2017a). By contrast, an average of $3860 and $2695 is spent by the US and UK governments respectively on health (Global Burden of Disease Health Financing Collaborator Network, 2017b). As a result, the few available health resources are not enough to service the large population in these areas leading to overcrowding, increased waiting time and insufficient time for exchange of information between service users and service providers which can lead to violence (Sisawo et al., 2017; Azodo et al., 2011). In addition, poor security controls in many hospitals and the political nature of violence in many poor countries also contribute to violence in the health sector of this region (Zafar et al., 2013; Sisawo et al., 2017). Patients may also be accompanied to the hospital by enraged political party members who intimidate health workers to allocate scarce time and resources to them.

Several studies conducted in high-income countries have repeatedly shown that workplace violence is associated with deleterious effects on the psychological wellbeing of affected health care workers (Phillips, 2016; Spector et al., 2007; Nielsen et al., 2015). However, there is a dearth of research exploring this phenomenon among healthcare workers in LAMICs, such as Nigeria (Ukpong et al., 2011; Azodo et al., 2011; Ogbonnaya et al., 2012). Of the few studies, many assessed only the physical form of violence (Ukpong et al., 2011), or assessed only a subset of the healthcare workers (Azodo et al., 2011); none investigated factors associated with workplace violence. In addition, these studies did not explore its association with psychiatric morbidity. This study aimed to fill this gap by assessing the prevalence, pattern and associated correlates of workplace violence and risk for psychiatric morbidity among all categories of health care workers in a tertiary healthcare setting in Nigeria.

2. Methods

2.1. Study design and population

This descriptive cross-sectional study was conducted among different categories of health workers who directly contribute to health care delivery at the Obafemi Awolowo University Teaching Hospitals Complex (OAUTHC), Ile-Ife, Nigeria. Only individuals who had worked in the hospital for at least one year were included in the study while those who were suffering from cognitive or neurological disturbances which impaired their ability to fully and independently participate in the study were excluded.

Questionnaires were administered to 380 participants. This sample size was estimated based on the prevalence rate of 33.7% reported in a previous Nigerian study (Ukpong et al., 2011) using the formula described by Kish (1965), which gave a minimum sample size of 343 with a power of 80% to detect workplace violence. A 10% attrition rate was calculated and added to this sample size to account for incomplete responses/improperly completed questionnaires.

A stratified random sampling technique was used to select samples from each profession. The hospital's workforce includes 1767 workers who contribute directly to health care: 458 doctors, 928 nurses, 51 pharmacists, 76 professionals allied to medicine (one clinical psychologist, 5 social workers, 28 radiographers and 42 physiotherapists), 108 technical staff (laboratory workers) and 146 support staff (12 ambulance drivers, 35 security officers, 42 record officers, 38 health attendants and 19 accounts clerks).

The participants were stratified according to profession and the number of participants to be recruited per profession was determined by proportionate sampling to ensure proportional representation of all the professional groups as follows: 99 doctors, 200 nurses, 11 pharmacists, 16 workers from professions allied to medicine, 23 technical staff and 31 support staff. Ethical approval was obtained from the Ethics and Research Committee of the OAUTHC, Ile-Ife. The data collection period was between May 2015 and December 2015.

2.2. Measurements

2.2.1. Workplace Violence Questionnaire

The questionnaire was developed by International Labour Organization/ International Council of Nurses/ World Health Organization/ Public Services International (ILO/ICN/WHO/PSI) joint programme on workplace violence in the health sector (ILO/ICN/WHO/PSI, 2003). It was developed to obtain information on the level of workplace violence in the health sector from several countries within different geographical regions, and so was adapted for the current study.

It consists of three parts: The first is the sociodemographic section which elicits information such as age, gender, marital status, profession, years of work experience, work setting, previous workplace violence training, and degree of worry about workplace violence. The second part evaluates the experience of physical violence within the past 12 months while the third part addresses the experience of psychological violence within the last 12 months including verbal abuse, bullying/mobbing, sexual harassment and threats.

Five professionals reviewed the questionnaire for face validity, clarity and sensitivity of items, and necessary modifications were made based on their feedback. We did not need to translate the language of the original version as English language is the language of communication at the study site. Thereafter, the adapted questionnaire was piloted tested on 40 health workers (representing 10% of the estimated sample size) who were not included in the study. The four forms of violence—physical, verbal, bullying, and sexual— were measured using single-item scales, thus their reliabilities could not be determined using Cronbach's alpha (Nagy, 2002). Therefore, the pilot study was conducted on two occasions with a 2-week interval. The test-retest correlation coefficients for physical violence, verbal abuse, bullying/mobbing and sexual harassment were 1.00, 0.90, 1.00 and 1.00 respectively.

Participants who had experienced at least one form of workplace violence within the past 12 months were categorized as having experienced workplace violence.

2.2.2. General Health Questionnaire (GHQ-12)

The General Health Questionnaire (GHQ) is a self-administered screening questionnaire designed to detect risk for common psychiatric disorders (Goldberg and Hillier, 1979). The 12- item version of the GHQ (GHQ-12) is used to screen for common mental disorders, and is a general measure of psychiatric well-being or psychological distress. It has been previously validated and used in this environment (Gureje, 1991).

The GHQ-12 was used to assess risk for psychiatric morbidity among the participants in this study. Scoring was done using the binary system. Thus, the maximum score obtainable was 12, and scores ≥ 3 were considered significant to indicate risk for psychiatric morbidity (Abiodun and Parakoya, 1992; Seun-Fadipe and Mosaku, 2017).

2.3. Data analysis

Data were analyzed using the Statistical Package for Social Sciences (SPSS, Chicago, IL) version 22. Nineteen questionnaires were excluded due to large amounts of missing information, giving a response rate of 95%. The data were summarized using descriptive statistics such as proportions and frequencies, and means and standard deviations. Bivariate associations between continuous and categorical variables were assessed using the Student's t test and Pearson's chi square test respectively while binary logistic regression analyses were used to determine the independent predictors of workplace violence, and risk of psychiatric morbidity. A p-value < 0.05 was considered indicative of

Table 1
Sociodemographic characteristics of the health workers.

Variable	Frequency (n = 361)	Percentage
Age (years)		
Mean ± SD	36.40 ± 7.64	
Gender		
Male	148	41.0
Female	213	59.0
Marital status		
Single	98	27.1
Married	250	69.3
Widow/Separated/Divorced	13	3.6
Professional group		
Nurses	199	55.1
Doctors	99	27.4
Support staff	24	6.6
Others*	39	10.8
Work setting		
Surgical specialties	147	40.7
Medical specialties	108	29.9
Technical services	27	7.5
Emergency	24	6.6
Support services	21	5.8
Psychiatry	17	4.7
Intensive care	17	4.7
Previous workplace violence training		
Yes	36	10.0
No	325	90.0
Degree of worry about workplace violence		
Not worried	284	78.7
Neutral	43	11.9
Worried	34	9.4

* Includes professionals allied to medicine, technical staff and pharmacists.

statistical significance.

3. Results

3.1. Sociodemographic characteristics and psychiatric morbidity of the health workers

Table 1 shows the socio-demographic characteristics of the subjects. The mean age of respondents was 36.4 (SD = 7.64) years. One hundred and forty-eight (41.0%) of the participants were male and majority (69.3%) were married.

One hundred and thirty-nine health workers (38.5%) were at risk for psychiatric morbidity (Table 2).

Table 2
Psychiatric morbidity and workplace violence.

Variable	Frequency n (%)
Risk of psychiatric morbidity	
Yes	139 (38.5)
No	222 (61.5)
Any workplace violence	
Yes	144 (39.9)
No	217 (60.1)
Physical Violence	
Yes	37 (10.2)
No	324 (89.8)
Verbal Abuse	
Yes	115 (31.9)
No	246 (68.1)
Bullying/Mobbing	
Yes	48 (13.3)
No	313 (86.7)
Sexual harassment	
Yes	12 (3.3)
No	349 (96.7)

3.2. Prevalence and pattern of workplace violence and its forms

Forty percent of the participants experienced at least one form of workplace violence within the year preceding the time of study (Table 2). The most common form of workplace violence was verbal abuse (31.9%) while the least common was sexual harassment (3.3%).

The commonest perpetrators of physical violence and verbal abuse were the patients and patients' relatives respectively while staff members were the main perpetrator of bullying/mobbing and sexual harassment. Furthermore, most of the respondents who were exposed to workplace violence considered physical violence, verbal abuse and bullying/mobbing as typical of their work setting while sexual harassment was reported to be atypical (Table 3).

3.3. Factors associated with workplace violence

The demographic and work-related variables were explored for significant association with workplace violence. The age ($p = 0.009$), gender ($p = 0.048$), work setting ($p < 0.001$), previous training on workplace violence ($p = 0.017$) and level of worry ($p < 0.001$) had significant association with workplace violence (Table 4). Respondents aged 21–30 years experienced more workplace violence when compared with other age categories while more women reported violence than men. Of the work setting, health workers in the psychiatry and emergency units reported experiencing more violence than other units. Respondents who had previously undergone workplace violence training experienced more violence when compared with those who had no training, while those who were worried about violence at the workplace experienced more incidents of violence compared with those who were not worried.

Participants' age, gender and level of worry due to the experience of workplace violence retained their independent relationships with workplace violence in the multivariate binary logistic regression (Table 5). The model significantly explained 25.3% of the variance in workplace violence ($\chi^2 = 74.839$, df = 12, $p < 0.001$).

Respondents aged 21–30 years were 2.5 times more likely to experience workplace violence than those who were older than 40 years (95% CI = 1.227–5.146) while female participants were 1.7 times more likely to experience workplace violence when compared to their male colleagues (95% CI = 1.015–2.706). Compared with health workers providing technical services, participants in the psychiatric unit were 11 times more likely to experience workplace violence (95% CI = 2.029–61.604). Health workers who expressed worry about violence at their workplace were 13.1 times more likely to experience workplace violence than those who did not express any worry (95% CI = 4.298–40.223).

3.4. Factors associated with risk for psychiatric morbidity

Regarding the factors associated with risk for psychiatric morbidity, health workers who were widowed/separated/divorced had higher risk for developing psychiatric morbidity than those who were single ($p = 0.010$) while participants with previous workplace violence training had greater risk for psychiatric morbidity when compared with those without training ($p = 0.027$). In addition, respondents who expressed worry about workplace violence had a higher risk for psychiatric morbidity than those who had no worry ($p = 0.037$) while those who reported they experienced incidents of workplace violence were more at risk of developing psychiatric morbidity than those who did not (Table 4).

After exploration using binary logistic regression, only marital status and workplace violence remained as independent predictors (Table 5). This model significantly explained 22.9% variance in the risk for psychiatric morbidity ($\chi^2 = 66.684$, df = 12, $p < 0.01$). Participants who were widowed/separated/divorced were 7.3 times more likely to be at risk for psychiatric morbidity than single participants (95%

Table 3
Pattern of workplace violence.

	Physical violence (n = 37)	Verbal abuse (n = 115)	Bullying/Mobbing (n = 48)	Sexual harassment (n = 12)
Perpetrator of workplace violence				
Patient/Client	23 (62.2%)	13 (26.1%)	5 (10.4%)	2 (16.7%)
Relatives of patients/clients	11 (29.7%)	30 (50.4%)	6 (12.5%)	2 (16.7%)
Staff member	2 (5.4%)	24 (20.9%)	34 (70.9%)	8 (66.7%)
Supervisor	1 (2.7%)	3 (2.6%)	3 (6.3%)	0 (0.0%)
Is violence incident typical?				
Yes	29 (78.4%)	70 (60.9%)	31 (64.6%)	4 (33.3%)
No	8 (21.6%)	45 (38.1%)	17 (35.4%)	8 (66.7%)

Table 4
Factors associated with workplace violence and risk for psychiatric morbidity.

Variables	Workplace violence		Statistics			Risk of psychiatric morbidity		Statistics		
	Yes n = 144 (%)	No n = 217 (%)	χ^2	df	p value	Yes n = 139 (%)	No n = 222(%)	χ^2	df	p value
Age in years [Mean (SD)]	35.11 (7.69)	37.26 (7.50)	t = −2.641	359	**0.009**	35.89 (7.62)	36.73 (7.66)	t = 1.008	359	0.314
21–30	48 (51.6)	45 (48.4)	7.852	2	**0.020**	39 (41.9)	54 (58.1)	1.956	2	0.376
31–40	70 (37.4)	117 (62.6)				74 (39.6)	113 (60.4)			
>40	26 (32.1)	55 (67.9)				26 (32.1)	55 (67.9)			
Gender										
Male	50 (33.8)	98 (66.2)	3.900	1	**0.048**	52 (35.1)	87 (40.8)	1.202	1	0.273
Female	94 (44.1)	119 (55.9)				87 (40.8)	126 (59.2)			
Marital status										
Single	46 (46.9)	52 (53.1)	3.028	2	2.220	40 (40.8)	58 (59.2)	9.215	2	**0.010**
Married	94 (37.6)	156 (62.4)				89 (35.6)	161 (64.4)			
Widow/Separated/Divorced	4 (30.8%)	9 (69.2)				10 (76.9)	3 (23.1)			
Profession										
Doctors	44 (44.4)	55 (55.6)	1.292	3	0.742	38 (38.4)	61 (61.6)	1.004	3	0.800
Nurses	77 (38.7)	122 (61.3)				79 (39.7)	120 (60.3)			
Support staff	9 (37.5)	15 (62.5)				7 (29.2)	17 (70.8)			
Others*	14 (35.9)	25 (64.1)				15 (38.5)	24 (61.5)			
Work setting										
Technical	6 (22.2)	21 (77.8)	26.344	6	**<0.001**	8 (29.6)	19 (70.4)	7.750	6	0.257
Medical specialties	47 (43.5)	61 (56.5)				44 (40.7)	64 (59.3)			
Surgical specialties	46 (31.3)	101 (68.7)				55 (37.4)	92 (62.6)			
Psychiatry	14 (82.4)	3 (17.6)				11 (64.7)	6 (35.3)			
Emergency	14 (58.3)	10 (41.7)				9 (37.5)	15 (62.5)			
Intensive care	6 (35.3)	11 (64.7)				4 (23.5)	13 (76.5)			
Support services	11 (52.4)	10 (47.6)				8 (38.1)	13 (61.9)			
Previous workplace violence training										
No	123 (37.8)	202 (62.2)	5.673	1	**0.017**	119 (36.6)	206 (63.4)	4.910	1	**0.027**
Yes	21 (58.3)	15 (41.7)				20 (55.6)	16 (44.4)			
Level of worry										
Not worried	89 (31.3)	195 (68.7)	47.777	2	**<0.001**	104 (36.6)	180 (63.4)	6.592	2	**0.037**
Neutral	25 (58.1)	18 (41.9)				15 (34.9)	28 (65.1)			
Worried	30 (88.2)	4 (11.8)				20 (58.8)	14 (41.2)			
Workplace Violence										
No						52 (24.0)	165 (76.0)	48.578	**1**	**<0.001**
Yes						87 (60.4)	57 (39.6)			

χ^2 = Pearson chi square; df = degree of freedom.
* Includes professionals allied to medicine, technical staff and pharmacists.

CI = 1.717–31.378). Having been a victim of workplace violence increased the odds of developing psychiatric morbidity by 5.4 times (95% CI = 3.219–9.105).

4. Discussion

4.1. Workplace violence

This study evaluated workplace violence and risk for psychiatric morbidity, as well as their correlates, among health workers in a tertiary hospital setting in the South-Western part of Nigeria.

The 12-month prevalence rate of workplace violence among healthcare workers in this study was 39.9%; and as documented in previous studies (Cashmore et al., 2012; Azodo et al., 2011; Fute et al., 2015), verbal abuse was the most common form of violence reported. This prevalence rate is similar to the 30% found in the US (Campbell et al., 2011), 33.7% reported amongst mental health workers in a Nigerian neuropsychiatric hospital (Ukpong et al., 2011), 31.9% reported among dental workers selected from the oral healthcare centers of four university teaching hospitals (Azodo et al., 2011) and 41% recorded among various health professionals in an Italian general hospital (Ferri et al., 2016). It was however lower than 88.1% reported by Ogbonnaya et al. (2012) in a Nigerian study, 61.9% reported by Steinman (2003) in a South African study. The higher rate reported by Ogbonnaya et al. may be due to differing organizational factors (Ferri et al., 2016). Their study was conducted in a smaller hospital with a lower staff strength which served a denser population than our study site which has a higher staff strength. The lower staff-patient ratio may result in hurried consultations which are not conducive to appropriate communication. Without communication, patients have insufficient knowledge of the diseases, costs, and effects of treatment, which may result in their misunderstanding the treatment and

Table 5
Predictors of workplace violence and risk for psychiatric morbidity.

Variables	Workplace violence			Risk for psychiatric morbidity		
	AOR	*p* value	95% CI	AOR	*p* value	95% CI
Age in years						
21–30	2.513	**0.012**	1.227, 5.146			
31–40	1.512	0.200	0.803, 2.846			
>40	Ref.					
Gender						
Male	Ref.					
Female	1.657	**0.043**	1.015, 2.706			
Marital status						
Single				Ref.		
Married				0.869	0.606	0.509, 1.483
Widow/Separated/Divorced				7.341	**0.007**	1.717, 31.378
Profession						
Doctors						
Nurses						
Support staff						
Others*						
Work setting						
Technical services	Ref.			Ref.		
Medical specialties	2.606	0.077	0.901, 7.539	0.958	0.931	0.357, 2.567
Surgical specialties	1.840	0.254	0.645, 5.243	1.033	0.947	0.396, 2.696
Psychiatry	11.180	**0.006**	2.029, 61.604	1.205	0.799	0.286, 5.079
Emergency	3.051	0.097	0.816, 11.404	0.754	0.664	0.211, 2.698
Intensive care	2.442	0.228	0.572, 10.420	0.461	0.310	0.103, 2.055
Support services	3.981	**0.042**	1.051, 15.073	0.752	0.675	0.199, 2.846
Previous workplace violence training						
No	Ref.			Ref.		
Yes	1.979	0.098	0.881, 4.446	1.692	0.195	0.763, 3.749
Level of worry						
Not worried	Ref.			Ref.		
Neutral	2.429	**0.017**	1.171, 5.037	0.607	0.206	0.280, 1.317
Worried	13.148	<**0.001**	4.298, 40.223	1.000	1.000	0.429, 2.330
Workplace Violence						
No				Ref.		
Yes				5.414	<**0.001**	3.219, 9.105

AOR - adjusted odds ratio, 95% CI - 95% confidence interval.

ultimately to violence. The variation from the South African study may be accounted for by the fact that many of the big hospitals used in the study were located in the areas of the country with high rates of violence. The higher rates reported in that study may therefore reflect the higher rates of violence in the immediate environments. The differences in the results may also be due to the variations in the definitions of workplace violence, sample size and study methods.

In this study, the perpetrators of workplace violence varied depending on the form of violence. The patients and patients' relatives were the commonest perpetrators of physical violence and verbal abuse respectively; while other staff members were the main perpetrators of bullying and sexual harassment. This pattern is similar to the observations from previous studies (Steinman, 2003; Azodo et al., 2011). Sometimes, patient-related violence is perceived differently from other types of violence as it is often interpreted that the perpetrator has no "overt dominance or power status" and so their behaviors are usually excused on compassionate grounds (Kennedy, 2005). The violence perpetrated by patients and/or their relatives has been associated with dissatisfaction with care, including concern about patient care, unmet expectations of care, and/or long wait for care/scheduling delays (Najafi et al., 2018). Violence perpetrated by colleagues/staff members also impairs team cooperation which ultimately creates a deleterious effect on the quality of service delivery and safety of patient care (Miedema et al., 2011). Understaffing, job stress, increased work-load and low job satisfaction are some of the factors that can explain this type of violence (Kitaneh and Hamdan, 2012).

The current study showed that health workers aged 21–30 years experienced more workplace violence than the older workers. More than half of those in this age group reported having been victims of workplace violence. Health workers' age has not been consistently associated with workplace violence. In a previous study by Abodunrin et al. (2014), exposure to violence increased as the age of the respondents increased. Steinman (2003), in the cross-country assessment of workplace violence in health facilities across South Africa, also reported that health workers aged between 40 and 45 years are vulnerable to the experience of workplace violence while Kitaneh and Hamdan (2012) found no relationship between workers' age and exposure to workplace violence among Palestinian physicians and nurses. In spite of these inconsistent findings, it may be argued that younger workers may not have developed adequate skills to handle situations which may predispose them to violent incidents in the hospital compared to the older ones who may have developed these skills on account of age and experience.

Staff in the psychiatric unit reported the highest rates of workplace violence in this study. While the absolute number of psychiatric staff included in this study was small, this finding is consistent with those from previous studies (Ferri et al., 2016; Magnavita and Heponiemi, 2012; Yang et al., 2017). The mental state of patients in psychiatric settings can induce behavioral disinhibition and irritability, as well as leading to agitation and aggressiveness (Lorenzo et al., 2014; Ferri et al., 2016). This may be because severely ill patients are more likely to present at the hospitals and require in-patient care. Moreover, the perceived threat of violence may result in greater use of coercive measures by staff such as seclusion, restraint and enforced medication (Lorenzo et al., 2014). This may create a vicious cycle in which aggression from patients increases the adoption of forceful measures by staff which in turn may trigger more aggressive responses from patients instead of cooperation (Lozzino et al., 2015).

Consistent with previous reports (Chen et al., 2008; Zhao et al., 2015), worry about workplace violence among health workers in this

study was associated with experiencing workplace violence. Although high levels of worry can also be a consequence of exposure to workplace violence, Hurrell et al. (1996) reported that a high level of worry may predate workplace violence. Fear at work from worry about workplace violence may lower workers' self-efficacy or confidence which may consequently lower the quality of services provided to patients and which may lead to violence when patients or their relatives consider their expectations unmet. Future studies may better investigate this relationship using prospective designs.

4.2. Risk for psychiatric morbidity

In this study, 38.5% of the health workers were at risk of developing psychiatric morbidity. This is consistent with 32.6% observed among Brazilian nurses (Pinhatti et al., 2018) and 45.4% reported among 1195 shift-work nurses in Shiraz, Iran (Ardekani et al., 2008). However, it is higher than the prevalence rate of 14.9% reported in two previous Nigerian studies (Obi et al., 2015; Issa et al., 2014). This variance from our study might be because Obi et al. (2015), in their study specifically investigated depressive symptoms while Issa et al. (2014) sampled a population comprising only of doctors. The high proportion of the health workers with increased risk of psychiatric morbidity in this study is significant considering that mental disorders have been associated with negative consequences on health workers' occupational functioning including absenteeism at work, loss of productivity at work and diminished output (Ferri et al., 2016), and poor clinical judgement and decision-making (Abdellah and Salama, 2017; Harnois and Gabriel, 2002) which may have adverse consequences on health care delivery.

While widowhood or separated/divorced status, previous workplace violence training, worry about workplace violence and actual prior experience of workplace violence were associated with risk for developing psychiatric morbidity in bivariate analyses, only marital status and experience of workplace violence showed independent associations. This suggests that the associations with workplace violence training and worry about workplace violence may be due to relationships with the experience of workplace violence. For example, it is possible that workers seek out training experiences following the experience of workplace violence. Similarly, workers may become worried about violence after experiencing violent events with patients. The independent relationship with marital status may indicate the broader adverse impact of social isolation (indexed by being separated, divorced or widowed) on mental well-being. Furthermore, the significant independent relationship between workplace violence and risk for mental health morbidity in health workers demonstrated in this study is consistent with that from other countries (Gong et al., 2014; Richman et al., 2002; Balducci et al., 2009), and the increased mental health morbidity may be triggered by the stress, consequent on these adverse experiences in predisposed individuals. However, it is also possible that staff with mental health morbidities are less able to prevent potentially violent situations from escalating.

While this is the first study in Nigeria and Sub-Saharan Africa to investigate workplace violence and its relationship with psychiatric morbidity among the different categories of health workers, the following limitations should be considered in interpreting our findings. Generalization of our study findings may be difficult considering that the study was carried out in only one center. The use of multiple study sites may enhance the generalizability of future studies. The association between workplace violence and risk for psychiatric morbidity is complex and bidirectional. However, because this study is cross-sectional, it is difficult to determine whether experience of workplace violence leads to an increased risk of psychiatric morbidity or whether psychiatric morbidity could have caused an increase in the experience of workplace violence. Furthermore, we relied on participants' ability to recall violent incidents which may raise the possibility of recall bias. We also did not collect information on the subspecialties in each medical specialty. This is because many subspecialties in the hospital where this study was carried out have very few doctors, which makes reasonable analysis by sub-specialization difficult.

In conclusion, this study has shown that workplace violence is prevalent among health workers in healthcare settings. It also showed that exposure to violence at work is significantly associated with risk for psychiatric morbidity. Considering the sensitive nature of clinical decisions that are made in hospital settings and the interactions between healthcare workers and patients, the potential negative impact of workers' mental health is significant. Protocols need to be developed to effectively manage violent incidents in the workplace. Primary and secondary interventions are also required to lower the risk for mental health morbidities in healthcare workers. More studies are needed to improve the understanding of workplace violence in the health sectors of developing countries.

Conflict of interest

The authors do not have any conflict of interest to declare.

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