

## Evaluation of “white code” notifications at the training and research hospital between 2015 and 2019

Workplace violence

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### Abstract

**Aim:** This study has been carried out as part of the activities to define Workplace Violence (WPV) based on the white code system according to age, gender, types, sources, time-periods, and groups in health care professionals (HCPs). The white code notification is a government support system including a web address, a call center serving all day, and free legal support for HCPs.

**Material and Methods:** A retrospective data-based study was realized by including 316 white code notifications at Gaziosmanpaşa Training and Research Hospital in Istanbul, Turkey, between January 3, 2015 and January 1, 2019. The statistical significance level of tests was accepted as  $p < 0.05$  using statistical software SPSS version 22.

**Results:** Samples consisted of 316 (mean age =  $31 \pm 6.8$  years) HCPs (49% male, 51% female) who were reported in white code applications for four years. WPV was distributed as doctors in 160/316 (50.6%), nurses in 65/316 (20.6%), security personal in 50/316 (15.8%), secretary in 29/316 (9.2%) cases respectively. Nurses and medical secretaries exposed to violence aged under 30 years had a significantly higher rate than those aged  $\geq 30$  years old ( $p = 0.002$ ). The highest prevalence of violence in the hospital was in polyclinic rooms (66.5%). Distribution of WPV based on departments was as follows: emergency medicine (36.4%), pediatrics (16.5%), and internal medicine (7.3%). In this study, the most common type of violence was insult plus verbal threat (39.6%) and the most common reason was the waiting-line problem (21.8%). WPV was highest in the summer season (30.4%), around 12:00-16:00 hours (28.2%), and peaked in September (10.8%) and December (10.8%). WPV was shown increased in 2018 (31.6%) than that of 2015 (19.9%), 2016 (24.1%), and 2017 (24.4%) especially in doctors ( $p = 0.002$ ) and female HCPs ( $p < 0.001$ ).

**Discussion:** The results of this research show the importance of increasing white code cases, especially the percentage of doctors and female HCPs. The implications of this study are expected to provide feedback in describing increased WPV to health workers. Institutions should train staff to handle violence, provide a therapeutic environment, simplify the reporting process, and encourage reporting of all types of violence.

### Keywords

White code; Health care professionals; Workplace violence

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## Introduction

The World Health Organization (WHO) describes workplace violence (WPV) as incidents where a person is abused, threatened, or assaulted in a working environment. Though health care workers are known to be particularly at risk of exposure to workplace violence, attention has been drawn to this problem only in recent years (Wiskow C. Guidelines on workplace violence in the health sector. World Health Organization/International Labour Office. 2003;40.) Nowadays, the trend of violence against physicians is like a new viral epidemic according to some authors [1].

The term “verbal violence” might be defined as an attempt to attack another person using harsh words, cursing, an aggressive manner of speech, threats, or any other manner of speech that is unacceptable but does not lead to physical injury. “Physical violence” might be defined as any form of attack that has a physical component [2].

The United States Government Accountability Office reported in 2016 that healthcare workers experienced violence-related injuries at a rate five times higher than workers in other industries [3]. In Turkey, of the 12 944 health workers in a national survey, 43.2% have experienced verbal violence, 6.8% physical violence. Mobbing and sexual harassment have been identified in 2.4% to 1% [4, 5] and studies have shown that 44.7% of all HCPs are victims of violence every year [6]. Unfortunately, over the past decade, five doctors were killed by patients or patients’ relatives [7]. A total of 65 studies reported a one-year prevalence of WPV against HCPs perpetrated by patients or visitors, with prevalence estimates ranging from 2.75% to 88.31%[8].

## Background

In the tenth development plan between 2014–2018 in our country, it was decided to develop approaches to the provision of medical care, taking into account the effectiveness of clinical interventions, the safety and satisfaction of patients and health professionals. The implementation of different colored codes (blue code in 2008, pink code in 2009, white code in 2011, and red code in 2015) was launched by the Ministry of Health policies. Code White is an emergency warning code created to respond to an action as soon as possible in the presence of violence risk/interference with staff working in the health institution and organization or in case of violence (Sağlıkta Ulusal Renkli Kodlara (URK) İlişkin Yeni Düzenleme/ New Regulation on National Color Codes in Health (URK) 2013). The web address [www.beyazkod.saglik.gov.tr](http://www.beyazkod.saglik.gov.tr) was created with the 113 White Code Call Center, which will serve 7 days and 24 hours, and a technical and administrative infrastructure related to the white code system has been requested in each hospital (Çalışan Güvenliği Genelgesi/ Employee Safety Circular (14.05.2012) - TC Sağlık Bakanlığı/ TR Ministry of Health ).

## Aim

In this study, the primary aim is to estimate the distribution of HCPs who experienced aggression and violence based on white code notifications by years, and the secondary aim is to observe characteristics (age, gender, department, reason, violence type, seasonality, etc.) associated with an increased risk of WPV.

## Material and Methods

### Study population and design

We conducted a retrospective analysis for the last four years between January 3, 2015 and January 1, 2019. We have applied for permission from the hospital management and ethics committee for using data. The demographic and clinical data of 316 white code victims aged  $\geq 18$  years were analyzed.

### Evaluation of WPV

The types of aggression were listed as verbal threats, physical violence, damage to property, insult, and/or combinations of these. The time of WPV was noted as hour, day, month, season, and year, while the WPV area was classified including information about the department of abused HCPs, as a polyclinic room, service floor, intervention room, and other locations.

### Selection Criteria

The white code list used in the study was retrospectively collected at the “Employee Rights and Security” unit of the hospital, and the white code incident forms collected in the “White Code Unit”. We discussed these results in light of recent legal reforms and researched evidence-based administrative data. The study included all cases in the 2015–2019 period.

### Classification of HCPs

Occupational groups were classified using the International Standard Classification of Occupations (ISCO-08) with modifications (ILO, ISCO-08—International Standard Classification of Occupations, 2012). The main groups of two branches were health professionals (medical doctors, nursing and midwifery professionals, paramedical practitioners, other health professionals such as dentists, pharmacists, physiotherapists, dieticians, audiologists, etc.), health associate professionals (medical and pharmaceutical technicians, nursing and midwifery associate professionals, other health associate professionals such as ambulance workers, etc.) and personal care workers. At the end of the study, occupation groups were revised with less grouping for statistical comparisons.

### Statistical data analysis

Data were prepared by Microsoft Excel 2016 program and analyzed with statistical software SPSS version 22. The analyses were summarised using pie charts, tables, mean, median, and frequencies and were presented in tables and graphs. The Chi-Square test was used to compare groups and categorical variables. It was set at 80% power with an alpha error = 0.05. The sample size was calculated using the G-power program.

### Ethical aspects

Taksim Training and Research Hospital Clinical Research Ethics Committee approved this study on May 28, 2020 ( Approval no:92).

## Results

The distribution of white code cases in hospitals by years was 2.8% (63/2183) in the 2015–2016 period, 3.8% (76/1978) in the 2016–2017 period, 3.9% (77/2000) in the 2017–2018 period, and 5.5% (100/1817) in the 2018–2019 period, respectively. Table 1 shows the medical demographics of screened 51% of

**Table 1.** Evaluation of Code White cases based on gender, occupation, department, time (hour), month, season and year

Variable	Groups	n	%
Age (median=30 years)	<30 years	181	57%
	≥30 years	134	43%
Gender	Male	155	49%
	Female	161	51%
Occupation	Doctor	160	50.6%
	Nurse	65	20.6%
	Security personnel	50	15.8%
	Secretary	29	9.2%
	Others	12	3.8%
Area of exposed Code White	Polyclinic room	210	66.5%
	Service floor	65	20.6%
	Interventional processing room	21	6.6%
	Other places (Parking. Elevator...)	20	6.3%
Department of Health Professionals	Emergency medicine	115	36.4%
	Pediatrics	52	16.5%
	Internal medicine	23	7.3%
	Neurosurgery	16	5.1%
	Otolaryngology	15	4.7%
	Gynecology	14	4.4%
	Anesthesia	14	4.4%
	Radiology	10	3.2%
	Orthopedics	9	2.8%
	Others	48	15.2%
Time	08:00 - 12:00	81	25.6%
	12:00 - 16:00	89	28.2%
	16:00 - 20:00	33	10.4%
	20:00 - 00:00	62	19.6%
	00:00 - 04:00	40	12.7%
	04:00 - 08:00	11	3.5%
Month	January	25	7.9%
	February	20	6.3%
	March	33	10.4%
	April	18	5.7%
	May	27	8.5%
	June	23	7.3%
	July	34	10.8%
	August	28	8.9%
	September	34	10.8%
	October	19	6.0%
	November	21	6.6%
	December	34	10.8%
Season	Winter	78	24.7%
	Spring	68	21.5%
	Summer	96	30.4%
	Autumn	74	23.4%
Year	2015	63	19.9%
	2016	76	24.1%
	2017	77	24.4%
	2018	100	31.6%

females 49% of males, and a total of 316 white code cases aged 31 ±6.8 (median=30) years during the period 2015-2019. Most of all white code notifications were from doctors (50.6%), exposed in polyclinic areas (66.5%), and in the emergency departments (36.4%). The rate of white code was highest in the summer season (30.4%), around 12:00-16:00 hours (28.2%), and peaked in September (10.8%) and December (10.8%); 72.3% of the nurses (47/65) and 69% of the secretaries (20/29) were under the age of 30 in cases of violence. There was a significant difference between younger and older nurses/secretaries ( $p=0.02$ ).

In this study, the most common violence resource was visitors/partners (63.3%), the most common type of violence was Insult+ Verbal threat (39.6%), and the most common reason was the waiting-line problem (21.8%) (Table 2). WPV sources were distributed as follows: only the patient in 21.5% of cases, only visitors/relatives in 63.3%, both patients and their visitors/relatives in 15.2% of all cases. Female gender was significant among locations of WPV ( $p=0.001$ ), occupational groups ( $p<0.001$ ), resource of violence ( $p=0.02$ ), medical departments ( $p<0.001$ ) and reasons of violence ( $p=0.001$ ). Female doctors (28%) had more often white code from male doctors (22.5%), female nurses (15.5%) than male nurses (5%), male security personnel (14.2%) than female security personnel (1.6%). While code alerts of male (33%) and female (33%) HCPs from the polyclinic room was similar, women reported more white codes from the service floor (12%) and intervention room (5%) comparing with males (8.5% service floor and 2% intervention room, respectively). Female HCPs had a higher rate of white code exposed by woman patients (7.2% female HCP, 2.5% male HCP) or woman patient plus her visitors (3.2% female HCP 2%, male HCP) than that of other groups. White code rate at the Emergency department was higher in male HCPs (23.5%) than that of female HCPs (13%). Female HCPs had higher rates for style problems in communication, waiting-line problem, the problem with opposing doctor's directives, and treatment dissatisfactions than that of male HCPs. The ratio of women to men reporting the white code did not change significantly depending on the season ( $p=0.36$ ). Table 3 reveals the assessment of the change in the distribution of gender, occupation, the area exposed violence, time, and season by years. The rate of WPV in 2018 was significantly higher in female gender ( $p<0.001$ ), in doctors ( $p=0.002$ ), in polyclinic room ( $p<0.001$ ), time around 00:00-04:00 ( $p<0.001$ ).

Figure 1 shows the periods (time) of WPV based on season and occupation. The best time was around 04:00-08:00 in all spring months for everybody but in the summer season, 100% of WPV cases were against secretaries around 04:00-08:00. The worst time for doctors was between 08:00-12:00 hours in autumn. The worst time for nurses was in summer between 20:00 and 00:00 time o'clock. In the summer, 08:00 to 16:00 was the worst time for the security personnel. Figure 2 shows that in 2018, while the number of WPVs against doctors has increased in polyclinic room during the autumn, it decreased at the service floor after the pick in spring. Especially in all winter months, there was a large difference in WPV against doctors between polyclinic room ( $n=58$  totally in winter) and service floor ( $n=8$  totally in winter) violence numbers. As seen in Figure 3, the first common

**Table 2.** Classification of features of workplace violence by resource, type, and reason characteristics

Variable	Groups	n	%
Resource of violence	Woman patient	31	9.8%
	Man patient	37	11.7%
	Visitors/relatives	200	63.3%
	Woman patient and her visitors/relatives	17	5.4%
	Man patient and his visitors/relatives	31	9.8%
Type of violence	Insult	85	26.9%
	Verbal threat	3	0.9%
	Physical violence	3	0.9%
	Insult+ Verbal threat	125	39.6%
	Insult+Physical violence	35	11.1%
	Insult+ Verbal threat+Physical violence	54	17.1%
	Insult+ Property damage	5	1.6%
	All together	6	1.9%
Reasons reported on violence	Patient transplant	2	0.6%
	Rejection of payment	2	0.6%
	Communication problems	21	6.6%
	Person with psychological problems	19	6.0%
	Hygiene complaints	2	0.6%
	Visitor problems	47	14.9%
	Technical and physical problems	41	13.0%
	Opposing doctor's directives	32	10.1%
	Waiting-line problem	69	21.8%
	Patient without appointment	18	5.7%
Inappropriate patient request	28	8.9%	
	35	11.1%	

reason of WPV against male HCPs was visitors' problems, and secondly, technical/ physical problems, while among female HCPs, the most common reason was the waiting-line problem and secondly, opposition to a doctor's directive by a patient. In 2018, patients or relatives with a psychological problems accounted for a higher percentage of violence against male healthcare workers but waiting-line problems had the highest rate in both genders.

**Discussion**

The results of this research show the importance of increased white code cases especially the percentage of doctors and female HCPs. The implications of this study are expected to provide feedback in describing increased WPV towards health workers. Institutions should train staff to handle violence, provide a therapeutic environment, simplify the reporting process, and encourage reporting of all types of violence.

**Age and Gender**

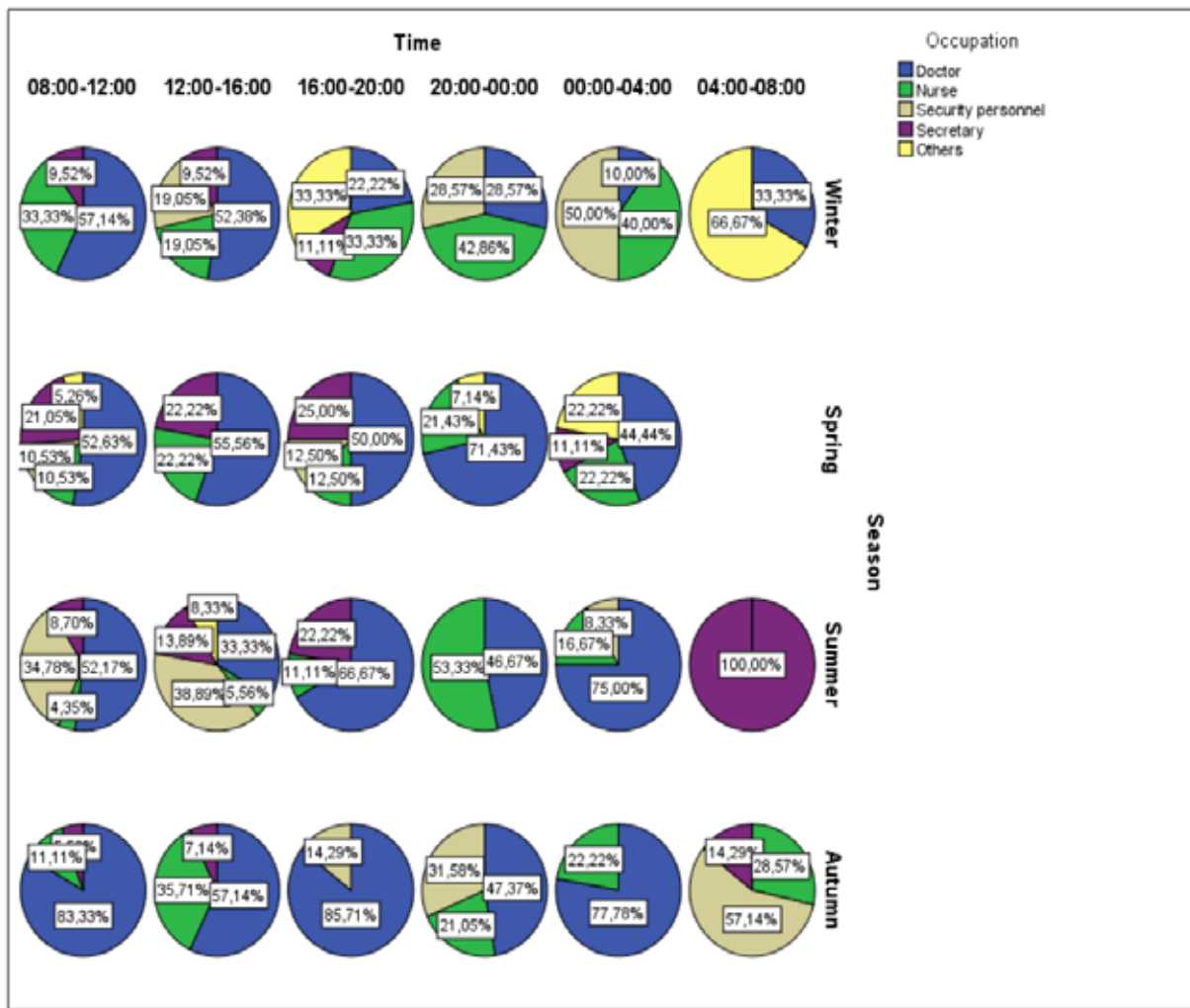
In some studies on WPV, the mean age of participants was 30.92 ± 7.94 years [9], 32.6 ± 5.1 years [10], 35.42 ± 7.89 years [11], or 36.4% were aged < 35 years [12] or it was significant for physicians aged between 31-40 years [11]. Bayram et al.

**Table 3.** Assessment of change in the distribution of gender, occupation, the violence exposed area, time and season by years

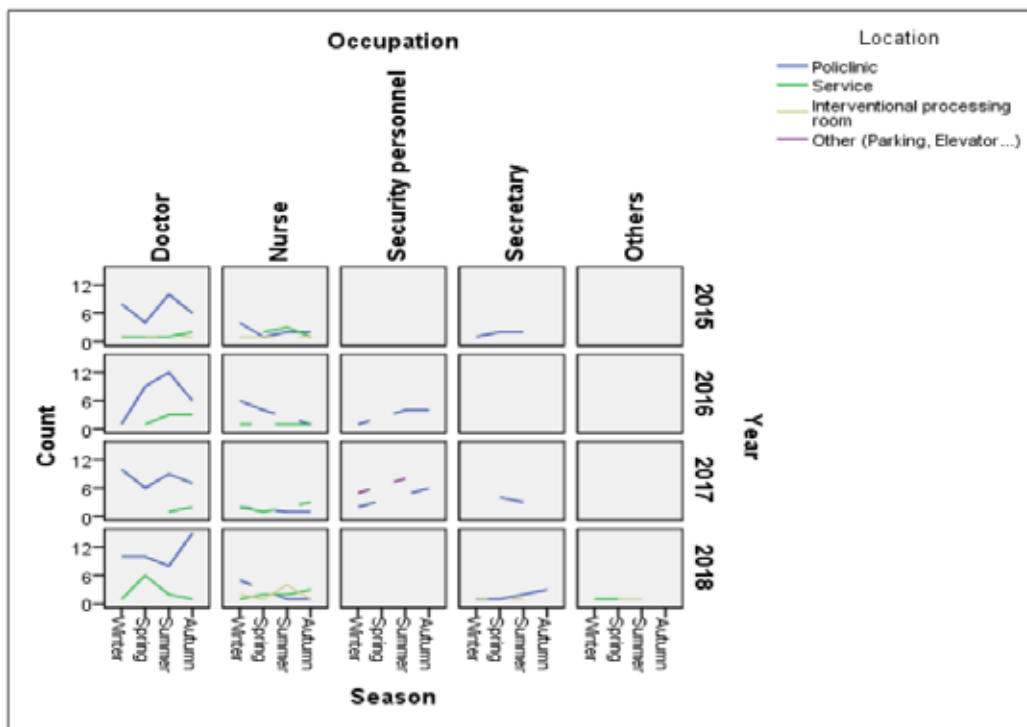
Variables	Groups	Distribution of workplace violence by years				p
		2015	2016	2017	2018	
		n (%)	n (%)	n (%)	n (%)	
Gender	Male	24 (15.5%)	53 (34.2%)	39 (25.2%)	39 (25.2%)	0.000*
	Female	39 (24.2%)	23 (14.3%)	38 (23.6%)	61 (37.9%)	
Occupation	Doctor	35 (21.9%)	35 (21.9%)	35 (21.9%)	55 (34.4%)	0.002*
	Nurse	18 (27.7%)	14 (21.5%)	10 (15.4%)	23 (35.4%)	
	Security personnel	2 (4.0%)	20 (40.0%)	21 (42.0%)	7 (14.0%)	
	Secretary	6 (20.7%)	4 (13.8%)	8 (27.6%)	11 (37.9%)	
	Others	2 (16.7%)	3 (25.0%)	3 (25.0%)	4 (33.3%)	
	Area	Polyclinic room	45 (21.4%)	52 (24.8%)	51 (24.3%)	
Service floor	12 (18.5%)	21 (32.3%)	10 (15.4%)	22 (33.8%)		
Interventional processing room	6 (28.6%)	2 (9.5%)	0 (0%)	13 (61.9%)		
Other places (Parking,Elevator...)	0 (0%)	1 (5%)	16 (80%)	3 (15.0%)		
Time	08:00 - 12:00	22 (27.2%)	12 (18.5%)	24 (29.6%)	20 (24.7%)	0.000*
	12:00 - 16:00	15 (16.9%)	32 (36.0%)	22 (24.7%)	20 (22.5%)	
	16:00 - 20:00	7 (21.2%)	5 (15.2%)	8 (24.2%)	13 (39.4%)	
	20:00 - 00:00	9 (14.5%)	16 (25.8%)	16 (25.8%)	21 (33.9%)	
	00:00 - 04:00	10 (25.0%)	7 (17.5%)	0 (0%)	23 (57.5%)	
	04:00 - 08:00	0 (0%)	1 (9.1%)	7 (63.6%)	3 (27.3%)	
Season	Winter	16 (20.5%)	11 (14.1%)	23 (29.5%)	28 (35.9%)	0.12
	Spring	16 (23.5%)	17 (25.0%)	12 (17.6%)	23 (33.8%)	
	Summer	18 (18.8%)	33 (34.4%)	23 (24.0%)	22 (22.9%)	
	Autumn	13 (17.6%)	15 (20.3%)	19 (25.7%)	27 (36.5%)	

\*p<0.05 statistically significant Chi-square test

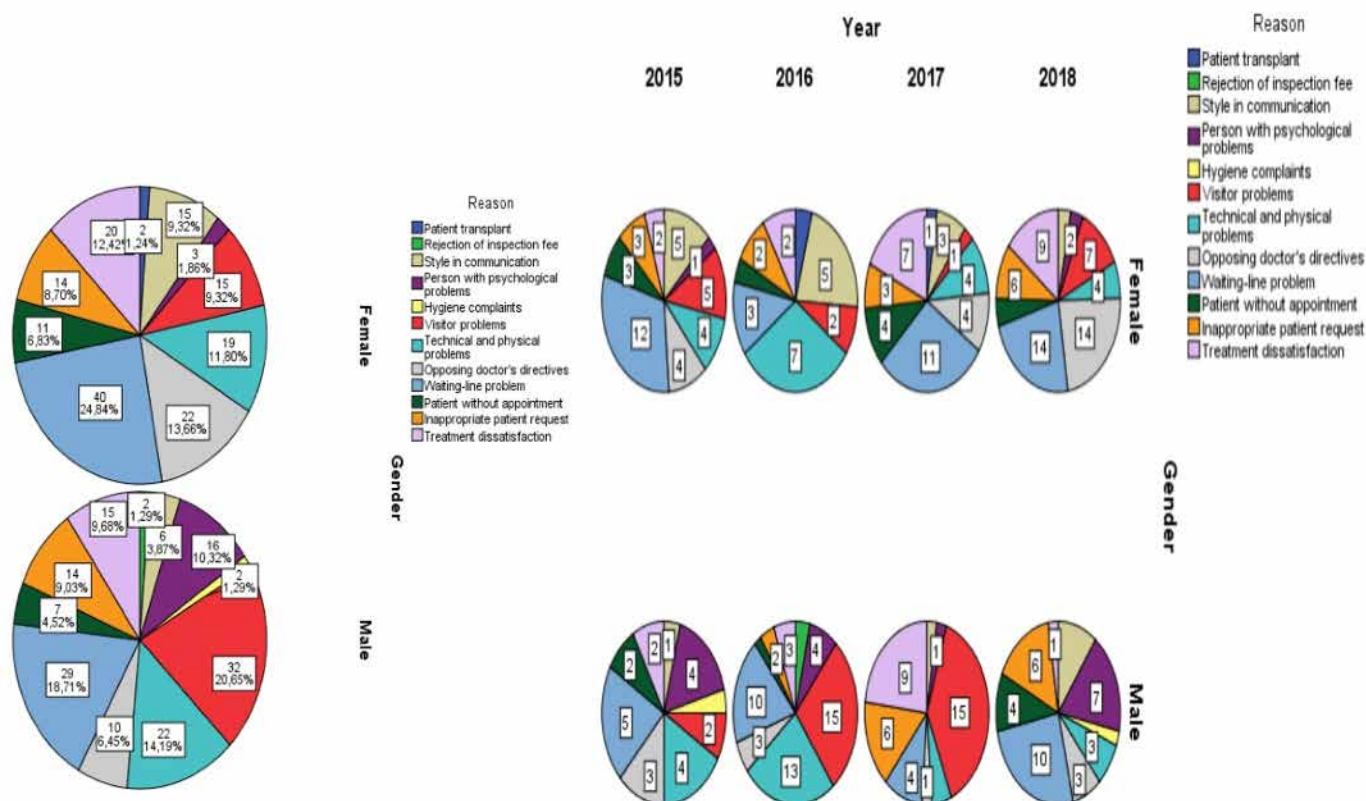
observed that most participants were between 30 and 40 years of age and 60.1% were male in their WPV study. On the other hand, the rate of female gender was 59.6%, and the risk of violence was 2.4 times higher among younger people (≤ 29 years) in the study by Pinar et al. [5]. In our study, the mean age was 31 ± 6.8 years and 57% aged <30 years, similarly. In a systematic review emphasizing gender differences in physical violence, the researcher found that numerous studies showed that male health care professionals experienced more workplace physical violence than females [13]. A study showed that workplace violence and post violence effect on work efficiency is more prevalent in younger doctors [9]. In our study, age <30 years was significant in nurses and medical secretaries, but not for doctors or other occupations. The age parameter was not significant between genders. The female group had a bit higher percentage than the male group. Although the age variables



**Figure 1.** Evaluation of the periods (time) of workplace violence based on season and occupation by pie-charts.



**Figure 2.** Evaluation of change in the distribution of the violence exposed location, occupation, and season based on years by multiple line graphs.



**Figure 3.** Evaluation of reasons for workplace violence based on the change in genders and years by pie-charts

were similar to the literature, we thought that differences in gender parameter may be the result of change in the working women rate based on some socio-cultural effects in different countries.

**Evaluation of prevalence for white code**

Among our white code cases, 63.3% were related to patient’s relatives or visitors. A total of 65 studies reported a one-year pooled 19.33% prevalence of WPV against HCPs, with prevalence estimates ranging from 2.75% to 88.31%. As a subgroup, WPV by patients or visitors was 26.38% in the European region, 14.53% in the western Pacific region, 20.71% in the African region, 17.07% in the eastern Mediterranean region, 23.61% in the Americas region, and 5.62% in the Southeast Asia region [8]. In our hospital, the prevalence of white code notifications seemed to be low (the highest value x %, yearly) for WPV literature rates, but it was just an iceberg because we could not learn the real percentage of unreported white code cases, all these were reported legal cases. It was an important problem related to most studies just like ours. For example, Niu et al. showed that only 4.9%–12% of the victims completed an incident or accident form [14]. Another rate of incidence was 33.3% in the study by Stanley et al. [15] and 41.6% of white code applications were submitted once or more, as well [11].

**Distribution of WPV**

The latest review based on the study by Mento et al. investigated the impact of WPV and found that major incidents of violence occur in emergency and psychiatric departments [16]. Most of the studies has assessed specifically workplace physical violence against nurses [8]. Even the proportion of WPV against nurses (22.99%) perpetrated by patients or visitors was

significantly higher than against physicians (14.66%) in a meta-analysis [8]. In contrast to the literature, in our study, half of the white codes were doctors and a quarter were nurses. In the study by Li et al., WPV against male health care professionals (7.37%) perpetrated by patients or visitors was similar to that against female (8.40%) health care professionals [8]. In the study by Din et al., the prevalence of “verbal abuse” was found to be 76.29%, while that of “threat to assault” and “physical assault” was found to be 17.77% and 5.92%, respectively [9]. Chiawa et al. indicated that the prevalence of psychological violence among participants was 49.7%, and verbal abuse was the most common form of psychological violence, accounting for 40.8% of all [12]. In our study, insult + verbal threat (39.6%) was the most common type of WPV, and aggression, including any insult and/or verbal threat-totally was 67.4%, that is similar to the study by Hacer et al., in which they found that doctors who were exposed to violence at work were exposed to verbal and psychological violence more than physical violence [11]. In a study from America, the inclination to violence springs from the ghetto poor, the stigma of race, the fallout from rampant drug use, and drug trafficking, resulting in alienation and lack of hope for the future. Simply living in such an environment exposes young people to special risk of falling victim to aggressive behavior [17]. At the same time, an Indian study declared long working hours and poor work environment for government doctors, which makes them susceptible to making mistakes and prone to violence [1]. We thought that socio-economic factors would be related to WPV. The district of hospital location is the 32nd district (32nd/39) within the city according to the level of socio-economic development. In our clinical experience, some



factors, such as living difficulties, drug use, etc, in this location, were higher than in other district locations.

#### **Time differences (time, seasonality, variation among months, difference in years)**

Working between 18:00 and 07:00 hours was an independent risk factor for WPV in the study by Pinar et al. [5]. According to a study by Al-Mascari et al., the majority of incidents took place during the afternoon (78.9%) or night shifts (93.1%) [10]. In our study, the most common time of violence occurrence was between 12:00 and 16:00 (%28.2) and between 08:00 and 12:00 (25.6%), similar to the study by Stanley et al., which showed that the time from 07:00 to 13:00 was the time of maximum violence occurrence (26.2%) [15].

#### **Most Reported Reasons of WPV**

In a study conducted in a university hospital, participants stated that the reason for the increase in violence against HCPs was related to lack of education of the patients and their relatives (73.2%) and was associated with longer waiting times in hospitals for examination (53.2%) [18]. A study from Israel suggested that waiting times may have a cultural element. While shortening waiting times and providing more information to patients and families could reduce the rate of violence, but a cultural change may need [2]. In our study, waiting line problems (such as long time waiting or mix waiting for line, etc.) were the most common reason (21.8%) reported with white code. Based on the years, especially the 2018 year was important because our hospital was damaged by a big fire and the health service was temporarily given in the additional service building. The additional service building was smaller than the main building, and all departments had to work together in very difficult conditions in polyclinics and emergency rooms. Thus, we thought that conditions like a long waiting-line or waiting time as a result of new working conditions might be a reason for increased WPV in 2018 compared to other years. Patients' high expectations in tertiary hospitals could not be met exactly in extraordinary situations like fire, epidemics, earthquakes, etc. A bit of tolerance would help all of us.

#### **Study Limitations**

Victims of WPV did not report an incident or accident form, and the main reason was the belief that reporting such incidents was useless or unimportant as seen in different study samples [14]. As we started this study, our goal was to make a qualitative analysis of workplace violence against healthcare professionals and related factors based on open-ended, semi-structured interviews with HCPs, but we saw that victims had no belief in anything changing about violence and they did not want to reply questions in our pilot study. Thus, we had to make a quantitative study based on reported cases in the descriptive study of the retrospective design.

#### **Conclusion**

- Increased percentage of white code distribution especially towards doctors more than other Health Care professionals (HCPs) and towards females more than males in 2018 than in 2015, 2016, and 2017 years
- Waiting-line problems were the most common WPV reasons reported
- Nurses and medical secretaries aged under 30 years had significantly higher workplace violence (WPV) rates than aged

over 30 years

- The only period without violence for all HCPs during four years was between 04:00-08:00 in the spring season every year

#### **Scientific Responsibility Statement**

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

#### **Animal and human rights statement**

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

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#### **Conflict of interest**

None of the authors received any type of financial support that could be considered potential conflict of interest regarding the manuscript or its submission.

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