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THE EFFECT OF HEALTH LITERACY, ANGER AND AGGRESSION LEVELS OF PATIENTS AND THEIR RELATIVES ON THE POTENTIAL TO COMMIT VIOLENCE AGAINST HEALTH WORKERS

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ABSTRACT

Objective: *This study aims to contribute to a better understanding of the problem of violence against health workers by examining the health literacy, anger, hostility, and aggression levels of people who use violence against health personnel.*

Material and Method: *This study applies the Buss-Perry Aggression Scale, Novaco Anger Scale, and Health Literacy Scale to 126 patients and relatives of patients who've either used (n=63) or not used (n=63) violence against health personnel using the one-on-one interview method.*

Results: *The frequency of violence was found to be significantly higher in men, married people, those with social security, those under 65 years of age, those with more than one disease, those receiving treatment, those with a high school level of education, and those with a higher education level. The study found hostility, anger, and aggression scores to be high and health literacy scores to be low in the violent group. The variables explaining violence against personnel in the logistic regression model were determined to be those with social security, the health literacy score, undergoing treatment, and marital status.*

Conclusion: *All relevant parties need to make efforts to increase the level of health literacy in all levels of society, as this is inversely proportional to violence against health personnel.*

Keywords: *Health workers, violence, health literacy, anger and aggression.*

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HASTA VE YAKINLARININ SAĞLIK OKURYAZARLIĞI, ÖFKE VE SALDIRGANLIK DÜZEYLERİNİN SAĞLIK ÇALIŞANLARINA ŞİDDET UYGULAMA POTANSİYELİNE ETKİSİ

ÖZET

Amaç: Bu çalışma, sağlık personeline şiddet uygulayan kişilerin sağlık okuryazarlığı, öfke, düşmanlık ve saldırganlık düzeylerini inceleyerek sorunun daha iyi anlaşılmasına katkı sağlamayı amaçlamaktadır.

Materyal ve Metot: Çalışmada sağlık personeline şiddet uygulayan ve uygulamayan toplam 126 hasta yakınına Buss-Perry Saldırganlık Ölçeği, Novaco Öfke Ölçeği ve Sağlık Okuryazarlığı Ölçeği birebir görüşme yöntemi kullanılarak uygulandı.

Bulgular: Şiddet sıklığının erkeklerde, evlilerde, sosyal güvencesi olanlarda, 65 yaş altı olanlarda, birden fazla hastalığı bulunanlarda, tedavi görenlerde, lise mezunu olanlarda ve yükseköğrenim görenlerde anlamlı olarak daha yüksek olduğu belirlendi. Çalışmamızda şiddet uygulayan grupta düşmanlık, öfke ve saldırganlık puanları yüksek, sağlık okuryazarlığı puanları ise düşük bulunmuştur. Lojistik regresyon modelinde personele yönelik saldırıyı açıklayan değişkenler; sosyal güvencesi olması, sağlık okuryazarlığı puanı, tedavi altında olma ve medeni durum olarak belirlendi.

Sonuç: Sağlıkta şiddetle ters orantılı olan sağlık okuryazarlığının toplumun her düzeyinde artırılması için ilgili tüm tarafların çaba göstermesi gerekmektedir.

Anahtar kelimeler: Sağlık çalışanları, şiddet, sağlık okuryazarlığı, öfke ve saldırganlık.

INTRODUCTION

Violence against health personnel has become an increasingly important problem due to its continuous increase in recent years. Violence in health institutions is defined to involve a "Patient, patient relative, or any individual who comes from and poses a risk to health workers; threatening behaviors and words, economic abuse, and physical and sexual assault".[1]

Life science and health workers have been shown to be exposed to workplace aggression the most among professions, with workplace violence incidents against medical occupational groups constituting 15.3% of all incidents of workplace violence.[2]

Knowing the effective factors in aggression toward health workers, as well as intervening and identifying the necessary precautions and taking measures for this, will enable the development of different policies and resolution to the problem. The better defined the problem and the better known the reasons are, the greater the chance producing a solution will be. Many reasons are known to exist for violence against health workers. At the forefront of these are changes in health policies, failure to provide a safe working environment for health personnel, the personal characteristics of the service beneficiaries, personal payments being made to receive services, the applied health policy, and the media's view of events and the way they are transferred to society. In addition to these, factors such as the environment where service is provided, patient's age, gender, marital status, family structure, education, income level, social security status, number of diseases, and whether they are still undergoing treatment have occurred among the topics researched.

Practically no study is found to have measured the anger and aggression levels of patients and their relatives. This study aims to examine the health literacy, anger, hostility, and aggression levels of people who commit violence against health employees in order to contribute to a better understanding of the problem and find new solutions in light of the obtained results.

MATERIAL AND METHOD

Planned Sample

A minimum sample size of 63 people for each group has been deemed sufficient for estimating an average difference of 2 points for anger and aggression scores between the violent and non-violent groups at a level of four standard deviations (Type I error = 0.05, Type 2 error = 0.20, Power = 0.80). Permission from the ethics committee to conduct the study was discussed at the meeting of the Istanbul Faculty of Medicine Clinical Research Ethics Committee (Decision No. 8 dated 22/04/2016) and found to be ethically appropriate.

The Sample: Individuals Over Whom the Application Has Been Made

Patients and their relatives were randomly selected from the Internal Medicine, General Surgery, Child Health and Diseases, and Emergency polyclinics and inpatient services from these clinics.

Research Method

The study has been planned as an analytical observational study that applies questionnaire forms about the demographic characteristics of those

participating in the study who were chosen using random sampling to examine their age (whether 18-64 years or over 65 years of age), gender (M/F), education level, health literacy level, income level, social security status, and whether they are currently undergoing treatment. In addition to the questionnaire form, the researchers used one-on-one interviews to apply the Buss-Perry Aggression Scale, Novaco anger scale and Health Literacy Scale in order to investigate the feelings of anger and aggression these factors may create.

Statistical Analysis

The discrete data obtained from the study were presented as frequencies and percentages, while the continuous data were presented as Mean ± SD, medians, and min-max values. The study used the Kolmogorov-Smirnov test to analyze the appropriateness of the scores obtained from the scales the study used in terms of being normally distributed. The groups' parametric data were evaluated using the independent samples t-test in independent groups between the two groups and by one-way analysis of variance (ANOVA) when in groups of more than two. Multiple benchmark tests were performed using the Tukey honest significance (HSD) test. Variables that do not conform to the normal distribution were tested using the Mann-Whitney U test between the two groups and the Kruskall-Wallis test when in groups of more than two. Multiple comparison tests were conducted using Dunn's test. The relationships between two variables were evaluated using Pearson's correlation analysis, or the Spearman correlation analysis if the variables are not normally distributed. The chi-square test is used to test the homogeneity of the categorical variables between the two groups. Forward logistic regression (LR) analysis was applied over the independent variables that were found to be significant between the two groups by taking whether or not violence had been applied as the group dependent variable. Statistical significance was accepted as two-tailed with $p<0.05$.

The Novaco Anger Scale

The Novaco Anger Scale consists of 25 items, and its Turkish form has been proven to exhibit a similar structure to the original form. The subscales measure different structures, with the scale having criterion, validity, and reliability for various age groups.[3,4]

The Buss-Perry Aggression Scale

Based on the Buss & Durke Hostility Inventory, Buss and Perry (BP) developed a new self-report scale called the Aggression Questionnaire in 1992. It has been refurbished and psychometrically improved, incorporating the main feature of the inventory while also meeting the standards currently in force. The scale was updated by Buss and Warren in 2000.[5] Demirtaş carried out the adaptation study of this scale for Turkish adults and stated the Cronbach α coefficients calculated for the whole scale and its subscales to vary between 0.58-0.89.[6] The scale has been used in various fields by different researchers in Türkiye.[7]

The Health Literacy Survey

The Health Literacy Survey-European Union (HLS-EU) has been made available for use as the Turkish Health Literacy Survey.[8,9]

RESULTS

Descriptive Analyses

The study includes within its scope 63 people who applied violence to health personnel and another 63 people who did not apply violence, with the distribution of demographic characteristics in the two groups being shown in Table 1.

When examining Table 1, the use of violence in men is significantly higher than in women. When evaluated according to age groups, the frequency of violence in the under 65 age group is significantly higher than in the 65 or older age group. The distributions according to marital status between the two groups were not found to be statistically significant. In the violent group, those who are married were found to be significantly higher than those who are single. The distributions according to income groups in the violent and non-violent groups were also not found to be statistically significant. The frequency of violence in the group with social security is significantly higher than in the group without social security. The distributions between the violent and non-violent groups according to whether they have one or more diseases were found to be statistically significant. The frequency of aggression was found to be significantly higher in people with more than one disease, in those who had been admitted to the emergency room more than once in the last year, and in those who been admitted more than four times in the last year. The frequency of violence by those undergoing treatment is also significantly higher than for those who are not undergoing treatment. When reviewing the distributions between the groups according to their educational status, those with high educational status were found to be significantly more likely to be violent toward health workers. No statistical significance in terms of aggression status was found based on income level or family type. The distributions of the scores from the scales used in the study are given in Table 2.

Table 1. Distributions of demographic characteristics the violent and non-violent Groups

Variables	Violent (n=63)		Non-Violent (n=63)		Significance
	Frequency	%	Frequency	%	
Gender					
Female	25	39.68	40	63.49	p=0.007
Male	38	60.32	23	36.51	
Age					
Under 65 years of age	53	84.13	63	100.00	p=0.001
65 and higher	10	15.87	0	0.00	
Marital Status					
Married	39	61.90	15	23.81	p<0.001
Single	19	30.16	33	52.38	
Widowed	5	7.94	15	23.81	
Social security					
Available	54	85.71	38	60.32	p=0.001
None	9	14.29	25	39.68	
Income level					
None	15	23.81	26	41.27	
Low	25	39.68	18	28.57	p=0.10
Moderate	23	36.51	19	30.16	
Under treatment					
Yes	23	36.51	5	7.94	p<0.001
No	40	63.49	58	92.06	
Education level					
High school and lower	40	63.49	52	82.54	p=0.02
College degree	23	36.51	11	17.46	
Family type					
Nuclear	51	80.95	48	76.19	p=0.51
Large	12	19.05	15	23.81	
Admission to the emergency room in the last year					
None	10	15.87	24	38.10	p=0.008
More than 1	53	84.13	39	61.90	
Admission to a doctor in the last year					
None	6	9.52	2	3.17	p<0.001
1-3	18	28.57	41	65.08	
More than 4	39	61.90	21	33.33	

When examining the distributions of the scale scores between the two groups, BP-hostility, BP-anger, and BP-aggression scores were found to be significantly higher in the violent perpetrators, while their health literacy scores were found to be significantly lower (p<0.05). People who showed aggressive behavior were compared with those who did not show such behavior using the dependent variable and by also taking the variables that were found to be significant into consideration (i.e., gender, social security status, the presence of one or more diseases, undergoing treatment, NOvaCo-Anger, BP-physical, BP-hostility, BP-anger, Bp-verbal attack, education, and marital status). Variables with health literacy (HL) scores less than or greater than 124.5 were applied as the independent variables, with Table 3 presenting the variables that were entered into the model.

When examining Table 3, the results from the Forward LR analysis how the variables that explain an attack on health personnel and that were thus left in the model to be social security, health literacy score, undergoing treatment, and marital status.

DISCUSSION

This study will attempt in this section to examine the results by considering the issue of violence against health personnel from a different angle by summarizing them systematically below.

Scales and Gender

When distributing the scores of the scales used in the study according to gender, the hostility score distribution values were found to be higher in men, while total health literacy scores were observed to be higher in women (p=0.001). This finding is in line with the finding that "hostility scores and anger aggression scores are significantly higher in those who commit violence." In other words, feelings of anger and hostility are also higher in men. In general, many studies have shown aggression to be higher in men.[10-12] This study found the distributions according to gender for the groups that did and did not commit violence to be statistically significant, with the use of violence in men being significantly higher than in women. Numerous sociocultural, familial, physiological, and pathological reasons have been proposed to explain the higher incidence of aggression in men, the most prominent of which is that testosterone levels in men are higher than in women and that the estrogen hormone prevents the effects of testosterone in women. In addition, boys being excused and encouraged regarding aggressive behaviors, boys being inadequately socialized, and errors in teaching gender roles are among the reasons that have been put forward to explain higher aggression levels in males.[13]

This study has shown aggression to be lower in women, and this can be said to possibly be due to many reasons, such as estrogen's suppression of the effects of testosterone, upbringing, and social role, as mentioned in previous studies. Another current finding is that health literacy (HL) is higher in women than in men.

As the level of literacy increases, the levels of anger and hostility decrease. Based on the findings obtained in this study, the following results have been obtained: 1) HL in women is higher than in men, 2) Anger and hostility levels are lower in women, and 3) Aggression in women is lower than in men. These findings allow for stating that the reasons for the lower levels of aggression in women compared to men to be gender, high HL levels, and low anger and hostility levels.

Age

When evaluating according to age groups, the frequency of violence in the under 65 age group is significantly higher than in the 65 or older age group. This finding is consistent with the field literature. A study conducted in Australia stated the risk of exposure to violence to be higher in regions where those under the age of 45 are proportionally higher.[10] A study conducted by İlhan *et al*. on violence against health workers in the eyes of society found that 20% of those who think that health workers deserve violence are mostly under the age of 30, male, and have low education levels.[14] The study Sarcan conducted on patients and their relatives found individuals who exhibit aggressive behaviors to be mostly in the 24-30 age group.[15] Another study from Kuruöz found the age range in which the most frequent people had arguments with health workers to be 20-29, followed by the 30-39 age group, while the frequencies for those under the age of 20 and over the age of 50 were very low.[16]

The higher rate of aggression at a young age is expected to be due to such things as people's self-control not being fully developed at these ages, how parents and other family members treat the child, the violence a child sees from their family and peers at a young age, the need to prove oneself, and how one adopts their social role.[17-19] One can speculate that the younger generation has grown up in a more comfortable environment, that they always want more, and that they are therefore more insatiable and less happy. Their failure to meet these expectations and unhappiness suggest that these factors can lead to aggression, especially in young people with a suitable personality background.

Scales and Age Groups

When examining the distributions of the scales used in the study according to age groups, the total health literacy scores were observed to be higher in the group under 65 years of age, while the difference between the groups was not found to be significant (p=0.076). For the first time, this study has shown HL levels to be high in the group under 65 years of age. This study has also shown the levels of aggression to be higher at a young age. Although anger and hostility are not high in the young age group while aggression is high despite a high HL, the reason for aggression in this group cannot be explained by anger and hostility but rather by such factors as hormonal levels, upbringing, and social reasons, as mentioned in the previous section.

Because the aggression levels are high in this group, high HL levels may be thought to not be sufficient at suppressing the effect of the factors that cause aggression. Low aggression in women may be explained by the combined effect of high HL and high estrogen levels.

Marital Status

The relationship between aggression and marital status is controversial. Unhappy marriages have been reported to cause chronic stress.[16,20] Meanwhile,

Table 2. Distributions of scores from the scales used in the research

	Violence	n	Mean	SD	Median	Min	Max	Significance
NOvaCo anger	Violent	63	72.15	26.10	82	8	102	Z=-1.865
	Non-violent	63	68.01	21.25	73	0	101	P=0.062
BP-physical	Violent	63	17.93	7.07	17	9	37	Z=-1.564
	Non-violent	63	15.77	5.20	16	9	32	P=0.118
BP-hostility	Violent	63	15.96	6.77	15	8	36	Z=-2.864
	Non-violent	63	13.03	5.16	12	8	31	P=0.004
BP-anger	Violent	63	13.87	5.74	13	7	31	Z=-1.996
	Non-violent	63	12.03	4.78	11	7	27	P=0.046
BP-verbal attack	Violent	63	9.53	3.59	9	5	20	Z=-1.647
	Non-violent	62	8.48	3.12	8	5	18	P=0.100
Health Literacy	Violent	61	103.90	35.23	100	47	108	Z=-4.671
	Non -Violent	62	137.54	35.93	134	47	188	P=0.000

SD: Standart Deviation, **BP:** Buss and Perry

Table 3. Logistic regression model (forward LR) and the entered variables

Variables entering the model	B	S.E.	Wald	df	Sig.	OR	95% CI.	
							Lower	Higher
Social security ref=none						1		
Social security available	1.112	0.513	4.696	1	0.03	3.041	1.112	8.313
Health literacy (Ref=124.5 points below)						1		
Health literacy (Over 124.5 points)	-1.388	0.441	9.919	1	0.002	0.25	0.105	0.592
Are you under treatment-REF=no						1		
Are you under treatment–yes	1.228	0.587	4.378	1	0.036	3.414	1.081	10.781
Marital status								
Reference=Single						1		
Marital status married	1.195	0.441	7.33	1	0.007	3.303	1.391	7.845
Constant	-0.86	0.476	3.261	1	0.071	0.423		

OR: Odds ratio (OR), **CI:** confidence interval

Şahin found the tendency of violence levels of married individuals surveyed in Samsun province to be higher in hospital than out of hospital.[21] This suggests that being in a hospital environment is important with regard to violence in health and not whether one is married or not.

Scales and Marital Status

Based on the scales that were used, significant differences were found regarding physical attacks, hostility, anger, verbal attacks, and total HL. The scores for all of the sub-dimensions that were found to be meaningful have also been found to be significantly higher in those who are married compared to those who are single or widowed ($p<0.05$). When combining these findings, the levels of physical and verbal attacks, hostility, and anger being higher in married people than in single and widowed individuals suggest that the factors such as the responsibilities brought by marriage and the stress created by knowing that health problems concern not only themselves but also the life and future of other members of the family make preventing the impulse to aggression difficult and cause aggressive thoughts to turn into action more easily. The higher HL levels in unmarried and widowed individuals may be due to the fact that people who do not have a spouse to take care of them when they are sick have to instead take care of their own health. Higher HL levels in unmarried and widowed individuals may also explain why aggression is lower in these groups than in the married group.

Social Security

Some research has found the violent tendency levels of those with health insurance to be lower than those who do not have health insurance.[21] However, the frequency of violence in the group with social security in the current study was found to be significantly higher than in the group without social security. Those with social security are 3.04 times more likely to attack (95% CI [1.11-8.31]) than those without. This finding is consistent with the fact that doctors serving lower income patients are at higher risk than doctors serving middle income patients, with violence having been shown to occur mostly in public hospitals.[22,23] This is because workers in almost every country of the world have social security and because public hospitals in almost every country of the world mainly serve patients with social security. When considering such statements s "It is my right to be treated" and "I pay a premium for treatment," which are known to be frequently said by attackers before the attack, they can be considered to view attacking those whose "salary they pay" to be a right in any situation that increases their dissatisfaction, with the delusion being that those with social security are seeking their rights. People who do not have social security usually do not receive any health service at all, or they are admitted or brought to the hospital when they reach their final moments. They may not be able to show aggression due to feelings and thoughts such as the happiness of receiving services when there is no chance to receive service, the fear that the service provided may be stopped if they cause a problem, not knowing any better service, or knowing that they cannot live without it.

Scales and Social Security

The score distributions of the scales used in the study according to having social security were not statistically significant ($p>0.05$). These findings seem to be contradictory, but the scales reveal that feelings such as anger, hatred, hostility, feelings of aggression, and violence show an actual situation and the process of transforming emotions into action. Probably the main reasons for violence being excessive in the group with social security is not emotions such as anger, hatred, hostility, or aggression but actually other factors such as age and gender. As mentioned above, those who have social security act with the delusion that they are entitled to health care by paying the SSI premium and therefore have the right to attack health personnel.

Presence of More Than One Disease

In the violent and non-violent groups, the score distributions according to having one or more disease states were found to be statistically significant. The frequency of aggression was found to be significantly higher in people with more than one disease. People with more than one disease have a greater deterioration of their health condition compared to patients with a single disease and can therefore be expected to be more unhappy, more stressed, and more aggressive for many other reasons such as having to struggle with problems, coming and staying in the hospital more often and longer; having to be separated from their family, having less job security due to the illnesses contributing to lower productivity, and having to deal with more than one doctor due to livelihood problems. When one goes to the hospital, the chance to intervene in all of one's diseases at once does not exist, and overcoming one disease still leaves the other(s). Moreover, these patients know that their diseases will continue for a lifetime due to the fact that these are usually chronic in nature, that they will use more than one drug at the same time due to the different diseases and thus have to pay more money for medication despite their poor economic status, as well as taking multiple medications having more side effects and greater drug interactions.

Scales and Number of Diseases

This study found anger scores to be significantly higher in the patients with more than one disease (p=0.001). This finding suggests that the frequency of aggression in people with more than one disease is significantly higher than in those with a single disease due to the general condition of having multiple diseases and due to dealing with more than one doctor possibly leading one to becoming more stressful, nervous, and aggressive. Patients who had previously been hospitalized and patients with chronic illnesses were shown to be more likely to exercise their patient rights. This situation is explained as chronic diseases causing longer and more frequent stays in the hospital, thus giving these patients more hospital experience. Due to their experiences, their knowledge of patient rights increases their behavior toward exercising their rights.[24,25]

The current study found HL scores to be high in patients with single diseases (p=0.03). People who are interested in health issues, who are meticulous in protecting their health, who take precautions not to get sick, and who look for early treatment when they are sick may also protect themselves a little better from the physical and psychological damage caused by disease. Their success in disease prevention, early treatment, and prevention of permanent damage from the disease may prevent new diseases from overlapping with the old disease or a continuation of an old disease, thus reducing the likelihood of more than one disease at the same time.

Undergoing Treatment

In the violent and non-violent groups, the score distributions according to the status of undergoing treatment were found to be statistically significant. The frequency of violence for those undergoing treatment is significantly higher (3.41 times; 95% CI [1.08-10.78]) than for those not undergoing treatment. A patient who is already sick, who is still being treated, who is anxious because of not having definite information about their fate, and/or who is struggling with the side effects of a drug may be expected to be unhappy and aggressive. Due to the lack of studies on this subject, this finding cannot be interpreted in comparison with the field literature.

Scales and the Status of Undergoing Treatment

BP-hostility and BP-verbal attack scores were found to be higher for those in the non-violent group who are undergoing treatment. Those with low HL scores were also found to be more likely to have more than one disease at the same time, with aggression already found to be more common in those with more than one disease. This finding supports the findings of those with low HL scores and higher aggression scores regarding those currently undergoing treatment. Gündüz *et al*.'s study determined 13.8% of the patients to have felt the desire to commit violence against a health worker during their hospital stay.[26] This finding is in line with the findings from the current study.

Education Level

Studies discussing the relationship between education level and violence have yielded different results. Takak and Artantaş reported patients and their relatives with low education levels to be one of the reasons for increased violence against health workers.[27] Tetik *et al*.'s study on patients and their relatives compared their violence statuses to their education statuses and found no statistically significant relationship between the two. Çıkman *et al*.'s study conducted with patients and their relatives found as the education levels of the individuals participating in the study increased, their rates of violence decreased.[28,29] Another study demonstrated that, of the 51.8% of those who'd argued with health officials, the majority were university graduates.[16] The current study found the odds of perpetrating violence to be significantly higher in those with a college or graduate level of education.

Scales and Education Level

When examining the score distributions of the scales used in the research according to the participants' educational statuses, this study found anger and physical violence to be higher in those with a secondary school education level, hostility to be higher in those with a secondary school or master's/doctorate education level, and health literacy to be higher in those with a secondary school education level. In addition, as the participants' education levels increase, so does their levels of anger, physical aggression, and hostility, as measured by the BP scales.[5]

The fact that physical violence is also higher in those who with a secondary school education level suggests the presence of a control problem regarding anger transforming into physical violence. The reduction of both anger and violence at the high school level can be interpreted as the acquisition of self-control through education; however, one of the most interesting results of this study is that the level of hostility was found to be high in those with secondary school and those with master's/doctorate education levels. The above-mentioned studies might explain this through the parallel increase in the patients' knowledge of patient rights as their education levels increase with their demands and attitudes toward exercising their rights.

The expectations of highly educated people are high, and they are more inclined to exercise their rights when the quality of service is not provided at the expected level. However, this study found the high level of hostility in those with secondary school and master's/doctorate education levels to add a different dimension to the event. This study found hostility scores to be higher among those who committed violence. Hostility is defined as a type of aggression that arises from hostile aggression or hatred, the main purpose of which is to harm and inflict pain on another person. To understand why such a feeling occurs in people who commit violence against health personnel, investigating this issue with new, broad-based studies to be carried out and to have experts interpret the findings in this regard would be appropriate. As a matter of fact, all the findings in the previous sections showed aggression to decrease as HL increases, whereas this section found the HL to be high in those with a secondary school education level, as well as their levels of anger, hostility, and physical aggression. The previous finding on reduced aggression for those with high HL does not apply to those with a secondary school education level. Those with a college education level also having a high sense of hostility is also a finding worth examining. Education and HL levels cannot be said to parallel one another. In addition, this study has also revealed aggression to be high in those with low HL. However, explaining the high level of hostility in those with a secondary school education despite also having a high HL level is difficult. Some studies may provide a partial explanation for this situation. For example, studies conducted on patient rights have explained the attitudes of patients with university and higher education levels toward exercising their patients' rights to be higher than the attitudes of literate, primary, and high school graduate patients.[24, 26, 30-32] These findings suggest that as a patient's education level increases, their demands and attitudes toward exercising their rights increase in parallel with having increased knowledge about patient rights. However, this is not enough to explain the situation (i.e., the coexistence of high HL and high hostility). One or more factors must exist in these two groups that lead to a feeling of high hostility regardless of their HL level; still, the current study cannot identify this due to falling outside the study's scope. Broad-based studies are needed to identify these factors.

Scales and Aggression

This study found the hostility, anger, and aggression scores to be significantly higher in those who were violent to hospital personnel for those with significantly lower HL scores ($p<0.05$). Aggression is known to be a form of anger expression, and when angry, verbal and physical aggression impulses may occur, with anger also being an important variable regarding the expression of aggression.[33-37] What is interesting here is that the feeling of hostility is also high. Due to hostile aggression being defined as a type of aggression that is motivated by the provocations of the other party and to include feelings of anger and hostility which arise from the aggressor not liking or hating the person, situation, or object being dealt with and whose main purpose is to harm and inflict pain on the other person, understanding and explaining hostile aggression with regard to violence against health personnel are difficult.[38-40] This study is the first study to show the causes of violence against health workers to include the feeling of hostility.

Multivariate Analysis

Those with social security were found to be 3.04 times more likely to commit violence than those who without social security (95% CI [1.11-8.31]). Those undergoing treatment were found to be 3.41 times more likely to commit violence than those not undergoing treatment. Those who were married were found to be 3.30 times more likely to attack than those note married, and those with an average HL score above 124.5 were found to be 0.25 times more likely to attack than those with a score under 124.5 (95% CI [0.11-0.59]). The hospitals that people with high HL levels apply to for protecting their health and being treated when they are sick are more likely to prevent feelings of aggression by controlling negative emotions through love and respect for the doctors who work in this hospital and by helping patients protect and regain their health as soon as possible.

CONCLUSION

To prevent violence against health personnel, violence needs to be understood, and all the factors that lead to and facilitate violence need to be examined and dealt with separately by taking corrective measures or eliminating the factors that increase violence. In addition, scientists who are psychology and psychiatry experts, as well as experts working in this field, should investigate why emotions and attitudes such as anger, hostility, and aggression, which have been shown to be effective regarding violence toward health personnel, are higher in violent patients and their relatives, and then these experts should develop measures for this. Health literacy should be increased with simple understandable messages presented in media environments that are used intensively by almost every segment of the public, as well as through the trainings to be given in formal and non-formal education institutions, as well as on the Internet and TV.

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