

# Examination By Multinomial Logistic Regression Model Of The Factors Affecting The Types Of Domestic Violence Against Women: A Case Of Turkey

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**Abstract:** In this paper, factors affecting the types of domestic violence against women was determined by multinomial logistic regression model. In this context, we used the data of "Research on Domestic Violence against Women in Turkey" that was applied by Turkish Statistical Institute in 2008. In the study, the variable of the types of domestic violence against women was used as dependent variable that has four levels. In addition, twelve independent variables were used removing irrelevant variables from the data set via chi-square test of independence. After that, the maximum likelihood estimates and the odds ratios of the variables of the model were obtained. Besides, the validity of the model was tested by likelihood ratio test. At last, comparisons were made for three categories depending on the odds ratio according to the selected reference category. In terms of odds ratios, the variables of "education level of woman" and "husband's work sector" were statistically significant in only comparison one; the variables of "agnation with husband", "education level of husband", "frequency of seeing drunk husband", and "frequency of gambling of husband" were statistically significant in both comparison one and three; the variables of "region", "deceived by husband", "common-law female for husband" were statistically significant in all comparisons.

**Index Terms:** Domestic Violence against Women, Multinomial Logistic Regression Model, Turkey, Violence.

## 1 INTRODUCTION

Violence against women, which has been ongoing for ages between men and women as a reflection of the unequal power relationship, has been in existence all over the world without recognizing geographical, cultural, and economic borders as a serious human rights violation and a serious social problem (General Directorate of the Status of Women (GDSW), Turkey, 2012). Violence, which is phenomenon as old as human history, is externally managed, hard, and painful action against the physical integrity of the person, in the narrow sense (Kocacik, 2001). On the other hand, the definition of violence in the broad sense is "violence is a behavior that cannot be measured clearly its physical and mental effects on human, and is behavior which is felt in a concrete way and indirectly." (Demir and Nam, 2014). There are five different types of violence as physical, sexual, emotional, economic, and verbal. Additionally, actions, such as honor killings, sexual abuse, and sexual harassment which women are exposed, are also located between the different forms of violence (Tezcan and Tunckanat, 2009). No matter what kind of violence, violence is a violation of human rights and freedoms and beyond that, is an action that may cause physical and mental health problems, and may lead to disability and death (GDSW, 2012). The realization of domestic violence against women has many causes.

These reasons are as follows: failure of quality social communication and in mutual expression of love, effect of media, poverty, alcohol use, customs / traditions, migration, gender discrimination, being forced to marry at an early age, legal loopholes, insufficiency of the education system, cultural differences (Altinay and Arat, 2009), and cultural thaw (Subasi and Akin, 2003). Society may internalize to this violent behavior and may tolerate to violence, insomuch that this can be sometimes seen as the traditional norm (Bloom, 2008). In societies in this case, some situations arise such as getting used to domestic violence against women, be accepted, and be unresponsive to it (Demir and Nam, 2014). Domestic violence against women began to enter the agenda of society through the efforts of the women's movement that began to become influential in the world since 1960. In addition, it has been recognized as one of the most important human rights violations in the last thirty years. For all, this issue could enter the agenda of Turkey through the efforts of the women's movement that began to be effective in the late 1980s (Tezcan and Tunckanat, 2009). Although gender equality has been strengthened by the constitutional changes made in 2004 and 2010, domestic violence against women remains widespread in Turkey. An indicator of this is that taking place of the tragic news of violence against women in the media almost every day (Tatlioglu and Kucukkose, 2015). In related literature, there are very few statistical studies about factors affecting domestic violence against women. Some of these studies were summarized below. Al-Nsour et al. (2009) studied to determine factors affecting the types of domestic violence for married women aged 18–49 who visited the public health clinics in the governorate of Balkan, Jordan by using logistic regression analysis. The results of the study showed that women were exposed to emotional abuse and wife beating by husband at most. Besides, it was concluded that the rural residence, marriage at young age, older age for women and working status of women are the most associated factors in domestic violence for women. Izmirli, et al. (2014) studied to determine risk factors affecting domestic violence categories

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for married women living in the southwest of Turkey by using logistic regression analysis. The results of the study showed that women were exposed to verbal/psychological violence at most. Besides, it was concluded that the existence of alcohol and gambling problem for husband; living in village, adolescent marriage and to be much younger than husband (19-29 age) are the most effective factors in terms of exposure to domestic violence for women. Mavrikiou et al. (2014) analyzed the factors affecting domestic violence against women living in Cyprus by using logistic regression analysis. Obtained model in this study showed that age of partners, place of living, family budget and marital status variables have statistically significant effect on violence against women. In this paper, factors affecting the types of domestic violence against women were analyzed by multinomial logistic regression model using Turkish Statistical Institute (TUIK) micro data set for 2008. In this study, many variables affecting domestic violence against women are included because there is a quite detailed data set collected by TUIK. Multinomial logistic regression model used in this study has the nominal dependent variable with more than two categories, and these categories have discrete structure from each other, but there is no ranking between the categories. Additionally, the dependent variable of the model shows polynomial distribution and this model can be used in situations where there is no constraint on independent variables (Hosmer and Lemeshow, 2000).

## 2 METHODOLOGY AND DATA SET

In this study, factors affecting type of domestic violence against women was determined by multinomial logistic regression model were analyzed using "Research on Domestic Violence against Women in Turkey" that was surveyed TUIK in 2008. The survey that is subject to research was applied to 12,795 women throughout Turkey. Chi-square test of independence was applied for 20 variables, which are located in survey and are thought to be effective variable in domestic violence, and then 12 variables were studied by removing irrelevant variables from the data set. In the study, the reason for Multinomial logistic regression analysis was applied is that violence against women variable has a nominal structure. After that, the maximum likelihood estimates and odds ratios of the variables of the model were obtained with the help of this model. Besides, the validity of the model was tested by likelihood ratio test. All data obtained from this study was analyzed via STATA software package. Dependent variable, which is the types of domestic violence against women variable, has a nominal structure with 4 levels, and it was categorized as "exposed to physical violence, sexual violence, physical and sexual violence and never exposed to violence. The independent variables are thought to affect the types of violence against women and their levels are given as follows:

**TABLE 1**  
**LEVELS of INDEPENDENT VARIABLES**

Independent Variables	Levels of Independent Variables
X1: Region	1:West 2:South 3:CentralAnatolia 4: North 5: East
X2: Age	1: 15-17 2: 18-30 3: 31-42 4: 43-59
X3: Education Level of Woman	1:Primary 2:Secondary 3: Primary (8 years) 4: High 5: University 6: Master/Doctorate 7: Illiterate
X4: Personal Income of Woman	1: No 2: Yes
X5: Type of Wedding	1: Civil 2: Religious 3: Civil and Religious 4: None
X6: Agnation with Husband	1: No 2: Yes
X7: Common-law Female for Husband	1: No 2: Yes
X8: Education Level of Husband	1:Primary 2:Secondary 3:Primary (8 years) 4:High 5:University 6:Master / Doctorate 7:Illiterate
X9: Husband's Work Sector	1:Agriculture 2:Industry 3:Service 4: Unknown
X10: Frequency of Seeing Drunk for Husband	1:No 2: Many days a week 3: One day a week 4: One day a month 5: Less than a month 6:Unknown
X11: Frequency of Gambling for Husband	1: No 2: Almost every day 3: 1-2 days a week 4: 1-3 times per month 5: Less than one day a month 6:Unknown
X12: Deceived by Husband	1:No 2:Yes 3:May be 4:Unknown / Cannot remember

### 2.1 Multinomial Logistic Regression Model

Logistic regression analysis is used in case of two-category dependent variable; for all that, multinomial logistic regression analysis is used to explain the cause and effect relationship between the independent variables and the dependent variable in case of dependent variable has at least three and more categories (Zortuk et al. 2013). In addition, these categories have discrete structure from each other, but there is no ranking between the categories (Washington et al. 2003). In brief, multinomial logistic regression model is an expanded version of the two-category model (binary model) for  $j$  category. Thereby, " $j-1$ " multinomial logistic regression models occur (Long and Freese, 2006). It is allowed that the response probabilities to depend on nonlinear transformations of the linear function of equation 1:

$$x_i' \beta_j = \sum_{k=0}^K \beta_{jk} x_{ik} \quad (1)$$

where  $K$  is the number of the predictors,  $i$  represents  $i_{th}$  individual,  $x$  represents independent variable and  $j$  expresses the category dependent variable. The multinomial logit model can be viewed as an extension of the binary logit model. For example, in case of three categories ( $J=3$ ), it can be written the probabilities as below:

$$P_{i1} = P(y_i = 1|x_i) = \frac{1}{1 + \exp(x_i' \beta_2) + \exp(x_i' \beta_3)} \quad (2)$$

$$P_{i2} = P(y_i = 2|x_i) = \frac{\exp(x_i' \beta_2)}{1 + \exp(x_i' \beta_2) + \exp(x_i' \beta_3)} \quad (3)$$

$$P_{i3} = P(y_i = 3|x_i) = \frac{\exp(x_i' \beta_3)}{1 + \exp(x_i' \beta_2) + \exp(x_i' \beta_3)} \quad (4)$$

In here,  $\beta_2$  and  $\beta_3$  denote the covariate effects specific to the second and third response categories with the first category as

the reference. Besides, a reference category (baseline category) is determined at first to compare and analysis. At this stage, the researcher can select the reference category ( $j$ ) optionally for instance, if there are categories such as 1, 2, and 3 in a dependent variable, 1 can be selected as the reference category. In this way, two different logistic models can be obtained for comparison of 1-2 and 1-3 (Hosmer and Lemeshow, 2000). On the other hand, the equation 1 for  $P_{i1}$  can be derived from the constraint that the three probabilities sum to 1

$$P_{i1} = 1 - (P_{i2} + P_{i3}) \quad (5)$$

The sum of the probabilities of categories of dependent variable should be equal to 1 as in binary logit model. For instance, if the dependent variable has a category three-level structure, the sum of the probabilities for each category will be equal to 1 as follows (Hosmer et al. 2013):

$$[P_{i1} = P(y_i = 1|x_i)] + [P_{i2} = P(y_i = 2|x_i)] + [P_{i3} = P(y_i = 3|x_i)] = 1 \quad (6)$$

In general, the probabilities of a dependent variable with  $j$  categories can be expressed in multinomial logit as below:

$$P_{ij} = P(y_i = j|x_i) = \frac{\exp(x_i' \beta_j)}{1 + \sum_{j=2}^J \exp(x_i' \beta_j)} \quad (7)$$

Besides, the probability of taking place in category  $j$  of dependent variable can be expressed as below (Liao, 1994):

$$P_{i1} = P(y_i = 1|x_i) = \frac{1}{1 + \sum_{j=2}^J \exp(x_i' \beta_j)} \quad (8)$$

The multinomial logit model is estimated using maximum likelihood with the log-likelihood function for a sample of  $n$  observations given by

$$\ln L = \sum_{i=1}^n \sum_{j=1}^J d_{ij} \log(P_{ij}) \quad (9)$$

Where  $d_{ij}$  is a dummy variable that takes a value 1 if observation  $i$  takes the  $j$ th category and 0 otherwise because  $P_{ij}$  is a nonlinear function of parameters of the regression model. In addition, in such a case, an iterative estimation method such as Newton-Raphson's is applied to estimate the model parameters (Dajcman, 2013). Odds and odds ratio play an important role in multinomial logit models just as they do in binary logit models. The odds ratios can be calculated for the categories of the model, however, the model should be transformed to linear form taking the natural logarithm of the odds ratio to estimate parameters of this model. In the multinomial logit, the odds between categories  $j$  and 1 for a given are as below:

$$P_{ij}/P_{i1} = \exp(x_i' \beta_j) \quad j = 2, \dots, j. \quad (10)$$

In addition, the log-odds (logit), is a linear function of  $x_i$ :

$$\ln (P_{ij}/P_{i1}) = \exp(x_i' \beta_j) \quad j = 2, \dots, j. \quad (11)$$

According to this, a positive parameter for an independent variable  $x$  means that an increased odds of observing an observation in category  $j$  rather than category 1 as  $x$  increases, holding other covariates constant; a negative parameter means that the chances of being in the baseline category are higher relative to category  $j$  as  $x$  increases. If  $x$  is a code 0 and 1 coded dummy variable, then  $\beta$  is a log-odds ratio:

$$\ln \left[ \frac{(P_j|x_k = 1)/(P_1|x_k = 1)}{(P_j|x_k = 0)/(P_1|x_k = 0)} \right] = \beta_{jk} \quad (12)$$

### 3 RESULTS

In this study, the fourth category of dependent variable, which is "never exposed to violence," is the reference category; and, the first category of independent variables is the reference category. Thereby, interpretations were made in this direction. The validity of multinomial logistic regression model were examined by likelihood ratio test, and the model was significant with value of  $\chi^2 = 85,917$  ( $p < 0,05$ ). It is seen that  $\beta$  coefficients have different values for each category of the model. Therefore, the odds ratios of the variable vary for each category. In multinomial logistic regression model, the effect of each independent variable on dependent variable is different from each other in each category. The effect of independent variable is expressed by  $\beta_1$  for the logit that compares the first category of dependent variable against the fourth category of dependent variable; the effect of independent variable is expressed by  $\beta_2$  for the logit that compares the second category of dependent variable against the fourth category of dependent variable; the effect of independent variable is expressed by  $\beta_3$  for the logit that compares the third category of dependent variable against the fourth category of dependent variable. Therefore, slope coefficients ( $\beta$ ) in the obtained multinomial logistic regression model are different from each other. The results regarding the multinomial logistic regression analysis are given in Table 2, 3, and 4.

#### Comparison Category for "exposed to physical violence" against "never exposed to violence" (Comparison 1)

➤ **Region:** Region variable is statistically significant. Probability of exposure to physical violence is 1.462 times more from probability of never exposure to violence for a woman living in the southern region of Turkey according to a woman living in the western region of Turkey. This probability is 1.817 times more for the central Anatolia region, is 1.255 times more for the northern region, and is 1.922 times more for the eastern region according to the western region of Turkey.

➤ **Age:** Age variable is statistically significant. Probability of exposure to physical violence is 6.203 times more from probability of never exposure to violence for whom a woman in the 18-30 age range according to a woman in the 15-17 age range in Turkey. This probability is 8.144 times more for a woman in the 31-42 age range, and is 10.254 times more for whom a woman in the 43-59 age range according to a woman in the 15-17 age range.

➤ **Education level of woman:** This variable is statistically significant. Probability of exposure to physical violence is 0.849 times less from probability of never exposure to violence for a woman who graduated from secondary school according to a woman who graduated from primary school in Turkey.

This probability is 0.295 times less for a woman who graduated from high school, is 0.282 times less for a woman who graduated from university, is 0.063 times less for a woman graduated from master degree/doctorate, and is 0.830 times more for an illiterate woman according to a woman who graduated from primary school.

➤ **Agnation with husband:** This variable is statistically significant. Probability of exposure to physical violence is 1.229 times more from probability of never exposure to violence for a woman who is agnate with her husband according to a woman who is not agnate with her husband.

➤ **Common-law female for husband:** This variable is statistically significant. Probability of exposure to physical violence is 4.188 times more from probability of never exposure to violence for a woman whose husband has a common-law female according to a woman whose husband has not a common-law female.

➤ **Education level of husband:** This variable is statistically significant. Probability of exposure to physical violence is 0.796 times less from probability of never exposure to violence for a woman whose husband graduated from secondary school according to a woman whose husband graduated from primary school. This probability is 0.094 times less for a woman whose husband graduated from high school, is 0.024 times less for a woman whose husband graduated from university and is 0.158 times less for a woman whose husband graduated from master degree or doctorate according to a woman whose husband graduated from primary school.

➤ **Husband's work sector:** This variable is statistically significant. Probability of exposure to physical violence is 0.762 times less from probability of never exposure to violence for a woman whose husband works in industry sector according to a woman whose husband works in agriculture sector. This probability is 0.727 times less for a woman whose husband works in service sector according to a woman whose husband works in agriculture sector.

➤ **Frequency of seeing drunk husband:** This variable is statistically significant. Probability of exposure to physical violence is 4.218 times more from probability of never exposure to violence for a woman whose husband is drunk for many days a week according to a woman whose husband does not use alcohol. This probability is 2.213 times more for a woman whose husband is drunk one day a week, is 2.146 times more for a woman whose husband is drunk one day a month and is 1.545 times more for a woman whose husband is drunk less than one day a month according to a woman whose husband does not use alcohol.

➤ **Frequency of gambling of husband:** This variable is statistically significant. Probability of exposure to physical violence is 3.416 times more from probability of never exposure to violence for a woman whose husband gambles almost every day according to a woman whose husband does not gamble. This probability is 4.839 times more for a woman whose husband gambles 1-2 days a week, is 1.497 times more for a woman whose husband gambles 1-3 days a month and is 2.507 times more for a woman whose husband gambles less than one day a month according to a woman whose husband does not gamble.

➤ **Deceived by husband:** This variable is statistically significant. Probability of exposure to physical violence is 3.123 times more from probability of never exposure to violence for a woman who says yes to question of "Did your husband deceive you?" according to a woman who says no.

This probability is 3.352 times more for a woman who says maybe to the question.

TABLE 2

Comparison 1 for Categories of the Estimated Multinomial Logistic Regression Model

Comparison for Type of Violence	Variable/Level of Variable	Coef. ( $\beta$ )	Odds Ratio ( $e^{\beta}$ )	p value
Comparison Category for "exposed to physical violence" (Comparison 1)	<b>Region</b>			
	Threshold 1	-1.214	---	---
	South	0.380	1.462	0.000*
	Central Anatolia	0.597	1.817	0.000*
	North	0.227	1.255	0.004*
	East	0.653	1.922	0.000*
	<b>Age</b>			
	Threshold 1	-2.857	---	---
	18-30	1.825	6.203	0.000*
	31-42	2.097	8.144	0.000*
	43-59	2.327	10.254	0.000*
	<b>Education Level of Woman</b>			
	Threshold 1	-0.647		
	Secondary School	-0.162	0.849	0.061
	High School	-1.219	0.295	0.000*
	University	-1.264	0.282	0.000*
	Master	-2.753	0.063	0.000*
	Illiterate	0.345	0.830	0.007*
	<b>Personal Income of Woman</b>			
	Threshold 1	-0.809	---	---
	Yes	-0.060	0.941	0.281
	<b>Type of Wedding</b>			
	Threshold 1	-0.802	---	---
	Civil and Religious	0.334	1.397	0.060
	Religious	0.088	1.092	0.520
	None	-1.143	0.318	0.289
	<b>Agnation with Husband</b>			
	Threshold 1	-0.759	---	---
	Yes	0.206	1.229	0.002*
	<b>Common-law Female for Husband</b>			
	Threshold 1	-0.832	---	---
	Yes	1.432	4.188	0.000*
	<b>Education Level of Husband</b>			
Threshold 1	-0.227	---	---	
Secondary School	-0.227	0.796	0.001*	
High School	-1.250	0.094	0.000*	
University	-1.149	0.024	0.000*	
Master	-0.770	0.158	0.025*	
Illiterate	-0.025	0.100	0.805	
<b>Husband's Work Sector</b>				
Threshold 1	-0.569	---	---	
Industry	-0.271	0.762	0.002*	
Service	-0.318	0.727	0.000*	
Unknown	-0.149	0.861	0.080	
<b>Frequency of Seeing Drunk Husband</b>				
Threshold 1	-0.946	---	---	
Many days a week	1.439	4.218	0.000*	
One day a week	0.794	2.213	0.000*	
One day a month	0.763	2.146	0.000*	
Less than one month	0.435	1.545	0.002*	

Unknown	-0.224	0.799	0.418
<b>Frequency of Gambling of Husband</b>			
Threshold 1	-0.839	---	---
Almost every day	1.228	3.416	0.000*
1-2 days a week	1.576	4.839	0.000*
1-3 times per month	0.403	1.497	0.297
Less than one day a month	0.919	2.507	0.022*
Unknown	0.337	1.400	0.204
<b>Deceived by Husband</b>			
Threshold 1	-0.916	---	---
Yes	1.138	3.123	0.000*
Maybe	1.209	3.352	0.000*

(\*p < 0.05)

**Comparison Category for “exposed to sexual violence” against “never exposed to violence” (Comparison 2)**

- **Region:** Region variable is statistically significant. Probability of exposure to sexual violence is 1.163 times more from probability of never exposure to violence for a woman living in the southern region of Turkey according to a woman living in the western region of Turkey. This probability is 1.589 times more for the central Anatolia region, is 2.387 times more for the northern region, and is 2.415 times more for the eastern region according to the western region of Turkey.
- **Common-law female for husband:** This variable is statistically significant. Probability of exposure to sexual violence is 2.995 times more from probability of never exposure to violence for a woman whose husband has a common-law female according to a woman whose husband has not a common-law female.
- **Deceived by husband:** This variable is statistically significant. Probability of exposure to sexual violence is 1.901 times more from probability of never exposure to violence for a woman who says yes to question of “Did your husband deceive you?” according to a woman who says no to question. This probability is 4.698 times more for a woman who says maybe to question of “Did your husband deceive you?” according to a woman who says no.

**TABLE 3**

*Comparison 2 for Categories of the Estimated Multinomial Logistic Regression Model*

Comparison for Type of Violence	Variable/Level of Variable	Coef. (β)	Odds Ratio (e <sup>β</sup> )	P value
Comparison Category for “exposed to sexual violence ” against “never exposed to violence ” (Comparison 2)	<b>Region</b>			
	Threshold 1	-3.553	---	---
	South	0.151	1.163	0.556
	Central Anatolia	0.463	1.589	0.010*
	North	0.870	2.387	0.000*
	East	0.882	2.415	0.000*
	<b>Common-law Female for Husband</b>			
	Threshold 1	-3.042	---	---
	Yes	1.097	2.995	0.041*
	<b>Deceived by Husband</b>			
	Threshold 1	-3.094	---	---
	Yes	0.642	1.901	0.000*
	Maybe	1.547	4.698	0.011*

(\*p < 0.05)

**Comparison Category for “exposed to physical and sexual violence” against “never exposed to violence” (Comparison 3)**

- **Region:** Region variable is statistically significant. Probability of exposure to physical and sexual violence is 1.960 times more from probability of never exposure to violence for a woman living in the southern region of Turkey according to a woman living in the western region of Turkey. This probability is 1.768 times more for the central Anatolia region, is 1.930 times more for the northern region, and is 3.707 times more for the eastern region according to the western region of Turkey.
- **Agnation with husband:** This variable is statistically significant. Probability of exposure to physical and sexual violence is 1.475 times more from probability of never exposure to violence for a woman who is agnate with her husband according to a woman who is not agnate with her husband.
- **Common-law female for husband:** This variable is statistically significant. Probability of exposure to physical and sexual violence is 6.999 times more from probability of never exposure to violence for a woman whose husband has a common-law female according to a woman whose husband has not a common-law female.
- **Education level of husband:** This variable is statistically significant. Probability of exposure to physical and sexual violence is 0.775 times less from probability of never exposure to violence for a woman whose husband graduated from secondary school according to a woman whose husband graduated from primary school. This probability is 0.396 times less for a woman whose husband graduated from high school, is 0.257 times less for a woman whose husband graduated from university, is 0.234 times less for a woman whose husband graduated from master degree or doctorate and is 1.576 times more for a woman whose husband is illiterate according to a woman whose husband graduated from primary school.
- **Frequency of seeing drunk husband:** This variable is statistically significant. Probability of exposure to physical and sexual violence is 8.882 times more from probability of never exposure to violence for a woman whose husband is drunk for many days a week according to a woman whose husband does not use alcohol. This probability is 2.891 times more for a woman whose husband is drunk one day a week, is 2.047 times more for a woman whose husband is drunk one day a month and is 2.060 times more for a woman whose husband is drunk less than one day a month according to a woman whose husband does not use alcohol.
- **Frequency of gambling of husband:** This variable is statistically significant. Probability of exposure to physical and sexual violence is 9.536 times more from probability of never exposure to violence for a woman whose husband gambles almost every day according to a woman whose husband does not gamble. This probability is 12.572 times more for a woman whose husband gambles 1-2 days a week, is 3.926 times more for a woman whose husband gambles 1-3 days a month and is 5.960 times more for a woman whose husband gambles less than one day a month according to a woman whose husband does not gamble.
- **Deceived by husband:** This variable is statistically significant. Probability of exposure to physical and sexual violence is 7.281 times more from probability of never exposure to violence for a woman who says yes to question of

"Did your husband deceive you?" according to a woman who says no to question. This probability is 8.526 times more for a woman who says maybe to question of "Did your husband deceive you?" according to a woman who says no to question.

**TABLE 4**  
Comparison 3 for Categories of the Estimated Multinomial Logistic Regression Model

Comparison for Type of Violence Against	Variable/Level of Variable	Coef (B)	Odds Ratio ( $e^B$ )	p value
Comparison Category for "exposed to physical and sexual violence" against "never exposed to violence" (Comparison 3)	<b>Region</b>			
	Threshold 1	-2.100	---	---
	South	0.528	1.960	0.000*
	Central Anatolia	0.819	1.768	0.000*
	North	0.387	1.930	0.000*
	East	1.007	3.707	0.000*
	<b>Agnation with Husband</b>			
	Threshold 1	-1.429	---	---
	Yes	0.389	1.475	0.000*
	<b>Common-law Female for Husband</b>			
	Threshold 1	-1.516	---	---
	Yes	1.945	6.999	0.000*
	<b>Education Level of Husband</b>			
	Threshold 1	-1.116	---	---
	Secondary School	-0.254	0.775	0.003*
	High School	-1.234	0.396	0.004*
	University	-1.355	0.257	0.000*
	Master Degree/Doctorate	-1.448	0.234	0.016*
	Illiterate	0.455	1.576	0.000*
	<b>Frequency of Seeing Drunk Husband</b>			
	Threshold 1	-1.639	---	---
	Many days a week	2.184	8.882	0.000*
	One day a week	1.061	2.891	0.000*
	One day a month	0.716	2.047	0.002*
	Less than one month	0.722	2.060	0.000*
	<b>Frequency of Gambling of Husband</b>			
	Threshold 1	-1.561	---	---
	Almost every day	2.255	9.536	0.000*
	1-2 days a week	2.531	12.572	0.000*
	1-3 times per month	1.367	3.926	0.000*
	Less than one day a month	1.785	5.960	0.000*
	Unknown	1.102	3.011	0.000*
	<b>Deceived by Husband</b>			
Threshold 1	-1.759	---	---	
Yes	1.985	7.281	0.000*	
Maybe	2.143	8.526	0.000*	

(\*p < 0.05)

#### 4 CONCLUSION

The main objective of this study was to reveal the factors affecting domestic violence against women by multinomial logistic regression model. When we look at related studies in literature, there are very few statistical studies about factors affecting domestic violence against women and the relationship between these factors. For this reason, we thought that the evaluation of this case by statistical viewpoint is also very important psychologically and sociologically. Moreover, it may be expected to give a different dimension to

the literature. In this study, when we look at category comparisons that obtained by multinomial logistic regression model, we can see that the odds ratios of the following variables are statistically significant ( $p=0.05$ ) according to each comparison:

- In comparison category for "exposed to physical violence" against "never exposed to violence" (Comparison 1)  
"region", "age", "deceived by husband", "common-law female for husband", "education level of woman", "agnation with husband", "husband's work sector", "education level of husband", "frequency of seeing drunk husband", "frequency of gambling of husband".
- In comparison category for "exposed to sexual violence" against "never exposed to violence" (Comparison 2)  
"region", "deceived by husband", "common-law female for husband".
- In comparison category for "exposed to physical and sexual violence" against "never exposed to violence" (Comparison 3)  
"region", "deceived by husband", "common-law female for husband", "agnation with husband", "education level of husband", "frequency of seeing drunk husband", "frequency of gambling of husband". Besides, following specific conclusions were obtained in terms of the factors affecting the types of domestic violence against women in this study:
  - Probability of exposure to physical violence is higher for a woman living in the eastern region according to the other regions of Turkey.
  - Probability of exposure to physical violence is higher for a woman in the 43-59 age range to a woman in the other age groups.
  - Probability of exposure to physical violence is higher for an illiterate woman according to women in other educational levels.
  - Probability of exposure to physical violence is higher for women who are agnate with their husbands according to women who are not agnate with their husbands.
  - Probability of exposure to physical violence is higher for women whose husbands have a common-law female according to women whose husbands have not a common-law female.
  - Probability of exposure to physical violence is higher for women whose husbands graduated from secondary school according to women whose husbands are in other educational levels.
  - Probability of exposure to physical violence is lower for women whose husbands work in industry sector according to women whose husbands work in other sectors.
  - Probability of exposure to physical violence is higher for women whose husbands are drunk for many days a week according to women whose husbands are drunk in other frequencies.
- In comparison category for "exposed to physical violence" against "never exposed to violence" (Comparison 1)

- Probability of exposure to physical violence is higher for women whose husbands gamble 1-2 days a week according to women whose husbands gamble in other frequencies.
  - Probability of exposure to physical violence is higher for women who say maybe to the question of "Did your husband deceive you?" according to the other women.
- **In comparison category for "exposed to sexual violence" against "never exposed to violence" (Comparison 2)**
- Probability of exposure to sexual violence is higher for a woman living in the eastern region according to the other regions of Turkey.
  - Probability of exposure to sexual violence is higher for women whose husbands have a common-law female according to women whose husbands have not a common-law female.
  - Probability of exposure to sexual violence is higher for women who say maybe to the question of "Did your husband deceive you?" according to the other women.
- **In comparison category for "exposed to physical and sexual violence" against "never exposed to violence" (Comparison 3)**
- Probability of exposure to physical and sexual violence is higher for a woman living in the eastern region according to the other regions of Turkey.
  - Probability of exposure to physical and sexual violence is higher for women who are agnate with their husbands according to women who are not agnate with their husbands.
  - Probability of exposure to physical and sexual violence is higher for women whose husbands have a common-law female according to women whose husbands have not a common-law female.
  - Probability of exposure to physical and sexual violence is higher for women whose husbands are illiterate according to women whose husbands are in other educational levels.
  - Probability of exposure to physical and sexual violence is higher for women whose husbands are drunk for many days a week according to women whose husbands are drunk in other frequencies.
  - Probability of exposure to physical and sexual violence is higher for women whose husbands gamble 1-2 days a week according to women whose husbands gamble in other frequencies.
  - Probability of exposure to physical and sexual violence is higher for women who say maybe to the question of "Did your husband deceive you?" according to the other women.
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