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# A STUDY OF FACTORS ASSOCIATED WITH EMOTIONAL VIOLENCE IN KENYA

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**ABSTRACT:** *Emotional abuse refers to a pattern of behavior where one person seeks to control, manipulate, and dominate another person, often causing emotional harm and trauma. It is committed more frequently against women. The repeated occurrence of this in Kenya necessitated the conduct of this research work on the factors associated with emotional violence in the country. A total of 8444 respondents were considered in this study. We employed binary logistic, probit, and complementary-log log regression on the retrieved data. The data were collected from the Kenya Demographic Health Survey (KDHS) via their website. Emotional violence has been identified as one of the most prevalent forms of violence against women globally (WHO, 2013). On average, Intimate Partner Violence (IPV) affects about 47% of the Kenya population. This study aimed to model some risk factors influencing emotional violence in Kenya and the investigation was carried out by observing the extent to which selected covariates such as number of other wives, number of children under the age of five , age at first marriage, partner's age, education status, husband living in the house, husband's smoking habit, marital duration, spending decision, number of sexual partner(s), husband's jealousy, accusation from husband, money trust and partner's ten-year age difference influence emotional violence. The result of the research work ascertained that "accusation from husband" is the factor which has the most significant impact on emotional violence.*

**KEYWORDS:** Binary logistic regression; Probit regression; C-log log; Emotional violence; ROC curves; Goodness of fit.



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## INTRODUCTION

Intimate partner violence (IPV) is considered as a human rights violation and a public health issue throughout the world (Campbell, 2002; Garcial-Moreno, Jansen, Ellsberg, Heise & Watts, 2006; Tjaden & Theonnes, 2000). As currently indexed, violent crimes against intimate partners – current or former spouses, boyfriends and girlfriends are committed more frequently against women; these include lethal (homicide) and non-lethal (rape, assault) forms (Catalano, 2000). Emotional abuse is any non-physical behavior or attitude that seeks to control, sub- due, punish, or isolate another person through the use of humiliation or fear (Engel, 2002). It can include verbal assault, dominance, control, isolation, ridicule or the use of intimate knowledge of degradation. It targets the emotional and psychological well-being of the victim and it is a catalyst to physical abuse. There is a high correlation between physical and emotional abuse in a population.

However, verbal abuse early in a relationship predicts subsequent physical spousal abuse. Some types of physical behavior can be considered emotional abuse and pose physical abuse. Examples include: throwing objects, kicking a wall, shaking a finger or fist at the victim. Much evidence has accumulated chronicling the deleterious effects specific to emotional violence. Emotionally abused women can be more lonely and despairing than physically abused women (Loring, 1994). Van Houdenhove et al. (2001) postulated that emotional abuse and neglect may be contributing factors to the development and severity of illnesses.

Intimate partner violence (IPV) is a complex, multidimensional phenomenon that is embedded in culture and interwoven with economic, social, and political issues (Anderson, 2007; Barnet, 2000; Davis & Taylor, 2006; Kearney, 2001; Nagae & Dancy, 2010). As a result, little is known about emotional violence within marriages, the factors maintaining IPV, and how women deal with it.

The power and control wheel is an analytical model developed by the Domestic Abuse Intervention Project, Duluth, Minnesota, USA, to illustrate the power dynamics of domestic violence and how it constitutes an overall pattern of power and control. The hub of the wheel illustrates its gendered nature, highlighting how the traditional power of male dominant society makes the choice to use violence more common to men than women. The examples in the wheel are illustrative, not definitive, but highlight some of the most common strategies identified. The wide range of abusive behaviour men use to control their female partners includes physical and sexual assault; intimidation; emotional abuse; isolation; denying and blaming; using male-privilege; using children; and, economic sanctions. The aim of this study is to build an appropriate model on emotional violence in Kenya and the risk factors associated with it.


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## LITERATURE REVIEW

Atetwe (2008) claimed that it is extremely difficult to obtain the prevalence rates of violence by husbands against their wives because the problem in many cases is still accepted as a cultural practice or a private affair and this is rarely reported to authorities. The explanatory study carried out in 2014 by University of Texas, set out to examine the prevalence of violence by husbands against their wives in Maseno and Nairobi areas of Kenya. Of the 208 women who participated in the study, 49.7% reported a history of violence. Prevalence for physical violence was 12.9% and emotional violence was 39.4%. Chyun–Fung (2013) chose Kenya for a study on domestic violence because of its relatively high gender prevalence ratio (prevalence in women is around 1.9 times higher than that of men and higher than most population based studies in Africa).

Kaspiew and Carson (2016) provided some statistics on the mistreatment of intimate partners saying there will be a dramatic increase in women experiencing emotional abuse. Abbott (1999) observed that all types of abuse are done for the purpose of gaining power and control over the victim. Kariuki (2016) in a study carried out by Ongeti, Ongego, Were, Gakara and Pulie at the gender violence recovery center (GVRC) of Nairobi women hospital which receives patients from Nairobi City and environs showed that gender violence increased across the years. The study revealed that 85.4% and 12.7% of the victims were sexually and physically abused respectively.

Johnstone (2002) investigated that two additional emotions emerged (anger and frustration) and this was due to the fact that very few abused women will admit to intimate partner assault, instead they lie and give substitute explanations for their state and injuries. Brewster (2003) examined that women in abusive relationships have a difficult time to maintain their economic resources when partners engage in behaviors that generate costs. Such behaviors include stealing, damage and destruction of possessions and household furniture. According to a study by Coker et al. (2000), 29% of women (n=6790) and 23% of men (n=7122) experienced physical, sexual or psychological IPV during their lifetime or psychological abuse was measured by two subscales, verbal abuse and abuse of power and control, created from the power and control scale.

Rivara et al. (2009) wanted to understand if the diminishing rates of IPV among American women over the past four decades were a result of age, period, and cohort effects. IPV was measured using questions from the behavioral risk factor surveillance system (CDC, 2006). Sackett and Saunders (1999) investigated the impact of different forms of abuse on women receiving services from a domestic violence agency and found that both emotional abuse and physical abuse contributed to depression and low self-esteem.


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## METHODOLOGY

The methods of data analysis adopted in this study were binary logistic regression, probit regression and complementary log-log regression with the analysis carried out using STATA. Also, the Hosmer-Lemeshow test for goodness of fit is used to know the best model that fits the data. The ROC curve is employed in this study to show how better the model does at classifying the data into categories. The dependent variable (response variable) is emotional violence with binary outcomes (1=Yes, 0=No) and there are 17 predictors (covariates), such as education, marital status, religion, place of residence, age at first marriage, spending decision, husband jealous, and husband accuses, among others.

**Logistic Regression:** This is the statistical technique used to predict the relationship between predictors (independent variables) and a predicted variable (response variable) where the response or dependent variable is dichotomous (binary). The independent variables (covariates) can be continuous (interval/ratio) or categorical (ordinal/nominal).

**Probit Regression:** This is also used to model dichotomous or binary outcome variables. In the probit model, the inverse standard normal distribution of the probability is modeled as a linear combination of the predictors. That is, it makes use of cumulative distribution of a standard normal. Both logit and probit models are symmetric about the $mean$ $(\mu)$.

**Complementary Log-Log:** This is used to model binary response variables when the probability of an event is very small or large. Unlike logit and probit the complementary log-log function is asymmetrical about the $mean$ (μ). The complementary log-log transformation takes a response restricted to the (0, 1) interval and converts $\texttt{it to } (-\infty, +\infty) \texttt{ interval.}$

Here, logit, probit and complementary -log-log models are compared to know which of them is the best for the study.

**Logit Model:** $log\ (\frac{\pi}{1-\pi}) = \alpha + \beta_1 x_1 + \cdots + \beta_p x_p$ ---------- (1)

**Probit Model:** $probit[\pi] = \alpha + \beta_1 x_1 + \cdots + \beta_p x_p$ ---------- (2)

$p(y=1) = \frac{exp\ (\alpha+\beta x)}{1+exp\ (\alpha+\beta x)} = \frac{e^{\alpha+\beta x}}{1+e^{\alpha+\beta x}}$ ---------- (3)

The binary logistic regression model form with multiple explanatory variables is given by:

$log\ (\frac{p(y=1)}{1-p(y=1)}) = \alpha + \beta_1 x_1 + \cdots + \beta_p x_p$ ---------- (4)

The random component for the (success, failure) outcomes has a binomial distribution.

The link function of $\pi = P(Y = 1)$ is the Logit function, $log\ (\frac{\pi}{1-\pi})$ symbolized by log it $(\pi)$. It is often called logit models. Where P(Y=1) is restricted to the 0 and 1 range. However, the logit could be any real number. The model can also be written as:

$\frac{\pi(x)}{1-\pi(x)} = exp\ exp\ (\alpha + \beta x) = e^{\alpha}\left(e^{\beta}\right)^{x}$ ..... (5)



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This gives odds of response variable *y*. The odds multiplied by $e^{\beta}$ for every 1 unit increase in *x* that is the odds at $x + 1$ equals the odds at *x* multiplied by $e^{\beta}$ when $\beta = 0$, $e^{\beta} = 1$, and the odds do not change as *x* changes.

**Hosmer-Lemeshow Test (HL Test):** This is a goodness of fit test for logistic regression, especially for risk prediction. A goodness of fit test tells us how well the data fits the model. Specifically, the HL-test calculates if the observed event rates match the expected event rates in population subgroups.

This test is usually run using statistical packages and the output returns a chi-square value (a Hosmer Lemeshow chi-squared) and a p-value (e.g. pr > chi sq). Small p-value means that the model is a poor fit. Like most goodness of fit tests, these small p-values (usually under 5%) mean that your model is not a good fit. But large p-values don't necessarily mean that your model is a good fit, just that there is not enough evidence to say it is a poor fit (Hosmer & Lemeshow, 1980).

A receiver operating characteristics (ROC) curve is a plot that displays the sensitivity and specificity of a logistic regression model. ROC curve plots sensitivity on the vertical axis versus (1- specificity) on the horizontal axis. The more the ROC curve hugs the top left corner of the plot, the better the model performs at classifying the data into categories. To quantify this, we can calculate the AUC (Area under the Curve) which tells us how much of the plot is located under the curve. The closer AUC to 1, the better the model and vice versa.

## RESULTS AND DISCUSSIONS

**Logit model:** The analysis of the logistic regression model (full model) output is tabulated below and the interpretations of the predictors/explanatory variables follow:

**Table 1: Logistic Regression Model (Full Model)**

| Variable | Coef. | Std. Error | Z | p-value | [95% Conf. interval] |
|---|---|---|---|---|---|
| *Child under five years* | 0.1388 | 0.0647 | 2.145 | 0.0320 | [- 0.0120, 0.2656]*** |
| *Age at first marriage* | -0.0484 | 0.0188 | -2.569 | 0.0102 | [-0.0254, 0.0115]*** |
| ***Place of residence*** | | | | | |
| Urban | Ref | | | | |
| Rural | 0.0718 | 0.1429 | 0.505 | 0.6138 | [-0.2072, 0.3509] |
| ***Highest education status*** | | | | | |
| No Education | Ref | | | | |
| Primary | 0.0633 | 0.2046 | 0.309 | 0.7572 | [-0.3377, 0.4642] |
| Secondary | -0.1258 | 0.2396 | -0.525 | 0.5996 | [-0.5953, 0.3438] |
| Tertiary | -0.4301 | 0.3148 | -1.366 | 0.1718 | [-1.0471,0.1869] |
| ***Husband lives in the house*** | | | | | |
| Home | Ref | | | | |
| Staying elsewhere | -0.3548 | 0.1550 | -2.288 | 0.0221 | [-0.6586, 0.0509]*** |


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| | | | | | |
|---|---|---|---|---|---|
| ***Marital duration*** | | | | | |
| 0-4 | Ref | | | | |
| (5 – 9) years | 0.4081 | 0.2010 | 2.031 | 0.0423 | [0.0143, 0.8020]*** |
| (10 – 14) years | 0.3274 | 0.2222 | 1.473 | 0.1408 | [-0.1082, 0.7629] |
| (15 – 19) years | 0.6583 | 0.2545 | 2.586 | 0.0097 | [-0.1595, 1.1571]*** |
| (20 – 24) years | 0.2970 | 0.2963 | 1.003 | 0.3161 | [-0.2837, 0.8777] |
| (25 – 29) years | 1.0883 | 0.3501 | 3.108 | 0.0019 | [0.4020, 1.7745]*** |
| 30 years and above | 1.0645 | 0.4739 | 2.246 | 0.0247 | [0.1356, 1.9934]*** |
| ***Spending decision*** | | | | | |
| Respondent alone | Ref | | | | |
| Respondent and husband | -0.4753 | 0.1310 | -3.628 | 0.0003 | [-0.7320, 0.2185]*** |
| Husband alone | -0.2850 | 0.2323 | -1.229 | 0.2199 | [-0.0184, 0.0178] |
| ***Husband jealous*** | | | | | |
| No | Ref | | | | |
| Yes | 0.4572 | 0.1304 | 3.505 | 0.0005 | [0.2015, 0.7128]*** |
| ***Husband accuses*** | | | | | |
| No | Ref | | | | |
| Yes | 1.2333 | 0.1616 | 7.634 | 0.0000 | [0.9167, 1.5500]*** |
| ***Husband does not trust*** | | | | | |
| No | Ref | | | | |
| Yes | 0.7470 | 0.1399 | 5.341 | 0.0000 | [0.4729, 1.0212]*** |
| Constant | -0.9610 | 0.5591 | -1.71 | 0.0856 | [-2.0567, 0.1397] |

**Note: Ref = Reference Category, Significant *** '0.05'**

Log likelihood = - 847.23303; Prob < 0.001; LR chi2 (27) = 271.57; Pseudo $R^2$ = 0.1462. In logit model 1, we have the log likelihood value (-847.233) with repeated likelihood-ratio chi-square 291.57 with 27 degrees of freedom, reported p-value < 0.05 tells us that our model as a whole fit significantly better compare to the reduced model which reported log likelihood (-995.61611) likelihood-ratio chi-square 358.24 with 19 degrees of freedom.

The coefficient of the number of children under five years is statistically significant (associated with p-value < 0.05). This reported a coefficient (0.1388) and it indicates that a unit increase in the number of children under five years will multiply the odds of emotional violence by ($e^{0.1388}$ = 1.15) moreover, at a unit increase in age at first marriage multiplies the odds of emotional violence by ($e^{-0.0484}$ = 0.95). This tells us that a unit increase in age at first marriage is associated with 5% reduction in the violence while adjusting for other covariates.

Also, husband staying away from home (i.e. outside matrimonial home) multiplies the odds of emotional violence by ($e^{-0.3548}$ = 0.70) it means that husband staying away from home causes 30% reduction in the risk of emotional violence compared to when husband lives at home. Marital duration between the periods of (5-9) years, (15-19) years, (20-24) years, (25-29) years, and 30 years above have substantial impacts on emotional violence, and duration in marriage between (5-9) years has a ($e^{0.4081}$=1.50) times odds of experiencing violence; this shows that there is 50% greater risk of exposure to emotional violence. However, between (15-190 years, it is associated with ($e^{0.6583}$=1.93) times odds of experiencing emotional violence; it has 93% chance of exposure to violence. Meanwhile, between (25-29) years and 30 years above indicate


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that they are ($e^{1.0883}$ = 2.97). and ($e^{1.0645}$=2.90), times of experiencing the violence compared to others levels of marital duration. This implies that they both have 97% and 90% greater chance of experiencing the violence.

Who decides how to spend money also has a significant impact on the violence. Decisions taken by the wife and husband to spend money associated with (p-value < 0.05) indicate that it causes a reduction in violence by 38% compared to when decisions are taken by the husband alone. That is, it is 0.38 times less likely to experience the violence. Next is the jealousy of the husband, with a reported coefficient (0.4572), it is deduced that it multiplies the odds of experiencing emotional violence by ($e^{0.4572}$ = 1.58), that is, it accounts for 58% increase of having emotional violence compare with when husband is not jealous. Husband accusing his partner is the most prominent risk factor which contributed to the improvement of the fit. It is ($e^{1.2333}$ = 3.43) times more likely to cause emotional violence. Husband not trusting his wife with money has a coefficient (0.7470). This shows that it has ($e^{0.7470}$ = 2.11) times the odds of exposure to violence unlike when the husband trusts her with money. This accounts for 111% of experiencing the violence.

**Probit model:** The analysis of the logistic regression model (full model) output is tabulated below and the interpretations of the predictors/explanatory variables follow:

**Table 2: Probit Regression Model (Full Model)**

| Variable | Coef. | Std. Error | Z | p-value | [95% Conf. interval] |
|---|---|---|---|---|---|
| *Child under five years* | 0.0824 | 0.0382 | 2.15 | 0.031 | [-0.0074, 0.1573]*** |
| *Age of first marriage* | -0.0296 | 0.0111 | -2.66 | 0.008 | [-0.0514, -0.0078]*** |
| ***Place of residence*** | | | | | |
| Urban | Ref | | | | |
| Rural | 0.0381 | 0.0836 | 0.46 | 0.648 | [-0.1256, 0.2019] |
| ***Highest education status*** | | | | | |
| Primary | 0.0320 | 0.1220 | 0.26 | 0.793 | [-0.2071, 0.2712] |
| Secondary | -0.0744 | 0.1418 | -0.53 | 0.599 | [-0.3523, 0.2034] |
| Tertiary | -0.2534 | 0.1811 | -1.40 | 0.162 | [-0.6082, 0.1015] |
| ***Husband lives in the house*** | | | | | |
| Home | Ref | | | | |
| Staying elsewhere | -0.204 | 0.9076 | -2.25 | 0.025 | [-0.3817,-0.0259]*** |
| ***Marital duration*** | | | | | |
| 0-4 | Ref | | | | |
| (5 – 9) years | 0.2368 | 0.1168 | 2.03 | 0.043 | [0.0078, 0.4657]*** |
| (10 – 14) years | 0.1954 | 0.1292 | 1.51 | 0.130 | [-0.0578, 0.4486] |
| (15 – 19) years | 0.3878 | 0.1488 | 2.61 | 0.009 | [0.0961, 0.6794]*** |
| (20 – 24) years | 0.1754 | 0.7308 | 1.01 | 0.311 | [-0.1638, 0.5147] |
| (25 – 29) years | 0.6249 | 0.2063 | 3.03 | 0.002 | [0.2206, 1.0292]*** |
| 30 years and above | 0.6205 | 0.2875 | 2.18 | 0.029 | [0.0628, 1.17823]*** |
| ***Spending decision*** | | | | | |
| Respondent alone | Ref | | | | |
| Respondent and husband | -0.2774 | 0.0770 | -3.60 | 0.0000 | [- 0.4283, -0.1265]*** |
| Husband alone | -0.1517 | 0.1376 | -1.10 | 0.270 | [-0.4213, 0.1179] |


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| | | | | | |
|---|---|---|---|---|---|
| ***Husband jealous*** | | | | | |
| No | Ref | | | | |
| Yes | 0.2688 | 0.0767 | 3.50 | 0.000 | [0.1185, 0.4191]*** |
| ***Husband accuses*** | | | | | |
| No | Ref | | | | |
| Yes | 0.7478 | 0.0972 | 7.69 | 0.000 | [0.5573, 0.9383]*** |
| ***Husband does not trust*** | | | | | |
| No | Ref | | | | |
| Yes | 0.4529 | 0.0839 | 5.40 | 0.000 | [0.2884, 0.6175]*** |
| Constant | -0.5662 | 0.3272 | -1.73 | 0.084 | [-1.2076, 0.0752] |

**Note: Ref = Reference Category, Significant *** '0.05'**
Log likelihood = -846.75737; Prob < 0.001; LR chi2 (27) = 292.53; Pseudo $R^2$ = 0.1473.

In model 2 output above, the likelihood ratio chi-square of 292.53 with a reported p-value (0.0000) < 0.05 tells us that our model as a whole is statistically significant, that is, it fits significantly better than a model with no predictors. We could also see the coefficients, their standard errors, the z-statistic, associated p-values and 95% confidence interval. The probit regression coefficients give the change in the z-score or probit index for a one unit change in the predictor. For a unit increase in the number of children less than five years, the z-score of emotional violence increases by 0.082, also, at a unit increase in age at first marriage, the z-score of emotional violence decreases by 0.030 keeping other variables constant. Meanwhile, husband staying elsewhere compared to husband living with his wife (reference group) decreases the z-score by 0.204.

Marital duration between (5-9) years compared to other levels of marital duration increases the z-score of emotional violence by 0.237 keeping other variables constant. Duration between (15-19) years increases the standard score of emotional violence by 0.3888 compared to all other levels of duration. However, marital duration of (25-29) years and 30 years above, increases the standard score (z-score) of emotional violence by 0.625 and 0.621 respectively. Hence, long term duration in marriage has nothing to do with reduction in violence. Also, when a wife and her husband decide to spend money together, it reduces the standard normal score (z-score) by 0.277.

Husband's jealousy and accusations have a significant impact on emotional violence as they increase the standard normal score (z-score) of experiencing violence by 0.269 and 0.748 respectively. Finally, when a husband does not trust his wife with money, it increases the z-score of emotional violence by 0.453 compared to when the husband trusts her with money.

The analysis of the complementary log-log results in the output: Log likelihood = -851.34377; Prob < 0.001; LR chi2 (27) = 283.36. The likelihood chi square of 283.36 with a reported p-value < 0.005 shows that the full model fits better than the null model. Hence, the full model is statistically significant.


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**Model Selection**

Next, is the comparison of non-nested models, i.e., Logit, probit and c-log log models using Akaike Information Criteria (AIC) and Bayesian Information Criteria (BIC).

**Table 3: Model Selection**

| Models | Observation | -2LL | df | AIC | BIC |
|---|---|---|---|---|---|
| Logit | 1596 | 1694.4661 | 28 | 1750.466 | 1900.973 |
| Probit | 1596 | 1693.5147 | 28 | 1749.515 | 1900.022 |
| Clog log | 1596 | 1702.6875 | 28 | 1758.688 | 1909.195 |

By reporting the AIC and BIC of three models, it is deduced that the probit model is the best fitted of all with least values of AIC (1749.515) and BIC (1900.022) respectively. However, Logit model also fits better compared to the c-log log model with the values of AIC and BIC reported for the logit model indicating that there is a slight difference compared to the probit model.

The ROC curves for the Probit and Logit regressions below show that the area under the curve; AUC values = 0.7522 and 0.7520 respectively, which tells us that the models classified 75.22% and 75.20% of the data into categories correctly. The closer the AUC value is to 1, the better the model performs in classifying the observations into categories.

**Figure 1: ROC Curve for Probit Model**

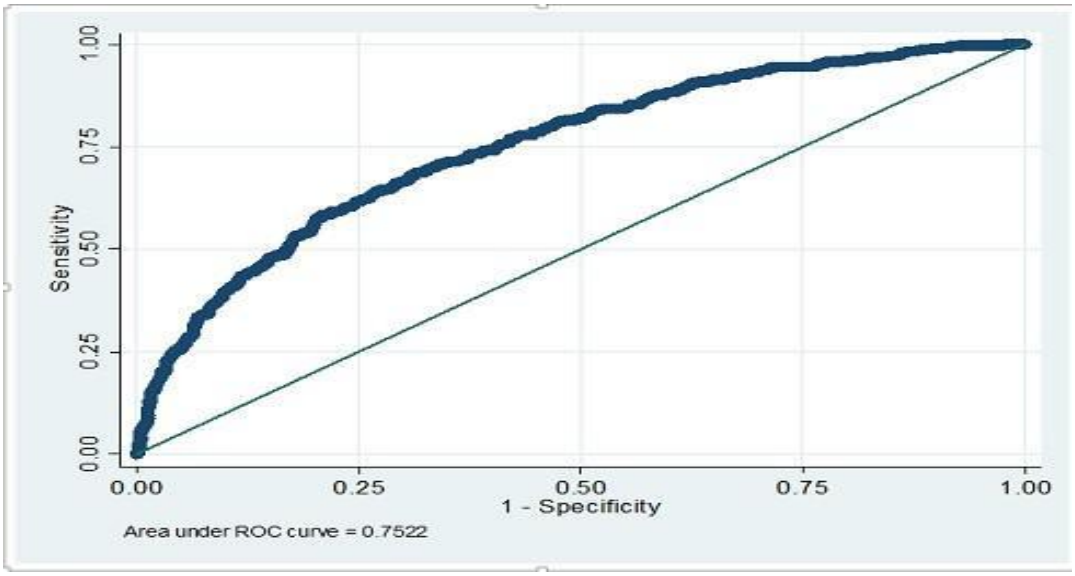


**Figure 2: ROC curve for logit model**


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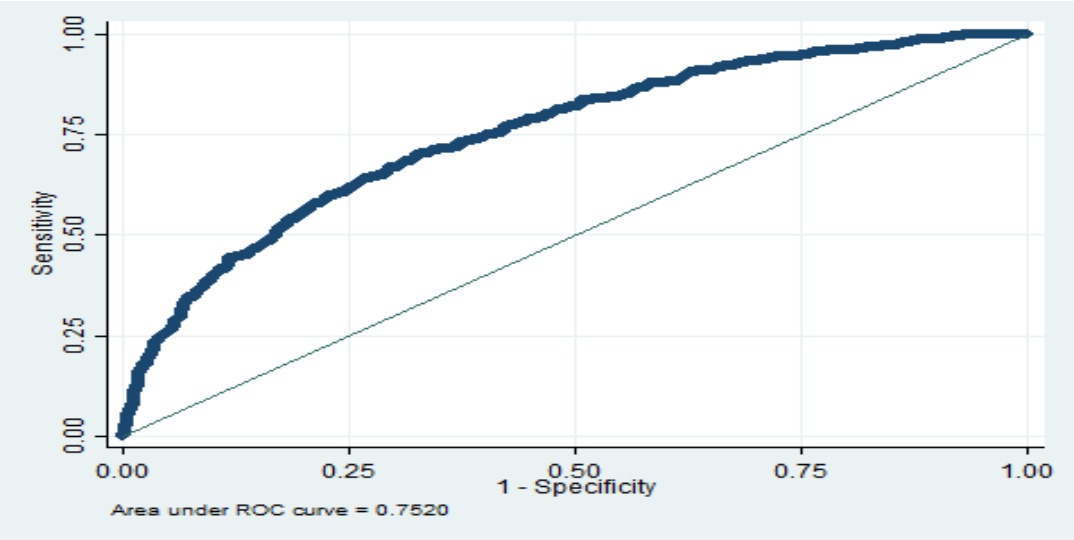


The table below shows the Hosmer-Lemeshow test for goodness of fit:

**Table 4: Hosmer Lemeshow (HL): Test for Probit Model**

| | |
|---|---|
| Number of observations | 1596 |
| Number of covariate patterns | 1595 |
| Pearson chi-squared | 1579.40 |
| Prob [chi-squared] | 0.4079 |

From the table shown above, the p-value = 0.4079 > 0.05which justifies that the model is a good fit which can be interpreted that the observed emotional violence rates match the expected violence rates in population subgroups.

## CONCLUSION

Based on the findings, the following conclusions were drawn;

Husband's accusations, jealousy of the husband, money trust, marital duration and number of children under five years have a positive impact on emotional violence. It means they are more likely to be experienced "positively "by the emotional violence.

However, spending decisions (i.e. wife and husband), age at first marriage and husband staying elsewhere have a negative impact on emotional violence. That is, they are less likely to experience violence. There is an association between emotional violence and the aforementioned factors at 5% level of significance.


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## RECOMMENDATIONS

Based on the findings of the study, we recommend that:

1. We need to take account of abused women's perspectives of what assistance would be helpful for them, with better understanding from the abused women's perspectives, making the information available to formal bodies and informal helpers. Thus, creating better understanding and tolerance in homes.

2. The concept of intimate partner violence (IPV) should be defined in national legislation in such a way that it is treated as a serious offense.

3. Special sensitization programmes should be launched by the government for both men and women with the aim of preventing all kinds of abuse which can result to violence.

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