An Analysis of Influencing Risk Models of Elderly Abuse

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Abstracts: *The elderly abuse recognizing to be a substantial and growing public health problem worldwide. The present study aims to analyse the risk factors of elderly abuse in family environment of Nijgadh Municipality. A descriptive cross-sectional study has been carried out among 204 elders taken from the community through simple random sampling method. The data were collected through face to face structured interview schedule in 2021. The binary logistic regression model was created as statistical analysis. The result of the study revealed that the elders who lived without spouse were 6.221 times more likely to be abused than those who lived with partners. Followed by functional disability of elders (elders with disability were 2.277 times higher than no disability), etc. This study created 5 models of risk factors among which model 2 had explained variation (24.6%) than others. This study found that living without a spouse, dependency, poor health, having fewer family members and the aging of seniors are the most common reasons for being abused in a family environment. This research has produced data on the odds ratio of elderly abuse based on many socio-demographic factors, which can be utilized to identify and protect elders who are at high risk of abuse through multi-sectoral social justice action.*

Keywords: Elderly abuse, elderly people, prediction of abuse, and risk factors

1. Introduction

The term 'elder abuse' was first used in British scientific journals in 1975 to describe the mistreatment of elderly persons (Timalsina, 2021). Later, in the 1980s, scientific research and government action emerged in several countries. The World Health Assembly (WHA) approved Resolution WHA49.25 (Heath, 2002) in 1996, recognizing abuse to be a substantial and growing public health problem worldwide. For a long time, elder abuse was considered a social and criminal justice issue, but with the World Health Organization's 2002 study, it was explicitly characterized as a public health issue (Krug EG et al., 2002). Abuse of the elderly has only recently been acknowledged as a worldwide issue. INPEA's lobbying efforts, as well as WHO's emphasis on elder abuse prevention, has helped to raise awareness around the world (WHO, 2008).

The words 'elderly' and 'older persons' are used in this study to refer to people aged 60 years and up (Timalsina, 2021). According to WHO's definition of old persons, the crucial age for being classified as elderly is 65 years (Connell, 1999). In Nepal, individuals over 60 years of age are considered elderly (GCN, 2010).

Several theoretical approaches to explaining the reasons of elder abuse have been developed. According to the so-called situational theory, an overworked and stressed caretaker creates a setting prone to abuse. Intra-individual dynamics (psychopathology) theory claims a link between a mentally or emotionally unstable abuser and abuse; exchange theory discusses reciprocity and reliance between the abused and the perpetrator. Feminist theory is based on domestic abuse models, highlighting the imbalance of power within relationships and how men use abuse as a way to demonstrate power; intergenerational transmission or social learning theory states that an adult's behavior is related to learned behavior as a child, thus reverting to the same pattern in adulthood; feminist theory is based on domestic abuse models, highlighting the imbalance of power within relationships and how men use abuse as a way to demonstrate power. The emphasis on individualistic ideas has been attacked by political economic theories, which say that structural pressures and the

marginalization of elders within society have created conditions that led to conflict and abuse (Perel-Levin & WHO, 2008)

The ecological model investigates the relationships between individuals and their surroundings. Abuse is viewed as the outcome of a complex interaction between a person's individual traits (biology, personal history), close interpersonal interactions, community characteristics in which the person lives or works, and societal factors such as policies and social norms. Elder abuse can be related to broader socioeconomic issues using the ecological model (Bronfenbrenner, 1994).

The ecological model of abuse is based on Bronfenbrenner's ecological paradigm, which was initially published in 1970, and it constitutes a transcription of the majority of developmental psychology surveys (Bronfenbrenner, 1994)). Bronfenbrenner's concept is a holistic approach to human development, asserting that understanding human development necessitates taking into account the entire ecological system in which growth happens (Bronfenbrenner, 1979). As a conceptual tool, the ecological model is continually being developed and enhanced. Its strength is that it aids in the differentiation of the various variables on misuse while also offering a framework for understanding how they interact (Sethi & Weltgesundheitsorganisation, 2011).

The ecological framework takes a multifaceted approach to interpersonal violence among the elderly. It looks at how different levels of individual, relationship, communal, and social factors interact to produce violence. This study looked at: 1) risk variables at the household level, such as family size, household composition (cohabiting with a partner, children, grandkids, and so on), and household income; and 2) risk factors at the community level, such as the region where older people dwell.(Jordanova Peshevska et al., 2014)**.**

For this study, Individual risk factors include age, income, dependency, education, and other physical and personal characteristics that might make someone a victim of abuse, taken as first level of risk factor. Similarly, Familial risk factors include family size and cohabitation status also might make someone a victim of abuse, taken as second level of risk variables.

Elder abuse has long been recognized as a study area, but quantitative prevalence studies are scarce (Yon et al., 2017). Furthermore, Nepal has a shortage of studies on the elderly. Chalise and Basnet (2017) noted, "Research on the abuse of elderly individuals is also quite new in Nepalese society" (p. 1). GCN (2010) also recommended doing a baseline study using numerous indicators to assess the health of the elderly. The study's key research gaps indicated in the study, which will be used to conduct this study, are a lack research on risk factors of elderly abuse, and newly emergent concerns.

1.1 Objective
To analyse the influencing risk factors of elderly abuse in family environment

1.2 Hypothesis of the Study
Socio-demographic characteristics (age, income, family size, literacy, dependency, living with or without spouse, functional disability, and health) influence elderly abuse.

2. Materials and Method Used
A descriptive, community-based, cross-sectional study was undertaken in Nijgadh Municipality from July to August 2021. The voter list in Nijgadh municipality listed 538 elders from three wards, and this number was chosen as the study's universe (NEC, 2018). Three wards were chosen at random from the municipality's nine wards using simple random sampling. The sample size was calculated using Yamane's (1967) formula:

$$n = \frac{N}{1+(N \times (0.05)^2)} .$$

The sample size was estimated using a pilot study, and 229 persons were picked using a simple random sampling approach from 538 elderly people. Using a pre-tested

questionnaire, the researchers trained enumerators to interview a total of 229 subjects. The interview was conducted entirely in Nepali. Finally, out of 229 samples, data for 204 senior citizens was successfully collected. Twelve of the twenty-five older adults who were not included in the study refused to participate, two had incomplete interviews, and eleven were not found when the data was gathered. The study's purpose was explained to the participants, and they gave their oral informed consent. The confidentiality and privacy of the study's interview were also taken into account. To avoid interference and influence from other family members and neighbors, each respondent was questioned individually in a location where they felt at ease. The statistical software SPSS, Version 26 for Windows, was used to tabulate and analyze the data. Descriptive and inferential statistics were used to describe the findings. The researcher used a regression model based on binary logistic regression to examine influencing risk factors of elderly abuse (Piri et al., 2018; Strasser et al., 2013; Astari & Kismiantini, 2019; Abdulqader, 2017), and this research prepared following risk factors model based on binary logistic regression to examine influencing risk factors of elderly abuse.

$$Y = \ln[P_i/(1-P_i)] = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_n X_n$$

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_n X_n \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.(1)$$

Here,

P_i = Probability of experiencing elderly abuse on age, family size, living with or without spouse, functional disability status, income, dependency, and health.

β_0 = Constant (intercept)

β_n = Regression coefficient of independent variable X_n

X_n = Explanatory variable n

Y= Dependent variable (elderly abuse)

n= 1, 2, 3, 4……….

2.1 Variable applied in regression analysis

A risk factor model based on binary logistic regression was used to investigate the impact of socio-demographic characteristics on senior abuse. The Binary Logistic regression method predicts the values of a dichotomous variable Y that has only two possible values: 0 or 1, based on a collection of explanatory factors that might be continuous or categorical. Gender, age, family size, living with or without spouse, literacy status, health status, functional handicap status, dependent status, income level, and property ownership status were all employed in the study, as shown in table 6. SPSS software was used to perform all calculations.

Elderly abuse was employed as a dependent variable in the study, with a score of 0 for not being mistreated and 1 for being abused. Similarly, multiple explanatory variables were included in this study to predict elderly abuse.

Table 1 lists the variables utilized in the study, along with their descriptions.

Table 1 *Variable used in the risk factors model for elderly abuse*

Variables	Description
EBS	Elderly Abuse: 1-Abused, 0-Not abused
AGE	Age
FMS	Family Size
LIT	Literacy status: 1-literate, 0-illiterate
INC	Income
FCD	Functional disability: 1-Without disability, 0-with disability
DEP	Dependency Status: 1-Independent 0-Dependent,
LWS	Living with/without spouse: 1-With Spouse, 0-Without Spouse

| HSE | Health Status of Elders: 1-Fair, 0-Not good |

3. Result and Discussion

3.1 Analysis of Correlation Coefficient for Risk Factors Model

This study looked at risk factors for elderly abuse using binary logistic regression analysis with various independent variables. For fitting the five models employed in the study, the researcher used binary logistic regression. The study's independent variables were chosen for each model based on their correlation status in order to assess their potential impact in cases of elderly abuse. The binary logistic regression estimation was carefully carried out by the researcher to rule out the potential of substantial multicollinearity between the variables. Table 7 illustrates the correlation state of the explanatory factors utilized in the study, which the researcher used to identify which variables to include in each model depending on their correlation status. In the same model, the researcher employed just those explanatory variables with a low degree of correlation. According to Ratner (2009), variables with a correlation coefficient of less than 0.3 indicate a low degree of association between them. When choosing variables for the models, the researcher utilized these values as a reference for lowering poor correlation status. Several risk factor models were employed to investigate the likelihood of elder abuse in relation to socio-demographic variables.

Table 2 *Pearson correlation coefficient among the variables*

Variables	Pearson Correlation							
	AGE	FMS	LIT	INC	HSE	FCD	DEP	LWS
AGE	1							
FMS	-0.058	1						
LIT	-0.070	-.140	1					
INC	.181	-.224	-.312	1				
HSE	-0.124	-.076	.-.006	-.060	1			
FCD	-.004	.035	.132	-.045	.046	1		
DEP	-0.139	.169	-.104	.084	.107	0.32	1	
LWS	-0.337	-.337	-.070	-.115	.147	.046	-.022	1

3.2 The Risk Factors Model for elderly abuse

Table 2 shows the correlation status of the explanatory factors employed in the study, which was used by the researcher to determine whichever variables to use for each model based on their correlation status. The researcher used only explanatory variables with a low degree of correlation in the same model. Variables having a correlation coefficient of less than 0.3 are deemed to have a low degree of correlation, according to Ratner (2009). The researcher used these values as a baseline for lowering low correlation status while choosing variables for the models. To evaluate the likelihood of elder abuse in connection to socio-demographic parameters, many risk factors models were used.

Furthermore, the results show that all of the Model 1 coefficients have significant values at the 5% significance level. These coefficients represent the change in the log odds of being abused for each unit increment in the predictor variable. In Model 1, the strongest influential element of elderly abuse was elders with functional limitations, as shown in Table 3. According to the study, elders with functional limitations are 2.277 times more likely to be abused than those without disabilities. According to the coefficient of family size (FMS) variable, the chances ratio of being abused for per unit larger family is 0.90, implying that the risks of elderly abuse are 10 percent more than for elders living in per unit smaller family. Older adults with functional limitations, according to the study's risk factors model 1, are the most likely to be abused.

In this study, Model 2 was built using the variables of age, family size, and whether or not you live with or without a spouse. Model 2 has a 95 percent confidence interval p value of 0.062 for Hosmer and Lemeshow goodness of fit. It proves that model 2 is not capable of accurately matching the data. The Nagelkerke R square value for Model 2 was likewise found to be 0.246. As a consequence, Model 2 was able to explain 24.6% of the variation in elder abuse.

Furthermore, according to the data, in Model 2, the presence of elderly adults without spouses was the most influential factor in elder abuse, as shown in Table 3. According to the study, elders who lived alone were 6.221 times more likely to be abused than those who lived with partners. According to the coefficient of family size (FMS) variable, the odds of being abused per unit larger family is 0.920, meaning that senior abuse are 8 percent more likely than in smaller homes. The existence of older adults without spouses is a strong predictor of senior abuse, according to the study's risk factors model 2.

Table 3 *Fitting of the risk factors Model for elderly abuse*

Variable	Model 1			Model 2			Model 3		
	β	OR	Sig. Value	β	OR	Sig. value	β	OR	Sig. Value
Intercept	0.347	1.425	0.520	-2.306	0.100	0.154	-4.504	0.011	0.002
AGE	…….	…….	…….	0.032	1.033	0.153	0.058	1.060	0.005
FMS	-0.105	0.900	0.020	-0.084	.920	0.056	…….	…….	…….
LWS	…….	…….	…….	1.828	6.221	0.000	…….	…….	…….
HSE	…….	…….	…….	…….	…….	…….	0.592	1.807	0.048
LIT	…….	…….	…….	…….	…….	…….	…….	…….	…….
INC	0.000	1.000	0.879	…….	…….	…….	0.000	1.000	0.682
FDS	0.823	2.277	0.068	…….	…….	…….	…….	…….	…….
DEP	-0.884	0.413	0.003						
NagelkerkeR^2		0.106			0.246			0.094	
Goodness-of-fit (sig.)		0.000			0.062			0.040	
N		204			204			204	

Contd. Table 3

Variable	Model 4			Model 5		
	β	OR	Sig. value	β	OR	Sig. value
Intercept	-3.661	0.026	0.014	-4.616	0.010	0.003
AGE	0.061	1.063	0.003	0.062	1.064	0.002
FMS	-0.088	0.916	0.055	…….	…….	…….
LWS	…….	…….	…….	…….	…….	…….
LIT	-0.223	0.800	0.491	…….	…….	…….
INC	0.000	1.000	0.833	…….	…….	…….
FDS	…….	…….	…….	0.784	2.191	0.080
DEP	…….	…….	…….			
NagelkerkeR^2		0.096			0.112	
Goodness-of-fit (sig.)		0.072			0.000	
N		204			204	

Significance at 95% CL

In this study, Model 3 was built using the variables of age, income, and health status. For model 3, the Hosmer and Lemeshow goodness of fit test returned a p value of 0.040 with a 95 percent confidence interval. It means that Model 3 is fitting the data well. Similarly, Model 3 had a Nagelkerke R square value of 0.094, suggesting that it explained 9.4 percent of the variation in elderly abuse.

Furthermore, all of the Model 3 coefficients exhibit significant values at the 5% significance level, according to the data. The change in the log probabilities of being abused at a unit increase in the predictor variable is indicated by these coefficients. In Model 3, the poor health status of elder was the most influential factor in elderly abuse, as shown in Table 3. Elders with poor health were 1.807 times more likely to be assaulted than elders with fair health, according to the study.

Model 4 was created utilizing the variables of age, family size, income, and literacy status in this study. Model 4 had a p value of 0.072 at the 95 percent confidence range for Hosmer and Lemeshow goodness of fit, indicating that it is not adequately fitting the data. Similarly, the Nagelkerke R square value of model 4 was found to be 0.096, indicating that the Model 4 explained 9.6 percent of the variability in elderly abuse. Furthermore, in Model 4, the elderly of older age was the most influential factor in elder abuse, as seen in Table 3. According to the study, per unit older aged elder were 1.063 times more likely to be abused than those younger.

Model 5 was created utilizing the variables of age and functional disability status in this study. Model 5 had a p value of 0.000 at the 95 percent confidence range for Hosmer and Lemeshow goodness of fit, showing that it is adequately fitting the data. Similarly, the Nagelkerke R square value of model 5 was found to be 0.112, indicating that the Model 5 explained 11.2 percent of the variability in elderly abuse. In Model 5, elders with disability were the most influential factor in elderly abuse, as shown in Table 3. Elders with disability were 2.191 times more likely to be abused than elders without disability, according to the study.

Model 5 was created utilizing the variables of age and functional disability status in this study. Model 5 had a p value of 0.000 at the 95 percent confidence range for Hosmer and Lemeshow goodness of fit, showing that it is adequately fitting the data. Similarly, the Nagelkerke R square value of model 5 was found to be 0.112, indicating that the Model 5 explained 11.2 percent of the variability in elderly abuse. In Model 5, elders with disability were the most influential factor in elderly abuse, as shown in Table 3. Elders with disability were 2.191 times more likely to be abused than elders without disability, according to the study.

Model 2 among the five risk factors models utilized in the study shows more variation in elderly abuse than the others.

3.3 Discussions

The goal of this study was to determine the prevalence of elderly abuse in the home and to look into the risk factors that contribute to elderly abuse. The major socio-demographic risk variables of elderly abuse were measured using risk factors models based on Binary Logistic Regression analysis in this study. The models we developed suggest that socio-demographic parameters have an impact on the likelihood of elder abuse. The living with or without a spouse had the highest risk of being abused. This finding is in line with the findings of other studies: Elders living alone are a risk factor for abuse, according to WHO (2014), and the likelihood of elderly abuse increases with age, according to Awal et al. (2020).

Because majority of the models had a 0.05 p value, the study's findings confirm the hypothesis that socio-demographic parameters (age, family size, living with or without spouse, dependency status, and health status) can predict elderly abuse at a 5% level of significance. Furthermore, the respondents stated that dependency, poor health, having fewer family members, living without a spouse, and the aging of seniors are the most common reasons for being abused in a family setting.

4. Conclusions

Using a cross-sectional survey approach, this study examines elder abuse, particularly among those living in families, in Nepal's Madesh province's Nijgadh, Municipality. This study discovered a significant link between elderly abuse and socio-demographic characteristics of elders, based on ecological model theory. The researchers discovered that much of the socio-demographic characteristics studied have a significant impact on the likelihood of elderly abuse. This research has produced data on the odds ratio of elderly abuse based on many socio-demographic factors, which can be utilized to identify and protect elders who are at high risk of abuse through multi-sectoral social justice action.

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