



COLLEGE OF NATURAL AND COMPUTATIONAL SCIENCE

DEPARTMENT OF STATISTICS

ASSESSMENT OF DRUG ADDICTION AND ITS ASSOCIATED FACTOR AMONG
YOUTHS IN WOLKITE TOWN: IN CASE OF GUBRE SUB CITY

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This is to certify that the paper prepared by Digafe Abera and Desta Gizaw entitled: assessment of drug addiction and its associated factor among youths in wolkite town: in case of gubre sub city and submitted in partial fulfilment of the requirements for the Degree of bachelor of Science complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

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Table Of Contents	Page Number
Acknowledgement	i
Abstract	v
List of abbreviation	vi
List of Table.....	vii
CHAPTER ONE	1
1. Introduction.....	1
1.1 Back ground of the study	1
1.2 Statement of the Problem	2
1.3 Objectives	2
1.3.1 General Objective	2
1.3.2 Specific Objectives	2
1.4. Significance ofthe Study.....	3
1.5 Scope ofthe Study.....	3
1.6 Limitation of the study.....	3
CHAPTER TWO	4
2. Literature Review.....	4
CHAPTER THREE	6
3. Methodology	7
3.1 Description of the study area	7
3.2 Target population.....	7
3.3 Sampling Techniques.....	7
3.3.1 Sample Size Determination	7
3.3.2 Method of Data Collection.....	9
3.4 Study Variables.....	9
3.4.1 Dependent variable.....	9
3.4.2 Independent variables	9
3.5 Methods of Data Analysis.....	10
3.5.1 Descriptive Statistics	10
3.5.2 Inferential Statistics	10

3.5.3 Chi-square test of independency	10
3.6 The Logistic Regression.....	11
3.6.1 Assumptions of the Logistic Regression Model	11
3.6.2 The Logistic Regression Model Description	12
3.7 The Likelihood Ratio Test.....	15
3.8 The Wald Test Statistic	16
3.8 Model Adequacy.....	17
3.9 Influence Diagnostics.....	18
CHAPTER FOUR.....	19
4. Result and discussion.....	19
CHAPTER FIVE	Error! Bookmark not defined.
5. Conclusion and recomendation.....	28
5.1Conclusions	28
5.2 Recomendatio	28
Reference	28
Appendix I	Error! Bookmark not defined.
Appendix II; Variables in equation.....	Error! Bookmark not defined.

ABSTRACT

The aim of this research was to identify assessment of drug addiction in the case of gubre sub city. We used primary data for this study which was collected by distributing questionnaire for 79 peoples (2011E.C).The sampling method used under this study was simple random sampling (SRS).The method of data analysis used under this study was descriptive and inferential statistics. From the result of descriptive statistics frequency table. we conclude that the assessment drug addiction of the respondent shows us (57%) are addicted and (43%) are not addicted, as well as from the result of inferential statistics, chi-square test of independence and binary logistic regression we conclude that age, education level, occupation, and religion had (0.037,0.006,0.004 and 0.025) significance value respectively are mainly assessment of drug addiction. We recommend to youth to limit using drug, giving more attention for illiterate people regarding to creating awareness about effect of addiction.

LIST OF ABBREVIATIONS

- Simple random sampling (SRS)
- Likelihood ratio test (LRT)
- Log likelihood (LL)
- Maximum likelihood estimation (MLE).

List of Table	Page Number
Table 4.1: Association between assessment of drug addiction and its explanatory variables.....	19
Table 4.2: Distribution of addicted and not addicted.....	20
Table 4.3: * Reason of using stimulant.....	20
Table 4.4: * Feeling of respondent after drug addiction.....	21
Table 4.5; * who is responsible addiction to stop drug.....	21
Table 4.6: Hosmer and lemeshow test of logistic regression.....	22
Table 4.7: Model summary.....	22
Table 4.8: Omnibus test of model coefficients.....	23
Table 4.9: Classification table.....	23
Table 4.10 Maximum likelihood estimation of binary logistic regression...	26

CHAPTER ONE

1. Introduction

1.1 Back ground of the study

Drug addiction is a condition which characterized by an overwhelming desire to continue taking a drug through which one has become habituated for repeated consumption. (NACADA, 2012) Drugs and substance abuse is a problem that has raised concern all over the world. At present, drug addiction is one of the serious problems which affect not only the addicted people but also the society as a whole. (NACADA, 2012, Word Drug Report, 2014). Across the globe, alcohol and drug abuse is a major challenge to young people. Indeed, use of alcohol and drugs continues to emerge as a strategy for most young people. (Lynskey MT, 2008). Alcohol addiction becomes one of the most wide spread and serious public health problems in the world both developing and developed countries. (Statistics on drugs misuse, 2013).

Historically addiction has been defined as physical and psychological dependence on psychoactive substances that cross the blood brain barrier once ingested temporarily altering the chemical milieu of the brain. It was a chronic, but treatable brain disorder. People who are addicted cannot control their need for alcohol or other drugs, even in the face of negative health, social or legal consequences. This lack of control is the result of alcohol or other drugs induced changes in the brain. Those changes enter cause behavior changes. Addiction was caused by different stimulants. These are psychoactive drugs which induce temporarily improvements in either mental or physical function or both (i.e. increase activity in the brain temporarily, elevate alertness mood and awareness). Also, speed up the signals passing throughout the central nerve system, heart rate, breathing rate, neurological disorder and brain function.

In Ethiopia, reports of young people's lives disturbed by alcohol and drugs are rampant, (Dada Z, 2005). Alcohol, cigarette and chat are the most and common types of stimulants. The young including students are especially, vulnerable by peer pressure, media influence, poor guidance and role modeling, (Federal Democratic Republic of Ethiopia, 2011).

1.2 Statement of the Problem

The problem of drug addiction now becomes a major problem in Ethiopia. This addiction tradition is often associated with the overgrowth of night clubs, bars and multiple sexual partnerships in Ethiopia. (Seme A, et al 2005).The problem of drug addiction is remaining the same in study area. The substance abuser includes alcohol, chat, cigarette and other. As seen in many developing countries, substance misuse is becoming a growing problem in Ethiopia. Moreover, students, staff at institutions of higher education and youths in the community are considerably at high risk of substance use. A study done on cigarette smoking and chat chewing among Youth.

Generally, this study would intend to study depth about types of stimulants mostly Youth use, the consequences of addiction on youth's, the reason why youth have become addictive, and how addiction affects the youth's. This research aims was to address and indicate possible ways for future awareness about addiction and its impacts in general.

1.3 Objectives of the study

1.3.1 General Objective

◆The main objective of this study was to assess drug addiction and its associated factor among youths in Gubre sub city.

1.3.2 Specific Objectives

- ✓ To assess the prevalence of drug addiction of youth in study area
- ✓ To identify risk factors of addiction on youth
- ✓ To assess and identify the types of addiction that affect youth

1.4. Significance of the Study

The study would be used to assess the determinant of addiction focuses on the addicted youth relative to non addicted youth in study area.

- It also shows the ways assure the quality of addicted with non addicted based on by specifying the reason why addicted youth share large population.
- This study would be used to increase a good attitude and decrement of the addiction will recognize growing importance of development of the country.
- The study would be used also to asses addicted youth good protection and watching out of unprotected sexual diseases and others by providing good information about this factors and impact of them.

1.5 Scope of the study

This study would be only focused on youth stimulants mostly youth use the consequences of addiction, the reason why youth become additives, how addiction affect youth and how youth can aware stimulants that affect their results. this study would conducted on only the assessment of addiction on youth in the gubre sub city this study would only focused on types of stimulants youth use

1.6 Limitation of the study

In any research there are different types of constraint that depends on the availability of the resources and the area where the research was taken place. In this investigation, we encounter some limitation which is listed below:

- Some respondents may not write the correct information to all questions.
- Miss understanding of some questions by some respondents.
- In some institution the management of the organization does not assist to give way to get data
- It does not know the actual number of use stimulants.

CHAPTER TWO

Literature Review

Drug addiction: is a condition which characterized by an overwhelming desire to continue taking drug through which one has become habituated for repeated consumption(KhatunT,Md.Anwar S,2013).

Peer pressure: It is influcing an individual voluntarily or involuntarily.

Drug abuse: It is the chronic use of a drug for a reason other than for which it was intended.

Drug addiction in a family results from three factors: (1) effect of pathological families on young people's behavior, (2) easy access to drugs, and (3) influence of groups of people of the same age. In the present study, it was investigated to what extent individual factors related to family and environment affect the extent of drug addiction among recruits.

In a wide- Some authors estimate that 10 million people chew khat daily, worldwide (Stefan & Mathew, 2005; Penning's et al, 2008). Studies of khat consumption in the United Kingdom suggest that the context of consumption (i.e. displacement and social marginalization) may have significant effects in shaping the outcomes from khat consumption (Badhadhe, 2000). UK Advisory Council on the Misuse of Drugs, 2005; Patel, 2008; Penning's et al., 2008).

In 2001, (Warsaw, Poland) Accessibility to various kinds of drugs is practically unrestricted; dealers reach younger and younger people very often using pressure, encouragement, or even "promotion" of goods.

Thompson SJ. (2004) reported that drug use is a common approach to numbing the daily experiences of life on the street and alleviating the stress of street life and the negative emotional effects of traumatic experiences.

Some drugs are used to help these young people stay awake for extended periods, especially at night when the chances of victimization increase (Fest J, 2003).

Drugs also provide a means of escape from the physical and emotional pain associated with surviving on the street (Zlotnick C, Tam Robertson MJ, 2003).

A recent literature review commissioned by the Home Office (Frisher et al., 2006) has identified associations between a diverse group of risk factors for drug use. These factors include parental discipline, family cohesion, parental monitoring, peer drug use, drug availability, genetic profile, self-esteem, hedonistic attitudes, reasons for drug use and the ratio of risk to protective factors. There is less consistent evidence linking drug use to mental health, parental substance use, Attention Deficit Hyperactivity Disorder/stimulant therapy, religious involvement, sport, health educator-led interventions, school performance, early onset of drug use and socio-economic status.

Alcohol addiction becomes one of the most wide spread and serious public health problems in the world both developing and developed countries (Statistics on drug misuse, 2013). The use of alcohol and other psycho-active substance has long been linked with risky sexual behavior. A recent study of young people in Scotland shows that above half of both female and male have consumed alcohols before their first experience of sexual intercourse and these who take alcohol were less likely to have used condom (Agrawal A, Lynskey MT, 2008).

Drug addiction affect people at all levels of development, they are also introduced at very early age, between 10-14 years (Eisenstein E, 2005).

some researchers argue that a person's overuse or abuse of the addiction is a behavioral manifestation of other things that may be problematic in their lives (Thatcher et al., 2008). Nevertheless, the term addiction was frequently used in scholarly journals, such as *Cyber Psychology & Behavior* and *Computers in Human Behavior*. In a recent attempt to Meta-analyze quantitative data on addiction, (Byun ET al.2009). Note that the matter of the definition of addiction is the first challenge to address and suggest developing "a complete definition of Internet addiction that is not only conclusive but decisive, covering all ages, gender, and educational levels".

In 2007, Bender K, et al reported demonstrating drug use behaviors are highly influenced by peer's use these findings indicated that associating with peers who were using drugs regularly increased the severity of drug use among homeless young adults. These young people often seek out similarly situated peers who provide opportunities and reinforcement for drug using attitudes and behavior (Johnson KD, 2005).

The rates of drug abuse are currently lower in women than in men. Nevertheless, the number of women using and abusing prescription and illegal drugs is on the rise. Adult men are 2 to 3 times more likely than women to have a drug abuse/dependence disorder, but this current gender difference may reflect differences in opportunity, rather than vulnerability to drug use (Van Etten ML, Anthony JC, 2001). If one looks at rate of escalation of drug use, however, women tend to increase their rate of consumption of alcohol, marijuana, opioids and cocaine more rapidly than do men (Mann K, Ackermann K, Croissant B, Mundle G, Nakovics H, Diehl A, 2005). Furthermore, once addicted to a drug, women can find it more difficult to quit than men do. This is true for nicotine, as well as many other drugs of abuse Carpenter (MJ, Upadhyaya HP, LaRowe SD, Saladin ME, Brady KT, 2006). Most of the research on sex differences in drug abuse, in both clinical and pre-clinical studies, has investigated the psychomotor stimulants, so opiates, nicotine, and alcohol are grouped together in this overview for convenience.

CHAPTER THREE

Methodology

3.1 Description of the study area

The study would be carried out in and around Gubre sub city, Wolkite, Gurage zone. Wolkite is a town and separate woreda in south-western Ethiopia. The administrative center of the Gurage zone of the southern Nations, Nationalities and Peoples region(SNNPR), this town has a latitude and longitude of 8.283oN 37.783°E and an elevation between 1910 and 1935 meters above sea level. Wolkite town is far apart from capital city of Ethiopia that means from Addis Ababa 158 km, and the study area Gubre sub-city is far apart 170 km from Addis Ababa and 12 km from Wolkite town.

3.2 Target population

The study population for this study would be Youth of Gubresubcity. The population of youths in gubresub city was 3000.

3.3 Sampling Techniques

Sampling techniques are a system of taking small ratio of information of this large population from the observation by using some statistical techniques for this study in order to get good representative sample the researcher use simple random sampling(SRS) because each person have equal chance to would be included in the sample.

3.3.1 Sample Size Determination

Determining the sample size is key on the overall statistical process. The researcher must find the correct balance between the reliability of the result and cost of obtaining those results. An appropriate sample size is one the means of gaining high precision, accuracy and confidence with minimum cost. To determine the sample size, the researcher used the following method.

In the planning of sample survey one of the first considerations in sample size determination. The minimum sample size is determined by using formula (Cochran, 1997).

$$n = \frac{n_o}{1 + \frac{n_o}{N}} \dots\dots\dots(3.1)$$

$$\text{And } n_o = \frac{\left(\frac{z_{\alpha}}{2}\right)^2}{d^2} pq \dots\dots\dots(3.2)$$

Where, n_o = desired sample size

n = required sample size

$p=0.7$ (The researcher obtain from previous study, Sebsibie G (2018))

By assuming where

$P=0.7$ p = proportion of drug addicted youth

$q=1-p=0.3$ q = proportion of not drug addicted youth

$d=0.1$ i.e 10% d = margin of error determined

$\frac{z_{\alpha}}{2}=1.96$ $\frac{z_{\alpha}}{2}$ = the point of normal distribution corresponding with $\alpha=0.05$ level of significance.

$$n_o = \frac{\left(\frac{z_{\alpha}}{2}\right)^2}{d^2} pq \dots$$

$$n_o = \frac{(1.96)^2}{0.1^2} (0.7) (0.3) = 80.67 \approx 81.$$

When calculate initial sample size to get adjusted sample size whether n_o/N is greater than

α -value.

When $\frac{n_o}{N}$ is > 0.05 it is need adjustment, but when it is $n_o/N < 5\%$ or $n_o/N = 5\%$, no need of adjustment.

$$\frac{n_o}{N} = \frac{81}{3000} = 0.025, \text{ which is less than } \alpha.$$

$$\text{Then } n = \frac{no}{1 + \frac{no}{N}}$$

$$n = \frac{81}{1 + \frac{81}{3000}} = 78.87 \approx 79, \text{ therefore the requirement sample size is 79.}$$

3.3.2 Method of Data Collection

The data collected in this research is obtained from primary sources through self-administered questionnaire based on drug addiction of youths. Self-administrative questionnaire is used as data collection instruments since this research proposal is conducted by primary data, self-administrative questionnaire is favorable. The questionnaire is distributed to addicted youths those who take as a sample.

3.4 Study Variables

The study has two variables; dependent variables and independent variables

3.4.1 Dependent variable

A variable that depend on another variable.i.e.drug addiction. The addiction type of the respondent which can be categorized as (1= if the youths are addicted, 0= if the youths are not addicted).

To measure the drug addiction towards youths, separate set of question (tool) prepared and would be asked and for each question scoring would be given i.e. 1 for yes and 0 for no.

3.4.2 Independent variables: is a variable that stand alone and not changed by other variables.

- Sex
- Age
- Level of education
- Income
- Occupation
- Religion

3.5 Methods of Data Analysis

3.5.1 Descriptive Statistics

Descriptive statistics studies the distribution of one variable: Its analysis refers to be transformation of raw data in to a form that would make them easy to understand and interpret the result. Descriptive statistics is a method in which the data collected are organized and summarized in the form of tables and charts.

3.5.2 Inferential Statistics

As its name indicate that, the inferential statistics infer about the population depending on the sample data, and analysis and test hypothesis.

3.5.3 Chi-square test of independency

Chi-square test is a method of analysis for data obtained from categorical variables. The data was the form of counts. The main objective of chi-square test of independence is to test whether there is relationship between two categorical variables or not.

$$\text{Model: } X^2 = \frac{\sum \sum (O_{ij} - E_{ij})^2}{E_{ij}^2}$$

Where:

O=observed count

E= expected count

Assumptions of chi-squares test

- The populations must be normally distributed for the variable under the study.
- The observations must be independent each other.
- The sample must be randomly selected from the population.
- Each data cell should contain at least five observation.

The chi-square test of independency approach consists of four steps:

1. State the hypothesis
2. Formulate an analysis
3. Analyze sample data
4. Interpret results

3.6 The Logistic Regression

Binomial (or binary) logistic regression is a form of regression, which is used when the dependent variable is dichotomous, such as presence/absence, success/failure, etc. and the independent variables are of any type. Logistic regression can be used to predict dependent variable on the basis of continuous and/or categorical independent variables and to determine the percent of variance in the dependent variable explained by the independent variables; to rank the relative importance of the independent variables; to assess interaction effects; and to understand the impact of the covariate control variables.

3.6.1 Assumptions of the Logistic Regression Model

There are assumptions one should consider for the efficient use of logistic regression. These are:

1. The logistic regression coefficients must be coded meaningfully by giving the codes 0 for the dependent class of lower interest and 1 for the dependent class of greatest interest.
2. The dependent variable must be categorical.
3. The independent variables need not to have equal variance within each group.
4. Linearity in the logit regression equation should have a linear relationship with the logit form of the dependent variable.
5. All relevant variables must be included and all irrelevant variables must be excluded.
6. Absence of multicollinearity. As with multiple regressions, multi co linearity is a potential source of confusing or misleading results and needs to be assessed. Multi collinearity occurs when there are high inter correlations among some set of predictor variables.
7. The sample size must be large in order to make the Logistic regression accurate.

8. Error terms are assumed to be independent (independent sampling).
9. No outliers.

3.6.2 The Logistic Regression Model Description

The basic aim of modeling is to derive a mathematical representation of the relationship between an observed response variable and a number of explanatory variables, together with a measure of the inherent uncertainty of any such relationship. Statistical models constructed for response variables are the best approximation to the manner in which an observable variable depends on other variables. No statistical model can be claimed to represent truth and, by the same token, no one model can be termed the correct model. Some models will be more appropriate than others, but typically, for any set of data, there will be a number of models, which are equally well suited to the purpose in hand, and the basis for choosing a single model from amongst them will not rest on statistical grounds alone. Statistical models are essentially descriptive and, in as much as they are based on experimental or observational data, may be described as empirical data (Collett, 1991).

The dependent variable in logistic regression is usually dichotomous, that is, the dependent variable can take the value 1 with a probability of success P_i , or the value 0 with a probability of failure $1 - P_i$. This type of variable is called a Bernoulli (or binary) variable.

The independent or predictor variables in logistic regression could be discrete, continuous or a mix of both. Logistic regression makes no assumption about the distribution of the independent variables. They do not have to be normally distributed, linearly related or have equal variance within each group. The model for logistic regression analysis assumes that the outcome variable Y is categorical. When we assume that Y is dichotomous, taking on values of 1 (that is, positive outcome, or success) and 0 (that is, negative outcome, or failure). Then the conditional probability that the respondent have about drug addiction given the X set of predictor variables is denoted by $\text{Prob}(Y_i = 1 \mid X) = P_i$

The model given in (3.2) is logistic regression model. The relationship between the predictor and response variables is not a linear function in logistic regression; instead, the logarithmic

transformation of equation yields the linear relationship between the predictor and response variables. The logit transformation of P_i given as follows: . The expression P_i has the form:

$$P_i = \frac{e^{(\beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + \dots + \beta_r x_{ri})}}{1 + e^{(\beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + \dots + \beta_r x_{ri})}} = \frac{e^{X' \beta}}{1 + e^{X' \beta}} \dots \dots \dots (3.2)$$

P_i = the probability that respondent i have about drug addiction.

Y_i = the observed outcome of respondent i

β is a vector of unknown coefficients.

$$\text{logit}[P_i] = \log\left(\frac{P_i}{1-P_i}\right) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_r x_r \dots \dots \dots (3.3)$$

Fitting the Logistic Regression Model (Parameter Estimation)

The general method of estimation that leads to the least squares function under the linear regression model (when the error terms are normally distributed) is called maximum likelihood. It is this method that provides the foundation for our approach to estimation with the logistic regression model. In a very general sense the method of maximum likelihood yields values for the unknown parameters which maximize the probability of obtaining the observed set of data. In order to apply this must first construct a function called likelihood function. The maximum likelihood estimators of these parameters are chosen to be those values which maximize this function. Thus, the resulting estimators are those which agree most closely with the observed data.

The maximum likelihood and non-iterative weighted least squares are the two most computing estimation methods used in fitting logistic regression model (Hosmer – Lemeshow, 1989; Greene, 1991; collet, 1991). When the assumption of normality of the predictors does not hold, the non- iterative weighted least squares method is less efficient (Maddala, 1997). In contrast, the maximum likelihood estimation method is appropriate for estimating the logistic model parameters due to this less restrictive nature of the underlying assumptions (Hosmer – Lemeshow, 1989). Hence, in this study the maximum likelihood estimation technique

was applied to estimate parameters of the model. Consider the logistic model $P_i = \frac{e^{X_i' \beta}}{1 + e^{X_i' \beta}}$, since observed values of Y say, y_i 's ($i=1, 2, 3, \dots, n$) are independently distributed as binomial with parameter P_i , the maximum likelihood function of Y is given by:

$$L(\beta | Y) = \prod_{i=1}^n P(y_i | X_{i1}, X_{i2}, \dots, X_{im}) = \prod_{i=1}^n \left[\frac{e^{X_i' \beta}}{1 + e^{X_i' \beta}} \right]^{y_i} \left[\frac{1}{1 + e^{X_i' \beta}} \right]^{(1-y_i)} \dots\dots\dots (3.4)$$

where, $\beta' = (\beta_1, \beta_2, \dots, \beta_r)$. The objective of stating likelihood function is to get an estimator $\hat{\beta} = (\hat{\beta}_0, \hat{\beta}_1, \dots, \hat{\beta}_r)$ of β which maximizes the likelihood function expressed in equation (3.4).

Since the likelihood equations are non-linear in the parameters, the Newton-Raphson iterative maximum likelihood estimation method that expresses $\hat{\beta}$ at the $(u+1)^{th}$ cycle of the iteration is expressed as $\hat{\beta}_{u+1} = (X' \hat{V}_u X)^{-1} X' R_u$, Where $u=0, 1, 2, 3, \dots$ and is a diagonal matrix with its diagonal elements $X_i=1$, $\hat{V} = \text{diag} \left[p_i(1-p_i) \right] = \text{cov}(y)$. Finally, $\hat{\beta}$ is the resultant maximum likelihood estimator of β with residual $R = y - \hat{p}$ (collet, 1991; Greene, 1991). Newton's method usually converges to the maximum of the log – likelihood in just a few iteration unless the data are especially badly conditioned (Greene, 1991). All the parameters $\hat{\beta}_0, \hat{\beta}_1, \dots, \hat{\beta}_r$ and estimates of Prob ($y_i=1/X$) for each subject was computed using the SPSS soft ware's.

Assessments of the fit of the model

Here we want to know how effective the model that is developed in the above steps is in describing the outcome of the variable. Several steps are needed in assessing the suitability, adequacy and usefulness of the model. Measures of goodness of fit are statistical tools used to explore the extent to which the fitted response obtained from the postulated model compares with the observed data. Clearly, the fit is good if there is a good agreement between the fitted and the observed data. In practice, any model may not exactly represent the true relationship between

$\theta(x)$ and x . Thus, as the sample size increases, the model-based estimator may not converge exactly to the true value of the probability. As explained above logistic regression model was used to describe and make inferences about the effects of predictors on the response. There is no guarantee, however, that a particular model of this form is appropriate or that it provides a good fit to the data. Hence, we need to assess the goodness of fit of the model (Agresti, 1996). The Pearson's Chi-square, the likelihood ratio test (LRT), Deviance, (Hosmer and Lemeshow, 2000) test and the Wald test are the most commonly used measures of goodness of fit for categorical data. The following section will give a brief discussion on how each of these criterions can be used as a measure of goodness of fit of a logistic model.

3.7 The Likelihood Ratio Test

The likelihood ratio is a function of log likelihood and is used in significance testing. A "likelihood" is a probability, specifically the probability that the observed values of the dependent may be predicted from the observed values of the independents. Like any probability, the likelihood varies from 0 to 1. The log likelihood (LL) is its log and varies from 0 to minus infinity (it is negative because the log of any number less than 1 is negative). LL is calculated through iteration, using maximum likelihood estimation (MLE).

Likelihood ratio test is a statistical test that is used to compare the fit of two models - one of which is a model which contains only an intercept term with all coefficients corresponding to the explanatory variables are set to zero (null model) and the other model containing all the parameters under consideration (full model). The test is based on the likelihood ratio, that is, the ratio of the maximum likelihood (ML) function under the null model (restricted ML) to the ML under the full model (unrestricted ML). The test statistic for testing the goodness of fit of a model is twice the difference in these log – likelihoods (-2LL).

Hosmer and Lemshow (H-L) Test

The H-L statistic is another measure of lack of fit. Hosmer and Lemeshow recommend partitioning the observation in to 10 equal sized groups according to their predicted

Probabilities. Then,

$G_{HL}^2 = \sum_{j=1}^{10} \left[\frac{(O_j - E_j)^2}{E_j \left(1 - \frac{E_j}{n_j}\right)} \right] \sim \chi_{\alpha}^2$, where n_j = Number of observations in the j^{th} group, O_j = Observed number of cases in the j^{th} group, E_j = Expected number of cases in the j^{th} group.

If H- L goodness of fit test is greater than 0.05, we can't reject the null hypothesis that there is no difference between observed and model predicted values, implying that the model estimates fit the data and acceptable level. That is well fitting the models shown non-significance of on H- L goodness of fit test.

R^2 -Statistic

A number of measures have been proposed in logistic regression as an analog to R^2 in multiple linear regressions. The Cox and Snell measure is based log-likelihoods and considers sample size. The maximum value that the Cox & Snell R^2 attains is less than 1. The Nagelkerke R^2 is an adjusted version of the Cox & Snell R^2 and covers the full range from 0 to 1, and therefore it is often preferred. Therefore, in this study R^2 statistics to indicate how useful the explanatory variables in predicting the response variable were used (Bewick et al., 2005).

$$R_{CS}^2 = \exp \left[-\frac{2}{n} [D(\text{model without variable})] - D(\text{model with the variable}) \right]$$

The Nagelkerke measure is as follows:

$$R_N^2 = \frac{R_{CS}^2}{R_{MAX}^2}, \text{ where } R_{MAX}^2 = 1 - \exp[2n^{-1}D(\text{model with the variable})]$$

The logistic regression in SPSS uses R^2 like measures as Nagelkerke and Cox and Snell was implemented.

3.8 The Wald Test Statistic

The Wald test is a way of testing the significance of particular explanatory variables in a statistical model. In logistic regression we have a binary outcome variable and one or more explanatory variables. For each explanatory variable in the model there would be an associated

parameter. The Wald test, described by Polit (1996) and Agresti (1996), is one of a number of ways of testing whether the parameters associated with a group of explanatory variables are zero. If for a particular explanatory variable, or group of explanatory variables, the Wald test is significant, then we would conclude that the parameters associated with these variables are not zero, so that the variables should be included in the model. If the Wald test is not significant then these explanatory variables can be omitted from the model.

The hypothesis to be tested is: $H_0: \beta_j = 0$ versus $H_A: \beta_j \neq 0$ at α level of significance. The Wald test statistics, for this hypothesis is $\hat{\beta}_j$ is the square of the estimated regression coefficient. Wald χ^2 statistics was used to test the significance of individual coefficients in the model and are calculated as follows:

$$Z = \frac{\hat{\beta}_j}{SE(\hat{\beta})}$$

Each Wald statistic was compared with a χ^2 distribution with 1 degree of freedom. Wald statistics are easy to calculate but their reliability is questionable, particularly for small samples. For data that produce large estimates of the coefficient, the standard error is often inflated, resulting in a lower Wald statistic, and therefore the explanatory variable may be incorrectly assumed to be unimportant in the model (Bewick et al., 2005).

3.8 Model Adequacy

Once a model is fitted to the observed values of a binary response variable, a thorough examination of the extent to which the fitted model provides an appropriate description of the observed data is a vital aspect of modeling process. The fitted logistic regression model may be inadequate due to a particular observation, termed outliers, or observations, termed influential values that have an undue impact on the conclusions to be drawn from the analysis and presence of complete or near complete linear dependencies among the predictor variables. Some of the statistical techniques which reemployed to examine the adequacy of a fitted model include: detection and treatment of outliers and influence diagnostics.

3.9 Influence Diagnostics

An observation is said to be influential if its omission from the data set results in substantial changes to certain aspects of the fit of the linear logistic regression model. In most cases, it is more important to pay attention on outliers that are influential than those that are not. Although outliers may also be influential observations, an influential observation need not necessarily be an outlier. In particular, an influential observation that is not an outlier will occur when the observation distorts the form of the fitted model to such an extent that the observation itself has a small residual.

Some of the statistical methods used in influence diagnostics are: Leverage statistic; ($\hat{h}_{ii}$, which is called the diagonal elements of the matrix $H = X (X'X)^{-1}X'$ with diagonal elements of $\hat{p}_i(1 - \hat{p}_i)$, called the “hat” matrix); DFBETA (the change in the logistic regression parameter estimates when the observation is deleted); Cook’s distance $C_i = \frac{r_i \hat{h}_{ii}}{p(1 - \hat{h}_{ii})}$ where r_i is the Pearson residual $\hat{h}_{ii}$ the leverage of case i and p the number of parameters in the model); and the change in the Pearson statistic or goodness-of-fit statistics (-2log-likelihood)).

The study used Cook’s distance to assess the overall impact of an observation on the estimated parameter vector $\hat{\beta}$. Hence, points for which Cook’s distance greater than one was considered as influential.

CHAPTERFOUR

4. RESULT AND DISCUSSION

The collected data on: Assessment of Drug Addiction and Its Associated Factor among Youths in Wolkite Town: IN Case Of Gubre Sub city Analyzed As Follows

4.1; Table of association between assessment of drug addiction and it explanatory variables.

Variable	Levels	Addicted type		Total (%)	Chi-square		
		Addicted (%)	Not addicted (%)		Value	Df	p-value
Sex	Female	3(3.8)	8(10.1)	11(13.9)	4.5595	1	0.032*
	Male	42(53.2)	26(32.9)	68(86.1)			
Religion	Orthodox	15(19)	15(19)	30(38.0)	12.381	3	0.006*
	Muslim	25(31.6)	10(12.7)	35(44.3)			
	Protestant	1(1.3)	8(10.1)	9(11.4)			
	Others	4(5.1)	1(1.3)	5(6.4)			
Age	15-19	2(2.5)	4(5.1)	6(7.6)	8.626	1	0.196*
	20-24	43(54.5)	30(37.9)	73()			
Level of education	Primary	7(8.9)	7(8.9)	14(17.7)	3.097	2	0.213*
	Secondary	16(20.3)	6(7.6)	22(27.8)			
	Secondary & above	22(27.8)	21(26.6)	43(54.4)			
Occupation of respondent	Student	20(25.3)	22(27.8)	42(53.2)	4.433	3	0.218*
	Driver	10(12.7)	3(3.8)	13(16.5)			
	Business man	9(11.4)	4(5.1)	13(16.5)			
	Teacher	6(7.6)	5(6.3)	11(13.9)			
Financial support	Family	19(24.1)	19(24.1)	38(48.1)	4.897	2	0.086*
	Relative	0(0)	2(2.5)	2(2.5)			
	Lonely	26(32.9)	13(16.5)	39(49.4)			
Total		45(57.00)	34(43.00)	79(100.00)			

*; this sign indicates if the variables are significant.

As we can see from the above result, the level of significance, which is 0.05, is greater than the p-value 0.032, 0.006, 0.00; therefore, we reject the null hypothesis. Since, the H_0 is reject we have evidence to conclude that the sex of respondents, religion of respondent and their status of addiction are dependent at level of significance and there is linear association between them.

And the variable that is greater than 0.05 and less than 0.25 that is (0.196, 0.213, 0.218, 0.086) important for our study (status of addiction). then the variables are significant in our study and have linear association b/n age of respondent, level of education of respondent, occupation of respondent and financial support of respondent with their status of addiction.

Table 4.2: The distribution of addicted and not addicted

Valid	Addicted type	Frequency	Percent	Valid Percent	Cumulative Percent
	not addicted	34	43.0	43.0	43.0
	Addicted	45	57.0	57.0	100.0
	Total	79	100.0	100.0	

From the result above in table 4.2, it can be concluded from the descriptive statistics that 57.0% of respondents are addictive's, while the rest 43.0% is non-addictive's. This implies that the number of respondents who addicted (use different kinds of stimulants) is much greater than of non-addicted.

Table 4.3: Reason of using stimulant?

Reason of using stimulant?						Total
Status of addiction	Angry	Recreation	Peer pressure	Recreation & angry	Others	
Addicted	2	21	14	6	2	45
Percent	4.4%	46.67%	31.1%	13.3%	4.4%	100.00

From above table 4.3; recreation is the most problem to young's are to be addicted and the second problem young's initiate to use drug is peer pressure.

Table 4.4: Feeling of respondent after drug addiction

Status of addiction of respondent	Feeling of respondent after drug addiction			Total
	Pleasure	Sadness	Confused feeling	
Addicted	24	9	12	45
Percent	53.3%	20%	26.67%	100.00

From above table after using of addiction most respondents feeling are pleasure and the second feeling of the respondents are confused feeling, and the last feeling are sadness feeling.

Table 4.5; who is responsible to stop drug addiction

Who is responsible to stop drug addiction						Total
	Family	Governmental & society	Users	Family & government	Family, government & society	
Addicted	4	4	24	5	8	45
Percent	8.89%	8.89%	53.3%	11.1%	17.78%	100.00

From the above table 4.4; the users are more responsibility of stop drug. The next responsible people for young's stopping drug are family, government and society.

4.6 Model adequacy checking

After a logistic regression model has been fitted, a global test of goodness of fit of the resulting model should be performed. It is necessary to see the appropriateness, adequacy and usefulness of the fitted model. The most commonly used technique are the likelihood ratio test and the Hosmer-Lemeshow test

Table 4.6.1; Hosmer and Lemeshow Test

The Hosmer-Lemeshow test is performed by dividing the predicted probabilities into deciles groups based on percentile ranks and then computing a Pearson chi-square that compares the predicted to the observed frequencies.

Chi-square	Df	Sig.
.000	7	1.000

Ho=the model is good fit

H1=the model is not a good fit

Since the p-value (1.00) is greater than $\alpha=0.05$ the statistical level of significance and it implies that fail to reject the null hypothesis (Ho). So we conclude that the model is a good fitted model.

4.6.2; LikelihoodTable ratio test

Model Summary

-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
80.603a	.293	.393

Classification Table the Cox and Snell R² or Nagelkerke's R² is analogous statistic in logistic regression to the coefficient of determination R² in linear regression. In this study Cox and Snell R² indicate that, about 39.3 % of variable in the dependent status of addiction is explained by the independent variable. Also nagelkerke R² indicate that 100%.

Table of 4.7; Omnibus Tests of Model Coefficients Omnibus Tests of Model Coefficients

	Chi-square	Df	Sig
Step	27.378	11	.004
Block	27.378	11	.004
Model	27.378	11	.004

Table 4.7 gives results of "Omnibus Test." "Omnibus" means "overall," and so this output tells whether the model with all explanatory variables predicts the response better than the intercept only model. The results show that the model with explanatory variables does better at predicting the response variable, and is statistically significant at $p = 0.004 < .05$. The Omnibus Test gives a Chi-Square of 27.378 with 11df, significant beyond .05. This is a test of the null hypothesis that adding explanatory variables to the model has significantly increased our ability to predict the decisions made by our subjects. Since the omnibus test is significant we can conclude that adding the explanatory variables to the model has significantly increased our ability to predict the status of addiction.

Table 4.8; Classification Table

Observed		Predicted		
		Status of addiction of respondents		Percentage correct
		Not addicted	Addicted	
Status of addiction of respondent	Not addicted	17	17	50.00
	addicted	3	42	93.3
Over all percentage				74.7

Table 4.8 contains the estimated coefficients (under the column heading β) and estimated values of the logistic regression model that predict use status of addiction. The standard error of the estimates (under the column heading S.E) will help in computing the Wald Statistics. The Wald

statistic, which is the square of the ratio of the coefficient to its Standard error, has a chi-square distribution with one degree of freedom.

The significance of the Wald statistic (under the column labeled Sig) tells the importance of the predictor variable in the model. The column $\exp(\beta_i)$, is the factor by which the odds of status addiction. Then the i th independent variable increases by one unit. If β_i is positive, $\exp(\beta_i)$ will be greater than one, which means the odds of status of addiction increases. If β_i is negative, $\exp(\beta_i)$ will be less than one which means status of addiction decreases.

4.10: Interpretation for coefficients of significant variables

4.9. 1 Wald test

Since Wald test is used to test the statistical significance of individual coefficient (β) in the model and the test statistic is a chi-square statistic.

The hypothesis to be tested is:

H_0 :

To conclude that the given coefficient is significant to model based on the following:-

- i. The chi-square (Wald) statistics must be greater than tabulated statistic ()
- ii. P- Values of coefficients are less than the level of significance, $\alpha=0.05$.

From the parameter estimation above; the p-values for the β_i is less than $\alpha=0.05$ level of significance. . Thus based on this result we see that the coefficient of β_i namely education level of respondent, religion, occupational status, sex and financial support are significant to the model

The fitted model can be written as:-

$\text{Logit}(\pi) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_p X_p$ Where: $X_1, X_2, \dots, X_p$ are the independent variable

$\beta_1, \beta_2, \dots, \beta_p$ are coefficient of independent variable and β_0 is constant (intercept).

$\text{Logit}(\pi) = -10.782\beta_0 + 0.474 \beta_1 X_1 - 4.44\beta_2 X_2(3) - 3.787\beta_3 X_3(1) - 3.208\beta_4 X_4(2)$ Variables in the Equation.

The Odds Ratio: The Odds Ratio Binary logistic regression analysis revealed controlling other variables in the model, as status of addiction Muslim (religion1) 0.917 are less likely to addicted than the reference category Orthodox (religion0) and others (religion3) 0.12 are less likely to addicted than the reference category orthodox (religion0). protestant (religion2) 4.043 is more likely to addicted than the reference one. Respondents whose their education level is secondary (0.23) are less likely to their primary school of respondent and above secondary (0.289) are less likely to the reference one. Mother level of education of respondent whose their secondary school (0.40) are less likely to than their reference primary school, and above secondary school (0.715) are less likely than their reference primary school. And Father level of education of respondent their secondary schools (24.057) are more likely than their reference primary school, and above secondary schools (2.142) are more likely than their reference. The occupation of respondents drivers (0.010-5.539) are OR is 0.234 are less likely to their reference of student. And business man (4.85-5262.97) are OR is 159.89 are more likely to their reference of student, and teacher (1.35-739.995) are OR is 31.623 are more likely to their reference. Relative supporter of respondents (OR = 7.931, CI; 0.221-284.353) are more likely to their reference of family, and no support anyone (lonely) (OR = 0.000, CI; 0.000-0.0) are less likely to their reference category family.

Table of 4.11; Maximum Likelihood estimation binary logistic regression model.

Covariates	Categories	B	S.E	Wald	df	Sig	Exp(B)	95% CI for Exp(B)	
								Lower	Upper
Sex	Male(ref)	-	-	-	-	-	-	-	-
	Female	.069	1.275	.003	1	.957	1.071	.088	13.040
Age	-	.474	.227	4.362	1	.037	1.607	1.030	2.509
Income	-	.000	.000	.636	1	.425	1.000	1.000	1.001
Religion	Orthodox(ref)			9.328	3	.025			
	Muslim	-.086	1.502	.003	1	.954	.917	.048	17.431
	Protestant	1.397	1.546	.816	1	.366	4.043	.195	83.746
	Others	-4.440	2.214	4.022	1	.045	.012	.000	.904
Education level of respondent	Primary(ref)			7.921	2	.019			
	Secondary	-3.787	1.374	7.598	1	.006	.023	.002	.335
	Above	-1.240	1.094	1.285	1	.257	.289	.034	2.468
Mother education level of respondent	Primary(ref)			5.565	2	.062			
	Secondary	-3.208	1.644	3.806	1	.051	.040	.002	1.015
	Above	-.336	1.134	.087	1	.767	.715	.077	6.605
Father education level of respondent	Primary(ref)			6.496	2	.039			
	Secondary	3.180	1.354	5.519	1	.019	24.057	1.694	341.681
	Above	.762	1.140	.446	1	.504	2.142	.229	20.021
Occupation	Student(ref)			9.130	3	.028			
	Driver	-1.454	1.615	.810	1	.368	.234	.010	5.539
	Business man	5.075	1.783	8.103	1	.004	159.896	4.858	5262.979
	Teacher	3.454	1.609	4.610	1	.032	31.623	1.351	739.995
Supporter	Family(ref)			1.286	2	.526			
	Relative	2.071	1.826	1.286	1	.257	7.931	.221	284.353
	Lonely	-19.952	24594.488	.000	1	.999	.000	.000	.
Constant	-	-10.782	5.566	3.753	1	.053	.000		

Discussion: The results from binary logistic regression analysis revealed that the status of addiction affected by age of respondent, sex of respondent, religion, income, level of education respondent, financial supporter, mother level of education and father level of education of respondent at 5% significance level.

The descriptive analysis of the study revealed that only 43.00% of the sample were not addicted while 57.00% were addicted. Finding previously studied by (Sebsibie G, 2018) from this study age and religions were significance and sex is insignificance. Therefore the result of this research is consistent with (Sebsibie G, 2018).

CHAPTER FIVE

5. CONCLUSSION AND RECOMMENDATION

5.1 CONCLUSSIONS

Based on the result of the study conclusion forwarded follows

- Among 79 respondents, (57%) of young's are addicted (use addiction) and (43%)of the respondents are not addicted.
- Most of the respondent use stimulant for recreation (33.9%), for angry (3.2%), by peer pressure (22.6%), for recreation &angry (9.7%) and others (3.2%).this implies that the number of respondent who addicted (use different kinds of stimulants) is much greater than not addicted.
- Out of the total respondent, about 12.9% of respondents respond that they use alcohol, about 32.3% use chat, while the rest of respondents use cigarette (8.1%), cigarette & alcohol (8.1%), cigarette, chat &alcohol (8.1%) and the rest one is others (1.6%).

5.2 RECOMENDATIONS

Based on the result and discussion, the following recommendations are forwarded;

- In order to avoid the drug addiction, the families and government local should have to use different techniques to avoid the effect of drug addiction on youth by learning and by giving awareness about badness of drug addiction.
- All young's and Governments local or the educated persons should give attention for effect of drug addiction on youth because; this factor has great effect on life of young's.
- In this research more youth use stimulant for recreation, then the society and the government local are work together to cooperate youth in different work.
- Overall, addiction is a serious effect on young's life. There is a need for campaign to inform parents, state official and government local about the dangers of the addiction.

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APPENDIX I

QUESTIONAR

WOLKITE UNIVERSITY

COLLEGE OF NATURAL AND COMPUTITIONAL SCIENCE

DEPARTEMENT OF STATISTICS

Dear respondents the aim (objective) of the study is assessment of drug addiction among youth in case of gubre sub city. So your responses are very crucial to success this study.

Instruction: For the following questions, please fill in the appropriate information and tick (✓) the answers to those questions in the box that best describes you.

1. Age: _____

2. Sex: Male ☐ Female ☐

3. Religion: Orthodox ☐ Muslim ☐ Protestant ☐ Others _____

4. Level of education of respondent: Primary School ☐ Secondary School ☐ Secondary and above ☐

5. Mothers level of education: Primary School ☐ Secondary School ☐ Secondary and above ☐

6. Fathers level of education: Primary School ☐ Secondary School ☐ Secondary and above ☐

7. What is your occupation _____

8. Who is your financial support: Family ☐ relative ☐ lonely ☐

9. What is your average monthly income _____?

10. Do you use stimulant yes ☐ No ☐.

11. If your answer is yes in question 10. How many days a week use the stimulant? _____

12. If yes in question 10 which one of the following you used: Alcohol ☐ cigarette ☐
Chat ☐ Chat and cigarette ☐ Chat, cigarette and alcohol ☐ others ☐ _____

13. If your answer is yes in question 10 why you use stimulant? Angry ☐ Recreation ☐ Peer
pressure ☐ Recreation and angry ☐ others _____

14. What is the feeling after drug addiction: Pleasure ☐ Sadness ☐ Confused feeling ☐

15. Who is responsible to stop drug addiction: Family ☐ Government Society ☐ Users ☐
Family and government ☐ Family, government and society ☐?

16. after using stimulant your sensitivity for working and happiness

Increase ☐ decrease ☐ no changed

Appendix II; Variables in equation

Covariates	Categories	B	S.E(B)	Wald	Df	Sig(p-value)	Exp(B)
Sex	Male(ref)	-	-	-	-	-	-
	Female						
Age		.474	.227	4.362	1	1.03	.037
Income	-	.000	.000	0.636	1	0.425	1.00
Religion	Orthodox(ref)	-	-	9.328	3	.025	-
	Muslim	-.086	1.502	.003	1	.954	.917
	Protestant	1.397	1.546	.816	1	.366	4.043
	Others	-4.44	2.214	4.022	1	.045	.012
Education level of respondent	Primary(ref)	-	-	7.921	2	.019	-
	Secondary	-3.787	1.374	7.598	1	.006	.023
	Above	-1.24	1.094	1.28	1	.257	.289
Mother education level of respondent	Primary(ref)			5.565	2	.062	
	Secondary	-3.208	1.644	3.806	1	.051	.040
	above	-.336	1.134	.087	1	.767	.715
Father education level of respondent	Primary(ref)			6.496	2	.03	
	Secondary	3.180	1.354	5.519	1	.019	24.057
	Above	.762	1.140	.446	1	.504	2.142
Occupation	Student(ref)			9.130	3	.028	
	Driver	-1.454	1.615	.810	1	.368	.234
	Business man	5.075	1.783	8.103	1	.004	159.896
	Teacher	3.454	1.609	4.610	1	.032	31.623
Supporter	Family(ref)			1.286	2	.526	
	Relative	2.071	1.826	1.286	1	.257	7.931
	Lonely	-19.952	24594.488	.000	1	.999	.000

Dependent Variable Coding

Original value	Internal value
Not addicted	0
Addicted	1

DECLARATION

we, the undersigned, declare that this paper is our original work and has not been presented for a degree in any other university, and that all sources of materials used for the paper have been duly acknowledged.

Declared by;

Name: _____

Signature: _____

Date: _____

Name: _____

Signature: _____

Date: _____

Confirmed by Advisor:

Name: _____

Signature: _____

Date: _____

