# Prevalence of Aggressive Behavior and Associated Factors among Patients with Schizophrenia Attending at Amanuel Mental Specialized Hospital Addis Ababa, Ethiopia

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**Abstract**

**Background:** Mental illness and aggression are often seen as inextricably linked, creating a harsh stigma for patients and, at times, an uncomfortable environment for mental health professional. There is a growing body of evidence on aggressive behavior towards others by people with schizophrenia. Thus, this study was designed to assess the prevalence of aggressive behavior and associated factors among schizophrenia patients attending at Amanuel Mental Specialized Hospital.**Method:** Institutional based cross-sectional study was employed on 403 patients with schizophrenia attending at outpatient department of Amanuel Mental Specialized Hospital from May 1 to 31 2017. A systematic random sampling technique was used. Aggressive behavior was assessed by using Modified Overt Aggression Scale.The coded Data was checked, cleaned and entered into EPI-INFO version 3.5.3 and then exported into SPSS version 20 for analysis. Multivariable binary logistic regression was applied to find out the explanatory variables associated with aggressive behavior. Significance was declared at p-value <0.05.**Results:** The prevalence of aggression in this study was 107 (26.55%) by using Modified Overt Aggression Scale. Of 107 aggressive patients, 81(75.7%) and 26(24.3%) were male and female, respectively. The commonest associated factors for aggressive behavior include male [AOR=2.61, 95%CI (1.21, 5.61)], unemployment [AOR=8.03, 95%CI (3.08, 25.95)], previous history of aggression [AOR=6.22, 95%CI (2.75, 14.10)], Psychotic symptoms [AOR=8.12, (3.11, 21.14)], poor social support [AOR=3.11, 95%CI (1.35, 7.17)] and alcohol use [AOR=2.40, 95%CI (1.02, 5.66)].**Conclusion:** The prevalence of aggression behavior was found to be slightly high. Occupation, diagnosis episode of schizophrenia, previous history of aggression, types of drug taken, psychotic symptom, social support and alcohol use were found to be significantly associated with aggressive behavior. Clinicians should consider early detection& management of aggression.

**Keywords:** Aggression, Schizophrenia, Violence

## 1. Introduction

Mental disorders are leading causes of disability worldwide, accounting for one-third of the years lost due to disability [1].In humans, aggressive behavior assumes the form of violent actions against others or self. Aggression implies the intent to harm or otherwise injure another person, an implication inferred from events preceding or following the act of aggression [2]. Schizophrenia has been the diagnosis most often associated with aggression as it has been taken as a paradigm of insanity/psychosis, incompetence and dangerousness [3].Evidence exists for an increased incidence of aggressive behavior in schizophrenia, estimated at two to ten times that of the general population [4, 5, 6].

Meta-analysis of published literature indicated that the proportion of aggression in individuals with schizophrenia and estimates vary from 6 to 28% [7]. Study conducted in Canada shows that those with schizophrenia had the occurrence of aggression over the course of the year was 14.8% [8]. The most common type of aggressiveness was verbal and the least common was self-directed [9]. In Prague the prevalence of aggression since in patient with recurrent schizophrenia was 44.4% [10].Study conducted at United States shows that the prevalence of aggressive behaviour among schizophrenia patients were40.9%. Respondents rated the following groups as very or somewhat likely of doing something aggressive to others those have: drug dependence (87.3%), alcohol dependence (70.9%) [11]. Study conducted in London showed a surprisingly high level of aggression: 52% verbal aggression in male patients (46% in females), 39% aggression against objects (25% in females), and 23% against self (9%females), and 39% against other people (34%females) as measured by MOAS [12].

A cross sectional Study was conducted at Jos university teaching hospital, Nigeria shows that the prevalence of aggressive behavior were 21.9%.The patient exhibited different forms of aggression in the following frequencies: verbal aggression (45), aggression against property(31), auto-aggression(12), and physical aggression(40) [13].

Another cross-sectional study was conducted at Aroneuro-psychiatric hospital; Nigeria shows that a total of 305 patients comprising 213(69.8%) male and 92(30.2%) females. Out of these, 73 patients manifested aggressive behavior. This represented a rate of 23.94 percent [14]. Study conducted at Columbia, the risk of aggressive was, Medication non-compliance (73%), Alcohol use (57%), and previous aggressive behavior (51%) were common prior to hospitalization[15, 16, 17, 18, 19].Study conducted in Japan indicated that Aggressive is associated with unemployment, which usually brings in its wake financial insecurity and social decline. This tends to encourage a drift into a marginal existence characterized by poor housing, if not homelessness, in socially disorganized neighborhoods where substance misuse, interpersonal conflict and crime are commonplace[20].

The proportion of persons with schizophrenia who engage in aggressive behavior reflects 6-28%, the prevalence and risk factors for aggressive behavior are not well known, especially in low and middle income countries including Ethiopia.Thus, this study was conducted with the aim to assess the prevalence and associated factors of aggressive behavior among people with schizophrenia.

## Materials and methods
### Study design and setting
Institutional based cross - sectional study design was employed at Amanuel Mental Specialized Hospital from may1 to may 30, 2017. The hospital is located in Addis Ababa, Addis ketema sub city, kebele 08. It was established during the Ethio-Italian war in 1930 G.C and is the only Mental Hospital in Ethiopia. At the beginning the Hospital was established to protect Royal families from mentally ill people.  In the Hospital the health service had been given up to 1940 G.C by low level psychiatric professionals. Starting from 1946-1970 G.C the treatment was given by doctors came from Russia, Bulgaria, and Cuba. The hospital is working on increasing the efficiency &effectiveness of the service to make itself the centre of mental health care excellences by giving core mental clinical services, conducting research and trainings and other administrative services.

### Population
All patients who were clinically diagnosed as schizophrenia in Ethiopia were taken as source population. Schizophrenic Patients who were attending the outpatient department at Amanuel Mental Specialized Hospital during the study period were taken as study population.

### Inclusion and Exclusion criteria
*Schizophrenia patients with the age of 18 years and above and Patients who came at out-patient department were included in this study. Patients who cannot be able to respond for data collectors were excluded in this study.*

### Sample size determination and sampling techniques
Sample size was calculated using single population formula with 95% CI, w=5% and p=0.5, was 384 subjects. To compensate for possible non respondents, then adding 10% (384 x 0.1 = 38 patients) of non respondents the total sample size for this study was 422. A systematic random sampling technique was used to select the study participants from 12 months data 48,884 schizophrenic patients. Since participants during study period (within 2 weeks was 2036) so, the sampling fraction is:

K= N/n = 2036/422= 5 Where N: was the total number of patients who had followed up visit during data collection period. Hence, the sampling interval was 5. Individuals were chosen at regular intervals (every 5th) and the selected patients were directed by the facilitator to the office where the data collectors were working.

### Data collection
### Measurements
Modified Overt Aggression Scale (MOAS) was used to assess the aggressive behavior. The Modified Overt Aggressive Scale is a one page protocol that documents and measures specific aspects of aggressive behavior based on observable criteria. The MOAS has four subscales of aggression (Verbal aggression, Aggression against Property, Auto- aggression and Physical Aggression against other people) which have 16 items, within each Type of aggressive behavior, high scores corresponds to a greater degree of violence, in a range of 0– 4 (from 0-none to 4 - extreme violence).And each subscales had weight and multiplied with respondents score; Verbal aggression weight 1, Aggression against property weight 2, Auto aggression weight 3 and physical aggression weight 4. In which aggressive behaviour is defined as a score of 3 or more in any of the MOAS sub scores. MOAS was validated and was used as tool in studies done in aggressive behavior in certain Africa countries including South Africa and Nigeria and foreign in Spain. Social support was measured using the Oslo-3 Social Support Scale (OSS-3) with three questions.  The response categories were assessed independently for each of the three questions, and a sum score was created by summarizing the raw scores. The Oslo-3 scale has

been used in several studies, thus confirming its feasibility and predictive validity with respect to psychological distress. In this study, the scale is used as both a sum score and an item-by-item scale. Used the sum score scale ranging from 3–14, which was then operationalzed into three broad categories: "poor support" 3–8, "moderate support"9–11 and "strong support"12–14. A semi structured questionnaire was used to collect socio-demographic characteristics and some clinical factors.

**Data collection Procedures**
Data was collected by ten Psychiatric BSc nurses and three public health staffs were participated as a supervisor. Data collectors and supervisors were trained for two days on the study instrument, consent form, how to maintain confidentiality and data collection procedure and data collection period which was collected for two weeks. Data was collected by interviewing patients and their caregivers (when available) during a routine follow-up visit. The patients and the families were interviewed whether the patient had behaved aggressively during the past week in any of these domains: verbal aggression, physical aggression towards others or him/her, or aggressive behavior towards objects. If that was the case, the investigator was completed the Modified Overt Aggression Scale (MOAS) with the help of the patient or caregiver. Pre-test was conducted on 21 patients (5% of the sample size) at AMSH two days prior to data collection. The questionnaire was translated backward and forward to Amharic and English using professional language translators. Supervision was held regularly during data collection period. The collected data was checked on daily basis for completeness and consistence.

**Data analysis**
Data entry was done using EPI-INFO version 3.5.3 and then exported into Statistical Package for the Social Sciences (SPSS) window version 20 for analysis. Descriptive summary using frequencies, percentage and graphs were used to present study results. Bivariate analysis was done for COR and multivariate analysis was employed to calculate AOR for variables which met p-value < 0.2 during bivariate analysis. P-value of < 0.05 was considered as statistically significant during binary logistic regression.

**Ethical Consideration**
Ethical clearance was obtained from Amanuel Mental Specialized Hospital. The data collectors were clearly addressed the purpose of the study to participants. The right was given to the study participants to refuse or discontinue the study. For the purpose of anonymity participant's name was not used at any time of data collection and all other personal information kept entirely anonymous and confidentially. The investigator has commitment that finding's was used later to prevent and manage aggressive behavior in people with schizophrenia.

## 4. RESULTS
**Socio-demographic characteristics**
Of whom 266(66.0%) male and 137(34.0%) female) were participated in this study. The mean age of participants was 33.9years (SD +10.28) and age ranged from 18 to 60. Of the total participants; 215(53.3%) were Orthodox Christians, 125(31.0%) Oromo, 198(49.1%) never married, 190(47.1%) jobless and 120(29.8%) attended no formal education, 169(41.9%) had earn less than 400.00 birr monthly. More than half of study subjects, 230(57.1%) were from Urban and 350(86.8%) live with their family. **(Table 1)**

**Aggression related factors**
Concerning clinical characteristics of the participants, 222(55.1%) had the diagnosis of recurrent schizophrenia, 300(74.4%) were on conventional antipsychotic drug, 163(40.4%) had poor social support, 52(12.9%) of the study subjects had symptoms of commanding hallucination, 54(13.4%) persecutory delusion and70 (17.4%) had previous history of aggression. Current substance useamong 316(78.5%) participants who used substance since aggression initiation, 122(30.3%) of the respondents were using Khat.**(Table 2)**

**Prevalence of Aggressive behaviour**
The overall prevalence of aggression in the study population was found to be 26.55%. **(Figure1)** Of total respondents 41(10.19%) were have verbal aggression, 26(6.46%) have aggression against property, 17(4.23%) have auto aggression, 23(5.72%) have physical aggression and 48(11.9%) have both verbal and physical aggression. **(Figure 2)**

Concerning the relationship between aggressive behavior and patients socio demographic characteristics: 80(74.77%) were males, 54(50.50%) live in urban, 57(53.27) earn monthly income below 400 birr, 62(57.94%) single and 84(78.50%) jobless. Looking at patient clinical related factors 70(65.42%) Have diagnosis of schizophrenia recurrent, 40(37.38%) had previous history of aggression, 91(85.05%) were taking typical antipsychotics, 28(26.17%) and 24(22.43%) had commanding hallucination and persecutory delusion

respectively. Seventy (65.42%) had poor social support, 27(25.23%) current alcohol use, 39(36.45%) current Khat use and 7 (6.54%) current cannabis useshadaggression.

**Factors associated with Aggressive Behavior**

Inthe bi-variable logistic regression analysissex, monthly income, Marital status, Occupation, Diagnosis of schizophrenia, Previous history of aggression, Types of medication, Current psychotic symptom, Social support, alcohol use, Khat use and cannabis use werefound to have statistically significant association with the outcome variable and for further analysis entered in to multivariate logistic analysis. On the other hand age, residence, religion, ethnicity, educational status, living circumstance, and cigarette use were not significant at 0.2 level of significance and were excluded from further analysis.

In the multivariable logistic regression analysis sex, occupation, previous history of aggression, current psychotic symptom, social support and alcohol use were found to be statistically significant with aggression. Study participants whose sex is male were about two times more likely to be aggressive as compared with patients who were female [AOR=2.61, 95%CI (1.21, 5.61)]. Patients who hadn't job were about eight times more likely to be aggressive as compared with patients who had job [AOR=8.03, 95%CI (3.08, 25.95)].

Regarding previous history of aggression among study participants, patients who had history of aggression were about six times more likely to be aggressive when compared to patients who had no history of aggression[AOR=6.22, 95%CI (2.75, 14.10)]. Similarly who had current psychotic symptom among study participants, those who had commanding hallucination and persecutory delusion were about eight and seven times more likely to be aggressive as compared to patients who had no symptoms[AOR=8.12,95%CI(3.11,21.14)] and[AOR=7.85 95%CI (2.88, 21.39)] respectively.

Patients who had poor social support were about three times more likely to be aggressive as compared with patients who had strong social support [AOR=3.11,95%CI(1.35,7.17)]. Concerning substance use patients who were using alcohol before aggression were found to be two times more likely aggressive than patients who had no history of alcohol use [AOR=2.40,95%CI(1.02,5.66)]. **(Table 3)**

**Discussion**

The overall prevalence of aggressive behavior in the study area was 26.55%. The finding of this study was slightly higher than study done in Canada14.8% [8], Nigeria Jos hospital 21.9%[13], &Nigeria Neuro psychiatric hospital 23.94%[14].Meta-analysis of published literature indicated that the prevalence of aggressive behavior in schizophrenia ranged from 6% -28 % [7].The possible reason for the difference in the magnitude of prevalence can be due to the socio cultural difference in the study population, clinical related factors and methodological differences; like using different screening tools. About 55.3% of study participants in the current study area were had recurrent episode of schizophrenia which were44.14% in Pragueand 24.6% in Nigeria[10, 14].The other possible factors that cause higher aggressive behavior in this study area might be the higher substance use (78.41%) which was 34% in Canada [8].

The overall prevalence of subtypes of aggressive behavior in current study area (10.19%) were verbal aggression, (6.46%) aggression against property, (4.23%) auto aggression, (5.72%) physical aggression and (11.9%) had both verbal and physical aggression,(6%) were had all types of aggression.The most common type of aggressiveness was verbal and the least common was self-directed which is in line with study done in Spain and London[9, 12].Most of the time aggression was observed at evening and night time which was 16.1% which was coincide with study done in Nigeria [14].The possible reason may be aggression partly explained socio culturally in the sense that in our environment, verbal or physical exchange is often a means of settling conflicts instead of discussing issues.

During multivariate analysis socio-demographic factors including age, residence ethnicity, religion, educational level and living circumstance were not found to be statistically associated with aggressive behavior.This finding was consistent with many previous studies [10, 13]. Contrary to this finding, study done in Columbia on mental ill patients depicts older age and better education level were negatively associated with aggressive behavior[14, 16].The possible explanation might be participants in those studies might had repeated episode for diagnosis of schizophrenia which implies that these patients are aware of the consequences of aggression such as relapses and hospitalizations and they fear this due to prior exposure.

Sex was observed to be significantly associated with aggressive behavior in this study (74.77%), which is coincides with study done in Nigeria (60.5%) and UK (49.1%)[14,6].The possible reason may be males are more prone to physical aggression than females has to do with biological, psychological, and social factors. Another possible reason may be when boys are able to express themselves at a higher rate. Females are therefore much more likely to respond to anger with feelings of depression, anxiety and shame.

Unemployment was found to be significantly associated with aggressive behavior in this sample, which is in line with study done in Nigeria and Japan[14, 20]. The possible reason may be unemployment is a potential cause of frustration, which in turn underlies the manifestation of aggressive behavior, even among individuals

not suffering from a mental disorder. Furthermore those patients can be moreknowledgeable and possess greater insight with regard to their condition.

Participants who had previous history of aggression were about six times more likely to be aggressive than those hadn't previous history of aggressionwhich is in line with study donein Nigeria;One of the major findings in this study is that there is significant association between aggression in a psychiatric patients and a history of previous acts of aggression [14].

Psychotic symptoms were about eight and seven times more likely to be aggressive than those hadn't psychotic symptoms which is in line with study done in Nigeria, Canada and Columbia; most of the aggressive patients reported experiencing psychotic symptoms preceding their acts of aggression and there is significant association between commanding hallucination, delusion of persecution (belief that people are against them) and aggression [13, 8, 16].

Participants who used alcohol were two times more likely to be aggressive than those who didn't used. This finding coincides with study done in USA and Columbia which reported aggressive was associated in patients with substance use particularly with Alcohol use[11, 16, and 17].Poor social supports were about three fold to be aggressive as compared patient having strong social support [17]. Possible reason includes the specified substance use can havenegative impacts on a person's internal state causing increased cognitive anomalies and unpleasant withdrawal symptoms. Since the study design was cross sectional cause and effectcannot be ascertained. Recall bias may be found due to asking the patient.This study didn't measure the severity of psychotic symptoms that elicited aggressive behavior rather the emphasis was on types of psychotic symptoms that preceded an act of aggression.

## Conclusion

In this study about one third of study participants were had aggressive behavior. This was found to be slightly higher than previous studies. Male, Unemployment, previous history of aggression, Psychotic symptom, poor social support and alcohol use were found to be statistical significance with aggressive behavior. On the other hand age, residence, religion, ethnicity, educational status, living circumstance, and cigarette use were not significantly associated with aggressive behavior.

## Acknowledgements

## List of abbreviation

AOR……..Adjusted Odds Ratio
COR……..Crude Odds Ratio
CI………..Confidence Interval
OSS-3……..Oslo-3 Social Support Scale
MOAS……Modified Overt Aggression Scale
SPSS ……..Statistical Package for the Social Sciences

## Availability of data and materials

The datasets used and/or analyzed during the current study are availablefrom the corresponding author on reasonable request.

## Authors' contributions

KM and AA had taken a principal role in the conception of ideas, developing methodologies, data collection, analyses and write up of the article. KM and AA participate in data analysis and had a great contribution to the write up of the draft and approval of the final version of the manuscript. All authors read and approved the final manuscript.

## Conflict of Interest

We have no conflict of interest

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Table 1: Distribution of schizophrenia patients by socio demographic factors attending at Amanuel Mental Specialized Hospital; May, 2017 (n=403)

| Variables | Category | Frequency | |
|---|---|---|---|
| | | Number | Percent (%) |
| Age | 18-24 | 65 | 16.1 |
| | 25-34 | 165 | 40.9 |
| | 35 -44 | 111 | 27.5 |
| | 45-54 | 39 | 9.8 |
| | ≥55 | 23 | 5.7 |
| Sex | Male | 266 | 66.0 |
| | Female | 137 | 34.0 |
| Residence | Urban | 230 | 57.1 |
| | Rural | 173 | 42.9 |
| Income | <400 birr | 169 | 41.9 |
| | 400-900 birr | 57 | 14.1 |
| | 900-1200 birr | 99 | 24.6 |
| | >1200birr | 78 | 19.4 |
| Religion | Orthodox | 215 | 53.3 |
| | Muslim | 133 | 33.1 |
| | Protestant | 55 | 13.6 |

| Variables | Category | Frequency | |
|---|---|---|---|
| | | Number | Percent (%) |
| Marital status | Single | 198 | 49.1 |
| | Separated | 68 | 16.9 |
| | Divorced | 51 | 12.7 |
| | Married | 86 | 21.3 |
| Ethnicity | Amhara | 117 | 29.0 |
| | Oromo | 125 | 31.1 |
| | Gurage | 115 | 28.5 |
| | Tigray | 46 | 11.4 |
| Education | No formal education | 120 | 29.8 |
| | Primary | 109 | 27.0 |
| | Secondary | 116 | 28.8 |
| | Above secondary | 58 | 14.4 |
| Occupation | Employed | 62 | 15.4 |
| | Self business | 122 | 30.3 |
| | Student | 29 | 7.2 |
| | Jobless | 190 | 47.1 |
| Living circumstance | With family | 350 | 86.8 |
| | Alone | 53 | 13.2 |

Table 2: Distribution of schizophrenia patients by factors related aggressive behavior attending at Amanuel Mental Specialized Hospital;   May, 2017(n= 403)

| Variables | Categories | Frequency | |
|---|---|---|---|
| | | Number | Percept (%) |
| Diagnosis | First episode | 40 | 9.9 |
| | Second episode | 141 | 35.0 |
| | Recurrent | 222 | 55.1 |
| History of aggression | Yes | 70 | 17.4 |
| | No | 333 | 82.6 |
| Types of Drug taken | Typical antipsychotic | 300 | 74.4 |
| | Atypical antipsychotic | 103 | 25.6 |
| Nature of aggression | Verbal aggression | 41 | 10.19 |
| | Aggression against objects | 26 | 6.46 |
| | Auto - aggression | 17 | 4.23 |
| | Physical aggression | 23 | 5.72 |
| | Both verbal & physical 48 11.9 | 48 | 11.9 |
| Time of aggression | None | 263 | 65.3 |
| | Morning | 35 | 8.7 |
| | After noon | 40 | 9.9 |
| | Evening/night | 65 | 6.1 |
| Psychotic symptoms | No symptoms | 297 | 73.7 |
| | Persecutory delusion | 54 | 13.4 |
| | Command hallucination | 52 | 12.9 |
| Social support | Poor support | 163 | 40.4 |
| | Moderate support | 157 | 39.0 |
| | Strong support | 83 | 19.6 |
| Current substance use | Alcohol | 74 | 18.4 |
| | Khat | 122 | 30.3 |
| | Smoking | 107 | 26.6 |
| | Cannabis | 13 | 3.2 |
| | No | 87 | 21.5 |

Table 3: Multivariate logistic regression analysis of associated factors for aggressive behaviours among schizophrenia patients attending at Amanuel Mental Specialized Hospital; May, 2017(n=403)

| Explanatory variables | frequency | Aggressive behavior | | COR ( 95% CI) | AOR (95% CI) |
|---|---|---|---|---|---|
| | N (%) | Yes | No | | |
| **Sex** | | | | | |
| Male | 266 (66.0) | 80 | 186 | 1.75(1.07, 2.88)* | **2.61(1.21, 5.61) **** |
| Female | 137(34.0) | 27 | 110 | 1.00 | 1.00 |
| **Monthly income** | | | | | |
| <400 birr | 169(41.9) | 57 | 112 | 2.14(1.12, 4.08)* | 1.32(0.53, 3.26) |
| 400-900 birr | 57(14.1) | 22 | 35 | 2.64(1.22,5.73)* | 3.28(1.07, 10.04) |
| 900-1200 birr | 99(24.6) | 13 | 86 | 0.63(0.28, 0.99)* | 0.64(0.20, 2.01) |
| >1200birr | 78(19.4) | 15 | 63 | 1.00 | 1.00 |
| **Occupational status** | | | | | |
| Employed | 62(15.4) | 57 | 5 | 1.00 | 1.00 |
| Self business | 122(30.3) | 107 | 15 | 0.48(0.16, 0.93)* | 0.25(0.65, 0.99) |
| Student | 29(7.2) | 9 | 20 | 3.54(1.16, 10.75)* | 5.28(1.18, 23.52) |
| Jobless | 190(47.1) | 84 | 106 | 6.23(2.69, 14.38)* | **8.03(3.08, 21.95) **** |
| **History of aggression** | | | | | |
| Yes | 70(17.4) | 40 | 30 | 5.29(3.07, 9.12)* | **6.22(2.75, 14.10) **** |
| No | 333(82.6) | 67 | 266 | 1.00 | 1.00 |
| **Psychotic symptoms** | | | | | |
| No symptoms | 297(73.7) | 55 | 242 | 1.00 | 1.00 |
| Persecutory delusion | 54(13.4) | 28 | 26 | 4.74(2.57,8.71)* | **8.12(3.11, 21.14) **** |
| Command hallucination | 52(12.9) | 24 | 28 | 3.77(2.03, 7.00)* | **7.05(2.88, 21.39) **** |
| **Social support** | | | | | |
| Poor support | 163(40.4) | 70 | 93 | 2.72(1.48, 4.98)* | **3.11(1.35, 7.17)**** |
| Moderate support | 157(39.0) | 19 | 138 | 0.49(0.25, 0.99)* | 0.56(0.22, 1.43) |
| Strong support | 83(19.6) | 18 | 65 | 1.00 | 1.00 |
| **Alcohol** | | | | | |
| Yes | 74(18.4) | 27 | 47 | 1.93(1.13, 3.32)* | **2.40(1.02, 5.66)**** |
| No | 329(81.6) | 80 | 249 | 1.00 | 1.00 |

**Key=** * p-value <0.2    ** statistically significant        P-value of Hosmer and Lemeshow test =0.88
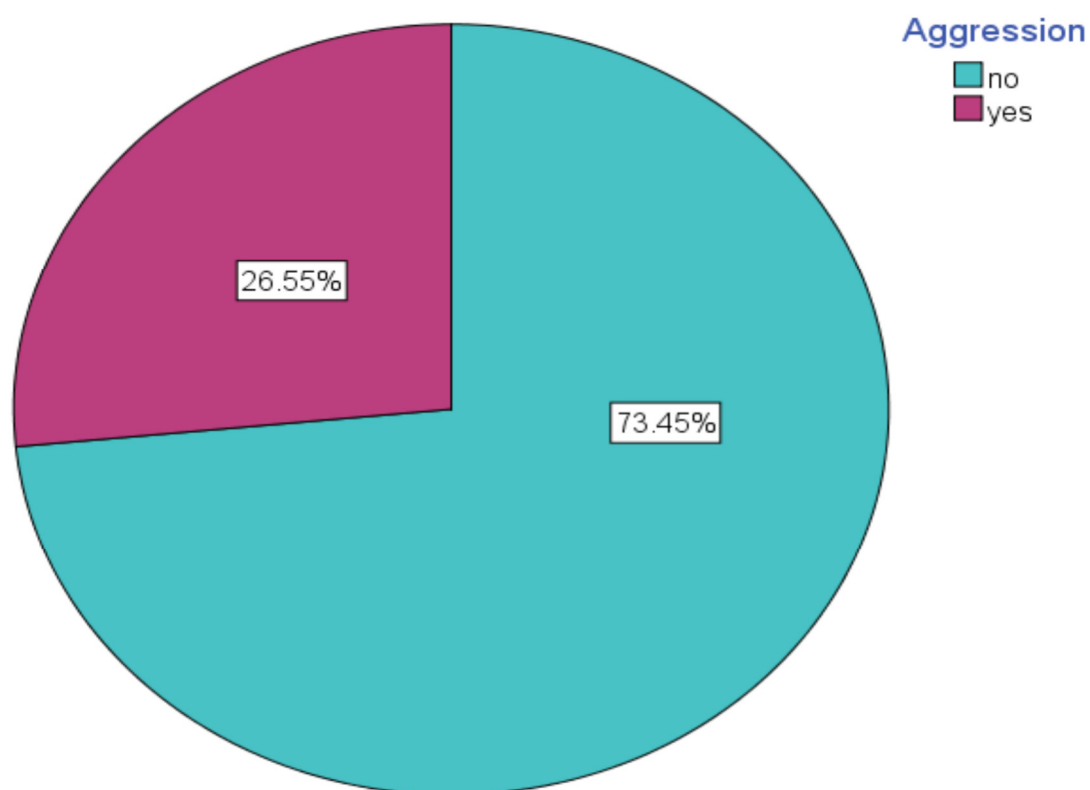
Fig.1: Prevalence of Aggressive behavior among schizophrenia Patients attending at amanuel mental specialized hospital; May, 2017.
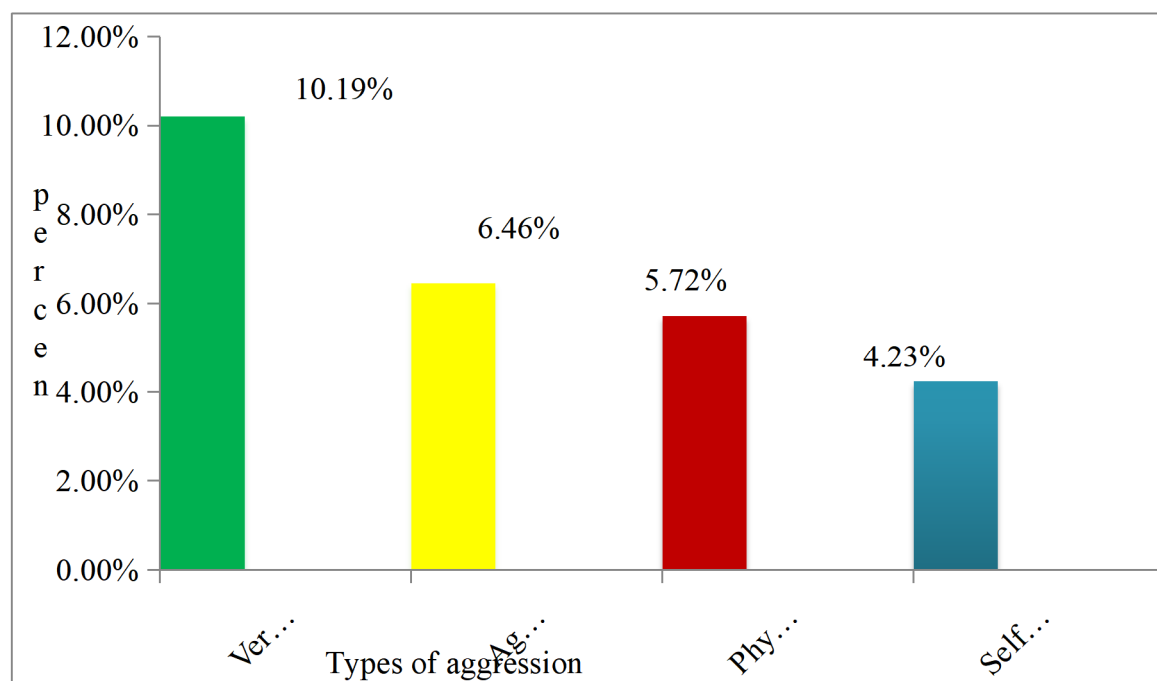


Fig.2: Subtypes of aggressive behavior among schizophrenic patients having aggressive behavior attending at amanuel mental specialized hospital; May, 2017.