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Indicators for Severity of Suicide Behaviors and Coexisting Mental Disorders among Adolescents

Samuel Olusegun Ojuade

Ph.D Student, Clinical Psychology, Daystar University, Kenya

Dr. Alice Munene

Ph.D. Co-Ordinator, Daystar University, Kenya

Dr. Paul Mbutu

Ph.D., Education Management, Registrar, Daystar University, Kenya

Abstract:

The ongoing scholastic debate on cursors of suicide behaviors among adolescents is fragmented. To bolster the discourse, this study therefore examined indicators for severity of suicide behaviors and co-existing mental health disorders. The research was conducted among 115 inpatient and out-patient adolescents at Federal Neuropsychiatric Hospital Kappa-Lagos Nigeria. The sample size was selected at 80% power and 30% effective size using purposive sampling technique. This research used Suicide Behavior Questionnaire-Revised (SBQ-R), Beck's Depression Inventory (BDI), and Mood Disorders Questionnaire (MDQ) and researcher-generated socio-economic demographic questionnaire to collect data. The findings showed that depressive illness is a basic predictor of adolescent suicide ($p=0.0001$) while mother's employment status was seen to be a predictor of mental health condition especially major depressive disorder among adolescents ($p=0.028$). Other indicators of suicide behaviors among adolescents include gender ($p=0.030$), education ($p= 0.0001$) and mother's employment status ($p=0.047$). Also, higher frequency of suicide ideation was seen to be a predictor of suicide attempt ($p < 0.0001$), those who made threat of committing suicide more than once are likely to attempt suicide later in life, ($p=0.001$). Further, the results also indicated that suicide attempt with intent had a higher likelihood of completing suicide in the future ($p < 0.0001$). Suicide attempts predict complete suicide. The more frequent the suicide attempt, the more likelihood to complete suicide. Having discovered predictors of suicide behaviors among adolescents, researcher concluded with the need for early intervention and other useful recommendations to curtail this endemic phenomenon among adolescents.

Keywords: Indicators, Severity, Suicide behaviors, Co-existing mental health disorders, Adolescents

1. Introduction

Suicidal behavior is a very complex, multi-causal behavior, involving several medical-biologic, psychosocial and cultural components, and history of untreated major mood disorders (Rihmer, Rihmer & Dome, 2015; Yang, 2004). According to Cutler, Glaeser, and Norberberg (2001), for every teen who committed suicide (0.01% each year), four hundred teens reported attempting suicide (4% per year), one hundred reported requiring medical attention for a suicide attempt (1% per year), and thirty were hospitalized for a suicide attempt (0.3% per year). In relation to these findings, researchers have indicated that between 31% to 50% of adolescent suicide attempter's re-attempted suicide within 3 months of their first attempt (Rathus & Miller, 2002).

However, it has been noted that a higher rate and the highest number of suicides occurred in the 15-19 -year group, followed by the 10-14-year group (Naidoo & Schlebusch, 2014). In a recent linear regression conducted in United State of America to examine the correlation between predictors and suicidal behaviors, the results showed that gender among others was significantly predictor of suicide behaviors (Kim, Moon, & Kim, 2011). Several other researchers have similarly indicated that gender was a predictor of suicide behaviors among the adolescents especially female gender (Frankowski, 2000; Hamid & Shah, 2016; Park, Schepp, Jang, & Koo, 2006). In addition, studies have shown that suicide tendencies are significantly higher among university students (Pereira & Cardoso, 2015; Wanyoike, 2015). Educational attribute of socio-demographic characteristics has been shown to be a predictor of suicide behaviors among adolescents (Kim, Moon, & Kim, 2011).

Suicide behaviors such as suicide ideation, plan, attempt or complete suicide are significantly increasing among adolescents. Studies have identified mental disorders, problems at school, family problems or difficulties in establishing stable relationships as major factors that put adolescents at risk (Marusic, Roskar, & Hughes, 2004). It has been shown that about 90% of adolescents with suicidal ideation, and over 96% of those who attempted suicide met criteria for a psychiatric disorder

(Shain, 2007) and specifically, about 57% of adolescents who had suicide ideations, about 70% of those who developed plans for suicide, and about 76% of those attempted suicide had depressive disorder (Eugene, 2013). Researchers have similarly affirmed that depressive symptoms are the strongest predictors of suicidal behaviors among adolescents and are predominant among female than male adolescents (Wichstrom, 2009; Wilkinson, Kelvin, Roberts, Dubicka, & Goodyer, 2011; Wolff, et al., 2013).

In a study by Wichstrom (2009), logistic regression analysis showed that future attempts to commit suicide were predicted by previous attempts. According to Borowsky, Ireland, and Resnick (2001), previous suicide attempts were noted to be important predictor to complete suicide among adolescents. These researchers estimated that more than 40% of adolescents who complete suicide have made previous attempts, and attempters are 20 to 50 times more likely to complete suicide than peers without a history of attempts. This study was interrelated with prior research that affirmed previous suicide attempts as predictor to complete suicide (Borowsky, Resnick, Ireland, & Blum, 1991). Similar study conducted in Taiwan indicated that 39.8% of subsequent suicide attempts re-occur within 6 months after the suicide attempt (Cooper, Kapur, & Webb, 2005; Huang, Wu, Chen, & Wang, 2014). In addition, 87% of those who completed suicide used the same method in the subsequent suicide attempts such as hanging, drowning, jumping from a height and use of a firearm (in men only) (Josephson, 2017).

Research has revealed that family background is also a predictor of suicidal behavior among adolescents (Bridge, Goldstein, & Brent, 2006). According to Amitai and Apter (2012), family-related factors that trigger suicide behavior among adolescents were parental psychopathology, family history of suicidal behavior, family discord, loss of a parent to death or divorce, poor quality of the parent-child relationship, and maltreatment (Zhai, et al., 2015). In a recent study among adolescents whose parents have divorced showed that poorer parental relationships and higher divorce rates can predict misfortune and psychological distress for students, which may eventually predispose them to experience suicide ideation (Fuller-Thomson & Dalton, 2011). Further findings have also emerged that unstable income for parents foretells the family's economic status and that low family income is a predictor of suicide thoughts (Zhai, et al., 2015). This is because, inconsistent family economic status defines quality of life in the family and similarly, parents' unstable work may also lead to a poor family economic status that in due course becomes a predictor of suicide behaviors among adolescents (Bridge, Goldstein, & Brent, 2006).

2. Methods

The research took place at Federal Neuropsychiatric Hospital, Kappa-Lagos, Nigeria after the research permit to conduct research and ethics screening approval was secured from both Daystar University Kenya and Federal Neuropsychiatric Hospital, Yaba-Lagos, Nigeria. The sample size was calculated based on the 20% prevalence of suicidal behaviors in Nigeria (Omigbodun, Dogra, Esan, & Adedokun, 2008), and 40% prevalence of suicidal adolescents at Federal Neuropsychiatry Hospital, Kappa-Lagos. The researcher considered the following aspects in the calculation of the sample size: the prevalence of the suicide behaviors (20%), the significance level of 0.05, the confidence level of 95% and the power which will be at the lowest 80%. The formula by Casagrande, Pike, and Smith (1978) was used to calculate the sample size. Based on the sample size calculation, the total of 115 participants was recruited in the study. The researcher reviewed 123 case files of inpatients as at the time of study, out of which 38 eligible inpatients constituting 33% were recruited, from the outpatients (n=34, 29.6%) and discovered patients (n=43, 37.4%). The discovered patients were friends, family members of the outpatients at the hospital and neighbourhood who met the criteria for the study but never subjected themselves for psychiatric treatment. They were referred as discovered patients. This study used both standardized psychological assessment tools such as Suicide Behavior Questionnaire (SBQ-R), Beck's Depression Inventory (BDI), Mood Disorders Questionnaire (MDQ) and researcher-generated socio-economic demographic questionnaire to collect data. Data collected from the participants were analysed using Statistical Package for the Social Sciences (SPSS) version 23.

3. Results

| Age/ Sex attributes | Mental Health Condition Classification | | | | | Chi-square | p-value |
|---------------------|--|------------------|--|---|---------------------------------------|------------|---------|
| | Major Depressive Disorder | Bipolar Disorder | Depressive Disorder due to another Medical Condition | Depressive Disorder with psychotic features | Substance Induced Depressive Disorder | | |
| 14 - 17 years | 16 (38.1%) | 12 (28.6%) | 9 (21.4%) | 4 (9.5%) | 1 (2.4%) | 5.147 | 0.273 |
| 18 - 21 years | 32 (43.8%) | 12 (16.4%) | 12 (16.4%) | 9 (12.3%) | 8 (11.0%) | | |
| Male | 19 (46.3%) | 6 (14.6%) | 6 (14.6%) | 5 (12.2%) | 5 (12.2%) | 3.568 | 0.472 |

| | | | | | | | |
|----------------------------|------------|------------|------------|-----------|-----------|--------|--------------|
| Female | 29 (39.2%) | 18 (24.3%) | 15 (20.3%) | 8 (10.8%) | 4 (5.4%) | | |
| Education Background | | | | | | | |
| High School | 5 (31.2%) | 7 (43.8%) | 1 (6.2%) | 3 (18.8%) | 0 (0.0%) | 18.510 | 0.101 |
| College | 11 (39.3%) | 2 (7.1%) | 6 (21.4%) | 4 (14.3%) | 5 (17.9%) | | |
| University | 21 (45.7%) | 11 (23.9%) | 10 (21.7%) | 2 (4.3%) | 2 (4.3%) | | |
| Others | 11 (44.0%) | 4 (16.0%) | 4 (16.0%) | 4 (16.0%) | 2 (8.0%) | | |
| Religion Affiliation | | | | | | | |
| Pentecostal | 23 (39.7%) | 13 (22.4%) | 13 (22.4%) | 6 (10.3%) | 3 (5.2%) | 9.667 | 0.645 |
| Islam | 10 (40.0%) | 5 (20.0%) | 5 (20.0%) | 3 (12.0%) | 2 (8.0%) | | |
| Orthodox | 12 (54.5%) | 5 (22.7%) | 0 (0.0%) | 2 (9.1%) | 3 (13.6%) | | |
| Catholic & Others | 3 (30.0%) | 1 (10.0%) | 3 (30.0%) | 2 (20.0%) | 1 (10.0%) | | |
| Father's Employment Status | | | | | | | |
| Employed | 17 (32.1%) | 15 (28.3%) | 9 (17.0%) | 8 (15.1%) | 4 (7.5%) | 14.062 | 0.297 |
| Jobless | 13 (52.0%) | 4 (16.0%) | 5 (20.0%) | 3 (12.0%) | 0 (0.0%) | | |
| Self-employed | 15 (50.0%) | 5 (16.7%) | 4 (13.3%) | 2 (6.7%) | 4 (13.3%) | | |
| No father | 3 (42.9%) | 0 (0.0%) | 3 (42.9%) | 0 (0.0%) | 1 (14.3%) | | |
| Mother's Employment Status | | | | | | | |
| Employed | 5 (29.4%) | 6 (35.3%) | 4 (23.5%) | 2 (11.8%) | 0 (0.0%) | 22.925 | 0.028 |
| Jobless | 30 (47.6%) | 14 (22.2%) | 5 (7.9%) | 9 (14.3%) | 5 (7.9%) | | |
| Self-employed | 8 (42.1%) | 4 (21.1%) | 4 (21.1%) | 1 (5.3%) | 2 (10.5%) | | |
| No mother | 5 (31.2%) | 0 (0.0%) | 8 (50.0%) | 1 (6.2%) | 2 (12.5%) | | |
| Family's Economic Status | | | | | | | |
| Poor | 11 (37.9%) | 5 (17.2%) | 7 (24.1%) | 4 (13.8%) | 2 (6.9%) | 14.304 | 0.074 |
| Average | 27 (49.1%) | 9 (16.4%) | 5 (9.1%) | 9 (16.4%) | 5 (9.1%) | | |
| Affluent | 10 (32.3%) | 10 (32.3%) | 9 (29.0%) | 0 (0.0%) | 2 (6.5%) | | |
| Family Set-up | | | | | | | |
| Parents living together | 23 (43.4%) | 12 (22.6%) | 9 (17.0%) | 5 (9.4%) | 4 (7.5%) | 3.726 | 0.881 |
| Parents living apart | 17 (35.4%) | 11 (22.9%) | 9 (18.8%) | 7 (14.6%) | 4 (8.3%) | | |
| Living with guardian | 8 (57.1%) | 1 (7.1%) | 3 (21.4%) | 1 (7.1%) | 1 (7.1%) | | |

Table 1: Demographic Distribution of the Participants' Mental Health Conditions

Table 1 presents the demographic distributions of the participants' mental health conditions. The distribution of major depressive disorder among 115 participants seemed to be higher (38.1%) compared to bipolar disorder (28.6%). Depressive disorder due to another medical condition was at 21.4% while persistent depressive disorder was at 4.5% and substance induced depressive disorder was at 2.4% among the participants aged 14-17. Similarly, the frequency of major depressive disorder appeared to be higher (43.8%) as opposed to bipolar disorder (16.4%) and depressive disorder due to another medical condition (16.4%). Likewise, depressive disorder with psychotic features was at 12.3% while substance induced depressive disorder was at 11% among suicidal adolescents aged 18-21.

When the chi-square test was used to investigate whether there was a statistically significant relationship between a dependent and an independent variable, the test revealed no statistically significant association between mental health condition and age ($p=0.273$). Similarly, the prevalence of major depressive disorder was higher among the participants aged 18-21 at 43.8% than participants aged 14-17 (38.1%). This implies that the majority of suicidal adolescents present with major depressive disorder, which is more profound among participants aged 18-21 than aged 14-17.

The study also examined the relationship between mental health condition and gender among the adolescents. The occurrence of major depressive disorder among the male participants was noted to be higher (46.3%) compared to bipolar disorder at 14.6%, depressive disorder due to another medical condition at 14.6%, depressive disorder with psychotic features at 12.2% and substance induced depressive disorder at 12.2%. The data for female participants also indicated that major depressive disorder had higher proportion (39.2%) compared to bipolar disorder (24.3%), depressive disorder due to another medical condition (20.3%), depressive disorder with psychotic features (10.8%) and substance induced depressive disorder (5.4%). However, the mean for participants' sex with mental health conditions was $1.6435 \pm (.48107 \text{ SD})$ which was not statistically significant ($p=0.715$). There was no significant association between mental health conditions and gender attribute ($p = 0.472$), though the severity appeared to be higher among female adolescents than male. This could mean that female adolescents with suicidal behavior seemed to exhibit depressive disorder compared to their male counterpart.

Regarding the relationship between mental health conditions and mother's economic status, the proportion of major depressive disorder appeared to be higher among suicidal adolescents whose mothers were jobless (47.6%) as opposed to adolescents whose mothers were employed (29.4%). In addition, the relationship between mental health conditions and mothers' employment status was examined and the findings revealed statistically significant association between mental health condition and mothers' economic status ($p=0.028$). Major depressive disorder seemed to be more severe at 47.6% compared to other mental health conditions such as bipolar disorder (22.2%), depressive disorder due to another medical condition (7.9%), depressive disorder with psychotic features (14.3%) and substance induced depressive disorder (7.9%).

The above data seems to suggest mother's employment status was a predictor of mental health condition especially major depressive disorder among adolescents. The study also examined the relationship between mental health conditions and other socio-demographic characteristics. The chi-square test revealed no statistically significant association between mental health condition and education level ($p=0.101$), religion affiliation ($p = 0.645$), father's employment status ($p = 0.297$), family's economic status (0.741) and family set-up ($p = 0.881$).

| | No Depressive Illness | Depressive Illness | Chi-square | p-value |
|----------------------------|-----------------------|--------------------|--------------|--------------|
| Participant's Age | | | | |
| 14 - 17 | 14 (33.3%) | 28 (66.7%) | 0.451 | 0.501 |
| 18 - 21 | 20 (27.4%) | 53 (72.6%) | | |
| Participant's Sex | | | | |
| Male | 10 (24.4%) | 31 (75.6%) | 0.819 | 0.365 |
| Female | 24 (32.4%) | 50 (67.6%) | | |
| Education level | | | | |
| Secondary school | 9 (56.2%) | 7 (43.8%) | 7.731 | 0.052 |
| College education | 8 (28.6%) | 20 (71.4%) | | |
| University education | 13 (28.3%) | 33 (71.7%) | | |
| Others | 4 (16.0%) | 21 (84.0%) | | |
| Religion | | | | |
| Pentecostal | 17 (29.3%) | 41 (70.7%) | 2.461 | 0.482 |
| Evangelical/ Orthodox | 9 (40.9%) | 13 (59.1%) | | |
| Catholic & Others | 3 (30.0%) | 7 (70.0%) | | |
| Islam | 5 (20.0%) | 20 (80.0%) | | |
| Father's Employment Status | | | | |
| Father Employed | 18 (34.0%) | 35 (66.0%) | 3.462 | 0.326 |
| Father Jobless | 7 (28.0%) | 18 (72.0%) | | |
| Father Self-employed | 9 (30.0%) | 21 (70.0%) | | |
| No Father | 0 (0.0%) | 7 (100.0%) | | |
| Mother's Employment Status | | | | |
| Mother Employed | 9 (52.9%) | 8 (47.1%) | 8.704 | 0.033 |
| Mother Jobless | 18 (28.6%) | 45 (71.45) | | |
| Mother Self-employed | 6 (31.6%) | 13 (68.4%) | | |
| No Mother | 1 (6.2%) | 15 (93.8%) | | |

| Family's Economic Status | | | | |
|--------------------------|------------|------------|--------------|--------------|
| Poor | 3 (10.3%) | 26 (89.7%) | 7.687 | 0.021 |
| Average | 18 (32.7%) | 37 (67.3%) | | |
| Affluent | 13 (41.9%) | 18 (58.1%) | | |
| Family Set-up | | | | |
| Parents Living Together | 23 (43.4%) | 30 (56.6%) | 9.134 | 0.010 |
| Parents Living Apart | 9 (18.8%) | 39 (81.2%) | | |
| Living with a guardian | 2 (14.3%) | 81 (70.4%) | | |

Table 2: Socio-Economic Demographic Distribution with Depressive Illness

Table 2 presents the distribution of socioeconomic demographic characteristics of depressive illness. Participants' age, sex, education level, religion, father's employment status, mother's employment status, family's economic status and family set-up were examined. The distribution of clinical depressive illness among suicidal adolescents aged 14-17 appeared to be higher (66.7%) compared to those with no clinical depressive illness (33.3%). In the same vein, clinical depressive illness was significantly higher (72.6%) as opposed to non-clinical depressive illness (27.4%) among suicidal adolescents aged 18-21. Chi-square analysis revealed no significant difference between depressive illness and the age of the participants ($p=0.501$). The result seems to show that the age of the participants does not predict clinical depressive illness. However, the prevalence of clinical depressive illness is higher among participants aged 18-21 at 72.6% compared to participants aged 14-17 at 33.3%.

In terms of participants' gender and depressive illness, the distribution of clinical depressive illness among male participants appeared to be higher (75.6%) as opposed to non-clinical depressive illness (24.4%). Likewise, among female participants, the proportion of clinical depressive illness seemed to be higher (67.6%) compare to non-clinical depressive illness (32.4%). The results of this study also showed that female adolescents appeared to exhibit higher clinical depressive illness (43.5%) than male counterpart (27%), although, there was no significant difference between clinical depressive illness and participants' sex ($p=0.365$). The result from this study indicates that participants' sex does not predict clinical depressive illness.

Participants' socio-economic demographic characteristics with depressive illness were also examined. The university students among the participants appeared to have higher proportion of clinical depressive illness at 71.7% compared to the 28.3% of the university students who were presenting with no clinical depressive illness. In terms of religious affiliations of the participants, the severity of clinical depressive illness seemed to be higher among Pentecostals (70.7%) compared to other religious affiliations. Among the evangelical/orthodox participants, 59.1% had clinical depressive illness as opposed to 40.9% who did not have. Out of the participants whose denomination was Catholic, 70% had clinical depressive illness while 30% did not. Out of the Islamic suicidal adolescents, 80% were presenting with clinical depressive illness while 20% did not. Pearson's chi-square analysis indicated that there was no significant difference between religion and clinical depressive illness even though the severity of depressive illness was higher among the Pentecostals than other religions ($p=0.482$).

Participants' father's employment status and depressive illness were also examined. The findings showed that the severity of clinical depressive illness was higher among participants whose fathers were employed (66%) as opposed to those who did not have clinical illness (34%). Among the suicidal adolescents whose fathers were jobless, 72% had clinical depressive illness while 28% presented with non-clinical depressive illness. In addition, 70% of those whose fathers were self-employed had clinical depressive illness compared to 30% who did not. Chi-square analysis showed the difference of fathers' employment status to be insignificant ($p=0.326$). However, the severity of clinical depressive illness was higher (66%) compared to the participants whose fathers were jobless (28%). This seems to suggest that the unavailability of fathers as a result of their employment status could cause clinical depressive illness for suicidal adolescents.

The proportion of 71.45% among adolescents whose mothers were jobless had clinical depressive illness as opposed to those who had no clinical depressive illness (28.6%). Participants whose mothers were jobless, or had no mother tended to have clinical depressive illness as opposed to those whose mothers were employed, and the difference was statistically significant ($p=0.033$). Family's economic status was also studied. Participants whose families were poor had the highest proportion (89.7%) of depressive illness compared to their affluent counterparts (58.1%). This means that the lower the family's economic status, the higher the proportion of depressive illness as indicated in the chi-square analysis ($p=0.021$). Participants with parents living apart (81.2%) or participants living with guardians (70.4%) tended to have a higher level of depressive illness as compared to participants living together with both parents (56.6%), and the difference was statistically significant ($p=0.010$). The findings from this study seem to imply that mother's employment status, family's economic status and family set-up are indicators of depressive illness among suicidal adolescents.

| | Non-Pathological suicide Conditions | Pathological Suicide Conditions | χ^2 statistics | p-value |
|----------------------------|-------------------------------------|---------------------------------|---------------------|----------|
| Participants Age | | | | |
| 14 - 17 | 6 (14.3%) | 36 (85.7%) | 0.587 | 0.544 |
| 18 - 21 | 7 (9.6%) | 66 (90.4%) | | |
| Participants Sex | | | | |
| Male | 1 (2.4%) | 40 (97.6%) | 4.994 | 0.030 |
| Female | 12 (16.2%) | 62 (83.8%) | | |
| Educational Level | | | | |
| Secondary | 6 (37.5%) | 10 (62.5%) | 14.629 | 0.002 |
| College | 2 (7.1%) | 26 (92.9%) | | |
| University | 5 (10.9%) | 41 (89.1%) | | |
| Others | 0 (0.0%) | 25 (100.0%) | | |
| Religion | | | | |
| Pentecostal | 5 (8.6%) | 53 (91.4%) | 1.483 | 0.686 |
| Evangelical/ Orthodox | 4 (18.2%) | 18 (81.8%) | | |
| Catholic & Others | 1 (10.0%) | 9 (90.0%) | | |
| Islam | 3 (12.0%) | 22 (88.0%) | | |
| Father's Employment Status | | | | |
| Father Employed | 3 (5.7%) | 50 (94.3%) | 4.140 | 0.126 |
| Father Jobless | 5 (20.0%) | 20 (80.0%) | | |
| Father Self-employed | 5 (16.7%) | 25 (83.3%) | | |
| Mother's Employment Status | | | | |
| Mother Employed | 3 (17.6%) | 14 (82.4%) | 1.223 | 0.542 |
| Mother Jobless | 6 (9.5%) | 57 (90.5%) | | |
| Mother Self-employed | 3 (16.7%) | 15 (83.3%) | | |
| Family's Economic Status | | | | |
| Poor | 2 (6.9%) | 27 (93.1%) | 0.752 | 0.687 |
| Average | 7 (12.7%) | 48 (87.3%) | | |
| Affluent | 4 (12.9%) | 27 (87.1%) | | |
| Family Set-up | | | | |
| Parents Living Together | 8 (15.1%) | 45 (84.9%) | 2.106 | 0.349 |
| Parents Living Apart | 3 (6.2%) | 45 (93.8%) | | |
| Living with a Guardian | 2 (14.3%) | 12 (85.7%) | | |
| Depressive Illness | | | | |
| No Depressive Illness | 10 (29.4%) | 24 (70.6%) | 15.785 | < 0.0001 |
| Depressive Illness | 3 (3.7%) | 78 (96.3%) | | |

Table 3: Socio-Demographic Distribution of the Participants' Suicide Conditions

SBQ-R classified suicide behaviors into two categories. Those who scored ≤ 7 are presenting with non-pathological suicide condition while those who scored ≥ 8 were diagnosed with psychiatric or pathological suicide condition. Table 3

therefore presents the socio-demographic characteristics of the participants such as age, sex, education level, religion, father's employment status, mother's employment status, family's economic status, family set-up and participants' depressive illness. Participants' age showed that 90.4% of the suicidal participants aged 18-21 had psychiatric suicide condition compared to 9.6% who presented with non-pathological suicide condition. Whereas, 85.7% of the participants aged 14-17 had pathological suicide condition as opposed to 14.3% who presented with non-pathological suicide condition. Chi-square analysis showed no significant difference ($p=0.544$). The mean age and suicidal conditions showed $1.6348 \pm SD .48360$ with no statistical significant difference $p=0.448$. These findings suggest that participants aged 18-21 had highest prevalence of psychiatric suicidal behaviors (64.7%) compared to participants aged 14-17 (35.3%).

The majority of male participants exhibited psychiatric suicidal condition at 97.6% while the minority of male adolescents had general suicidal condition at 2.3%. The female participants with psychiatric suicide conditions were 83.8% compared to 16.2% with general suicide condition. However, higher distribution of female participants at 58.8% had psychiatric suicidal tendency as opposed to 39.2% of male participants with psychiatric suicide condition. The chi-square analysis shows the difference between participants' gender and suicide condition to be statistically significant ($p=0.030$). This seems to suggest that gender is a predictor of suicide condition with a higher prevalence among female participants.

The participant's educational level shows that, a higher proportion of university students at 40.2% had psychiatric suicide condition as compared to college students at 25.5%, and others who were not in school at 24.5%. The chi-square analysis indicated that there was a significant correlation between educational level of the participants and suicide conditions ($p=0.002$). The result seems to suggest that the educational level of the adolescents is a predictor of suicide condition statistically.

Table 3 also examined the association between clinical depressive illness and suicide conditions. The proportion of participants that were clinically depressive were 76.5% compared to 23.5% that were not. Statistically, chi-square analysis showed a significant difference between the participants that were clinically depressive and those who were not ($p=0.0001$). This seems to imply that clinical depressive illness is a predictor of suicide conditions. However, the table reveals no statistically significant association between participants' age, religion, father's employment status, mother's employment status and family set-up ($p > 0.05$) but it shows significant association between the respondents' sex, education level, depressive illness and participants' suicidal conditions ($P < 0.05$).

In summary, the findings showed a prevalence of psychiatric suicidal behavior among female compared to male. In addition, the findings indicated participant's sex as a predictor of psychiatric suicidal behaviors and this is statistically significant ($p = 0.030$). Participant's education level appeared to be significantly associated with developing psychiatric suicidal condition among adolescents ($p = 0.002$) and it is more prevalent among university students. Similarly, there was a statistical significance between clinical depressive illness and psychiatric suicidal behaviors ($p=0.0001$). This also implies that clinical depressive illness is a predictor of suicidal tendencies among participants.

| | Suicide Thought | Suicide Plan | Suicide Attempt | | |
|----------------------------|-----------------|--------------|-----------------|--------|-------------------|
| Participants Age | | | | | |
| 14 - 17 | 9 (21.4%) | 16 (38.1%) | 17 (40.5%) | 6.891 | 0.032 |
| 18 - 21 | 14 (19.2%) | 13 (17.8%) | 46 (63.0%) | | |
| Participants Sex | | | | | |
| Male | 7 (17.1%) | 9 (22.0%) | 25 (61.0%) | 0.989 | 0.610 |
| Female | 16 (21.6%) | 20 (27.0%) | 38 (51.4%) | | |
| Education level | | | | | |
| Secondary school | 7 (43.8%) | 4 (25.0%) | 5 (31.2%) | 27.082 | <0.0001 |
| College education | 9 (32.1%) | 8 (28.6%) | 11 (39.3%) | | |
| University education | 7 (15.2%) | 5 (10.9%) | 34 (73.9%) | | |
| Others | 0 (0.0%) | 12 (48.0%) | 13 (52.0%) | | |
| Religion | | | | | |
| Pentecostal | 10 (17.2%) | 15 (25.9%) | 33 (56.9%) | 10.444 | 0.107 |
| Evangelical/ Orthodox | 7 (31.8%) | 9 (40.9%) | 6 (27.3%) | | |
| Catholic & Others | 2 (20.0%) | 2 (20.0%) | 6 (60.0%) | | |
| Islam | 4 (16.0%) | 3 (12.0%) | 18 (72.0%) | | |
| Father's Employment Status | | | | | |
| Father Employed | 9 (17.0%) | 14 (26.4%) | 30 (56.6%) | 4.793 | 0.571 |
| Father Jobless | 6 (24.0%) | 4 (16.0%) | 15 (60.0%) | | |

| | | | | | |
|----------------------------|-----------|------------|------------|-------|--------------|
| Father Self-employed | 8 (26.7%) | 8 (26.7%) | 14 (46.7%) | | |
| No Father | 0 (0.0%) | 3 (42.9%) | 4 (57.1%) | | |
| Mother's Employment Status | | | | | |
| Mother Employed | 6 (35.3%) | 1 (5.9%) | 10 (58.8%) | 7.882 | 0.047 |
| Mother Jobless | 11(17.5%) | 19 (30.2%) | 33 (52.4%) | | |
| Mother Self-employed | 5 (26.3%) | 4 (21.1%) | 10 (52.6%) | | |
| No Mother | 1 (6.2%) | 5 (31.2%) | 10 (62.5%) | | |
| Family's Economic Status | | | | | |
| Poor | 3 (10.3%) | 8 (27.6%) | 18 (62.1%) | 5.687 | 0.224 |
| Average | 12(21.8%) | 17 (30.9%) | 26 (47.3%) | | |
| Affluent | 8 (25.8%) | 4 (12.9%) | 19 (61.3%) | | |
| Family Set-up | | | | | |
| Parents Living Together | 15(28.3%) | 10 (18.9%) | 28 (52.8%) | 6.296 | 0.178 |
| Parents Living Apart | 5 (10.4%) | 16 (33.3%) | 27 (56.2%) | | |
| Living with a guardian | 3 (21.4%) | 3 (21.4%) | 8 (57.1%) | | |

Table 4: Distribution of Participants by Suicidal Behavior Classification

Table 4 presents the distribution of participants by suicide behavior classification. Participants' socio-economic demographic characteristics were examined and the study showed that among the participants who had attempted suicide, 73% were aged 18-21 while 27% were aged 14-17. Similarly, among suicide plan participants, 55.2% were adolescents aged 14-17 compared to participants aged 18-21 at 44.8%. Meanwhile, participants aged 14-17 who only exhibited suicide ideation were 29.1% while 60.9% of participants aged 18-21 only had suicide ideation.

The mean age of suicide behavior classification ($1.6348 \pm (.48360 \text{ SD})$) showed significant difference ($p=0.042$) and chi-square analysis indicated that there was a significant difference between participants' age and suicide behavior classifications ($p=0.032$). This result means that severity of suicide attempt was prominent among participants aged 18-21 at 73% compared to those aged 14-17. The prevalence of suicide plan was among adolescents aged 14-17 as opposed to participants aged 18-21, while frequency of suicide ideation was higher among participants aged 18-21 compared to adolescents aged 14-17. This means that age is a predictor of suicidal behaviors.

Further, distribution of participant's gender was also studied. Out of the participants who had attempted suicide in the past year, 60.3% were female participants while 39.7% were male. Similarly, among the participants who only had suicide plan but had not yet executed the plan, 69% were female while 31% were male. In addition, among adolescents with suicide ideation, the prevalence seemed to be higher among female participants at 69.6% compared to 30.4% of male counterparts. The mean of suicide behavior classifications for gender ($1.6435 \pm (.48107 \text{ SD})$) shows no significant difference to predict suicidal behaviors ($p=0.559$), this also correlates with chi-square analysis that there is no significant difference between participants' gender and suicide behavior classifications ($p=0.610$). This implies that the prevalence of suicide attempt, suicide plan and suicide ideation is higher among females compared to males though the difference was not statistically significant.

Suicide planners had the higher prevalence among others who were out of school as at the time of data collection (41.4%) compared to university students at 17.2%, college students at 27.6% and secondary students at 13.8%. The frequency of suicide ideation was higher among college students (39.2%) compared to secondary school students (30.4%) and university students (30.4%). The mean for educational level of suicidal behavior classifications ($2.6957 \pm (.96585 \text{ SD})$) showed a statistical difference of $p=0.002$ which concurs with chi-square analysis that there was a significant difference between participants' educational level and suicide behavior classifications ($p=0.0001$). This suggests that the educational level of the participants was statistically associated with suicide behavior classifications, especially among university students.

The study also indicated that out of the participants that had attempted suicide in the past a year, 52.4% of were adolescents whose mothers were jobless compared to those whose mothers were employed (15.9%), self-employed (15.9%), and those whose mothers had passed away (15.9%). Among the participants who had suicide plan but were yet to execute the plans, 65.5% were participants whose mothers were jobless, 17.2% were participants who had lost their mothers, while 13.8% were participants whose mothers were self-employed. The remaining 3.5% were participants whose mothers were employed. Similarly, the prevalence of suicide ideation was higher among participants whose mothers were jobless at 47.8% compared to participants whose mothers were employed (26%), self-employed (21.7%) and those who had no mothers (4.3%). The mean for mothers' employment status of suicidal behavior classifications ($2.2957 \pm (.88827 \text{ SD})$) showed a statistical difference of $p=0.014$. This seems to relate with the chi-square analysis that there was a significant difference

between mothers' employment status and suicide behavior classifications ($p=0.049$). This suggests that the mothers' employment status was statistically associated with suicide behavior.

There was no statistically significant association between the participants' religion, father's employment status, and family set-up and suicidal behavior classification ($p > 0.05$). Nevertheless, there were statistically significant associations between age, gender, education level, mothers' employment status and suicidal behavior classification ($P < 0.05$). In other words, the age of the participants was statistically related to suicidal behavior ($p = 0.032$) and this was more profound among participants aged 18-21 compared to participants aged 14-17. Similarly, the education level of the participants was significantly associated with suicidal behaviors ($p = 0.0001$). The prevalence is significantly higher among university students than other educational levels. This means that education level is a predictor of suicidal behavior most especially among university students.

| Suicide ideation | Suicide Threats | | Chi-square | p-value |
|------------------|-----------------|------------|------------|---------|
| | Once | > once | | |
| Less severe | 34 (89.5%) | 4 (10.5%) | 46.826 | <0.0001 |
| Severe | 17 (22.1%) | 60 (77.9%) | | |

Table 5: Relationship between Severe Suicide Ideation and Suicide Threats

Table 5 presents the association between suicidal ideation and suicide threat. The result showed that participants with severe form of suicidal behaviors (77.9%) were more likely to have higher threat of committing suicide compared to those who had less severe form of suicide ideation (22.1%). The inference statistics showed that that the difference was statistically significant ($p < 0.0001$). This implied that participants with brief passing thoughts of suicide are not likely to tell people of their ideation. However, the severe form of suicide behavior such as suicide plan with intent and suicide attempt with intent are more likely to have higher threat than lesser forms of suicide behaviors. This seems to imply that the more frequent the suicide attempts with intent, the more likelihood that the suicide will be completed.

| Frequency | Likelihood of suicide attempt | | Chi-square | p-value |
|--------------------|-------------------------------|------------|------------|---------|
| | Unlikely | Likely | | |
| Sometimes ≤ 3 | 37 (97.4%) | 1 (2.6%) | 34.338 | <0.0001 |
| Often ≥ 4 | 31 (40.3%) | 46 (59.7%) | | |

Table 6: Relationship between Frequency of Ideation and Likelihood of Suicide Attempt

Table 6 presents the respondents' frequency of ideation and its relationship to suicide attempt. The study showed that when frequency of suicide ideation was sometimes less or equal to 3 times at a particular time, the possibility of attempting suicide was unlikely (97.4%) compared to when it was greater or equal to 4 times (2.6%). In the interim, when the frequency of suicide ideation was greater or equal to 4 times at a particular time, the likelihood of attempting suicide was higher (59.7%) as compared to 40.3%. Chi-square analysis was also used to test independence between variables of frequency of suicide ideation and suicide attempt. The finding indicated that participants with higher frequency of suicide ideation had a higher likelihood of suicide attempt and this was statistically significant ($p < 0.0001$). In other words, if the suicide ideation is ≤ 3 times at a particular period, the chances of suicide attempt is unlikely but if the frequency is ≥ 4 times at a particular period, the tendency to attempt suicide is higher. This means that the frequency of suicidal thoughts is a predictor of suicide attempt.

| Threat | Likelihood of suicide attempt | | Chi-square | p-value |
|--------|-------------------------------|-------------|------------|---------|
| | Unlikely | Very likely | | |
| Once | 44 (86.3%) | 7 (13.7%) | 27.940 | <0.0001 |
| > 1 | 24 (37.5%) | 40 (62.5%) | | |

Table 7: Suicide Threat and Likelihood of Suicide Attempt

Table 7 represents the relationship between suicide threat and likelihood of suicide attempt. The findings shows that the participants who made suicide threat once were unlikely to attempt suicide (86.3%). However, the suicidal participants who made suicide threat more than once were very likely (62.5%) to attempt suicide compared to those whose suicide threat was less (37.5%). The chi-square analysis revealed that participants with more frequent threat of committing suicide had a higher likelihood of suicide attempt in the future and this was statistically significant ($p < 0.0001$). This could be interpreted to mean that those who made suicide threat once are not likely to attempt suicide but those who made threat of committing suicide more than once are likely to attempt suicide later in life, and this is statistically significant from this study ($p=0.001$). It can also be deduced that the more frequent the threat of committing suicide, the more the likelihood of suicide attempt, which means that the frequency of threat to commit suicide is a predictor of suicide behavior.

| Suicide behavior | Likelihood of Complete Suicide | | Chi-square | p-value |
|--------------------------|--------------------------------|-------------|------------|---------|
| | Unlikely | Very likely | | |
| Attempter without intent | 47 (90.4%) | 5 (9.6%) | 38.368 | <0.0001 |
| Attempter with intent | 21 (33.3%) | 42 (66.7%) | | |

Table 8: Suicide Attempt and Likelihood of Complete Suicide

Table 8 presents the association between suicide attempts and the likelihood of completing suicide. The distribution of suicide attempts without intent showed that 90.4% of the participants were unlikely to complete suicide as opposed to 9.6% who were very likely to. The participants who have attempted suicide with intent showed higher probability (66.7%) to complete suicide compared to 33.3% who were unlikely to. Inferential statistics using chi-square was used to analyse the relationship between frequency of suicide attempts and likelihood of complete suicide. The findings from the table indicated that respondents with suicide attempt with intent had a higher likelihood of completing suicide in the future and this was statistically significant ($p < 0.0001$). This seems to mean that suicide attempts without intent are unlikely to complete suicide and more so, suicide attempts with intent are very likely to complete suicide. It is therefore deduced from this study that suicide attempts predict complete suicide. The more frequent the suicide attempt, the more likelihood to complete suicide.

4. Discussions

The objective of this study was to examine the indicators of severity of suicidal behaviors and co-existing mental disorders among suicidal adolescents. This was done at determining whether the socio-economic demographic characteristics of the participants, their suicidal behaviors and coexisting mental disorders were correlated. These included the participants' age, sex, education level, religion affiliation, father's employment status, mother's employment status, family's economic status and family set up. The bivariate analysis of the socio-economic demographic attributes showed that there is no association between participants' age and suicide behavior among adolescents ($p = 0.544$). The finding of this study contradicts a recent study which reported age as a significant risk factor to suicide behaviors among Chinese adolescents (Zhai et al., 2015), whereas this study correlates with another study that age does not statistically predict suicide behaviors (Auerbach, Stewart, & Sheri, 2017). However, the proportion of participants between the ages of 18 and 21 was higher (65.5%) than participants aged 14-17. This finding also correlates with another study by Rojas et al. (2015).

Further, the bivariate analysis of suicide behaviors among parasuicidal adolescents indicated that there was a significant difference in participants' gender ($p < 0.030$). Gender according to this study was an indicator of severity of suicide behavior. The prevalence of Female suicidal participants was higher (64.3%) than that of male participants (35.7%). This contradicts a similar research conducted in Kenya where male suicidal participants were found to be higher than the female (Khasakhala, Ndeti, & Mathai, 2013). However, the prevalence of suicide attempts with intent was higher among male participants (66.7%) than the female (33.3%), as indicated in a most recent research (Auerbach, et al., 2017). Additionally, the proportion of suicide plan with intent was also significantly higher among male participants (80%) than female participants (20%), which is in line with another study (Zhai, et al., 2015).

The bivariate statistics showed a significant difference in education level of the participants ($p < 0.002$). This implies that education level was a predictor of suicide among the participants. The proportion was higher among university students than other educational levels among the participants in the study. This finding is similar to research done in Kenya (Wanyoike, 2015) indicating that suicide behavior is significantly higher among university student (Pereira & Cardoso, 2015; Wanyoike, 2015). Further, this study shows statistically that major depressive disorder is a predictor of suicide behaviors among adolescents ($p < 0.0001$). Several other researchers have also reported a similar result (Khashakala et al., 2013; Ndeti et al., 2009; Rihmer, Rihmer, & Dome, 2015).

The result of this research revealed the severity of suicide ideation among participants whose mothers were jobless at 47.8% compared to participants whose mother were employed at 26%, self-employed at 21.7% and those who had mother at 4.3%. This study examined the mean for mothers' employment status of suicidal behavior classification, which showed $2.2957 \pm (.88827 \text{ SD})$ and the p value of 0.014. By implication, the association between mothers' employment status and suicidal behavior classification was found to be related. When the chi-square analysis was conducted, the result showed that there was a significant difference between mothers' employment status and suicide behavior classifications ($p = 0.049$). This findings were in accord with prior research that low family income was a predictor of suicide thoughts (Zhai, et al., 2015) and that parents' unstable work was a predictor of suicide behaviors among adolescents (Bridge, Goldstein, & Brent, 2006). However, the severity of suicide behavior seemed to be insignificant among adolescents whose fathers were employed ($p = 0.571$) compared to the significant level of mothers' employment status ($p = 0.047$). Further investigation may be required to uncover effects of maternal socio-economic instability on adolescents and why fathers' employment status increases the risk of suicide behavior among adolescents.

Furthermore, this study found that participants with severe form of suicidal behaviors were more likely to have higher threat of committing suicide and more so, participants with more frequent threat of committing suicide had a higher likelihood of suicide attempt in the future and this was statistically significant ($p < 0.0001$). Similarly, the findings from this

study indicated that participants with suicide attempt with intent had a higher likelihood of completing suicide in the future and this was statistically significant ($p < 0.0001$). This seemed to indicate that the more frequent the suicide attempts, the more likelihood of complete suicide. This results were congruent with prior researches that reported more than 40% of adolescents who completed suicide have made previous attempts, and attempters were 20 to 50 times more likely to complete suicide. (Borowsky et al., 1991; Cooper et al., 2005; Huang et al., 2014; Wichstrom, 2009). These studies affirmed that previous suicide attempts as predictor to complete.

5. Conclusion

This study examined indicators of suicide behaviors and co-existing mental health disorders among adolescents at Federal Neuropsychiatric hospital, Kappa-Lagos, Nigeria. The results showed that depressive illness is a basic predictor of adolescent suicidality and mother's employment status was revealed to be a predictor of mental health conditions especially major depressive disorder among adolescents. The result also indicated that gender, education and mother's employment status were indicators of suicide behavior among the participants. Additionally, higher frequency of suicide ideation was discovered to be a predictor of suicide attempt. The results also indicated that suicide attempt with intent had a higher likelihood of completing suicide in the future. Moreover, suicide attempts were reported to predict complete suicide. The more frequent the suicide attempt, the more likelihood to complete suicide.

6. Recommendations

Sequel to the above mentioned findings, this study therefore recommends the followings to curtail this endemic phenomenon among adolescents;

- Since suicide behaviors are widespread among students as early as 14 years (Junior Secondary Schools) and across university levels, the Federal Ministry of Education in Nigeria and Africa at large needs to come up with holistic prospectus that would cater not only for academic needs of adolescents but their psychosocial needs as well.
- The Federal Government of Nigeria should consider, as a matter of urgency, the need to employ clinical psychologists or professional counselling psychologists in all schools so as to meet the psychosocial needs of students, as mentioned above.
- There is a need for the Ministry of Health to have wide-ranging consultations with clinical psychologists, psychiatrists and medic personnel to come up with suicide prevention strategies that are implementable across our institution of learnings
- Special orientation and awareness through media houses and electronic social medial platforms is needed through the Ministry of Social and Family Development (MSF) and Non-Governmental Organizations (NGOs) to foster family interconnections and functionalities. This is pertinent because dysfunctional family, family set-up, mothers' employment status and family life have been noted to be strong disposing factors of adolescent suicide.
- Because economic hardship is distressful to the family and eventually triggers suicide behaviors among adolescents, the National Economic Management team (NEM) in Nigeria should pursue policies that would bring about national economic recovery and stability. This is because economic hardship on the part of parents and family life makes adolescents vulnerable to self-harm and suicide behaviors.

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