FACTORS AFFECTING THE SUICIDAL BEHAVIOR OF ADOLESCENTS WITH MAJOR DEPRESSIVE DISORDER. A RETROSPECTIVE STUDY

Kasiane Lynn H. Campo, MD, Davao Doctors Hospital, Davao City, Philippines.

Background: Adolescent depression, a cause of illness for boys and girls aged 10-19 years old in the Philippines, remain underrecognized leading to adverse outcomes including suicide. Studies on its epidemiology, which may help pediatricians detect this disorder, provide immediate care and promote control and preventive strategies, are scarce thus gaps in the understanding remain.

Objective: To determine the factors affecting the suicidal behavior of adolescents ages 10-18 years old with Major Depressive Disorder(MDD) admitted in a tertiary hospital in Davao City

Design: Retrospective Cross-Sectional Design.

Setting: Ten-year study conducted in a private tertiary hospital in Davao City

Participants: Medical charts of 30 adolescents admitted from January 2010-January 2020 diagnosed with MDD.

Main Outcome Measures: Fisher's Exact Test and Baptista-pike method were used to analyze association between socio-demographic profile, stressors and history of suicide attempt. Poisson Regression Analysis was used to determine association between socio-demographic profile, stressors and number of suicide attempt.

Results: Among 30 adolescents, females predominated and average age was 16.23±1.76. Majority had normal BMI, studied in private schools and were Roman Catholics. Equally, adolescents lived with both parents or with one parent with their mother as primary caretaker. Majority inhibited themselves from substance use. Peer rejection was the most common identified stressor followed by patient-parent fighting, loss of a parent/loved one, school teasing/bullying and inability to cope in school. All cases had suicidal ideation and majority were males with at least one suicide attempt. Wound infliction was the most common manner of suicidal attempt. None had a completed suicide.

Conclusions: No significant associations were found between the socio-demographic profile and stressors with the history and number of suicide attempts among adolescents with major depressive disorder. However, those with inability to cope in school had 3 times the risk of suicide attempt.

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INTRODUCTION

Background of the Study

Depression, as defined by the World Health Organization (WHO), is a common mental disorder, characterized by sadness, loss of interest or pleasure, feelings of guilt or low self-worth, disturbed sleep or appetite, feelings of tiredness and poor concentration. It can be long lasting or recurrent, substantially impairing a person's ability to function at work or school, or cope with daily life. At its most severe, depression can lead to suicide.[1]

Being one of the most common diagnoses made by mental health professionals, depression is now a global threat.[2] In today's population, it is prevalent and is perceived to have a considerable impact in one's development and well-being.[3] Among adolescents worldwide, depression is becoming a common mental disorder.[4] According to Borrilo et.al., the lifetime prevalence of depression starting in adolescence is 15%-25%[5] with a noted recurrence rate of 60%-70%.[6] In the United States, an estimated 3.1 million adolescents aged 12-17 had at least one major depressive episode.[7] In India, a study confirmed that one in every five Indian adolescents are suffering from depression.[8] Specifically, in Mangalore City where out of the 308 pre-university participants, depression was seen among 79.2% students, majority of whom were found to be suffering from moderate depression at 41.2%.[9,10] In China, 47.5% out of 203 Chinese International Students are suffering from depression.[11]

The Philippines is not spared by the problem other countries have been facing. A clear statistic on depression in the country was reported in 2014 by the WHO which showed that depression is the predominant cause of illness and disability for both boys

and girls aged 10 to 19 years old in the Philippines.[12] Mental disorders such as depression describes a wide range of emotional lows, from mere sadness to a pathological state that may possibly contribute to unintentional and intentional injury, including suicide.[13] Of the students surveyed by the Global School-based Student Health Survey, 42% had felt sad or hopeless for two weeks or more in the past year, 17.1% had seriously considered committing suicide in the last year and had made plan about how they would commit suicide.[14]

According to Barbe et. al., there is a robust link between adolescent depression and suicide.[15] Several studies have claimed that Major Depressive Disorder (MDD) is among the most powerful and significant predictors of suicidal ideation and suicide attempts in adolescents,[16-18] making suicide one of the most significant sequels of depression.[19] The longitudinal study done by Kovacs, et.al., showed that about 60-70% of youth with depression have suicidal ideation and 13-39% have suicide attempts.[17]

Although in most cases, some relationship between depression and suicide seems apparent, it is by no means direct. Such that in adults, most depressive adolescents are not suicidal, and many suicidal adolescents are not depressed.[20] However, of all forms of psychopathology, depression has been the most resiliently and consistently associated with suicidality.[21] Shaffer et. al., claimed that MDD is the most significant risk factor for suicide deaths among girls, suggesting an estimate of 20-fold increase in risk and among boys, it is the second most potent predictor of suicide, following prior attempts.[22] In the psychological autopsy studies done by Brent et.al., up to 60% adolescent suicide victims have a depressive disorder at the time of death[23]. Comparably, the study of Goldston et.al., revealed that at the time of attempt, a high proportion of teens with suicidal ideation or attempt (40-80%) meet the criteria

for depression.[24] Attempt of suicide among the youth poses a risk of negative outcomes, including repeat suicide attempts, substance use, school problems, misdemeanor and death by suicide.[22] Thus, it is imperative that depression in adolescents be accurately diagnosed and treated to prevent suicide in this population.[25]

Studies of depression and suicidality have been under taken in the past few decades but gaps still remain in our understanding of the epidemiology of adolescent depression and suicidality, both currently and on a national level. At present, there is no published study on the profile of adolescents with major depressive disorder and suicidality in the hospital setting. In an area where psychiatrists are sometimes inaccessible, recognition of the profile and probable factors for making adolescents at risk for depression and suicidality may help health care practitioners, particularly pediatricians, detect this disorder and provide immediate care as well as promote preventive and control strategies until psychiatrists are in the midst. Thus, the researcher is prompted to conduct this study.

REVIEW OF RELATED LITERATURE

Depression and Adolescent Vulnerability

Depression, as defined by Thaper et. al., is a cluster of specific symptoms with associated impairment and its features are somewhat similar with adolescents and adults.[26] The international Classification of Diseases (ICD-10) and the American Diagnostic and Statistical Manual of Mental Disorders IV (DSM-IV), the two main classification systems, define depression similarly only that in the DSM IV, irritable rather than depressed mood is allowed as a core diagnostic symptom for children and adolescents.[27] According to Maharaj, et.al., it should also be considered when a previously well-performing youth does poorly in school, withdraws from society or displays acts of delinquency and senseless behavior. However, these symptoms are often associated with rebelliousness and may be seen by the family as a normal and temporary stage of the adolescent's development. [28] In addition, there is prominence of irritability, mood reactivity and fluctuating symptoms in adolescents.[29] As such, adolescent depression is more often unnoticed until crisis occurs.[28] Other more classic symptoms in adolescent depression include a sad countenance, reduced capacity for pleasure, feelings of rejection and being unloved, weight loss or gain, persistent self-blame and suicidal intention.[28]

In most studies, the prevalence of depression is less than 1% among children[30] then a significant upsurge is observed throughout adolescence.[31] The study of Cyranowksi et.al., showed no sex predilection of depression before adolescence. However, it becomes twice as common in girls than in boys after the onset of puberty.[32] This post-pubertal rise in depression could be explained by many factors because adolescence is a developmental period with prominent biological and social

changes.[33] According to Blakemore, puberty, brain and cognitive maturation are the most common proposed contributors which, included enhanced social understanding and self-awareness, changes in brain circuits involved in responses to reward and danger and increased reported stress levels especially in girls.[34] This was also supported by Patton, saying that puberty is a key development accompanied by significant physical growth, neurologic changes, peak levels of sex hormones and changes in social roles.[35]

*Gender Differences***:** The study of Susman et.al., noted that the time available for children to acquire, conform and strengthen adaptive and coping skills was curtailed by early maturation, putting early maturing adolescents at risk for adjustment difficulties.[36] Among girls, early maturation is believed to have a negative psychological impact thus those with early pubertal timing are more vulnerable to stressors.[37] During the time of puberty, the increase in gonadal sex steroids has also been associated with mood and behavioral problems as observed by Angold et.al.,[38] Estradiol increase in girls is believed to make them more sensitive to negative psychological effects and as observed, estrogen might promote depression while testosterone provide protection against it.[39] The evidence is less consistent among boys as observed by Mendle et.al., because the biological processes and social changes during puberty differ according to gender, the mechanisms relevant to girls might be irrelevant to boys.[40] The onset of puberty is less obvious, and the evidence concerning depressive symptoms is limited among the males.[41] A previous study among Chinese adolescents reported that early maturation in girls, but not boys, was coupled with more depressive symptoms.[42] Even though depression is generally more common in girls, to recognize it in boys is especially important.[43]

Although immense opportunities for the youth are offered by such maturational transitions, since the brain development, behavioral and cognitive systems mature at different rates, this development period is disfigured by heightened vulnerability.[44] According to Rudolph et.al., the normative development transitions associated with adolescence might serve as sensitive events for the activation of specific processes involved in the onset, persistence, and recurrence of depressive episodes.[45]

*BMI and adolescent depression***.** Major depressive disorder (MDD) and obesity are said to be associated, according to Butryn. et.al.[46] A reliable predictor of depression is body dissatisfaction of which BMI is the most common factor linked to it.[47] In a cross sectional study by Goldfield et al., among school youth, those with obesity reported high body dissatisfaction and greater depressive symptoms.[48] The National Health and Nutrition Examination Survey (NHANES) showed the prevalence of major depression in 20% to 30% of adolescents with obesity,[49] and high rates of peer victimization or bullying were reported by them and victimization is a predictor of depression.[50-52] In addition, there is a biological link, as emphasized by Luppino and colleagues, of which between overweight, obesity and depression, obesity is seen as an inflammatory state leading to elevated pro-inflammatory cytokines which serve as a mediator for both environmental and genetic factors triggering depression disorder development.[53-55]

Interpersonal Relationships: It was emphasized by Bowbly, that social, environment and the development of secure attachment are important. Vulnerability to depression presumably arises in early family environments in which the children's needs for security, comfort, and acceptance are not met.[56] Several literatures on the relationship between family environment and depression indicate that depressed individuals have families that are characterized by problems with attachment,

communication, support and escalating adolescent-parental conflict, as well as poor child-rearing practices.[57,58] Moreover, perceived rejection by peers, family, and teachers, loss of a loved one or a parent predicts an increase in depressive symptoms in adolescents.[59]

Stress and Depression: In most theories of depression, stress plays a prominent role. A clear empirical link exists between stress and depression adolescents.[60] Although no single or specific type of stressful event leads to depression, certain types of negative events have been consistently found to be associated with depression: child abuse/neglect, especially for women, socioeconomic disadvantage, personal disappointments, failures, and losses, and interpersonal problems for eample.[61] According to Ge et.al., the relationship between stress and depression appears to be stronger in adolescents than in children, particularly in girls. However, identified reasons for this are not entirely clear but hormonal effects, consolidation of cognitive styles, cumulative stress burden, and stress reactivity might have a potential role.[62]

Profile Studies on Adolescent Depression. In the study done by Singh et.al., of the 542 children studied, 7.6% were found to have major depressive disorder, adolescent males outnumbered females and among the population 6.9% were overweight and 52.5% were studying in private schools.[63] Moreover, the study by Maharaj et.al., revealed that the prevalence of depression was 25.3% ± 2.37% among the 1290 students. 70.6% lived with both parents. Analysis showed that there are significant associations between depression and the categories of living arrangements and school type. Adolescents who were not living with both parents were 1.5 times as likely to be depressed; afraid of parents or being injured by parents were 3 times as likely to be depressed too as opposed to those who didn't experience it.[64] In addition,

significantly higher prevalence of depression was seen among those with the presence of financial constraints in the family, lack of supportive environment in school, lack of satisfaction of self with academic performance, and having a girlfriend/boyfriend. Other factors such as age group and gender, use of substance, level of play activity in the school, support and motivation by parents and teachers, attitude of parents towards future of children, parental satisfaction with academic performance, bullying at school, peer pressure did not emerge as associated factors for depression.[63]

In the Philippines, the study by Lee et.al., in 2,436 students aged 16-18 years old found that 6 of the 11 factors analyzed were significantly associated with more intense levels of depressive symptoms, namely: frequency of smoking, frequency of drinking, not living with biological parents, dissatisfaction with one's financial condition, level of closeness with parents, and level of closeness with peers while sex, age category, course category, year level and religion were not significantly related. Thus, in identifying adolescents with greater risk for depression, characteristics related to lifestyle, financial condition, parents and peers are crucial.[65]

Suicidality among Adolescents: Worldwide, suicidal behavior among adolescents is now a notable public health problem.[66] In 2016, an estimate of 62,000 adolescents died as a result of self-harm.[67] It is the third leading cause of death among adolescents in the United States and the second in European countries.[68] Epidemiologic surveys indicate that such acts occur more frequently than suggested by hospital statistics.[69,70] There has been a rise of suicide among adolescents. In 1998, the rates were 14.6 per 100,000 in boys and 2.9 per 100,000 in girls ages 15-19 years old.[71] Philippine statistics is unclear, a study done by Nepomuceno et.al., in Philippine General Hospital, there was increase adolescent suicide cases from 35.8% and 26%

in 2003 -2004 to 41.7% and 58.4% in 2005-2006.[72] In addition, higher rates were noted among late adolescents than those of the early ones.[73] Three general reasons were cited on a comparative study by Groholt et al., First, they have less stress and are exposed to fewer precipitants and risk factors influencing suicidal behavior. Second, they are more resilient and have a higher threshold before the risk factors lead to suicide and third, the level of maturity is not yet reached as it requires planning and acting out of a suicidal act.[74]

Risk Factors and the Adolescent Suicidal Behavior: Included in the spectrum of suicidal behavior are suicidal ideation, suicide attempts and deliberate self-harm behavior that ranges from fatal acts, (completed suicide) high-lethality and failed attempts to low-lethality outcomes[75] thus, it is critical that one may be distinguished from the other.[76] One of the recent models of suicidal behavior, the Integrated Motivational- Volitional (IMV) Model, emphasized the biopsychosocial context where suicidal ideation may develop, highlighting that the milieu constituting it are vulnerability and stressful life events. The presence of moderators such as having access to means of suicide, increased capability to attempt suicide, exposure to suicide, and feelings of impulsivity are said to be factors that allow transition from suicidal ideation to behavior.[77] Factors associated with suicidal phenomena in adolescents include: psychiatric, psychosocial and environmental and familial domains.[78,79] Among the psychiatric disorders, depression remains the most prevalent in adolescents who commit suicide ranging from 49% to 64% and is a proximal factor in the transition of suicidal ideation to suicidal attempt.[80,81] For young suicides, vulnerability factors have included social and environmental domains such as recent disciplinary crisis, interpersonal loss like peer rejection, bullying, school difficulties and presence of recent stressful life events such as romantic difficulties,

substance use like alcohol and smoking.[82,83] The perceived causal role of family factors in influencing vulnerability of the adolescent to suicide has showed that parental divorce, loss of parent, impaired parent-child relationship, poor communication with mother or father, weakened parental support and living away from either parent is associated with increased risk for adolescent suicidality.[16,84,85] There are no tests available to identify a suicidal person and this specific risk factors exist thus, must be carefully interpreted since they are common, and suicide is infrequent. More importantly, the lack of most risk factors does not make an adolescent safe from suicide.[86] In the Philippines, a study on suicidal ideation of school going adolescents showed that the prevalence of suicidal ideation among 5,290 adolescents was 17.1% (21.8% among females and 12% among males) with those aged less than 14 years old less likely to commit suicide. Characteristics of those who contemplated the act were lonely, had no close friends, were bullied, reported smoking and abusing alcohol. It was also found that those who had parental understanding and privilege of parental care were 17% less likely to contemplate committing suicide.[87]

Suicide among Depressed Adolescents: The association between Major Depressive Disorder (MDD) and suicidal behavior has been well documented.[88] Among all forms of psychopathology, depression has the strongest link to suicidality with rates reaching to 58% and 60% in 2 psychological autopsy studies of adolescent.[89] Among girls, MDD is the most significant factor for suicide deaths with estimates suggesting a 20-fold increase in risk. On the other hand, among boys, it is the second most powerful predictor of suicide, following prior attempts. [22]

However, Apter et.al, raised that not all suicidal ideation or behavior is directly attributable to depression.[90] But since depression was found to be the most frequently reported factor associated with adolescent suicide, an examination of such factor and

interpretation of its relationship to other risk factors are vital. This finding supports the notion that depression should probably be considered as a general factor.[91]

According to several studies, adolescent suicides are often preceded by stressful events and their failure to adapt to them. This is consistent with the diathesis-stress model, which hypothesized that stressful events are precipitating factors for youth who are already at risk of attempting suicide due to their psychiatric symptoms.[22,75,82] In studies of suicidal behavior among depressed youth, the identified precipitating stressors include low parental support, living in a non-intact household, absence of father in the home, peer rejection, loss of parent or serious bereavement, romantic break-up, lack of close friends, school difficulties, bullying, alcohol, cigarette and drug use.[15,19,79,90, 92,93]

Methods of Suicide: In the United States in 2013, the identified methods of suicide among adolescents 15-19 years old were suffocation(43%), discharge of firearms (42%), poisoning (6%) and falling (3%).[86] In contrast to the study of Andrews., et al., the leading means of depressed adolescents committing suicide were through ingesting pills, cutting wrists both at 36%, followed by asphyxiation and jumping off a building. This was further supported by Apter et.al., where ingestion of pills (54.4%) and cutting (13.2%) were identified as the means of suicide attempt among hospitalized depressed adolescents, which were linked with the availability of lethal medications or instrument for wound infliction at home.[90]

Significance of the Study

The transition period from childhood to adulthood is a stage marked by emotional instability that makes adolescents vulnerable to depression. Major Depressive Disorder (MDD) can have far-reaching effects to individual affecting their emotional, interpersonal and social relationships. The study can contribute to the

important academic data in the medical field by providing information on the socio-demographic profile and stressors on individuals with MDD. As well as its association with their suicidal behavior.

With the result of the study, primary health clinicians, especially pediatricians who have the initial encounter with the adolescent population can be able to recognize and understand possible dynamics on the suicidal behavior of an individual with MDD. This will serve as a concrete basis in developing preventive and control strategies to efficiently address adolescents with Major Depressive Disorder and most importantly negate suicide.

OBJECTIVES

General objective: To determine the factors affecting the suicidal behavior of adolescents ages 10-18 years old with Major Depressive Disorder admitted in a tertiary hospital in Davao City from January 2010 to January 2020.

Specific objectives :

1. To describe the sociodemographic profile of the adolescents with Major Depressive Disorder according to
    a. Age
    b. Sex
    c. Body Mass Index (BMI)
    d. School
    e. Religion
    f. Living arrangement
    g. Primary caretaker
    h. Substance use

2. To determine stressors of the adolescents with Major Depressive Disorder in terms of:
    a. Teasing/bullying at school
    b. Inability to cope in school
    c. Loss of parent/loved one
    d. Feeling of neglect
    e. Patient-parent fighting
    f. Parental fighting
    g. Peer rejection
    h. Fight with boyfriend
    i. Chronic illness
3. To determine the suicidal behavior profile of the adolescents in terms of
    a. suicide ideation
    b. history of suicide attempt
    c. number of suicide attempts
    d. manner of suicide attempt
    e. completed suicide
4. To determine the association between socio-demographic profile and history of suicide attempt among the adolescents with Major Depressive Disorder
5. To determine the association between stressors and history of suicide attempt among the adolescents with Major Depressive Disorder
6. To determine the association between socio-demographic profile and number of suicide attempt by the adolescents with Major Depressive Disorder
7. To determine the association between stressors and number of suicide attempt by the adolescents with Major Depressive Disorder

Operational Definition of Terms

A. Adolescent - pediatric patient aged 10-18 years old

B. Major Depressive Disorder – diagnosis based on a structured clinical interview and DSM V assessment of the psychiatrist

C. Suicidal Behavior Profile– includes suicidal ideation, history of suicide attempt, number of suicide attempt, manner of suicide attempt and completed suicide

Conceptual Framework

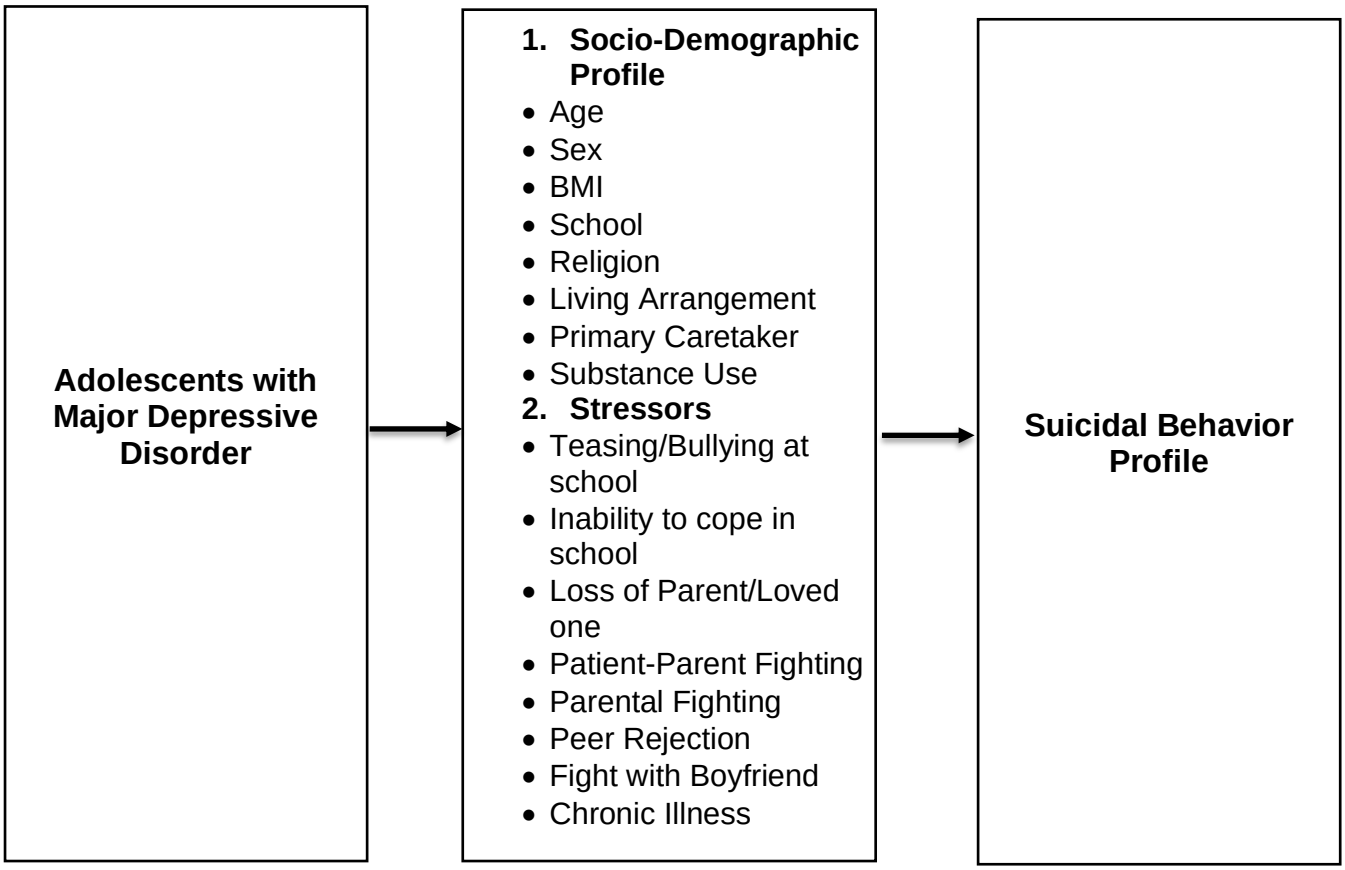

Figure 1. Conceptual Framework of the Study

METHODOLOGY

Study Design:

A retrospective cross-sectional study design was employed in this study.

Study Setting and Population

The study was conducted in a tertiary Hospital in Davao City. Medical charts of adolescent patients, 10-18 years old were retrieved based on the following inclusion and exclusion criteria:

Inclusion Criteria

- Adolescent patients 10-18 years old
- Confirmed Diagnosis of MDD by a psychiatrist
- Admitted from January 2010 to January 2020

Exclusion Criteria

- Patients with other psychiatric diagnosis

Sampling Design

Complete enumeration was used where all individuals who fulfilled the inclusion criteria were included in the study.

Data Collection

Upon approval of the department's research committee and Hospital Ethics Review Board**,** a letter was sent to the medical director and head of the medical record

section (Appendix 1) for permission to access the charts of those who satisfied the inclusion criteria. The following data were obtained: demographic profile (age sex, Body Mass Index, school, religion, living arrangement, primary caretaker and substance use), suicidal behavior profile (suicide ideation, history of suicide attempt, number of suicide attempt, manner of suicide attempt and completed suicide) and their stressors (teasing/bullying at school, inability to cope in school, loss of parent/loved one, feeling of neglect, patient-parent fighting, parental fighting, peer rejection, fight with boyfriend, chronic illness).

Statistical Analysis

Descriptive Statistics utilizing frequency and percentage were used to reflect the socio-demographic, stressors and suicidal behavior profiles of the qualified participants. Mean and Standard Deviation were used in the analysis of age. To determine the association and risk ratios between socio-demographic profile and stressors with the history of suicide among the adolescents with Major Depressive Disorder, Fisher's Exact test statistics with Baptista-pike method were used for sex, BMI, school type, living arrangement, primary caretaker and simple binary logistic regression for age.

Poisson Regression Analysis was used to determine the factors that would significantly predict the number of suicide attempt of the adolescents. Body Mass Index was categorized as Normal and Otherwise (Overweight and Obese), Private and Public for school type. The primary caretaker was also recoded with two categories; those who were taken cared by mothers and otherwise (Auntie/Father/Grandparents), and Roman Catholic and otherwise for the religion. For the stressors, the variables were also recoded into parental related problem, problem

at school/peer rejection and loss. The effect size was expressed as estimated attempts in 95% confidence interval. All analyses were done using SPSS version 22.

Ethical Consideration

This study was retrospective in nature where it only involved the use of secondary data via medical chart review of the qualified patients. The ethical risks associated in this study may include the mismanagement of the chart, wherein the patient's identity may be inadvertently revealed in the final report. Thus, the researcher ensured due diligence to take measures in protecting the privacy of the individuals whose charts were reviewed.

Confidentiality

To protect the confidentiality and identity of the patients during the data gathering procedure, the names of the qualified patients were deleted and Hospital Registry Numbers were used as a unique code identification. All files associated with the research were secured in a cabinet and only the researcher and statistician accessed the data. No individual identities were used in any reports or publications resulting from the study.

Extent of Use of Study Data

There were no other plans on the use of data aside from what was stated in the objectives of the study.

Authorship and Contributorship

The primary proponent of this study was also the main author and researcher. The consultants under the Department of Pediatrics of a tertiary hospital guided the researcher in order to direct the study in correct course. A copy of the entire text of this research was submitted to the committee.

Conflict of Interest

The primary author declared no conflict of interest in this study.

Publication

The researcher acknowledged that this study may be used by the institution for publishing in the local and international conferences and or publications when needed.

RESULTS

A total of 30 charts were retrieved from January 2010 to January 2020. Majority of the cases were females in 70% and males in 30%. The average age was 16.23±1.76. Majority of the adolescents had normal body mass index in 66.6% of cases while the recorded obese and overweight adolescents were 23.33% and 10% respectively. (Table 1)

Table 1. Socio-Demographic Profile of Adolescents with Major Depressive Disorder

PROFILE	n=30
SEX	
Female	21 (70.0)
Male	9 (30.0)
AGE (in year±SD)	16.23±1.76
BODY MASS INDEX	
Normal	20 (66.67)
With Obesity	7 (23.33)
Overweight	3 (10.00)
SCHOOL	
Private	23 (76.67)
Public	6 (20.0)
Out of School	1 (3.33)
LIVING ARRANGEMENT	
Living with both parents	12 (40.0)
Living with one parent	12 (40.0)
Not Living with parents	6 (20.0)
PRIMARY CARETAKER	
Mother	20 (66.67)
Auntie	5 (16.67)
Father	4 (13.33)
Grand Parents	1 (3.33)
SUBSTANCE USE	
None	22 (73.34)
Alcohol	3 (10.0)
Alcohol and Cigarette	3 (10.0)
Alcohol and Drugs	1 (3.33)
Alcohol Cigarette and Drugs	1 (3.33)
RELIGION	
Roman Catholic	26 (86.66)
Protestant	2 (6.68)
Christian	1 (3.33)
Pentecostal	1 (3.33)

Most of the adolescents were from private schools (76.67%). Forty percent of the patients were living with both their parents, another 40% of them were living with one of their parents while 20% of them were not living with either of their parents. Majority of the adolescents (66.67%) had their mother as their primary caretaker while the other adolescents were taken cared by either their auntie(16.67%) or their father (13.33%). Most of the cases inhibited themselves from substance use (73.34%). Ten percent of the adolescents had alcohol use and another 10% had both cigarette and alcohol use. There were 3.33% adolescents who had both alcohol and drug use and another 3.33% of the cases who had alcohol, cigarette and drug use. Majority of the adolescents were Roman Catholic at 86.66% while 13.34% of the cases were from the other denominations.(Table1)

Peer rejection (27.12%) was the most common stressor identified by the subjects as opposed to patient-parent fighting (18.64%). There were also adolescents who were challenged by loss of a parent/loved one (15.25%), teasing/bullying at school (15.25%), inability to cope in school (6.78%) and parental fighting (6.78%). In addition, there were those who felt neglected (5.08%), had a chronic illness (3.39%) and had a fight with boyfriend (1.69%). (Table 2)

Table 2. Stressors of Adolescents with Major Depressive Disorder

STRESSORS	**n=63**
Peer Rejection	16 (27.12)
Patient-Parent Fighting	11 (18.64)
Loss of Parent/Loved One	9 (15.25)
Teasing/Bullying at School	9 (15.25)
Inability to Cope in School	4 (6.78)
Parental Fighting	4 (6.78)
Feeling of Neglect	3 (5.08)
Chronic Illness	2 (3.39)
Fight with boyfriend	1 (1.69)

All of the 30 cases had suicidal ideation and 61.9% of the adolescents had attempted suicide at least once. Wound infliction (41.37%) and drug overdose (34.48%) were the two most common manners of suicidal attempts identified. None of the adolescents had a completed suicide. (Table 3)

Table 3. Suicidal Behavior Profile of Adolescents with Major Depressive Disorder

PROFILE	n=30
SUICIDAL IDEATION	
Yes	30 (100.0)
No	0 (0.0)
HISTORY OF SUICIDE ATTEMPT	
Yes	21(70.0)
No	9 (30.0)
NUMBER OF SUICIDE ATTEMPTS	
1	13 (61.90)
2	8(38.10)
MANNER OF SUICIDE ATTEMPTS	
Wound Infliction	12 (41.37)
Drug Overdose	10 (34.48)
Substance Intoxication	4 (13.80)
Attempted to Jump (Building)	2 (6.90)
Chemical Ingestion	1 (3.45)
COMPLETED SUICIDE	
Yes	0(0.0)
No	30(100.0)

There was no significant association between the socio-demographic profile and the history of suicide attempts among adolescents with major depressive disorder. However, higher odds of suicide attempts were observed among adolescents with MDD who were males, overweight studied in private schools, do not live with their parents and those who engaged in substance use. (Table 4)

Table 4. Association of Socio-demographic Profile and History of Suicide Attempt among Adolescents with Major Depressive Disorder

SOCIO-DEMOGRAPHIC PROFILE	HISTORY OF SUICIDE ATTEMPT				
	YES	NO	*p**	OR	95% CI
SEX					
Male	13 (14.7)	8 (6.3)	.166	4.923	.515-47.071
Female	8 (6.3)	1 (2.7)			
AGE	16.57	15.44	.113	1.472	.912-2.374
BODY MASS INDEX					
Normal	13 (14.0)	7 (6.0)	*Ref.*		
With Obesity	6 (4.9)	1 (2.1)	1.00	1.077	.109-17.62
Overweight	2 (2.1)	1 (0.9)	.633	3.231	.429-41.76
SCHOOL TYPE					
Private	16 (15.86)	7 (7.13)	.756	1.291	.257-6.471
Public	4 (4.13)	2 (1.86)	1.00	.875	0.418-5.462
Out of school	1 (0.7)	0(0.3)	1.00	[b]	[b]
LIVING ARRANGEMENT					
Living with both parents	8 (8.4)	4 (3.6)	*Ref*.		
Living with one parent	8 (8.4)	4 (3.6)	1.00	1.00	0.212-4.717
Not living with parents	5 (4.2)	1 (1.8)	.418	2.50	0.212-35.98
PRIMARY CARETAKER					
Mother	13 (14.0)	7 (6.0)	.356	1.645	.572-4.730
Others	8 (7.0)	2 (3.0)			
SUBSTANCE ABUSE					
Yes	7 (5.6)	1 (2.4)	.231	4.00	.414-38.649
No	14 (15.4)	8 (6.6)			
RELIGION					
Roman Catholic	17 (18.2)	9 (7.8)	.287	.654	.494-.8657
Protestant	4 (2.8)	0 (1.2)			

Observed (Exp. Count); * Significant at .05 alpha level [b] *cannot be determined*

There was no significant association between the stressors and the history of suicide attempts among adolescents with major depressive disorder. However, adolescents with MDD who had inability to cope in school had 3 times the associated risk of suicide attempt. (Table 5)

Table 5. Association of Stressors and History of Suicide Attempt among Adolescents with Major Depressive Disorder

STRESSORS		History of Suicide Attempt		*p**	OR	95% CI
		Yes	No			
Teasing/ bullying at school	Yes No	6 15	3 6	1.00	1.071	0.627 – 1.83
Inability to cope in school	Yes No	1 20	3 6	0.069	3.077	0.556 – 17.019
Loss of parent/Loved one	Yes No	7 14	2 7	0.681	0.857	0.54 – 1.36
Feeling of neglect	Yes No	3 18	0 9	0.534	0.667	0.51 – 0.87
Patient-parent fighting	Yes No	10 11	3 6	0.691	0.841	0.53 – 1.33
Chronic Illness	Yes No	1 20	1 8	0.517	1.429	0.35 – 5.83
Parental fighting	Yes No	2 19	1 8	1.00	1.05	0.457 – 2.437
Peer rejection	Yes No	11 10	4 5	1.00	0.909	0.568 – 1.455
Fight with boyfriend	Yes No	1 20	0 9	1.00	0.69	0.54 - 0.88

**Exact significance; Significant at .05 alpha level*

Poisson Regression analysis showed no significant association between the socio-demographic profile and the number of suicide attempts by adolescents with major depressive disorder. (Table 6)

Table 6. Association of Socio-demographic Profile and Number of Suicide Attempts by Adolescents with Major Depressive Disorder

PROFILE	p	Estimated Attempts	95% CI
Sex	.636	1.241	.507 - 3.037
Age	.091	1.263	.963 - 1.656
Body Mass Index	.174	1.472	.843 - 2.570
Living Arrangement	.836	1.096	.462 - 2.602
School type	.316	.627	.252 - 1.560
Primary Caretaker	.458	1.309	.643 - 2.665
Substance use	.248	1.864	.648 - 5.360
Religion	.289	.532	.166 - 1.709

Significant at .05 alpha level

Likewise there was no significant association between the stressors and the number of suicide attempts by the adolescents with major depressive disorder. (Table 7)

Table 7. Association of the Stressors and Number of Suicide Attempts by Adolescents with Major Depressive Disorder

STRESSORS	p	Estimated Attempts	95% CI
Teasing/ bullying at School	.995	.998	.573 - 1.739
Inability to cope at school	.072	.485	.221 - 1.065
Loss of parent/ Loved one	.976	.991	.539 - 1.822
Feeling of neglect	.213	1.662	.747 - 3.699
Patient-parent fighting	.380	1.272	.744 - 2.175
Chronic Illness	.432	.650	.222 - 1.906
Parental fighting	.260	.635	.289 - 1.400
Peer rejection	.585	1.176	.657 - 2.105
Fight with boyfriend	.931	1.067	.249 - 4.574

Significant at .05 alpha level

DISCUSSION

Adolescent depression has become a worldwide burden and the lifetime prevalence of depression starting in this population is 15%-25% with a noted recurrence rate of 60%-70%.[4-6] Despite its treatability, almost 75% of adolescent depression remain underrecognized and undertreated leading to adverse outcomes including suicide.[94] The 2009 policy statement of the American Academy of Pediatrics included the recognition, through screening, and initial management of depression in the primary care setting where the depressed adolescent often initially presents.[95] This study aimed to recognize the profile and probable factors that make adolescents at risk for depression and suicidality which may help pediatricians who are well positioned to alleviate this burden.

In this study, a total of 30 adolescents with Major Depressive Disorder were admitted in the tertiary hospital for the past 10 years. Majority of the cases were females with an average age of 16 years old. This finding was consistent with several studies which showed that females were 1.7 times more likely to be depressed as compared to males.[64,96,97] The early pubertal timing, increase in gonadal sex steroids and vulnerability for stressors, mood and behavioral problems at this stage represents the personality trait difference that makes girls at risk than boys.[40,41,98]

Most of the patients in this study had a normal BMI, (66.6%). As similarly observed by Nemiary et.al., this implied that the direct causal pathway from obesity to depression was not substantiated.[47] In addition, the youth at this stage, have an increased concern over their appearance as influenced by mass media. Particularly, social preference for slim-bodied females and muscle-bound males affected their weight perception.[99]

Majority of the adolescents in our study were from private schools (76.67%) Although inconsistent with the results of a previous study., where depression was significantly more in those attending the government schools,[63] the results agreed with that done by Shukla et.al., which showed that depression was more common among those in private schools (OR 3.22; $P < 0.001$). The possible reason seen was the study culture, where students were more competitive and had more hectic schedules which on a long term, lead to stress among students and indirectly lead to depression.[100]

This study showed that a total of 80% of the patients lived with both of their parents (40.0%) or with either one of their parents (40.0%). Majority of the cases (66.67%) had their mother as their primary caretaker. While some advocates explained that spending more time with a parent or both parents, ensured communication, allowed feeling of social support, gave greater well-being and less depressive symptoms,[101,102] our findings emerged contrary to expectations. This was probably because a negative family relationship, such as family discord, was a risk for depression among adolescents and was not entirely dependent on where and whom they live with.[103,104]

As compared to other studies, most of the adolescents (73.3%) in this study inhibited themselves from substance use. This may be attributed to the denied access for minors of this substances and the illegality of drug use in our country . But among the adolescents with substance use (10% alcohol only, 10% alcohol and cigarette, 3.33% alcohol and drugs; 3.33% alcohol, cigarette and drugs) the results were consistent with the study by Lee, where Filipino students who smoked for some days and who took alcohol for some days had higher depressive symptoms levels and increased further when the use of this substances combined.[65]

Roman Catholic (86.66%) was the predominant religious affiliation of the adolescents in this study while 13.34% of them were from the other denominations(Protestant, Christian and Pentecostal). Although religious affiliations do not seem to play a significant role in determining mental health,[65] Protestants were found to be less depressed than Catholics. The possible reason cited was there were more religious gatherings and support groups in the practice of Protestantism that helped the depressed adolescent buffer against stressors thereby providing social resources and more coping skills.[105]

Scientific evidence explained that the external stress upon the occurrence of the first Major Depressive Episode (MDE) causes long-lasting changes to the biology of the brain that causes neuronal loss or decline of synaptic contacts[106]. Stress was also investigated as a significant risk factor for MDD. In particular, the correlation between stress response and increased hypothalamic–pituitary–adrenal activity strongly supports this biological mechanism.[107,108]

Several authors have already reported on the common stressors that were associated with adolescents with major depressive disorder.[109,110] In our study, peer rejection, patient and parent fighting, loss of a parent or loved one and teasing/bullying at school were the top identified stressors of the patients. With the adolescent having an increased drive toward individuation; they were more self-conscious and function autonomously, driving their relationships outside the family. Thus, peer rejection and feeling of neglect were confirmed as reasons for MDD. The finding of this study coincides with several studies which that showed if adolescents felt being rejected even by their parents and bullied, the feeling of insecurity and loneliness may continue and eventually lead to higher risk of isolation, withdrawnness then depression.[111,112] Patient-parent fighting was a reflection of a negative family relationship where the

adolescent feels the lack of family support and thus, was also seen as a common risk factor for MDD.[103,104] Recent negativities such as bereavement or the loss of parent or loved one and even friends were also common to individuals with MDD.[113-115] Although chronic illness only reflected a relatively lower percentage in this study, several researches have confirmed that MDD is associated with physical illnesses and life-threatening diseases.[116,117]

In terms of their suicidal behavior profile, all of the adolescents in this study had suicidal ideation and 70% of them had attempted suicide. Consistent with other literatures, a high proportion of teens with suicidal ideation or attempt (40-80%) meet the criteria for depression during the time of attempt.[15,118] Instead of a passing mood, depression at this time becomes long-lasting and a sense of worthlessness and hopelessness distorts the adolescents point of view, focusing only on negative things until convinced that there is nothing to live for.[79,119]

Preponderance of male adolescents (14.7 %) to commit suicide compared to female adolescents (6.3%) was observed in this study. Although not statistically significant, this results negated the findings of several literatures which showed that females had a greater prevalence of suicide attempts than males.[21,76,81] This was seen to be related to adolescent males acting on problems instead of talking about it; suppressing their emotions and using avoidance-based strategies like smoking and drinking, making depressive symptoms higher which can interact with the impulsivity related to suicide risk.[120]

Most of the adolescents in this study resorted to wound infliction (41.37%) and drug overdose (34.48%) which were similar to other studies. [97,121,122] This showed that the manner of attempt was greatly influenced by the availability and accessibility to what was needed to make the attempt.[90,97]

Most of the cases in this study reported perceived stressors rather than purely demographic at the time of the suicide attempt. Identified factors were comparable with other studies that included dysfunctional family, bullying, school difficulties, isolation from the society, stressful life experiences and even difficulty in romantic relationships.[123]

Results of the Poisson regression analysis showed that there were no significant associations between the demographic profile and stressors with the history of suicide attempts and the predicted number of suicide attempts among adolescents with MDD. However, those noted to have inability to cope in school were observed to have thrice the risk of suicide attempt compared to adolescents with MDD who experienced other stressors. The result of the study may be attributed to the school being an avenue for additional stressors to the adolescent, notwithstanding the pressures of school domain, peer situations such as rejection. These factors may add to the life stressors for the already depressed adolescent.[124,125]

The main idea of this research was to determine the associations between the socio-demographic profile and the stressors with the suicidal behavior profile of the adolescents with Major Depressive Disorder. It is noteworthy that this study found 100% of the admitted adolescents with MDD had suicidal ideation. Although no significant associations were observed, the results of this study should be interpreted with caution due to the low sample size.

CONCLUSION

A total of 30 adolescents with Major Depressive Disorder from January 2010 to January 2020 were reviewed.

There was female predominance with an average age of 16.23±1.76. Majority had normal BMI, studied in private schools and were Roman Catholics. There was an equal distribution of adolescents who lived with both their parents and with either of their parents. Majority of the adolescents had their mother as their primary caretaker. Most of the adolescents inhibit themselves of substance use.

Peer rejection was the most common identified stressor of the adolescents with major depressive disorder. Other stressors experienced by them were patient-parent fighting, loss of parent/loved one, teasing/bullying at school, inability to cope in school, feeling of neglect, chronic illness and fight with boyfriend.

All of the cases had suicidal ideation and majority were males and had at least one suicide attempt. Wound infliction and drug overdose were the most common manner of suicidal attempts.

Using Poisson Regression Analysis, there was no significant association between socio-demographic profile and stressors with the history of suicide attempts among adolescents with major depressive disorder. However, those who had inability to cope in school had 3 times the risk of suicide attempt. Likewise, there was no significant association between the socio-demographic profile and stressors with the number of suicide attempts by adolescents with major depressive disorder.

LIMITATIONS AND RECOMMENDATIONS

Similar with the other studies, the study was faced with several limitations.

1. The Study only covered data from 2010-2020. It was recommended to increase the duration of data coverage in order to increase the sample size.

2. The study only focused in one hospital institution. All the variables associated with the history of suicide among adolescents with MDD were found to be not significant and these results may not be consistent with the findings of other hospital settings. More interesting results and valid conclusions could be drawn from a multi-center study.

3. The study was limited due to the retrospective design that was utilized. Possibly, conducting a prospective/cohort research design would confirm the findings of this study.

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APPENDIX 1: ETHICS APPROVAL LETTER

DAVAO DOCTORS HOSPITAL
We care for life

20 July 2020

KASIANE LYNN H. CAMPO, M.D.
Principal Investigator
Davao Doctors Hospital
118 E. Quirino Avenue
Davao City

Dear Dr. Campo,

The Davao Doctors Hospital Research Ethics Committee met last 15 July 2020 and deliberated on the study-related documents of the protocol number 20-004-sis, entitled:

Factors Affecting the Suicidal Behavior of Adolescents with Major Depressive Disorder, A Retrospective Study

Please find attached the Protocol Amendment Review Form (Form 3.2) for the following documents that were reviewed and ***approved***:

- Title Revision
- Additional Objectives
- Conceptual Framework Revision

The members of the Research Ethics Committee who met included:

1. Dr. Joyce S.A. Custodio – Chair – Obstetrician and Gynecologist
2. Dr. Raul Martin A. Coching – Vice Chair – Cardiologist
3. Dr. Kathryn U. Roa – Member-Infectious Disease Specialist
4. Dr. Lucila T. Lupo – Secretary – Dean, College of Allied Health Sciences, Davao Doctors College
5. Dr. Lourdes C. Cabintoy – Member-Vice President for Academic Affairs, Rizal
6. Fr. Erwin Rommel C. Torres – Priest

The Davao Doctors Hospital Research Ethics Committee is organized and operates according to Good Clinical Practice (GCP) and applicable local laws and regulations.

Yours truly,

JOYCE S.A. CUSTODIO, M.D.
Chairperson, Research Ethics Committee

E. Quirino Ave., Davao City | Tel. Nos. +6382 221-2101 | Fax No. +6382 226-4770
E-mail: info@ddh.com.ph | Website: www.ddh.com.ph

APPENDIX 2: LETTER TO THE MEDICAL DIRECTOR

DR. RONALD P. TANGENTE

Medical Director

Davao Doctors Hospital

Dear Doctor,

Greetings of Peace!

I am Dr. Kasiane Lynn H. Campo, a pediatric resident of Davao Doctors Hospital. I am currently conducting a study entitled, **"FACTORS AFFECTING THE SUICIDAL BEHAVIOR OF ADOLESCENTS WITH MAJOR DEPRESSIVE DISORDER. A RETROSPECTIVE STUDY"** This study aimed to determine the factors affecting the suicidal behavior of adolescents ages 10-18 years old with Major Depressive Disorder admitted in a tertiary hospital in Davao City from January 2010 to January 2020.The academic data that will be gathered in this study will serve as a concrete basis in developing preventive and control strategies to efficiently address adolescents with Major Depressive Disorder and most importantly negate suicide.

In this regard, I am asking for your permission to view and collect data from the charts in our medical records section of the patients enrolled in my study. I assure you that all information gathered in this study will be treated with utmost confidentiality. I am hoping for your positive response on this request. Thank you very much.

Respectfully yours,

Dr. Kasiane Lynn H. Campo
Resident Physician
Department of Pediatrics
Davao Doctors Hospital

Noted by:

Dr. Grace Ann Q. Pecson
Research Committee Chair
Department of Pediatrics
Davao Doctors Hospital

APPENDIX 2: DATA COLLECTION FORM (DCF)

I. Socio-Demographic Characteristics

PARTICIPANT CODE (HRN) _____

Sex: ( ) Male ( ) Female
Age: ____
Height: ____ Weight: ____
BMI: ____
School: ( ) Public ( ) Private
Living Arrangement: ( ) Living with Both Parents
( ) Living with one
( ) Not Living with Parents

Primary Caretaker: ( ) Mother
( ) Father
( ) Both Parents
( ) Grand Parents
( ) Auntie/Uncle
( ) Multiple

Substance Use : ( ) Cigarette
( ) Alcohol
( ) Drugs
( ) Others: Specify _____

Religion : ( ) Roman Catholic
( ) Protestant
( ) Others: Specify_____

II. Psychological Stressors

: ( ) Parental Fighting
( ) Patient-Parent Fighting
( ) Inability to cope at school
( ) Teasing/Bullying at School
( ) Peer Rejection
( ) Loss of Parent/Loved one
( ) Others: Specify _____

III. Suicidal Behavior Profile

Suicide Ideation : ( ) Yes ( ) No
History of Suicide Attempt : ( ) Yes ( ) No
Number of Suicide attempt : _____
Manner of Suicide attempt : _____
Completed Suicide : ( ) Yes ( ) No