IJMRP

Original Research Article.

Prevalence and Determinants of Suicidal Ideation among Patients Diagnosed With Depression at Mental Health hospital, Jeddah 2018

Abeer Saleh[1*], Jawaher Al-Ahmadi[2], Sara Al-Hazmi[3]

[1*]**Family Medicine Resident, Joint Programme of Family Medicine, Jeddah, Saudi Arabia.**
[2]**Department of Family Medicine, Faculty of Medicine, King Abdulaziz University, Jeddah, Saudi Arabia.**
[3]**Consultant Psychiatry, University medical services center, King Abdulaziz University, Jeddah, Saudi Arabia.**

ABSTRACT

Introduction: In Saudi Arabia, depressive disorders are ranked as the fifth of 10 top causes of death and it accounts for 5 % of all deaths. Although there are a wide range of factors associated with suicidal ideation include social and demographic factors and related health issues, depression is the most important risk factor of suicidal behavior which characterized by suicidal ideation, planning and attempts. This study aimed to identify prevalence and sociodemographic determinants of suicidal ideation among depressive patients.

Methods: This is a cross-sectional study conducted in adult patients diagnosed with depression and attended the outpatient clinics located at Mental Health Hospital in Jeddah city. A random sample of 213 patients was selected and the questionnaires were distributed to collect data about demographics and 21 depression items of Beck Depression Inventory-II. The scores of the depression items were summed to indicate the severity of the depression. The frequencies and percentages were calculated for demographics and presented in tables. Chi-square test, Spearman's correlations, and regression analysis were conducted to identify significant associations and predictors at 0.05 level of significance.

Results: The prevalence of suicidal ideation among those depressive patients was 37.6%. The depression was severe in about 47% of the patients and minimal in approximately 20% of the patients. The associations between suicidal ideation and each of marital status, occupation, age, and depression severity were found statically significant

(p<0.05), while association between gender and suicidal ideation was not statistically significant (p= 0.311). The findings of logistic regression show that age and depression severity are significant predictors for suicidal ideation. Patients who aged > 44 years old have 2.3 less risk to develop suicidal ideas than those aged ≤44 years old. The increase in depression severity by one degree, such as from mild to moderate, will increase the risk of suicidal ideation by 4.1 times.

Conclusions: A high prevalence of suicidal ideation was detected among Saudi depressive patients. The multivariate analysis reveals that only age and depression severity was significant predictors for suicidal ideation.

Keywords: Depression, Suicide, Determinant, Severity, Psychosis.

INTRODUCTION

Suicide is defined as death due to self-administered injurious practice associated with intention to die as a consequence of this practice.[1] Globally, the annual death of suicide is 800,000 with estimated ratio of 20 interrupted or aborted attempts for every completed suicidal attempt.[2] World widely, suicide is considered the second leading cause of death among young adults (<30 years old) and the first leading cause of death in 15-19-years old females.[3-6] The variation in suicide rates is wide between countries, as high as ten-time difference, which mainly depends on sociocultural factors. Community based studies found a 12-months prevalence of major depression to range from 4 to 10%[4-7],

while the lifetime prevalence be as high as 30% in males and 40% in females.[8] The suicide rates of immigrants are similar to those of original countries which reflect the cultural influence that overcomes the effect of geographical location.[9] Due to underreporting, since only 35% of countries have valid suicide registration, the estimation is generally imprecise with common overlapping between suicidal attempts and completed suicides.[10] Suicidal behaviors are classified based on suicidal intention into suicidal ideation "Thinking about suicide", suicidal planning "Formulation of a specific method for suicide" and suicidal attempts "engagement in potentially self-injurious behavior with an

intent to die as a result of the behavior".[11] Suicidal behavior is more common among older persons or patients with psychosis[12], psychosocial[13,14] and physical illness.[15] The lifetime prevalence of suicidal ideation, plan and attempt were found as high as s 15.2%, 3.3%, and 3.2% respectively.[16] The majority of transition from suicidal plan to a suicidal execution occurs within the first year of the onset of ideation. Thus, it is important to identify the frequency and determinants of the ideation in order to prevent suicidal attempts and subsequent death.

As community become more and more urbanized, the prevalence of depression is increased with high prevalence occur in developed industrial countries.[17] The depression is identified as the main risk factor of suicidal behavior, thus assessment of prevalence of various suicidal behavior can help in estimating the burden of suicide in Saudi community. Identification of other determinants can provide data for planning and implementation for public health interventions aiming at prevention of suicide. Thus, the early detection of suicidal behavior in an early stage of suicidal ideation is a cornerstone for suicidal prevention. This study aimed to assess the prevalence of suicidal ideation among depressive patients and the sociodemographic determinants which influence this suicidal ideation.

MATERIALS AND METHODS

This is an analytical cross-sectional study conducted in 2018, Jeddah, Saudi Arabia. The study included adult patients diagnosed with depression from 2013-2018 and attended the outpatient clinics located at Mental Health Hospital. Patients with other psychosis, patients who had mental problems, and patients who refused to provide written consent were excluded.

The estimated number of depressive patients treated at Mental Health Hospital is 1500. The sample size of 213 patients was calculated using the equation of proportion estimation assuming prevalence of 20% based on the literature with infinite population correction at 95% confidence level, 0.05 error of estimation. A simple random sample was drawn from list of depressive patients. The data were collected using Arabic version of Beck Depression Inventory-II (BDI-II) which is self-administered questionnaire consists of 21 items in addition to sociodemographic questions such as age, gender, marital status, and occupation. The Beck Depression Inventory II (BDI II) is a validated instrument which has been effectively used to assess depression severity as well as suicidal ideation among either depressive patients or normal population. An Arabic version of BDI was tested in several Arab countries with Cronbach's alpha ranged from 0.67 to 0.93.[18,19]

The researcher collected data from the depressed patient's records at the two psychiatric clinics at the university health care centers of male and female sections. The data collection was done in September 2018, from Sunday to Thursday, during the working hours from 8 am-3 pm. The dependent variable was suicidal ideation, while the independent variable includes age, gender, marital status, occupation. In addition to variables of depression scale include grief, pessimism, previous failure, loss of enjoying life, remorse, feeling of being subject to punishment, lack of self-love, self-criticism and blaming, crying, excitement, loss of interest, hesitation in decision making", lack of value, lack of energy at work, changes in sleep system, susceptibility to anger, changes in appetite, difficulty in concentrating, fatigue or stress, loss of interest in sex.

Data were introduced into computer, screened and coded then analyzed using Statistical Package of Social Sciences (SPSS), version 23. The scores of the depression items were summed to indicate the severity of the depression were calculated. The frequencies and percentages were calculated for demographics and presented in tables. The Pearson's chi-square for testing of homogeneity was used to detect significant differences in prevalence of suicidal ideation between various groups of sociodemographic variables and depression severity. Spearman's correlations were run to calculate coefficients between suicidal ideations and different depression items. The regression analysis was conducted to predict the effect of age, depression severity, and certain items of depression on suicidal ideation. Any p value less than 0.05 was considered statistically significant. This study was approved by ethical committee of the Joint Program of Family Medicine in Jeddah city.

Done on 10% of the sample size only, and among subjects not included within the actual study. A pilot study carried out with the application of the full methodology and analysis of results. The method, the feasibility, and duration were assessed. The questionnaire reliability was tested using Cronbach's alpha and the validity of the questionnaire was explored using exploratory factor analysis. Thus, several assessment tools, such as Inventory of Depressive Symptoms (IDS), investigate depression and suicide ideation at one glance.[20]

The patients were educated about the aims of the study, their right to participate or refuse without any consequences, the confidentiality of the provided information. The written informed consents were taken from patients then they were instructed about how to answer the questionnaire.

RESULTS

Characteristics of the Participants

Among 213 depressive patients recruited in this study, 54.5% were males and 45.5% were females and the majority of the patients (56%) aged between 20 and 44 years old. About 55% of the patients were married while 16.9% were either divorced or widowers. Only 20% were employed in a job and about 17% were retired. The depression was severe in about 47% of the patients and minimal in approximately 20% of the patients. The prevalence of suicidal ideation among those depressive patients was 37.6% (Table 1).

The Calibration of the Scale

The reliability of the QoL scale was checked using Cronbach's alpha and it was 0.93 which indicated excellent reliability. In addition, there was and no substantial increase in reliability if we delete any item. Thus, we decided to keep all items in the analysis. Factor analysis of depression scale was conducted using Promax method of rotation (oblique method of rotation). The determinant value was 5.4 which much higher the cut of level of 0.00001 which indicates the absence of multicollinearity. The KMO measure of sampling adequacy showed a value of 0.933, which is higher than the minimal required value (0.50). Additionally, the Bartlett's test was significant (p<0.001). According to rotated values and scree plot the variables load into 4 factors; 11 variables loaded to a factor which could be called "lack of motivation". These variables include pessimism, loss of enjoying life, feeling of being subject to punishment, lack of self-love, excitement, loss of interest, hesitation to decision making,

lack of value, and lack of energy at work. Two variables (crying and susceptibility to anger) loaded more to the second factor which can be called "negative emotions". Remorse and self-blaming loaded to the third factor "feeling bad", while the fourth factor is mainly related to "loss of physical wellbeing" for which three variables were loaded (changes in sleep system, changes in appetite, and loss of interest in sex). We concluded that extracted factors are subcomponent of the main construct of depression.

Relationship between Suicidal Ideation and Patients' Demographics

The associations between suicidal ideation and each of marital status, occupation, age, and depression severity were found statically significant ($p<0.05$), while association between gender and suicidal ideation was not statistically significant ($p= 0.311$). About 57% of patients with single marital status have suicidal ideation in comparison to only 28% of married patients. The prevalence of suicidal ideation was the highest among students (65.4%) followed by unemployed, employed and then finally the retired patients.

The majority of the severely depressive patients have suicidal ideation (64%) in comparison to only 29.3%, 13.3% and 0.0% in moderate, mild and minimally depressive patients (figure 1).

Relationship between Suicidal Ideation and Depression Items

The correlations between suicidal ideation and other 21 items of Beck II questionnaire were significant positive correlations. The correlation coefficients indicated week correlation between suicidal ideation and each of self-criticism and blaming, changes in sleep system, changes in appetite, fatigue or stress, and loss of interest in sex. The low correlation was detected between suicidal ideation and other items and no item reported moderate or high correlation (table 3).
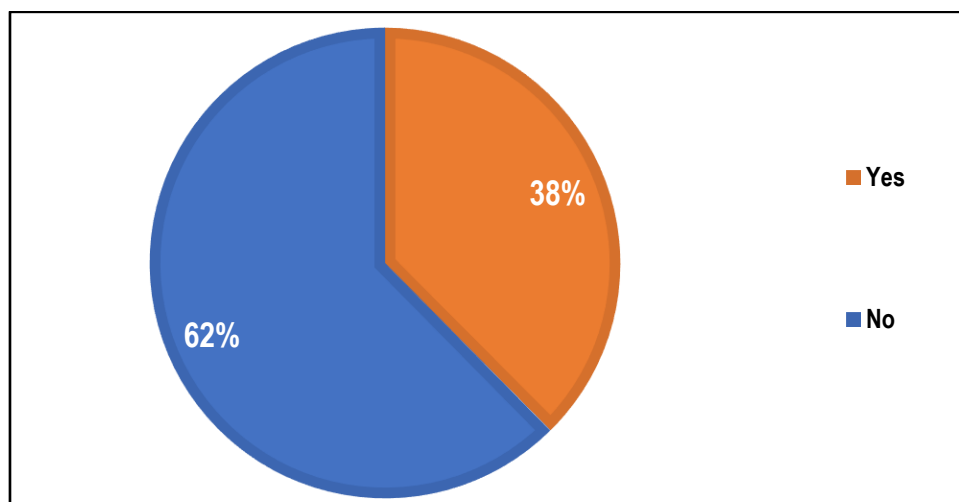
Multivariate Association between Suicidal Ideation and Independent Variables

The findings of logistic regression show that age and depression severity are significant predictors for suicidal ideation. Patients who aged > 44 years old have 2.3 less risk to develop suicidal ideas than those aged ≤44 years old.

The increase in depression severity by one degree, such as from mild to moderate, will increase the risk of suicidal ideation by 4.1 times. In the second model, the predictors of suicidal ideation included lack of value, loss of enjoying life, excitement, and feeling of being subject to punishment were introduced. All of the found significant predictors with odds ratios 1.72,1.65, 1.56, and 1.45 respectively.

Table 1: Demographic characteristics and psychological problems among study participants (n = 213)

Variables	Frequency	Percent (%)
Gender		
Male	116	54.5
Female	97	45.5
Age		
<19 years old	6	2.8
20 – 44 years old	119	55.9
>44 years old	88	41.3
Marital status		
Single	60	28.2
Married	117	54.9
Divorced	27	12.7
Widower	9	4.2
Occupation		
Employed	43	20.2
Student	26	12.2
Retired	36	16.9
Unemployed	108	50.7

Figure 1: The prevalence of suicidal ideation among the depressive patients

Table 2: Association between patients' characteristics and suicidal ideation

Variables	Suicidal ideation		Chi-square	P value
	Yes F (%)	**No** F (%)		
Gender				
Male	40 (34.5%)	76 (65.5%)	1.1	0.311
Female	40 (41.2%)	57 (58.8%)		
Marital status				
Single	34 (56.7%)	26 (43.3%)	13.8	0.003*
Married	33 (28.2%)	84 (71.8%)		
Divorced	10 (37.0%)	17 (63.0%)		
Widower	3 (33.3%)	6 (66.7%)		
Occupation				
Employed	15 (34.9%)	28 (65.1%)	10.4	0.015*
Student	17 (65.4%)	9 (34.6%)		
Retired	10 (27.8%)	26 (72.2%)		
Unemployed	38 (35.2%)	70 (64.8%)		
Age				
≤44 years old	60 (48.0%)	65 (52.0%)	14.1	<0.001*
>44 years old	20 (22.7%)	68 (77.3%)		
Depression severity				
Minimal	0 (0.0%)	42 (100%)	63.8	<0.001*
Mild	4 (13.3%)	26 (86.7%)		
Moderate	12 (29.3%)	29 (70.7%)		
Severe	64 (64.0%)	36 (36.0%)		

*Significant difference

**Table 3: Correlation matrix between suicidal ideation item and other items in BDI-II scale**

No.	Item	Correlation coefficient	P value
1	Grief	0.433	<0.001*
2	Pessimism	0.425	<0.001*
3	Previous failure	0.397	<0.001*
4	Loss of enjoying life	0.460	<0.001*
5	Remorse	0.328	<0.001*
6	Feeling of being subject to punishment	0.403	<0.001*
7	Lack of self-love	0.400	<0.001*
8	Self-criticism and blaming	0.259	<0.001*
9	Suicidal thoughts	1.000	<0.001*
10	Crying	0.354	<0.001*
11	Excitement	0.466	<0.001*
12	Loss of interest	0.451	<0.001*
13	Hesitation in decision making	0.306	<0.001*
14	Lack of value	0.452	<0.001*
15	Lack of energy at work	0.376	<0.001*
16	Changes in sleep system	0.292	<0.001*
17	Susceptibility to anger	0.384	<0.001*
18	Changes in appetite	0.293	<0.001*
19	Difficulty in concentrating	0.400	<0.001*
20	Fatigue or stress	0.285	<0.001*
21	Loss of interest in sex	0.233	<0.001*

*significant correlation

Table 4: Findings of logistic regression of suicidal ideation using age and depression severity as predictors

Regression model	Step	Predictor	Odds ratio	p value	Cox & Snell R Square	Nagelkerke R Square
Model 1	Step 1	Depression severity	4.35	<0.001	0.299	0.407
		Constant	0.005	<0.001		
	Step 2	Age	0.43**	0.020	0.317	0.431
		Depression severity	4.13	<0.001		
		Constant	0.02	<0.001		
Model 2	Step 1	Lack of value	2.71	<0.001		
		Constant	0.17	<0.001		
	Step 2	Lack of value	2.08	<0.001		
		Loss of enjoying life	2.14	<0.001		
		Constant	0.07	<0.001		
	Step 3	Lack of value	1.82	0.001		
		Loss of enjoying life	1.82	0.002		
		Excitement	1.61	0.006		
		Constant	0.06	<0.001		
	Step 4	Lack of value	1.72	0.003		
		Loss of enjoying life	1.65	0.011		
		Excitement	1.56	0.013		
		Feeling of being subject to punishment	1.45	0.020		
		Constant	0.05	<0.001		

** Reference group ≤44
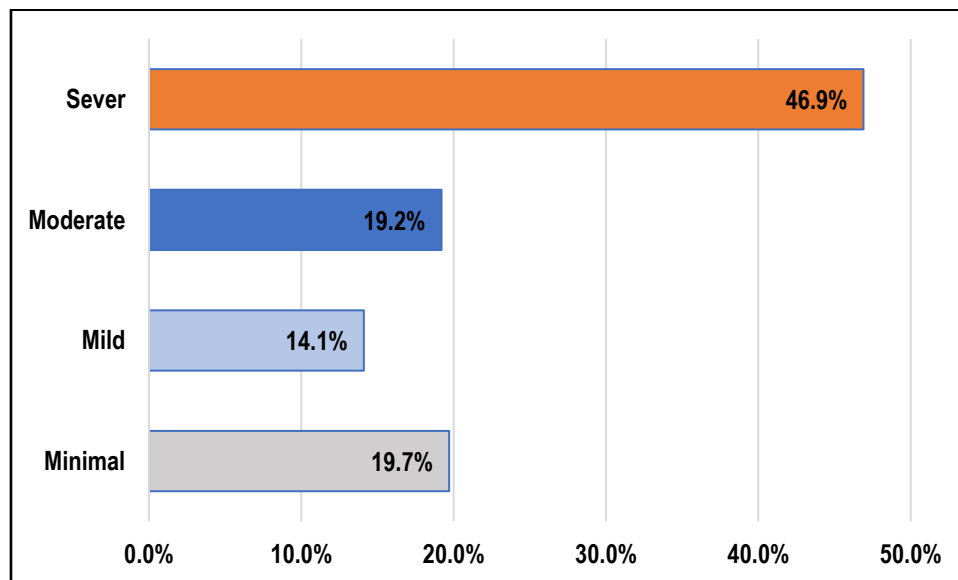
Figure 2: The distribution of depression severity among patients

DISCUSSION

Suicidal ideation is a common behavior preceding the suicidal attempts in depressive patients. A study used psychological autopsy found the majority of patents with completed suicide had expressed their intent in the last 3 months of their life.[21] Although there are a wide range of factors associated with suicidal ideation include social and demographic factors and related health issues[22], depression is the most important risk factor of suicidal behavior which characterized by suicidal ideation, planning and attempts.[23] This study aimed to assess prevalence and sociodemographic determinants of suicidal ideation in depressive patients.

The present study found 37.6% prevalence of suicidal ideation among depressive patients. In a longitudinal study conducted by Sokero et al., suicidal ideation persisted in 21% of depressive patients for the whole period of follow up (6 months).[24] The difference could be attributed to different outcomes, since Sokero et al., assessed the prevalence of those with persistence suicidal ideation, while we estimated the point prevalence of suicidal ideation. Chang et al. studied the suicidal ideation among Taiwanese participants and found 51% at high risk of suicidal ideation.[25] They identified the presence of depressive symptoms as a predictor of suicidal ideation.[25]

Other factors than sociodemographic have much higher effect on suicidal ideation. A study identified consultation time and depression severity as main positive predictors for early detection of suicidal ideation.[26] Verger et al. found low rate of early identification of suicidal ideation by general practitioners (52%) in France. We found depression severity was important since the majority of severely depressive patients have suicidal ideation (64%) in comparison to only 29.3%, 13.3% and 0.0% in moderate, mild and minimally depressive patients.

Our findings indicated that association between suicidal ideation and gender was not statistically significant. These findings were consistent with Bogers et al. since no significant difference between males and females regarding suicidal ideation.[27]

We found association between suicidal ideation and marital status was significant with higher prevalence of suicidal ideation in single patients (57%) in comparison to other categories. In addition, we found young patients (≤44 years old) had higher suicidal ideation than older patients. This in disagreement with a stud found age and marital status not significantly associated with depression duration.[24] In a multivariate analysis of the Australian surveillance data, Taylor et al. found marital status, income mental health service significant predictors of suicidal ideation among persons aged 16 or older.[22] The effect of family cohesion on depression and suicidal ideation has been demonstrated by many studies.[28-31]

We found about 57% of patients with single marital status have suicidal ideation in comparison to only 28% of married patients. Similar findings reported by Taylor et al. with 2 and 3 times greater risk of suicidal ideation among separated and never married Australian persons respectively.[22]

Our findings indicated a significant association between suicidal ideation and depression severity. Similarly, Sokero et al. found duration of suicidal ideation can be predicted by depression when assessed by Beck Depression Inventory.[24]

Our findings of logistic regression show that age and depression severity are significant predictors for suicidal ideation. Patients who aged > 44 years old have 2.3 less risk to develop suicidal ideas than those aged ≤44 years old.

This is in accordance with Taylor et al. who found 45-64 and 16-24 aged participants approximately 1.5 times were more likely to have suicidal ideation than those aged 65 or older [22]. Different results found by Bogers et al. where age was not associated with suicidal ideation. However the included patients in their study were elderly aged 60 years or older.[27] Eshun compared the effect of gender, religion and family cohesion on suicidal ideation among American and Ghanaian college student.[29] He found gender and family closeness negative associated with suicidal ideation, while religion was non-significant predictor among Ghanaian students. However, in American students, only family closeness was significant predictor for suicidal ideation with negative correlation.[29] The present study removed religion from the analysis since all included patients were Muslims and no other religion was found in the study area. We fpund an increase in depression severity by one degree, such as from mild to moderate, will increase the risk of suicidal ideation by 4.1 times. Similarly, Bogers et al. found patients with suicidal ideation were more severely depressed.[27]

Strengths and Limitations
The strength point of this study was a validated questionnaire which found highly reliable among Saudi patients with Cronbach's alpha equals to 0.93. This reflected the importance of using calibrated psychometric scale in the research aiming at study of psychological health. Moreover, validity assessment indicated 4 factors which were considered as subcomponents of depression scale.

The limitations of this study are the specific study population which limited the generalizability of the results. In addition to the cross-sectional design which lack the follow up of patients which can provide more insight in persistence of suicidal ideation and will allow for calculation of period prevalence instead of point prevalence.

CONCLUSIONS
A high prevalence of suicidal ideation was detected among Saudi depressive patients. Marital status, occupation, age, and depression severity was significantly associated with suicidal ideation, however multivariate analysis reveals that only age and depression severity were significant predictors. Early detection of suicidal ideation should focus on severely depressed, single, and young adults to whom the prevention strategies should be directed. Based on the findings of our study we recommend the following:

- Planning and implementation of screening interventions to achieve early detection of suicidal behavior among depressive patients.
- Patients who are young adult or with severe depression should be given a priority in the monitoring and treatment of suicidal ideation, as young age and depression severity were the main determinants of suicidal ideation.
- Further studies are recommended to assess the suicidal behavior among young population, as previous study showed high prevalence in this age group.

REFERENCES
1. Matarazzo BB, Clemans TA, Silverman MM, Brenner LA. The Self-Directed Violence Classification System and the Columbia Classification Algorithm for Suicide Assessment: A crosswalk. Suicide and Life-Threatening Behavior 2013;43(3):235-49.
2. Rogers ML, Hom MA, Dougherty SP, Gallyer AJ, Joiner TE. Comparing suicide risk factors among individuals with a history of aborted, interrupted, and actual suicide attempts. Archives of suicide research 2018:1-18.
3. Fleischmann A, De Leo D. The World Health Organization's report on suicide: a fundamental step in worldwide suicide prevention. Crisis. 2014;35(5):289-91. doi: 10.1027/0227-5910/a000293.
4. Bijl RV, Ravelli A, Van Zessen G. Prevalence of psychiatric disorder in the general population: results of The Netherlands Mental Health Survey and Incidence Study (NEMESIS). Social psychiatry and psychiatric epidemiology 1998;33(12):587-95.
5. Kessler RC, McGonagle KA, Zhao S, Nelson CB, Hughes M, Eshleman S et al. Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States: results from the National Comorbidity Survey. Archives of general psychiatry 1994;51(1):8-19.
6. Offord DR, Boyle MH, Campbell D, Goering P, Lin E, Wong M et al. One-year prevalence of psychiatric disorder in Ontarians 15 to 64 years of age. The Canadian Journal of Psychiatry 1996;41(9):559-64.

7. Andrews G, Henderson S, Hall W. Prevalence, comorbidity, disability and service utilisation: overview of the Australian National Mental Health Survey. The British journal of psychiatry 2001;178(2):145-53.

8. Kruijshaar ME, Barendregt J, Vos T, De Graaf R, Spijker J, Andrews G. Lifetime prevalence estimates of major depression: an indirect estimation method and a quantification of recall bias. European journal of epidemiology 2005;20(1):103-11.

9. Spallek J, Reeske A, Norredam M, Nielsen SS, Lehnhardt J, Razum O. Suicide among immigrants in Europe—a systematic literature review. The European Journal of Public Health 2014;25(1):63-71.

10. Turecki G, Brent DA. Suicide and suicidal behaviour. The Lancet 2016;387(10024):1227-39.

11. Beck AT, Kovacs M, Weissman A. Assessment of suicidal intention: the Scale for Suicide Ideation. Journal of consulting and clinical psychology 1979;47(2):343.

12. Pompili M, Serafini G, Innamorati M, Lester D, Shrivastava A, Girardi P et al. Suicide risk in first episode psychosis: a selective review of the current literature. Schizophrenia research 2011;129(1):1-11.

13. Yuodelis-Flores C, Ries RK. Addiction and suicide: a review. The American journal on addictions 2015;24(2):98-104.

14. Norman RE, Byambaa M, De R, Butchart A, Scott J, Vos T. The long-term health consequences of child physical abuse, emotional abuse, and neglect: a systematic review and meta-analysis. PLoS medicine 2012;9(11):e1001349.

15. Zaorsky NG, Zhang Y, Tuanquin L, Bluethmann SM, Park HS, Chinchilli VM. Suicide among cancer patients. Nature communications 2019;10(1):207.

16. Jeon HJ, Lee J-Y, Lee YM, Hong JP, Won S-H, Cho S-J et al. Lifetime prevalence and correlates of suicidal ideation, plan, and single and multiple attempts in a Korean nationwide study. The Journal of nervous and mental disease 2010;198(9):643-6.

17. Ayuso-Mateos JL, Vázquez-Barquero JL, Dowrick C, Lehtinen V, Dalgard OS, Casey P et al. Depressive disorders in Europe: prevalence figures from the ODIN study. The British journal of psychiatry 2001;179(4):308-16.

18. Abdel-Khalek AM. Internal consistency of an Arabic adaptation of the Beck Depression Inventory in four Arab countries. Psychological reports 1998;82(1):264-6.

19. Alansari BM. Internal consistency of an Arabic adaptation of the Beck Depression Inventory-II with college students in eighteen Arab countries. Social Behavior and Personality: an international journal 2006;34(4):425-30.

20. Montgomery SA, Åsberg M. A new depression scale designed to be sensitive to change. The British journal of psychiatry 1979;134(4):382-9.

21. Isometsä ET, Henriksson MM, Aro HM, Heikkinen ME. Suicide in major depression. The American journal of psychiatry 1994;151(4):530.

22. Taylor A, Dal Grande E, Gill T, Fisher L, Goldney R. Detecting determinants of suicidal ideation: South Australian surveillance system results. International journal of public health 2007;52(3):142-52.

23. Cummins N, Scherer S, Krajewski J, Schnieder S, Epps J, Quatieri TF. A review of depression and suicide risk assessment using speech analysis. Speech Communication 2015;71:10-49.

24. Sokero P, Eerola M, Rytsälä H, Melartin T, Leskelä U, Lestelä-Mielonen P et al. Decline in suicidal ideation among patients with MDD is preceded by decline in depression and hopelessness. Journal of Affective Disorders 2006;95(1-3):95-102.

25. Chang H-J, Yang C-Y, Lin C-R, Ku Y-L, Lee M-B. Determinants of suicidal ideation in Taiwanese urban adolescents. Journal of the Formosan Medical Association 2008;107(2):156-64.

26. Verger P, Brabis P-A, Kovess V, Lovell A, Sebbah R, Villani P et al. Determinants of early identification of suicidal ideation in patients treated with antidepressants or anxiolytics in general practice: a multilevel analysis. Journal of Affective Disorders 2007;99(1-3):253-7.

27. Bogers IC, Zuidersma M, Boshuisen ML, Comijs HC, Voshaar RCO. Determinants of thoughts of death or suicide in depressed older persons. International psychogeriatrics 2013;25(11):1775-82.

28. Kaltiala-Heino R, Rimpelä M, Marttunen M, Rimpelä A, Rantanen P. Bullying, depression, and suicidal ideation in Finnish adolescents: school survey. Bmj 1999;319(7206):348-51.

29. Eshun S. Sociocultural determinants of suicide ideation: A comparison between American and Ghanaian college samples. Suicide and Life-Threatening Behavior 2003;33(2):165-71.

30. Au AC, Lau S, Lee MT. Suicide ideation and depression: the moderation effects of family cohesion and social self-concept. Adolescence 2009;44(176):851.

31. Frey LM, Cerel J. Risk for suicide and the role of family: A narrative review. Journal of Family Issues 2015;36(6):716-36.