




# Prevalence of and Risk Factors for Suicide Attempts Among Patients With Severe Psychiatric Disorders in Eastern Morocco

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**Abstract.** *Background:* Suicide attempts are common in patients with severe psychiatric disorders; however, they are rarely studied in this population. *Aims:* To investigate the prevalence and risk factors associated with suicide attempts among patients with severe psychiatric disorders. *Method:* This is a cross-sectional study of patients admitted to the Mohammed VI University Hospital of Psychiatry in Oujda, Morocco. *Results:* A total of 250 patients with a psychiatric disorder were recruited in this study. Among these, 78 cases (31.2%) had a personal history of suicide attempts. A personal history of suicide attempt was significantly higher among women compared to men (45.5% vs. 27.2%,  $p = .0099$ ). The most common method of suicide attempts was jumping from heights (31%). Patients with a personal history of suicide attempts had a significantly higher prevalence of alcohol consumption ( $p = .0063$ ), family history of psychiatric disorders ( $p = .002$ ), family history of suicide attempt ( $p = .00004$ ), and family history of suicide ( $p = .018$ ) compared to those who had never made suicide attempts. *Limitations:* As suicidal behavior is highly stigmatized in Morocco, the number of patients who have made a suicide attempt may be underestimated. *Conclusion:* Our findings justify the need to provide specialized support to psychiatric patients with risk factors for suicide attempts.

**Keywords:** suicide attempt, severe psychiatric disorder, prevalence, risk factors, Morocco

Suicide is a worrying public health problem. It is the third leading cause of death in industrialized countries among persons aged 15–44 years. The prevalence of suicide attempts has been estimated to be 10–20 times higher than the number of suicide deaths (De Leo & Evans, 2004). Epidemiological studies indicate that between 3% and 5% of the general population have tried to take their own life and between 10% and 18% have expressed suicidal ideation during their lifetime (Kessler et al., 1999).

Psychiatric disorders have been identified as a major causative factor in suicidal behavior, and their management may play an important role in reducing the recurrence of suicide attempts and preventing suicide (American Psychiatric Association, 2003).

A number of clinical studies on suicide attempts have been conducted in medical or emergency facilities. However, the number of investigations with patients who made a suicide attempt and been admitted to psychiatric hospitals remains insufficient. It is worth noting that these two populations of patients are quite different and may need different medical treatments (Hayashi et al., 2010).

The identification of psychiatric disorders and risk factors for suicidal behavior is essential to plan appropriate psychiatric and social care. However, only a small number of patients who have made a suicide attempt and been admitted to medical or emergency facilities are referred for psychiatric hospitalization. Indeed, it has been reported that among patients presenting to the emergency

department of a general hospital following a suicide attempt, 15% would be treated on an outpatient basis by general practitioners at the emergency department and 45.5% would be hospitalized for an average length of stay of 1.8 days, while 9.7% of patients would be referred to a psychiatric hospital (Sinclair et al., 2006).

Because personal history of psychiatric hospitalization is considered to be a strong predictor of suicide, there is considerable interest in studying factors that increase the risk for suicide attempts among patients with mental illness and for whom psychiatric hospitalization is required (Qin & Nordentoft, 2005). Compared to many countries, relatively little is known about the prevalence of suicidal behaviors and patients who made a suicide attempt in Morocco (Agoub et al., 2006; Barrimi et al., 2020; Zarrouq et al., 2014). Moreover, there are no specialized health care centers dedicated to the treatment and prevention of suicidal behavior. In addition, management of psychiatric patients who have a history of suicide attempts is poorly organized and lacks an agreed strategy.

The main objectives of our work were to investigate the prevalence and risk factors associated with suicide attempts among patients with severe psychiatric disorders in Eastern Morocco.

## Method

### Design of the Study and Data Collection

This is a cross-sectional study carried out at the Psychiatric Hospital of Oujda, which is affiliated with the Mohammed VI University Hospital of Oujda, Morocco. The Psychiatric Hospital of Oujda was launched in June 2013, it includes several units, and it is the only hospital specialized in the management of patients with psychiatric disorders in Eastern Morocco.

Patients with a psychiatric disorder consecutively admitted to the Psychiatric Hospital of Oujda between January and July 2016 were included in this study. We excluded patients with agitation and those who refused to participate in the study. A suicide attempt was defined as an act in which a person tries to take own life but survives. It is often referred to as a nonfatal suicide attempt. The assessment of suicide attempts was conducted by psychiatrists during interviews with patients and their families. The interviews aimed to clarify the following:

- Whether there was a personal history of suicide attempt.
- If the patient had made at least one previous suicide attempt, the following elements were determined: (1) the number of suicide attempts, (2) the means used to

carry out the suicide attempts (hanging, self-cutting/stabbing, jumping from heights, self-poisoning, etc.), and (3) the psychopathological context of the suicide attempts (depression, delusion, hallucination, mental automatism, and anxiety).

- Whether there was a family history of suicide attempt.
- In the case of a history of suicide attempt in the family, the following elements were determined: (1) the relationship of the person(s) who made a suicide attempt with the patient, (2) the number of suicide attempts in the family, (3) the means used to carry out the suicide attempts, and (4) the psychopathological context of the suicide attempts.
- Whether there was a family history of suicide.
- In the case of a history of suicide in the family, the following elements were determined: (1) the relationship of the person(s) who died by suicide with the patient, (2) the number of previous suicide cases in the family, and (3) the means used to carry out the suicide.

The data were collected by the psychiatrist responsible for the study at the time of the initial clinical assessments and during follow-up inpatient consultations. These data were collected during interviews with the patients in the presence of a close member of their family (spouse, father, mother, brothers or sisters, etc.). A form was used to collect the data, which included the patient's socio-demographic characteristics (gender, age, place of residence, family status, level of education, occupation, etc.), the patient's clinical characteristics (psychiatric history, medication, alcohol use, substances use, and suicide attempt details), family history of psychiatric disorders, personal and family history of suicide attempts, family history of suicide as well as the quality of treatment adherence, and family support. Data were also obtained from the patient's medical file, especially those regarding the treatments received by the patient in previous consultations and hospitalizations.

Therapeutic adherence was assessed subjectively. We defined poor therapeutic adherence as a cessation of treatment of more than one month with multiple relapses and/or readmissions during the last year. Psychiatric diagnosis was based on the criteria of DSM-5. The quality of therapeutic adherence as well as family support was assessed by a psychiatrist based on the opinions of the patient's family, the patient's medical records, and reports from psychiatric nurses.

The patients were informed about the objectives of the study. We only recruited patients who were willing to participate in the study and gave their informed consent. They were informed that participation in the study was voluntary and that all data would be anonymous and confidential.

## Statistical Analysis

The statistical analysis was performed using Epi Info version 3.5.1. We started by describing our sample according to the different characteristics, and then, we analyzed the risk factors for suicide attempts. The percentages were compared by using the  $\chi^2$  test or Fisher's exact test. Student's *t*-test was used to compare the means. To identify risk factors for suicide attempts, we performed a univariate analysis followed by a multivariate analysis. We chose the logistic regression model step-by-step descending method. In all statistical tests, the significance level was set to 0.05.

## Results

### Sociodemographic Characteristics of the Patients

During the study period, a total of 250 patients with a psychiatric disorder and admitted to the Psychiatric Hospital of Oujda were recruited. Table 1 describes the sociodemographic characteristics of these patients. The mean age was 34 years ranging from 15 to 68 years: 62.2% of patients were aged 21–40 years, 28.5% aged 41–68 years, and 9.2% aged 15–20 years. Seventy-eight percent of the patients were male with a male-to-female ratio of 3.54. The majority of patients (81%) were from urban areas. Sixty-eight percent of the patients were single, 22% were married, 8.8% were divorced, and 1.2% were widowed. Fourteen percent had never attended school, 28% had a primary academic level, 33% had a secondary level, and 14% had a university level. Among patients recruited in this study, 76.4% were unemployed.

### Clinical Characteristics of the Patients

The clinical characteristics of the patients are shown in Table 1. 81.5% of patients had a personal history of psychiatric hospitalization. For those patients, the average number of psychiatric hospitalizations was 3, with a minimum of one and a maximum of 29 hospitalizations. Our study found that 67% of patients had a history of psychoactive drugs use. Of these, 64% used tobacco, 50% used cannabis, and 36% used alcohol. The average age of onset of tobacco use was 17.5 years, cannabis 18 years, and alcohol 18.3 years (Table 2). The average duration of tobacco use was 14.5 years, cannabis 10.5 years, and alcohol 10 years (Table 2). Thirty-eight percent of patients had a family history of psychiatric disorders, 9.2%

had a family history of suicide attempt, and 6.4% had a family history of suicide (Table 1). The most common psychiatric disorder was schizophrenia (62%), followed by depression (13.6%), acute psychotic episode (10%), bipolar disorder (3.2%), paranoia (2.4%), and others (8%; Table 1). Therapeutic adherence and family support were of poor quality in 50% and 34% of patients, respectively. 31.2% of patients had a personal history of suicide attempts, of whom 39.5% had a single suicide attempt and 60.5% had repeated suicide attempts (Table 1). For those with a history of suicide attempts, the number of suicide attempts varied between 1 and 20 (average number of 2.47). The psychopathological context of the suicide attempts was depression (45%), hallucination (18.3%), impulsivity (16.9%), delirium (14.1%), and others (5.7%; Table 3). Jumping from heights was the most common method of suicide attempt, accounting for 31% of cases, followed by hanging in 18.3% of cases (Table 3).

### Factors Associated With Suicide Attempts

With regard to sociodemographic and clinical characteristics, some differences were observed between patients with a personal history of suicide attempts and those who had never made suicide attempts (Table 1). A personal history of suicide attempt was significantly higher among women compared to men (45.5% vs. 27.2%), and this difference was statistically significant ( $p = .0099$ ). Similarly, alcohol consumption differed significantly between patients with or without a personal history of suicide attempts, and this difference was statistically significant ( $p = .0063$ ). Our analysis also revealed that patients with a personal history of suicide attempts had a significantly higher prevalence of family history of psychiatric disorders ( $p = .002$ ), family history of suicide attempt ( $p = .00004$ ), and family history of suicide ( $p = .018$ ) compared to those who had never made suicide attempts. Likewise, the distribution of diagnosed psychiatric disorders differed significantly between patients with or without a personal history of suicide attempts, and this difference was statistically significant ( $p = .02$ ). However, there were no statistically significant differences in use of tobacco ( $p = .4844$ ) or cannabis ( $p = .2991$ ) between patients with or without a personal history of suicide attempts. There were also no statistically significant differences between the two groups regarding personal history of psychiatric hospitalization ( $p = .1173$ ), therapeutic adherence ( $p = .3771$ ), and family support ( $p = .4554$ ).

The multivariate analysis confirmed the association between gender ( $p = .0012$ ), alcohol use ( $p = .0033$ ), and family history of suicide attempts ( $p = .0008$ ; Table 4).

**Table 1.** Univariate analysis of sociodemographic and clinical characteristics in the study population

	Total % (n)	Personal history of suicide attempt		OR [95% CI]	p
		Yes % (n)	No % (n)		
Subjects	100 (250)	31.2 (78)	68.8 (172)		
Gender					
Male	78 (195)	27.2 (53)	72.8 (142)	<b>0.44 [0.24-0.83]</b>	<b>.0099</b>
Female	22 (55)	45.5 (25)	54.5 (30)		
Age group (years)					
15–20	9.2 (23)	43 (10)	56.5 (13)		.0919
21–40	62.2 (155)	26.5 (41)	73.5 (114)		
41–68	28.5 (72)	38 (27)	62 (45)		
Residence					
Urban	81 (202)	30 (60)	70 (142)	0.68 [0.35–1.32]	.1348
Rural	19 (48)	37.5 (18)	62.5 (30)		
Civil status					
Widow(er)	1.2 (3)	66.7 (2)	33.3 (1)		.1133
Divorced	8.8 (22)	50 (11)	50 (11)		
Single	68 (170)	29 (50)	71 (120)		
Married	22 (55)	27.3 (15)	72.7 (40)		
Professional activity					
Employed	23.6 (59)	25.4 (15)	74.6 (44)	0.69 [0.35–1.33]	.1392
Unemployed	76.4 (191)	33 (63)	67 (128)		
Personal history of psychiatric hospitalization					
Yes	81.5 (203)	33 (67)	67 (136)	1.56 [0.74–3.27]	.1173
No	18.5 (47)	23.9 (11)	76.1 (36)		
Tobacco use					
Yes	64.3 (160)	31.3 (50)	68.7 (110)	0.9 [0.5–1.7]	.4844
No	35.7 (90)	31.5 (28)	68.5 (62)		
Cannabis					
Yes	49.2 (123)	33.1 (40)	66.9 (83)	1.15 [0.67–1.9]	.2991
No	50.8 (127)	29.9 (38)	70.1 (89)		
Alcohol					
Yes	36 (90)	41.6 (37)	58.4 (53)	<b>2.03 [1.16-3.5]</b>	<b>.0063</b>
No	64 (160)	25.9 (41)	74.1 (119)		
Family history of					
Psychiatric disorders					
Yes	38 (95)	42.1 (40)	57.9 (55)	<b>2.23 [1.3-3.8]</b>	<b>.0020</b>
No	62 (155)	24.5 (38)	75.5 (117)		
Suicide attempts					
Yes	9.2 (23)	69.6 (16)	30.4 (7)	<b>6 [2.3-15.5]</b>	<b>.00004</b>
No	90.8 (227)	27.3 (62)	72.2 (165)		
Suicide					
Yes	6.4 (16)	56.3 (9)	43.8 (7)	<b>3 [1.1-8.5]</b>	<b>.0181</b>
No	93.6 (234)	29.5 (69)	70.5 (165)		

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**Table 1.** (Continued)

	Total % (n)	Personal history of suicide attempt		OR [95% CI]	p
		Yes % (n)	N % (n)		
Diagnosed psychiatric disorder					
Schizophrenic disorder	62.8 (157)	26.75 (42)	73.25 (115)		<b>.0200</b>
Depression	13.6 (34)	55.88 (19)	44.12 (15)		
Acute psychotic episode	10 (25)	24 (6)	76 (19)		
Bipolar disorder	3.2 (8)	50 (4)	50 (4)		
Paranoia	2.4 (6)	33.33 (2)	66.67 (4)		
Others	8 (20)	25 (5)	75 (15)		
Therapeutic adherence					
Good	50 (125)	32.3 (40)	67.7 (85)	1.09 [0.6–1.8]	.3771
Poor	50 (125)	30.4 (38)	69.6 (87)		
Family support					
Good	66 (165)	31.1 (51)	68.9 (114)	0.96 [0.5–1.7]	.4554
Poor	34 (85)	31.8 (27)	68.2 (58)		

Note. Bolded values indicate statistically significant results.

## Discussion

Suicide is a worrying public health problem and is among the leading causes of death worldwide (De Leo & Evans, 2004). Therefore, the main objectives of our work were to investigate the prevalence of and risk factors associated with suicide attempts among patients with severe psychiatric disorders in Eastern Morocco.

Our study has revealed a high prevalence (31.2%) of suicide attempts among psychiatric patients. This prevalence of suicide attempts is much higher compared to what has been reported in the general Moroccan population where it was estimated at 2.1% (Agoub et al., 2006). This result is in agreement with other studies which have shown that the risk of suicide increases by 30 in the presence of a mood disorder and by 20 in the case of schizophrenia compared to the general population (Baldessarini & Tondo, 2020; Barrimi et al., 2014). This finding is also in line with several other studies that reported a high rate of suicide attempts among patients with depression (Röcker & Bachmann, 2015; Shibre et al., 2014), schizophrenia (Niehaus et al., 2004; Shibre et al., 2014), and mood disorders (Beautrais et al., 1996; Isometsä, 2014). However, the prevalence of suicide attempts in patients with mood disorders varied considerably between studies; it was found to be from 30% to 40% in patients with major depressive disorders and around 50% in patients with bipolar disorder (Isometsä, 2014).

Our study showed that jumping from heights was the most common methods of suicide attempts (31%), followed by hanging (18%), self-poisoning (drug, caustic, and rodenticide), and injury (self-cutting and self-stabbing).

Therefore, our patients had commonly used violent suicidal means. This result is probably due to the fact that our patients are recruited at the level of a psychiatric hospital and have severe psychiatric illnesses, such as psychotic disorders (schizophrenia, delusional disorder, etc.) or mood disorders (depressive disorders, bipolar disorders, etc.). Our result is in agreement with previous studies which showed that, psychiatric patients, regardless of disorder, died by suicide by jumping from heights more often than by hanging (Park et al., 2013). Furthermore, other studies showed that psychotic disorders were associated with jumping from heights, while substance-related disorders were associated with self-poisoning (Huisman et al., 2010; Persett et al., 2018). Similarly, self-poisoning was the most often used method for suicide attempts in many countries (Filippatos & Karasi, 2017; Lee et al., 2012; Muheim et al., 2013). Therefore, the methods of suicide attempts may vary among countries and depend

**Table 2.** Prevalence and characteristics of psychoactive drugs use in the study population

	Psychoactive drugs		
	Tobacco	Cannabis	Alcohol
Prevalence (%)	64	50	34
Age of onset			
Average (years)	17.5	18	18.3
Range (years)	8–55	8–46	10–38
Average duration of use			
Average (years)	14.5	10.5	10
Range (years)	1–41	0.33–38	0.2–33

**Table 3.** Psychopathological context and methods of suicide attempts among patients with a history of suicide attempts

Context	%	Method	%
Depression	45	Jumping from heights	31
Hallucination	18.3	Hanging	18.3
Impulsivity	16.9	Drug self-poisoning	11.3
Delirium	14.1	Caustic ingestion	7
Others	5.7	Rodenticide ingestion	4.2
		Self-cutting	8.5
		Self-stabbing	8.5
		Other	11.2

on many factors such as gender, psychiatric disorder, availability of suicide methods, and regulations like gun control and drug prescribing practices.

With regard to risk factors for suicide attempts, our multivariate analysis revealed significant association of female gender, alcohol use, and family history of suicide attempts with suicide attempts among psychiatric patients. Indeed, our study showed that a personal history of suicide attempt was significantly higher among women compared to men, and this difference was statistically significant. This result confirmed previous findings that suicide attempt rates were higher among women than men in many countries (Filippatos & Karasi, 2017; Lee et al., 2012; Muheim et al., 2013; Narishige et al., 2014; Zhao et al., 2015). In line with these findings, a study has explained the gender difference in suicidal behavior by the fact that women survive suicide attempts more often than men because they use less lethal means (Freeman et al., 2017).

In our study, we found that alcohol and cannabis use were higher in patients with a personal history of suicide attempts compared to those who had never made suicide attempts. Moreover, the association between alcohol use and suicide attempts among psychiatric patients was significant on the multivariate analysis. This finding is in agreement with previous studies which indicate that alcohol use disorder is a potent risk factor for suicidal behavior (Conner & Bagge, 2019). The association between substance abuse and suicidal behavior is widely established, and the prevalence of substance use among suicidal patients varies between 10% and 73% (Cho, 2020; Hesse et al., 2020; Liu et al., 2018). Similarly, substance use

disorders have been shown to be strongly associated with the risk of suicide attempts in people with severe psychiatric disorders (Østergaard et al., 2017).

In our study, we also found that patients with a personal history of suicide attempts had a significantly higher prevalence of family history of suicide attempts and family history of suicide compared to those who had never made suicide attempts. Several authors have reported that the occurrence of a suicide attempts or suicide in the family constitutes a risk factor for suicide attempts (Subramanian et al., 2020). Suicide rates in this population would be 18 times higher than the general population (De Leo & Evans, 2004).

## Limitations

Our study has several limitations. First, the study was carried out at a single hospital and during a short period of time. Second, because only hospitalized patients were enrolled in the study, a selection bias may influence the outcome of the analysis. Third, because suicidal behavior is highly stigmatized in Morocco, the number of patients who have made a suicide attempt may be underestimated. Fourth, we were unable to determine whether some of the risk factors we identified were present prior to the suicide attempts made by patients or whether they occurred after them.

## Conclusion

Despite the aforementioned limitations, this study provides for the first indication of the prevalence of and risk factors for suicide attempts among patients with severe psychiatric disorders in Eastern Morocco. In our study, three potential risk factors were identified: female gender, alcohol use, and family history of suicide attempts. Our findings justify the need to provide specialized support to patients with psychiatric disorders because many of them have a history of suicide attempts, especially when they have one or more of the three risk factors mentioned above.

**Table 4.** Multivariate analysis of variables associated with suicide attempts in the study population

	OR	95% CI	z	p
Alcohol (yes/no)	2.5940	[1.3737, 4.8983]	2.9389	.0033
Family history of suicide attempts (yes/no)	5.2329	[1.9844, 13.7991]	3.3452	.0008
Gender (m/f)	0.3120	[0.1539, 0.6326]	−3.2297	.0012

Note. OR = odds ratio.

## References

- Agoub, M., Moussaoui, D., & Kadri, N. (2006). Assessment of suicidality in a Moroccan metropolitan area. *Journal of Affective Disorders*, 90(2–3), 223–226. <https://doi.org/10.1016/j.jad.2005.09.014>
- American Psychiatric Association. (2003). *Practice guideline for the assessment and treatment of patients with suicidal behaviors*. [https://psychiatryonline.org/pb/assets/raw/sitewide/practice\\_guidelines/guidelines/suicide.pdf](https://psychiatryonline.org/pb/assets/raw/sitewide/practice_guidelines/guidelines/suicide.pdf)
- Baldessarini, R. J., & Tondo, L. (2020). Suicidal risks in 12 DSM-5 psychiatric disorders. *Journal of Affective Disorders*, 271, 66–73. <https://doi.org/10.1016/j.jad.2020.03.083>
- Barrimi, M., Maazouzi, M., Malakt, S., Lazaar, S., & Khaoulani, H. (2020). Les idées et les tentatives de suicide chez les étudiants en médecine au Maroc : Résultats d'une étude multicentrique [Suicidal ideation and attempts among medical students in Morocco: Results of a multicenter study]. *Annales Médico-psychologiques, revue psychiatrique*, 178(5), 481–486. <https://doi.org/10.1016/j.amp.2018.11.012>
- Barrimi, M., Zaidi, K., Hlal, H., Kettani, N., Khelafa, S., Rammouz, I., & Aalouane, R. (2014). Tentatives de suicides violentes à l'hôpital général de Fès (Maroc) : Évaluation et prise en charge en psychiatrie de liaison. Étude prospective sur six mois [Attempted violent suicides at the general hospital of Fez (Morocco): Assessment and management in liaison psychiatry. Six-month prospective study]. *L'Évolution Psychiatrique*, 79(4), 619–628. <https://doi.org/10.1016/j.evopsy.2013.07.003>
- Beautrais, A. L., Joyce, P. R., Mulder, R. T., Fergusson, D. M., Deavoll, B. J., & Nightingale, S. K. (1996). Prevalence and comorbidity of mental disorders in persons making serious suicide attempts: A case-control study. *The American Journal of Psychiatry*, 153(8), 1009–1014. <https://doi.org/10.1176/ajp.153.8.1009>
- Cho, M. S. (2020). Use of alcohol, tobacco, and caffeine and suicide attempts: Findings from a nationally representative cross-sectional study. *Journal of Primary Care & Community Health*, 11, 2150132720913720. <https://doi.org/10.1177/2150132720913720>
- Conner, K. R., & Bagge, C. L. (2019). Suicidal behavior: Links between alcohol use disorder and acute use of alcohol. *Alcohol Research: Current Reviews*, 40(1), 02. <https://doi.org/10.35946/arrcr.v40.1.02>
- De Leo, D., & Evans, R. (2004). *International suicide rates and prevention strategies*. Hogrefe & Huber.
- Filippatos, G., & Karasi, E. (2017). Characteristics of attempted suicide patients presenting to a Greek emergency department. *Health Science Journal*, 11(3), 503. <https://doi.org/10.21767/1791-809X.1000503>
- Freeman, A., Mergl, R., Kohls, E., Székely, A., Gusmao, R., Arensman, E., Koburger, N., Hegerl, U., & Rummel-Kluge, C. (2017). A cross-national study on gender differences in suicide intent. *BMC Psychiatry*, 17(1), 234. <https://doi.org/10.1186/s12888-017-1398-8>
- Hayashi, N., Igarashi, M., Imai, A., Osawa, Y., Utsumi, K., Ishikawa, Y., Tokunaga, T., Ishimoto, K., Harima, H., Tatebayashi, Y., Kumagai, N., Nozu, M., Ishii, H., & Okazaki, Y. (2010). Psychiatric disorders and clinical correlates of suicidal patients admitted to a psychiatric hospital in Tokyo. *BMC Psychiatry*, 10, 109. <https://doi.org/10.1186/1471-244X-10-109>
- Hesse, M., Thylstrup, B., Seid, A. K., & Skogen, J. C. (2020). Suicide among people treated for drug use disorders: A Danish national record-linkage study. *BMC Public Health*, 20(1), 146. <https://doi.org/10.1186/s12889-020-8261-4>
- Huisman, A., van Houwelingen, C. A. J., & Kerkhof, A. J. F. M. (2010). Psychopathology and suicide method in mental health care. *Journal of Affective Disorders*, 121(1–2), 94–99. <https://doi.org/10.1016/j.jad.2009.05.024>
- Isometsä, E. (2014). Suicidal behaviour in mood disorders – Who, when, and why? *The Canadian Journal of Psychiatry*, 59(3), 120–130. <https://doi.org/10.1177/070674371405900303>
- Kessler, R. C., Borges, G., & Walters, E. E. (1999). Prevalence of and risk factors for lifetime suicide attempts in the national comorbidity survey. *Archives of General Psychiatry*, 56(7), 617. <https://doi.org/10.1001/archpsyc.56.7.617>
- Lee, C. A., Choi, S. C., Jung, K. Y., Cho, S. H., Lim, K. Y., Pai, K. S., & Cho, J. P. (2012). Characteristics of patients who visit the emergency department with self-inflicted injury. *Journal of Korean Medical Science*, 27(3), 307. <https://doi.org/10.3346/jkms.2012.27.3.307>
- Liu, B.-P., Qin, P., Liu, Y.-Y., Yuan, L., Gu, L.-X., & Jia, C.-X. (2018). Mental disorders and suicide attempt in rural China. *Psychiatry Research*, 261, 190–196. <https://doi.org/10.1016/j.psychres.2017.12.087>
- Muheim, F., Eichhorn, M., Berger, P., Czernin, S., Stoppe, G., Keck, M., & Riecher-Rössler, A. (2013). Suicide attempts in the county of Basel: Results from the WHO/EURO multicentre study on suicidal behaviour. *Swiss Medical Weekly*, 143, w13759. <https://doi.org/10.4414/smw.2013.13759>
- Narishige, R., Kawashima, Y., Otaka, Y., Saito, T., & Okubo, Y. (2014). Gender differences in suicide attempters: A retrospective study of precipitating factors for suicide attempts at a critical emergency unit in Japan. *BMC Psychiatry*, 14(1), 144. <https://doi.org/10.1186/1471-244X-14-144>
- Niehaus, D. J. H., Laurent, C., Jordaan, E., Koen, L., Oosthuizen, P., Keyter, N., Muller, J. E., Mbanga, N. I., Deleuze, J.-F., Mallet, J., Stein, D. J., & Emsley, R. (2004). Suicide attempts in an African schizophrenia Population: An assessment of demographic risk factors. *Suicide and Life-Threatening Behavior*, 34(3), 320–327. <https://doi.org/10.1521/suli.34.3.320.42778>
- Østergaard, M. L. D., Nordentoft, M., & Hjorthøj, C. (2017). Associations between substance use disorders and suicide or suicide attempts in people with mental illness: A Danish nationwide, prospective, register-based study of patients diagnosed with schizophrenia, bipolar disorder, unipolar depression or personal: Substance use and suicide behaviour. *Addiction*, 112(7), 1250–1259. <https://doi.org/10.1111/add.13788>
- Park, S., Ahn, M. H., Na, R., Kim, S.-O., Yoon, J. S., Park, J.-H., & Hong, J. P. (2013). Factors associated with suicide method among psychiatric patients in a general hospital in Korea. *Psychiatry Research*, 210(3), 945–950. <https://doi.org/10.1016/j.psychres.2013.08.037>
- Persett, P. S., Grimholt, T. K., Ekeberg, O., Jacobsen, D., & Myhren, H. (2018). Patients admitted to hospital after suicide attempt with violent methods compared to patients with deliberate self-poisoning – A study of background variables, somatic and psychiatric health and suicidal behavior. *BMC Psychiatry*, 18(1), 21. <https://doi.org/10.1186/s12888-018-1602-5>
- Qin, P., & Nordentoft, M. (2005). Suicide risk in relation to psychiatric hospitalization: Evidence based on longitudinal registers. *Archives of General Psychiatry*, 62(4), 427–432. <https://doi.org/10.1001/archpsyc.62.4.427>
- Röcker, S., & Bachmann, S. (2015). Suizidalität bei psychischen Erkrankungen – Prävention und Behandlung [Suicidality in mental illness – Prevention and treatment]. *Therapeutische Umschau*, 72(10), 611–617. <https://doi.org/10.1024/0040-5930/a000727>
- Shibre, T., Hanlon, C., Medhin, G., Alem, A., Kebede, D., Teferra, S., Kullgren, G., Jacobsson, L., & Fekadu, A. (2014). Suicide and suicide attempts in people with severe mental disorders in Butajira, Ethiopia: 10 year follow-up of a population-based cohort. *BMC Psychiatry*, 14(1), 150. <https://doi.org/10.1186/1471-244X-14-150>
- Sinclair, J. M. A., Gray, A., & Hawton, K. (2006). Systematic review of resource utilization in the hospital management of deliberate

self-harm. *Psychological Medicine*, 36(12), 1681–1693. <https://doi.org/10.1017/S0033291706008683>

Subramanian, K., Menon, V., Sarkar, S., Chandrasekaran, V., & Selvakumar, N. (2020). Study of risk factors associated with suicide attempt in patients with bipolar disorder type I. *Journal of Neurosciences in Rural Practice*, 11(2), 291–298. <https://doi.org/10.1055/s-0040-1709347>

Zarrouq, B., Bendaou, K., Rammouz, I., Lyoussi, B., Nejari, C., & El Rhazi, K. (2014). Risque suicidaire et tentatives de suicide en milieu scolaire marocain, Centre Nord du Maroc [Suicidal risk and suicide attempts in Moroccan schools, North Center of Morocco]. *Revue d'Epidémiologie et de Santé Publique*, 62 (Suppl 5), S182–S183. <https://doi.org/10.1016/j.respe.2014.06.038>

Zhao, C., Dang, X., Su, X., Bai, J., & Ma, L. (2015). Epidemiology of suicide and associated socio-demographic factors in emergency department patients in 7 general hospitals in North-western China. *Medical Science Monitor*, 21, 2743–2749. <https://doi.org/10.12659/MSM.894819>

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