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Real world assessments of suicide ideation and behavior: Challenges and next steps.

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Key Points

1. ****Suicide is a complex topic****
2. Suicide risk, ideation, behavior and death represents heterogenous, but related, concepts
3. Individuals at risk of suicide are a heterogeneous population
4. Suicide risk is multifactorial, and the effects of some factors may vary depending on others
5. Research examining suicide should be aware of the subject's complexity and consider it when interpreting results



Fluctuating nature of suicidality

- Suicidal ideation can vary dramatically over course of the day
 - Retrospective report may not always capture previous suicidality
- Deisenhammer et al., 2009
 - Nearly half of participants (47.6%) in one study reported that the period between first current thought of suicide and actual attempt lasted 10 minutes or less.
- Presence of suicidal ideation as an outcome may have limited utility if measured infrequently
- Frequency/duration/intensity of periods of suicidal ideation may be another measure of response to treatment



Heterogeneity of suicidality

- Using deaths from suicide as an outcome is often not feasible
 - Ethically, individuals identified as at-risk must receive some form of treatment
 - Death from suicide is rare
 - 10.5 per 100,000 population globally in 2016
 - Even in one of the highest risk populations (psychiatric inpatients), rate is five per 1000 (0.5%) occupied beds per year

StatCalc - Sample Size and Power

Unmatched Case-Control Study (Comparison of ILL and NOT ILL)

Two-sided confidence level: 95%

Power: 80%

Ratio of controls to cases: 1

Percent of controls exposed: 0.5%

Odds ratio: 0.49875

Percent of cases with exposure: 0.25%

	Kelsey	Fleiss	Fleiss w/ CC
Cases	9384	9383	10167
Controls	9384	9383	10167
Total	18768	18766	20334

World Health Organization. 2018. Mental health atlas 2017. Geneva: World Health Organization. p. 51-52.

Bolton JM, Gunnell D, Turecki G. 2015. Suicide risk assessment and intervention in people with mental illness. BMJ. 351:h4978.



Ideation, behavior and death

- Suicidal ideation and attempts are often used as a measure of suicide risk
- Limitations
 - Difficult to differentiate between degrees of suicidal ideation and lethality of attempts in research settings



Heterogeneity of suicidality

- Suicidal ideation and attempts are often used as a measure of suicide risk
- Suicidal ideation is distinct from death from suicide
 - Low prevalence of SI in >65 years-old (1.6%)
 - Despite low prevalence of SI in white males >75 years, they are a demographic with one of the highest rates of death from suicide (~40 per 100,000)

Harmer B, Lee S, Duong TVH, Saadabadi A. Suicidal Ideation. In: *StatPearls*. Treasure Island (FL): StatPearls Publishing; May 2, 2022.

Parra-Uribe I, Blasco-Fontecilla H, Garcia-Parés G, et al. Risk of re-attempts and suicide death after a suicide attempt: A survival analysis. *BMC Psychiatry*. 2017;17(1):163. Published 2017 May 4. doi:10.1186/s12888-017-1317-z



Heterogeneity of suicidality

- Suicidal ideation and attempts are often used as a measure of suicide risk
- Suicidal ideation is distinct from death from suicide
 - Survey of Canadian population
 - Significantly higher prevalence of suicidal ideation in year after pandemic began (4.2%) compared to pre-pandemic/2019 (2.7%)
 - Rate of death from suicide in Canada decreased (McIntyre et al., 2021)
 - 10.82 deaths per 100,000 in March 2019 – February 2020
 - 7.34 per 100,000 in March 2020 – February 2021

Liu L, Pollock NJ, Contreras G, Tonmyr L, Thompson W. Prevalence of suicidal ideation among adults in Canada: Results of the second Survey on COVID-19 and mental health. *Health Rep.* 2022;33(5):13-21. doi:10.25318/82-003-x202200500002-eng

McIntyre RS, Lui LM, Rosenblat JD, et al. Suicide reduction in Canada during the COVID-19 pandemic: lessons informing national prevention strategies for suicide reduction. *J R Soc Med.* 2021;114(10):473-479. doi:10.1177/01410768211043186



Heterogeneity of suicidality

- Suicidal ideation and attempts are often used as a measure of suicide risk
- Limitations
 - Using attempts as a surrogate measure for risk has similar limitations
 - Spanish observational study of first-time attempters, $n = 1241$ (Parra-Urbe et al., 2017)
 - Older age was a protective factor against future suicide attempt...
 - But older age was also associated with increased risk of death from suicide



Heterogeneity of populations at-risk

- Diverse patterns of suicidal ideation may reflect different types of risk.
- Longer time span between first thought of suicide and attempt associated with significantly higher suicidal intent.



Heterogeneity of populations at-risk

- Cluster analysis in Toronto suggests different characteristics associated with different methods used
 - Deaths from suicide in older individuals more associated with stressful life events
 - Conversely, stressful life events were less of a factor in deaths from suicide in patients with severe mental illness (ex. Schizophrenia and bipolar disorder)



Risk factors and suicide risk

- Many factors contribute to suicide risk
- Some factors associated with increased suicide risk:
 - Suicidal ideation
 - History of suicide attempts
 - Depression
 - Insomnia
 - Pain
 - Substance use



Risk factors and suicide risk

- The interplay between factors can complicate our ability to understand risk
- Rogers et al. (2018)
 - Severity of depression on BDI correlated with history of suicide attempts
 - BSS suicidal ideation was strongly related to BDI depression
 - BSS suicidal ideation was strongly related to history of suicide attempts



Risk factors and suicide risk

- The interplay between factors can complicate our ability to understand risk
- Rogers et al. (2018)
 - BUT...
 - BSS suicidal ideation had a stronger relationship with a history of attempts at lower levels of BDI depression
 - Furthermore...
 - The relationship between suicidal ideation and history of suicide attempts was stronger at higher energy



Risk factors and suicide risk

- The interplay between factors can complicate our understanding of risk
- Insight in first-episode psychosis and suicidal ideation and behavior
 - Meta-analysis (Challis, 2013)
 - **Greater insight** was associated with **increased risk** of self-harm (OR=1.64)
 - Bornheimer, 2021
 - **Increased insight** associated with **increased** likelihood of experiencing suicidal ideation



Different factors may be more relevant to different research goals



Different factors may be more relevant to different research goals

- **Understanding** drivers of suicidal ideation and behavior
- **Classifying** populations at-risk
- **Screening** populations to identify those at-risk
- **Assessing** risk to determine acute hospital management
- **Determining** steps to decrease imminent risk
- **Personalizing** treatment plans based on the individual
- **Monitoring** changes in suicidal ideation and behavior during treatment
- **Measuring** decreases in rates of suicide after an intervention/initiative
- **Predicting** if someone is likely to die from suicide
- **Developing** population level policies/programs/initiatives to prevent suicide



Risk factors and suicide risk

- Suicide research should consider the relation of considerations to the **purpose/goal** of the study/intervention
 - **Access to means**
 - Highly relevant in **clinical assessment/treatment planning** and **public health measures**
 - Less useful as an outcome to **measure response to a pharmacological agent**
 - **Age/race/gender**
 - May be useful in **understanding** suicidality and suicide risk
 - May help in **matching** patient to specific interventions
 - **Ethical concerns** (discrimination) if heavily weighted in AI-driven determination of **involuntary commitment**

New Methods for Assessing Suicide Risk

Suicide Ideation and Behavior Assessment Tool (SIBAT)

- Designed to act as comprehensive assessment of risk/protective factors and warning signs
- Intended for the detection of changes in suicidal ideation and behavior over time

Ecological Momentary Assessment (EMA)

- Repeated assessment of specific items throughout day
- Increased validity compared to retrospective report
- Can capture transient symptoms

Digital Phenotyping

- Collection of passive data such as GPS location, speech samples, keyboard activity, actigraphy

Alphs L, Fu DJ, Williamson D, et al. Suicide Ideation and Behavior Assessment Tool (SIBAT): Evaluation of Intra- and Inter-Rater Reliability, Validity, and Mapping to Columbia Classification Algorithm of Suicide Assessment. *Psychiatry Res.* 2020;294:113495. doi:10.1016/j.psychres.2020.113495

Ballard ED, Gilbert JR, Wusinich C, Zarate CA Jr. New Methods for Assessing Rapid Changes in Suicide Risk. *Front Psychiatry.* 2021;12:598434.

Kleiman EM, Turner BJ, Fedor S, Beale EE, Huffman JC, Nock MK. Examination of real-time fluctuations in suicidal ideation and its risk factors: Results from two ecological momentary assessment studies. *J Abnorm Psychol.* 2017;126(6):726-738.



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Thank you for your attention!

