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Research Review: "A Practical Risk Calculator for Suicidal Behavior Among Transitioning U.S. Army Soldiers"

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A practical risk calculator for suicidal behavior among transitioning U.S. Army soldiers: results from the Study to Assess Risk and Resilience in Servicemembers-Longitudinal Study (STARRS-LS)

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ABSTRACT:

"Background. Risk of suicide-related behaviors is elevated among military personnel transitioning to civilian life. An earlier report showed that high-risk U.S. Army soldiers could be identified shortly before this transition with a machine learning model that included predictors from administrative systems, self-report surveys, and geospatial data. Based on this result, a Veterans Affairs and Army initiative was launched to evaluate a suicide-prevention intervention for high-risk transitioning soldiers. To make targeting practical, though, a streamlined model and risk calculator were needed that used only a short series of self-report survey questions.

Methods. We revised the original model in a sample of n = 8335 observations from the Study to Assess Risk and Resilience in Servicemembers-Longitudinal Study (STARRS-LS) who participated in one of three Army STARRS 2011–2014 baseline surveys while in service and in one or more subsequent panel surveys (LS1: 2016-2018, LS2: 2018-2019) after leaving service.

We trained ensemble machine learning models with constrained numbers of item-level survey predictors in a 70% training sample. The outcome was self-reported post-transition suicide attempts (SA). The models were validated in the 30% test sample.

Results. Twelve-month post-transition SA prevalence was 1.0% (S.E. = 0.1). The best constrained model, with only 17 predictors, had a test sample ROC-AUC of 0.85 (S.E. = 0.03). The 10-30% of respondents with the highest predicted risk included 44.9-92.5% of 12-month SAs.

Conclusions. An accurate SA risk calculator based on a short self-report survey can target transitioning soldiers shortly before leaving service for intervention to prevent post transition SA."

RESEARCH HIGHLIGHTS:

- This study looked at how to prevent suicide among military personnel who are at a high risk during their transition to civilian life.

- Utilizing a prediction model, the probability of suicide attempts was assessed by employing the Super Learner (SL) technique, analyzing 220 data points from surveys and records. The model was further streamlined to 64 key factors, ultimately identifying 30% of transitioning service members at a high risk of suicide, encompassing 92.5% of all documented suicide attempts.

- Median age of respondents was 26, predominantly male (84.9%), Non-Hispanic White (67.4%), heterosexual (93.8%), with a high school education (69.7%), mostly married or never married, with a significant proportion separated from the Army (87.8%).

- The study highlights the need for targeted support for transitioning U.S. service members (TSMs) as most current support is universal and lacks focus on individuals with the greatest need.

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Implications

FOR PRACTICE

From these findings, practitioners should investigate and gain a deeper understanding of counter-intuitive associations identified in the study, such as the negative association between multiple combat deployments and self-reported suicide attempts. Table 3 in the article provides the list of factors that were the best predictors. In addition to aiming for a future assessment tool, practitioners would benefit from understanding the essential client information to gather. This knowledge can lead to better-targeted interventions and support for transitioning U.S. service members, (TSMs). In addition to the risk calculator, practitioners should consider exploring precision treatment models to match high-risk TSMs with the most appropriate and effective interventions and services based on their individual needs and characteristics.

FOR POLICY

Policy implications from these findings include a need for policy changes in the Department of Defense (DoD) and Veterans Affairs (VA) to move away from universal support for transitioning service members (TSMs) and towards targeted assistance. Findings also support policy efforts to gather and integrate relevant data about TSM's before their transition from active service, including attention to the patterns identified by the model regarding predictors of self-reported suicide attempts after leaving service. Overall, the study provides evidence for policies that shift towards targeted support, data-driven decision-making, and a focus on understanding the unique risk profiles of transitioning service members.

FOR FUTURE RESEARCH

Future research should seek to support further scale development or refinement, replicate using different data for external validation, or develop longitudinal studies to assess the long-term effectiveness of the risk calculator and targeted interventions. This will help determine whether the model's accuracy remains consistent over time and whether the implemented interventions lead to improved outcomes for high-risk TSMs. To address the limitations of self-report assessments, future research could explore the use of administrative data to assess self-reported suicide attempts. This will enable a comparison of the accuracy of the model when using self-reports versus administrative records. Additional research could also explore the potential benefits of precision treatment models in matching high-risk TSMs (transitioning service members) with tailored interventions based on their individual characteristics and needs. Evaluating the effectiveness of such precision treatments may help optimize the allocation of resources and improve outcomes for at-risk individuals. Overall, the study's findings offer valuable insights for future research emphasizing the importance of data-driven approaches to support transitioning service members and reduce self-reported suicide attempts during their transition to civilian life.

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