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Editorial

Building on the past 50 years, not starting over: A balanced interpretation of meta-analyses, reviews, and commentaries on treatments for suicide and self-injury

Several recent meta-analyses and reviews on interventions for self-injurious thoughts and behaviors (SITBs) have been conducted [3–5,9,10,15,25,26,40]. The primary finding of these papers is that the observed effects of interventions for SITBs are generally quite small and are far from where we need to be as a field. Although we agree with these general findings, we disagree, however, with many of the overly bleak conclusions drawn from these findings that emphasize creating new treatments while discounting the benefit of improving existing interventions and the decades of research that were involved in creating them. In this paper, we begin by summarizing the broad findings from these reviews and meta-analyses and then offer future directions with promise to build upon and improve our existing treatments, while we simultaneously work to develop new ones.

1. Background

The suicide rate has steadily increased over the past few decades [6], despite a proliferation of trials testing new and longstanding interventions aimed to reduce self-injurious thoughts and behaviors (SITBs). One potential cause for this discrepancy is that available treatments for SITBs are not optimally effective, yet strong conclusions about overall treatment efficacy have remained elusive. Addressing this idea, within the past year at least six meta-analytic reviews [3,5,9,10,15,40] and three systematic narrative reviews [4,25,26] have been published covering randomized controlled trials (RCTs) and other evaluations of interventions for SITBs conducted to date. Many others have been published before this past year [29,33,34,39]. The main findings from these meta-analyses – that overall intervention effects on SITBs are quite small and have not improved over time – are sobering. As such, we agree unequivocally that there is considerable improvement to be made. We believe, however that the interpretations of the conclusions of these papers tend to present an overly bleak view of current treatments and tend to focus on developing new treatments instead of improving the ones we have. By doing so, they discount decades of research aimed at better understanding and treating psychological mechanisms that maintain SITBs (as well as the thousands of individuals helped by this research to date). Thus, we believe a more measured conclusion is warranted. Here, we present an alternative view that the current state of the literature, point to several ways in which we may *improve existing treatments to make them work better*, rather than "throwing the baby out with the bathwater." Central to our alternative interpretation of the finding of recent reviews is the view that we have not yet reached the efficacy "ceiling" with existing treatment models. Accordingly, we offer three future directions with promise to improve the effect of existing treatments: (1) determine which intervention is needed for which person and at which time, (2) before concluding that brief interventions are just as efficacious as longer ones, conduct research that allows such conclusions to be drawn, and (3) evaluate the potential for comprehensive models of suicide prevention to be better than any one individual treatment.

2. We lack data on which intervention(s) are needed for which person and at which time

Fox et al. [10], the most comprehensive of all of the recent meta-analyses, emphasize the need to develop new treatments instead of improving the treatments we already have. In reality, we can both create new treatments and improve existing interventions, an idea in line with NIMH's current priorities [13]. Fox et al. [10] only briefly note some ways that we could increase efficacy of existing treatments, for example suggesting that there may be some promise in using idiographic models to capture who might respond best to any given treatment. We agree with this idea but believe that idiographic models have more potential to improve existing treatments than would be apparent from the conclusions of this meta-analysis. Indeed, determining what treatment(s) work for whom is an area of increasing interest in psychiatry, and even specifically SITBs. Promising work on personalized treatment for anxiety [31] and depression [7] lends support to this optimism. Groundbreaking work by Kessler et al. [17] on Precision Treatment Rules provides a highly-scalable machine learning framework to combine multiple streams of data (e.g., electronic medical records (EMRs), social media posts, prior self-report data) to identify the optimal treatment for any given individual. Preliminary work using the Collaborative Assessment and Management of Suicidality (CAMS) supports the promise of this methodology for individuals at risk for suicide [18].

One inherent issue with purely idiographic approaches is that they require some amount of data to be collected to "get to know" the patient/participant before assignment to the optimal intervention. This could mean time is spent either assessing but not treating the patient or treating them with a suboptimal intervention before a more optimal one is assigned. Neither option is ideal and thus other methods that allow the merging of both individual and group level information (e.g., group iterative multiple model estimation (GIMME); [11,43]) present an opportunity to assign an intervention based on what is already known about the patient (e.g., using baseline data or EMR data to identify subgroups) and then modify intervention assignment based on individual data (e.g., how well the patient responds to an intervention).

Beyond identifying who needs which intervention(s), it is important

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that we also study *when* someone needs an intervention. Recent advances in technology that have been featured heavily in SITB assessment research [21,22] have now made their way to intervention research, making it more possible to design and implement interventions tailored to the person and the context. Newer research designs, such as the Micro-Randomized Trial [20] and Sequential, Multiple Assignment, Randomized Trial (SMART; [24]) allow researchers to gain insight into whether someone's current context (e.g., location, prior ratings of suicide risk, activity during the day) impact the effect of an intervention. Such models allow us to learn when an intervention may have the best effect. New treatment delivery methods such as ecological momentary intervention (EMI) and especially just-in-time adaptive interventions (JITAI; [30]) leverage findings from these studies and have the potential to allow delivery of interventions precisely when they are needed, dynamically adapting intervention delivery based on the observed effect of any given intervention event. There has been some work using JITAIs to target health behaviors like physical activity [14] and substance use [32]. Although not yet applied to SITBIs, these methods are particularly well-suited for targeting SITBs given research showing that suicidal thinking can arise quickly and fluctuate rapidly over just a few hours [23]. Many of these advances have emerged only in the past few years and studies using them take time. This means that there are likely many studies still in the early stages that may already have promise to improve the treatments we already have. Current searches of NIH Reporter and ClinicalTrials.gov support this idea: nearly a dozen SITB prevention studies using these technologies are ongoing.

3. We cannot yet conclude that brief interventions are just as efficacious as longer ones

A theme across several meta-analyses, as well as some recent reviews (e.g., [27]) is that brief interventions are preferable because they are just as efficacious as longer ones. For example, Fox et al. state: "Nearly all existing interventions tested within RCT studies produce similar effects, meaning that short, cheap, and easily accessible interventions appear to be just as efficacious as long, expensive, and difficult-to-access interventions. To maximize SITB reductions, we accordingly recommend that—for now—clinicians disseminate the most scalable existing interventions." *Provided that the interventions are equivalently efficacious,* we agree that brief, cost-effective, and easily accessible interventions are preferred over long, expensive, and difficult-to-access ones. However, *there is currently no such evidence of equivalence*. It only shows that length of treatment (here, the number of weeks) does not moderate treatment effects observed at the group level. This lack of moderation effect is insufficient to draw such a conclusion about brief interventions because (1) brief does not necessarily mean non-intensive or cheap (e.g., inpatient hospitalization does not typically span many weeks but is very intensive and expensive), (2) more severe cases may require longer treatment, and (3) the goals of brief interventions (e.g., to reduce imminent risk) and longer interventions (e.g., to address the underlying mechanisms of suicide risk) have different treatment targets.

Recommending that clinicians prioritize delivering short treatments to high-risk individuals is an overly broad and potentially dangerous suggestion. There are likely many differences between studies testing briefer treatments and studies testing longer treatments that would prohibit an accurate comparison between these types of treatments. For example, many studies of brief interventions compare a brief intervention (e.g., safety planning) combined with usual care to usual care alone [37]. Such studies thus prohibit comparison of treatment length given that all participants in the study, even those who receive the brief treatment, may also be receiving concurrent longer treatments. Comparative effectiveness trials designed to test superiority or non-inferiority are best equipped to compare these two types of treatments. A final point, related to the idea of understanding which treatment works for whom, is that longer treatments may be better for some people at some times. For example, there is mounting evidence that adolescents may benefit from longer, more comprehensive treatments that include family [1,28] or that individuals with borderline personality features are less likely to respond to briefer, targeted interventions [35].

4. Comprehensive models of suicide prevention have more promise than any single treatment

Although meta-analyses of individual treatments certainly have value, by comparing one single treatment to another, this approach inevitably ignores discussion of multi-level approaches (e.g., primary, secondary, and tertiary approaches) and multi-component approaches to prevention. The reviews that do (briefly) mention multi-level approaches to prevention generally support such ideas. [25]. It is not a new idea, especially within youth suicide, that interventions directed at each of the levels (e.g., school-based prevention, peer specialists, suicide hotlines) are likely needed, in combination, to have truly meaningful reductions in suicidal thoughts and behaviors [16,19,36,42]. A variety of complementary strategies may be needed together to reduce risk, rather than being pitted against each other "head to head" in a meta-analysis. Comparing one treatment to another ignores the benefit of comprehensive treatments that work together. This may be especially true in the case of brief and long-term treatments when the target of each treatment differs. For example, brief, fast-acting interventions designed to reduce the intense distress and agitation proximally associated with imminent suicide risk could help bridge the gap while patients learn the skills in a longer-term therapy that targets more distal risk factors.

Although this idea is relatively new in the study of suicide, multi-level and multi-component approaches to treatment have been applied to related domains for many years. A comprehensive meta-analysis published 15 years ago (summarizing research from as long as 35 years ago) finds that collaborative care is more effective than any single standard treatment for depression [12]. A growing body of work also exists for more complex types of comprehensive treatments for depression as well. Stepped care approaches that "step up" patients to higher levels of care when they do not respond to less intense levels have established support (see [38] for review and meta-analysis). Advances have also been made in methods that determine a patient-specific combination of medication and therapy to treat depression [7,8]. Taken together, this work in depression provides reason for hope that similar comprehensive approaches may also be effective in reducing suicide risk.

New technology (e.g., EMI) makes comprehensive approaches even more possible. Such technology can take what is learned in session and bring it into the "real world," thereby improving the accessibility and efficacy of existing treatments [41]. However, this technology has only recently been widely accessible (e.g., as more people have smartphones). Thus, many of these early-stage treatments (several of which are listed on ClinicalTrials.gov) and others which have only recently been published [2] would not have been included in the aforementioned recent meta-analyses.

5. Conclusion: We view recent findings on the efficacy of suicide risk reduction interventions as the floor, not the ceiling, for SITB treatments

In this commentary, we strive to strike a balance between (a) the relatively pessimistic conclusions several recent meta-analyses, reviews, and commentaries make about the status of existing interventions for suicide risk reduction and (b) a more optimistic view of a way forward to improve the efficacy of our existing treatments. Although we do not discount the need to simultaneously develop new treatments, we also believe there is still much to be gained by building upon and improving existing treatments. There are several concrete (and already ongoing) ways to do this. Specifically, we believe there is great promise to improve existing treatments by gaining a better understanding of what

works for whom and when, testing and refining brief interventions, and determining the best combinations of treatments within comprehensive suicide prevention models moving forward.

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